

Project Management Workshop

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(PMP, PMI-ACP, CSM, SPOC, SDC, SAM, MCT, SCT, MBA, MCA, PGDOM, PGDFM, CIC, PRINCE2-Practitioner, ZED Master Trainer)

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Introduction

- Name
- Role
- Experience (Total/PM)
- Hobby
- Expectations

Workshop Agenda

- **Day 1:**
 - PMI & PMP
 - Project Management Framework
- **Day 2:**
 - Project Integration Management
 - Project Scope Management
- **Day 3:**
 - Project Time Management
 - Project Cost Management
- **Day 4:**
 - Project Quality Management
 - Project Human Resource Management
 - Project Communication Management
- **Day 5:**
 - Project Stakeholder Management
 - Project Risk Management
 - Project Procurement Management
 - Professional Responsibility

Workshop Ground Rules

- ✓ Please keep your mobile on the silent mode. Always take your calls outside the training room.
- ✓ No corner talk! Discussions only when group discussion is allowed
- ✓ Keep your focus on the ongoing topic. Await your turn during the questionnaire round.
- ✓ Strictly follow the workshop schedule for management of time.
- ✓ There is parking lot. Write you questions and post with your name on parking lot.
- ✓ Breaks only on agreed time
 - ✓ Tea
 - ✓ Lunch
 - ✓ Tea
- ✓ Everybody need to contribute
- ✓ Use your experience only for relating the processes and best practices. To avoid confusion keep it outside of the class. Unlearning is first and biggest learning to learn something new.
- ✓ Two Bowls

Workshop Objective

- ✓ *Learn Project Management best Practices* as per PMBOK 6th Edition
- ✓ *Build confidence to handle day to day Project Management Challenges*
- ✓ **Getting accustomed to new terminology** of Project Management
- ✓ **Understand the PMP® certification process**
- ✓ *Get familiarize* with number of *multiple choice questions* in line with the PMP® Certification
- ✓ *Build confidence to face the PMP® examination challenge*

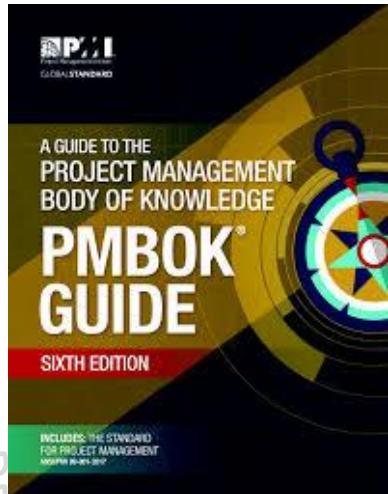
PMI® & PMP®

An Overview

PMI® - Overview

- ✓ Largest, not-for-profit global professional association for project management practitioners
- ✓ Established in 1969
- ✓ Governed by a Board of Directors; elected “volunteer” members
- ✓ PMI Office is in Newtown Square, Pennsylvania in the USA.
- ✓ Chapters act as “franchises”, providing education and networking opportunities

PMI Facts



5+ million copies



774,000+



207 Countries



10,000+



470,000+ members

CAPM®	33,880
PgMP®	1,957
PMI-RMP®	4,158
PMI-SP®	1,710
PMI-ACP®	16,283
(PfMP)®	450
(PMI-PBA)®	1,479

PMI® – Membership Benefits

- ✓ Get member's only discount on many of PMI's valuable products
- ✓ Free Access to all PMI Standards
- ✓ Subscriptions to PM Network®, Project Management Journal® and PMI Today™
- ✓ Access the Members Area of the Web site
- ✓ Access the PMI Member Community online

PMP® – Certification Benefits

- ✓ Provides professional and personal recognition
- ✓ Expedites professional advancement
- ✓ Creates job growth and opportunities within an organization
- ✓ Provides a framework for standardized project management requirements
- ✓ Increases an employee's value to the organization
- ✓ You have a truly global certification.
- ✓ PMI Certified Project Managers are a preferred lot by any organizations worldwide
- ✓ High Demand due to short supply of Certified PMP
- ✓ Increase in compensation within the organization

PMI Standards

Foundation Standards

1. PMBOK Guide 5th Edition, 2013/ 6th , 2016
2. Portfolio Management, 3rd Edition
3. Program Management, 3rd Edition
4. OPM3, 3rd Edition

Practice Standards

1. Practice Standard for Earn Value Management, 2nd
2. Practice Standard for Schedule Management, 2nd
3. Practice Standard for Risk Management
4. Practice Standard for Project Estimating
5. Practice Standard for Configuration Management
6. Practice Standard for Work Break Down Structure
7. Project Manager Competency Development Framework Profession

Practice Guides

1. Agile Practice Guide
2. Requirement Management Practice Guide
3. Governance of Portfolios, Program, Projects: A Practice Guide
4. Business Analysis for Practitioners: A Practice Guide
5. Implementing Organization Project Management: A Practice Guide
6. Navigation Complexity: A Practice Guide
7. Lexicon of Project Management Terms

Extensions

1. Construction Extension
2. Government Extensions

Certifications from PMI

1. Certified Associate in Project Management (CAPM)® certification
2. PMI Agile Certified Practitioner (PMI-ACP)® certification
3. PMI Risk Management Professional (PMI-RMP)® certification
4. PMI Scheduling Professional (PMI-SP)® certification
5. Portfolio Management Professional (PfMP) ® certification
6. Program Management Professional (PgMP)® certification
7. **Project Management Professional (PMP)® certification**
8. PMI Professional in Business Analysis (PMI-PBA)® certification

PMP Exam Prerequisite

- **Certification Body :** PMI (Project Management Institute, USA)
- 35 contact hours of formal education

AND

- Secondary degree (high school diploma, associate's degree or global equivalent) +
- Minimum five years/60 months unique non-overlapping professional project management experience during which at least 7,500 hours were spent leading and directing the project

OR

- Four-year degree (bachelor's degree or global equivalent) +
 - Minimum three years/36 months unique non-overlapping professional project management experience during which at least 4,500 hours were spent leading and directing the project*
-
- **Audit :** PMP exam application gets audited randomly.

Exam Fees, Validity, Exam

- **Exam Fees** : Fees for PMI members : \$405, Fees for PMI non-members: \$555
- **Re-Exam Fees** : Fees for PMI members : \$275, Fees for PMI non-members: \$375
- **Renewal Fees** : \$60 (for members), \$150 (for non-members). Certificate is valid for next three years.
- **Validity of certificate** : Certificate is valid only for 3 years. Within 3 years certified person need to accumulate 60 PDUs and submit to PMI through online interface.
- **Exam** : 4 hours. 200 questions. Close book exam. Passing Score not known. Online exam.

PMP Certification Process

1. Go through PMP training and get 35 Contact hours training
2. Get your experience data ready
3. Submit your application
4. Get your PMP application approved
5. Pay your PMI-Exam Fees
6. Book your exam at Prometric Center <http://prometric.com/PMI>
7. Write you exam & Pass

Questions Distribution in Exam

DOMAIN	% of Questions	# of Questions
Initiating	13%	26
Planning	24%	48
Executing	31%	62
Monitoring & Controlling	25%	50
Closing	7%	14

25 Questions are pre-test questions

Earning 60 PDU for Maintaining PMP

Before 3rd anniversary of your PMP certificate accumulate 60 PDU within 3 years and pay \$60 (Members)/ \$150 (Non-Members) to renew your certificate for another 3 years.

Ways to get 60 PDUs

- ✓ Update your Project Management Knowledge
 - ✓ Attend some training on project management
 - ✓ Self paced on-line training on project management
- ✓ Giving Back to society
 - ✓ Co-author PM book
 - ✓ Participate in Project Management Events
 - ✓ Write Paper /Article/ Blogs on PM
 - ✓ Speak on Project Management from PMI platforms
 - ✓ Conduct PM related trainings
 - ✓ Manage Projects using Project Management Methodologies

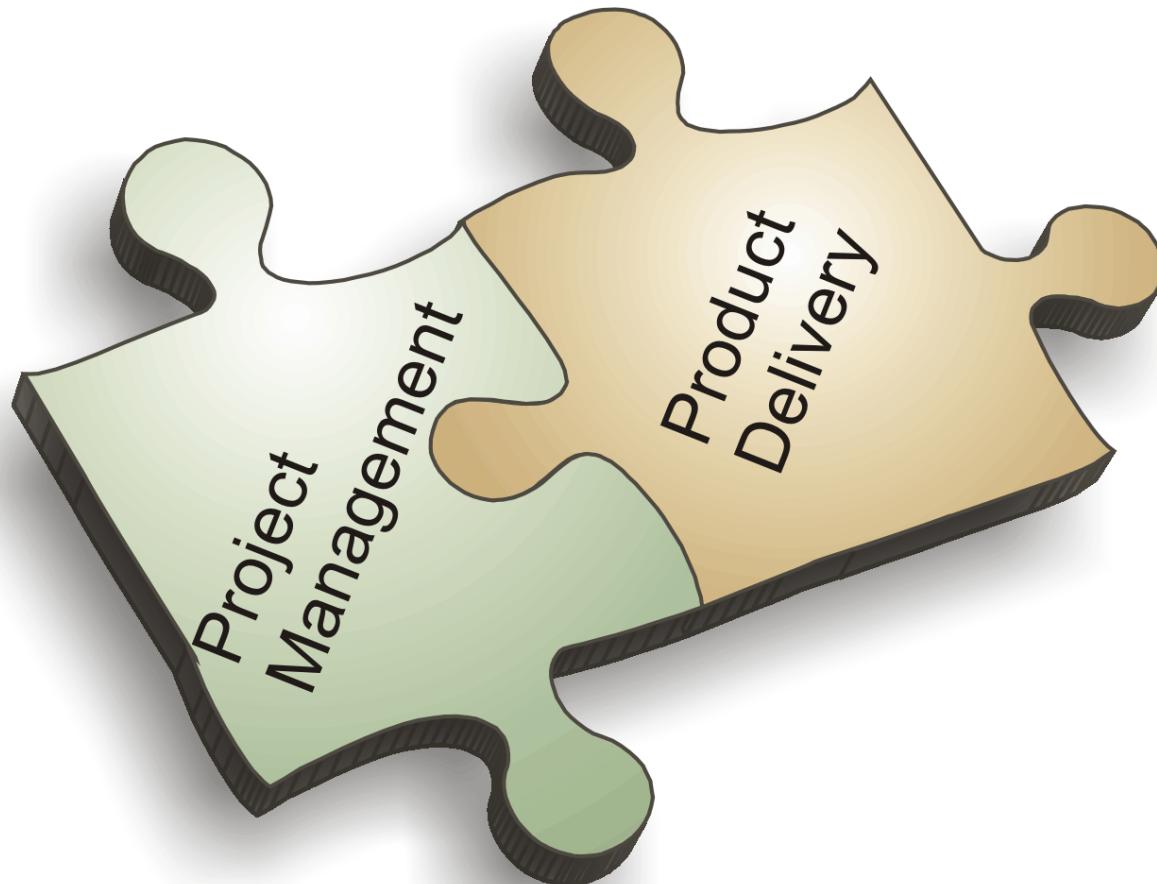
Benefits of Project Management

- Meet business objectives;
- Satisfy stakeholder expectations;
- Be more predictable;
- Increase chances of success;
- Deliver the right products at the right time;
- Resolve problems and issues;
- Respond to risks in a timely manner;
- Optimize the use of organizational resources;
- Identify, recover, or terminate failing projects;
- Manage constraints (e.g., scope, quality, schedule, costs, resources);
- Balance the influence of constraints on the project (e.g., increased scope may increase cost or schedule); and
- Manage change in a better manner.

Top 10 Reasons *NOT* to Use Project Management

10. Our customers really love us, so they don't care if our products are late and don't work.
09. Organizing to manage projects isn't compatible with our culture, and the last thing we need around this place is change.
08. All our projects are easy, and they don't have cost, schedule, and technical risks anyway.
07. We smart enough to deliver successfully without these this extra work
06. We might have to understand our customers' requirements and document a lot of stuff, and that is such last thing we want to do.
05. Project management requires integrity and courage, who will pay for this?
04. Our bosses won't provide the support needed for project management; they want us to get better results through magic.
03. Once we start we have to apply same project management processes blindly to all projects regardless of size and complexity, this is unfair, better not do adopt this.
02. I know there is a well-developed project management body of knowledge, but I my project mess is too different, so next project..
01. We have found it's more profitable to have 50% overruns than to spend 10% on project management to fix them.

Project Management Framework



Topics

- | | |
|---|---|
| 1. Project | 19. Progressive Elaboration |
| 2. Operations | 20. Rolling Wave Planning |
| 3. Project Constraints | 21. Project Documents |
| 4. Project Phases, Milestones, Deliverables, Activities | 22. Business Documents |
| 5. Project Lifecycle (PLC) & Level of Activities | 23. Project Management Plan |
| 6. Typical Costing & Staffing across PLC | 24. Organizational Process Assets |
| 7. Risk, Cost of Change in PLC | 25. Enterprise Environmental Factors |
| 8. Project Boundary | 26. Project Selection Criteria |
| 9. Relationship between Process Group & Phases | 27. Project Manager Responsibilities |
| 10. Project Management | 28. Project, Program, Portfolio Overview |
| 11. Program Management | 29. Tools & Techniques : 9 Data Gathering |
| 12. Portfolio Management | 30. T&T : 27 Data Analysis |
| 13. Program Management Office | 31. T&T : 15 Data Representation |
| 14. Project Stakeholders | 32. T&T : 2 Decision Making |
| 15. Stakeholder Register | 33. T&T : 17 Interpersonal & Team Skill |
| 16. Organization Types & Influence of Project Success | 34. Expert Judgement |
| 17. Project Management Methodologies | 35. Meetings |
| 18. Configuration Management | 36. Project Management Knowledge Areas |
| | 37. Process Groups |

What is Project???

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What is Project?

Project – A temporary endeavor undertaken to create a unique product, service or result

How Temporary?

- Has a definite *beginning and end*, not an on-going effort
- *Ceases* when objectives have been attained
- Team is *disbanded* upon project completion

Unique?

- The product or service is *different* in some way from other product or services
- Product characteristics are *progressively elaborated*

Project has...

- Goal (measurable/verifiable) Oriented
- Finite duration with a beginning and end
- Uniqueness to a great extent and related uncertainties
- Coordinated undertaking of interrelated activities
- Performing the activities involve resources
- Resources cost money

Source of Project?

- Need for improvement
- Market Competition
- Strategic/ Mission/ Vision
- Government Regulation
- Environmental Forces

“Projects” different from “operations”?

Projects

- Permanent Project Charter
- Catalyst for change
- Unique product or service
- Heterogeneous teams
- Start and end date
- Progressive elaboration

Operations

- Semi-permanent charter
- Maintains status quo
- Standard product or service
- Homogeneous teams
- Ongoing
- Predefined product

Project Constraints



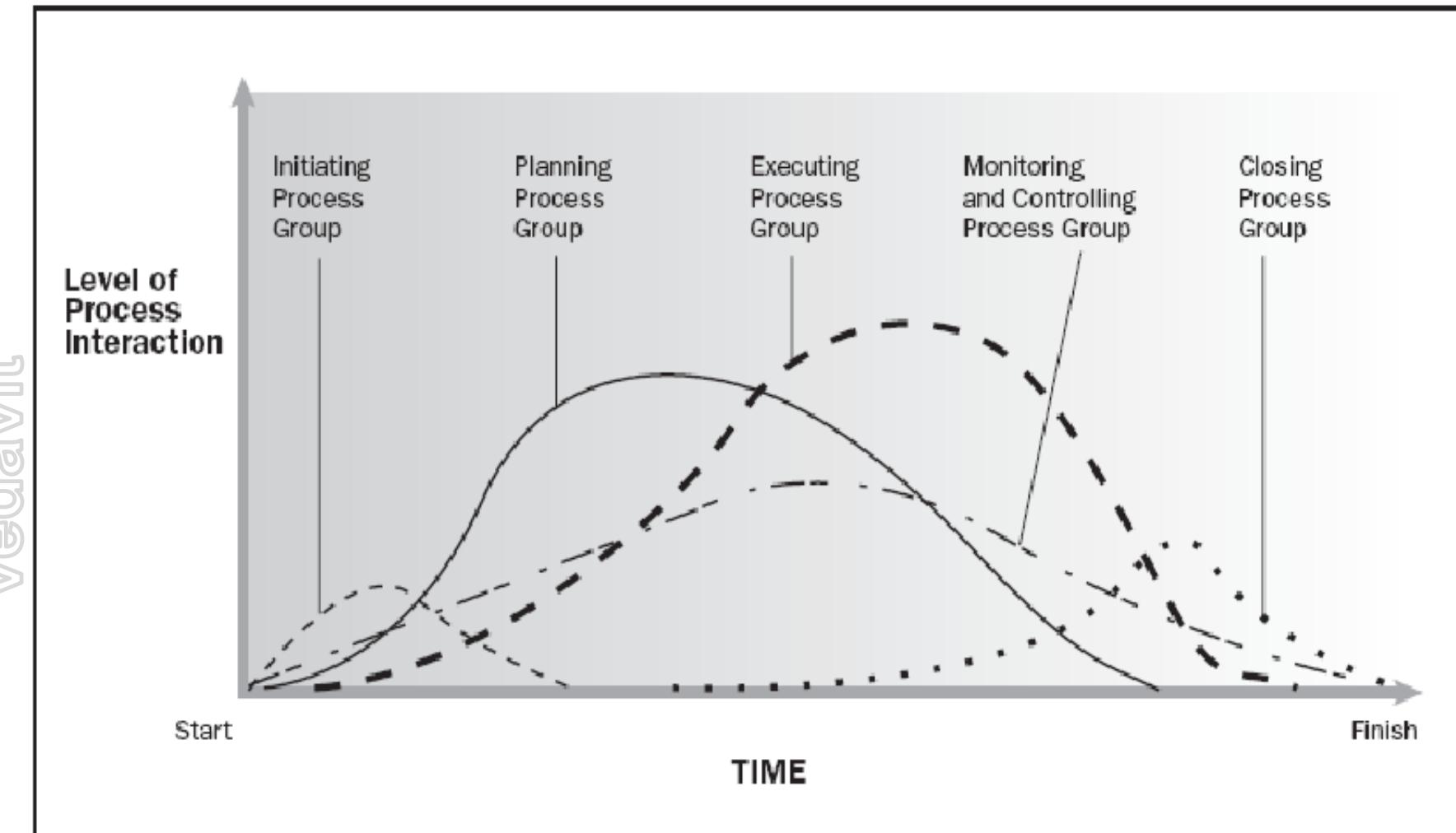
Project Phases

- ✓ Projects are divided into phases where extra control is required to effectively manage the completion of the major deliverables
- ✓ Collectively, the project phases put together is known as **Project life cycle**
- ✓ Each phase is marked by one or more tangible verification work product
- ✓ The conclusion of a project phase is generally marked by a review
- ✓ The phase end points are referred to as phase exits, milestones, phase gates, decision gates, stage gates or kill points
- ✓ Starting a phase before approval of deliverables of a previous phase is called Fast Tracking
- ✓ Phases are not cyclical they are sequential
- ✓ Phases are not deliverables but deliverables are part of a Phase
- ✓ *E.g. Product Feasibility, Product Prototyping, Product Design, Development, System Testing, Deployment, Concept development, Customer requirements, Solution development, Build, Test, Transition, Commissioning*

Milestones, Deliverables

- Deliverables
 - Work product, product component developed by the project team
 - *E.g. Wireframe, Database ER Diagrams, Sequence Diagram, Test Case, Test Results, Any Feature of the Product.*
- Milestone
 - Zero Duration Activity. Mark of Completion of some set of activities with deliverables
 - *E.g. Design Complete, Security Testing Complete, Requirement Gathering Complete, Quality Audit Complete, Development Complete, Deployment Complete*

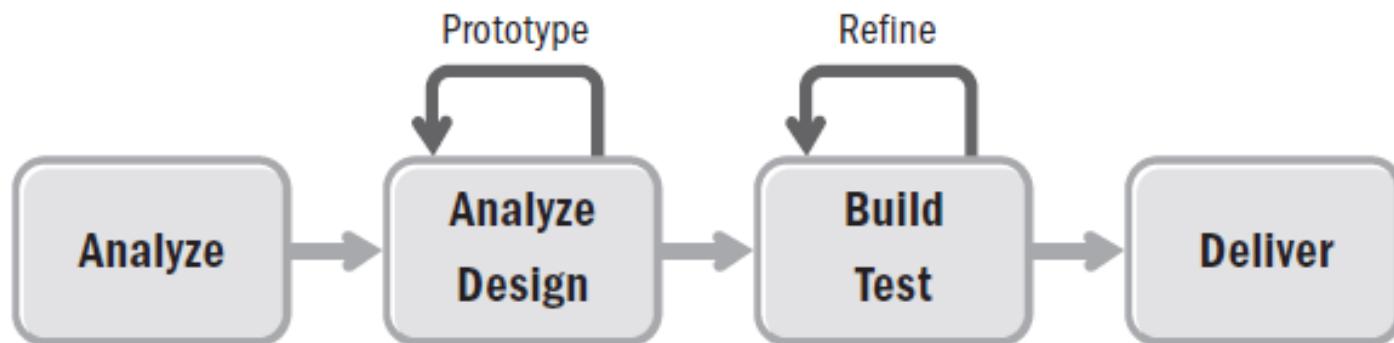
Project Lifecycle (PLC) & Level of Activities



Project vs Development Lifecycle

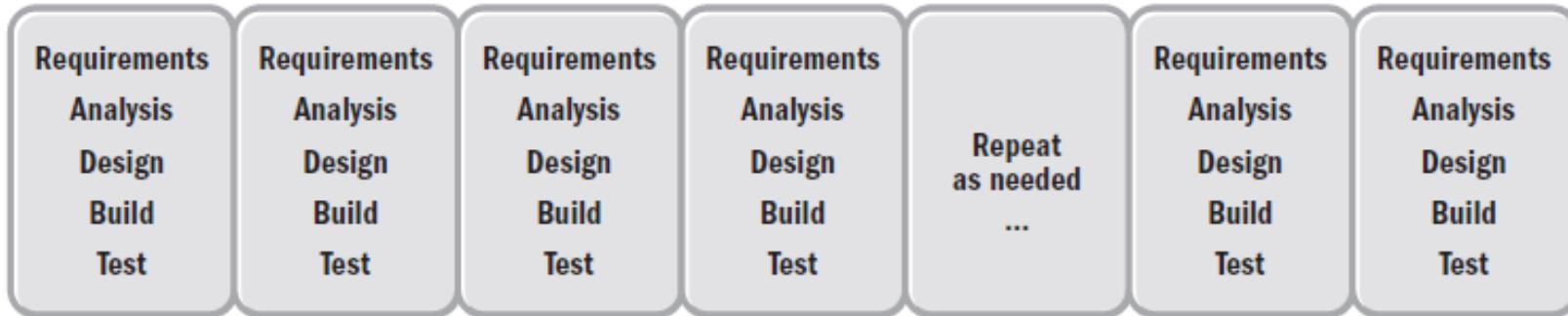
- Project life cycles can be predictive or adaptive. Within a project life cycle, there are generally one or more phases that are associated with the development of the product, service, or result. These are called a development life cycle.
- Development life cycles can be **predictive, iterative, incremental, adaptive, or a hybrid model**

Iterative vs Predictive Life Cycles



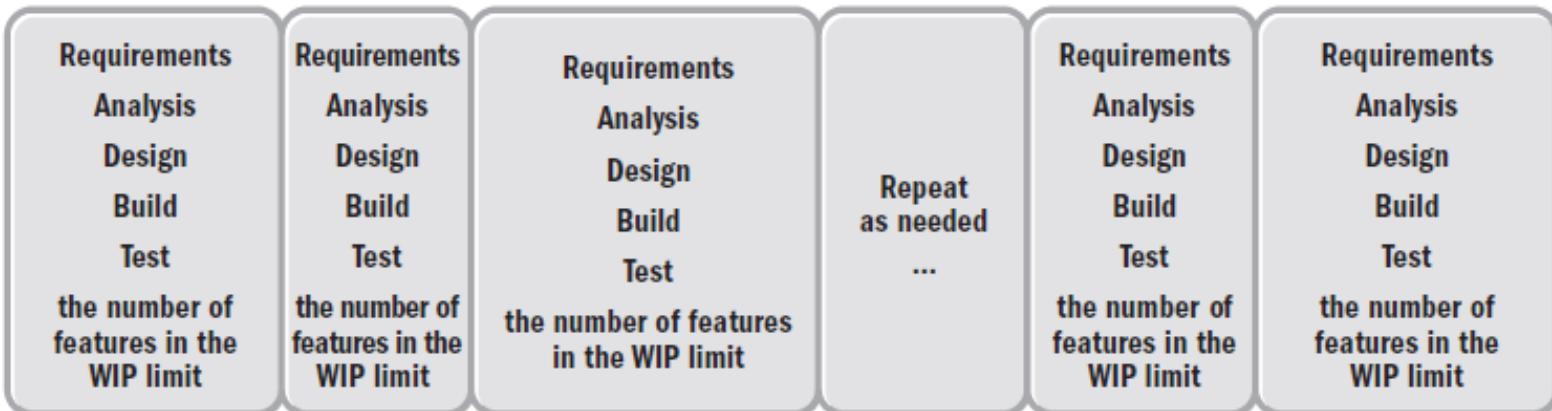
Change Driven Life Cycle

Iteration-Based Agile



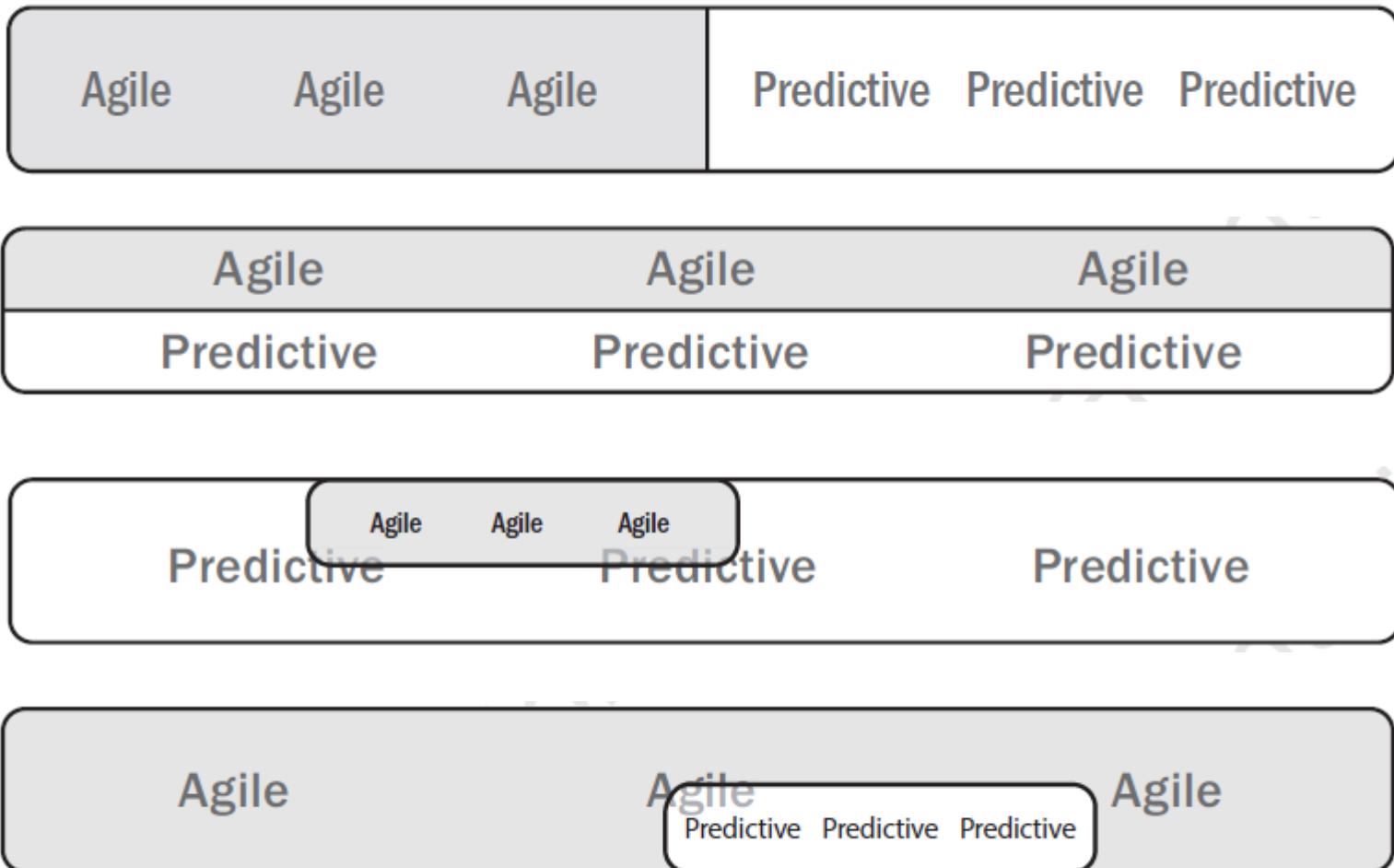
NOTE: Each timebox is the same size. Each timebox results in working tested features.

Flow-Based Agile

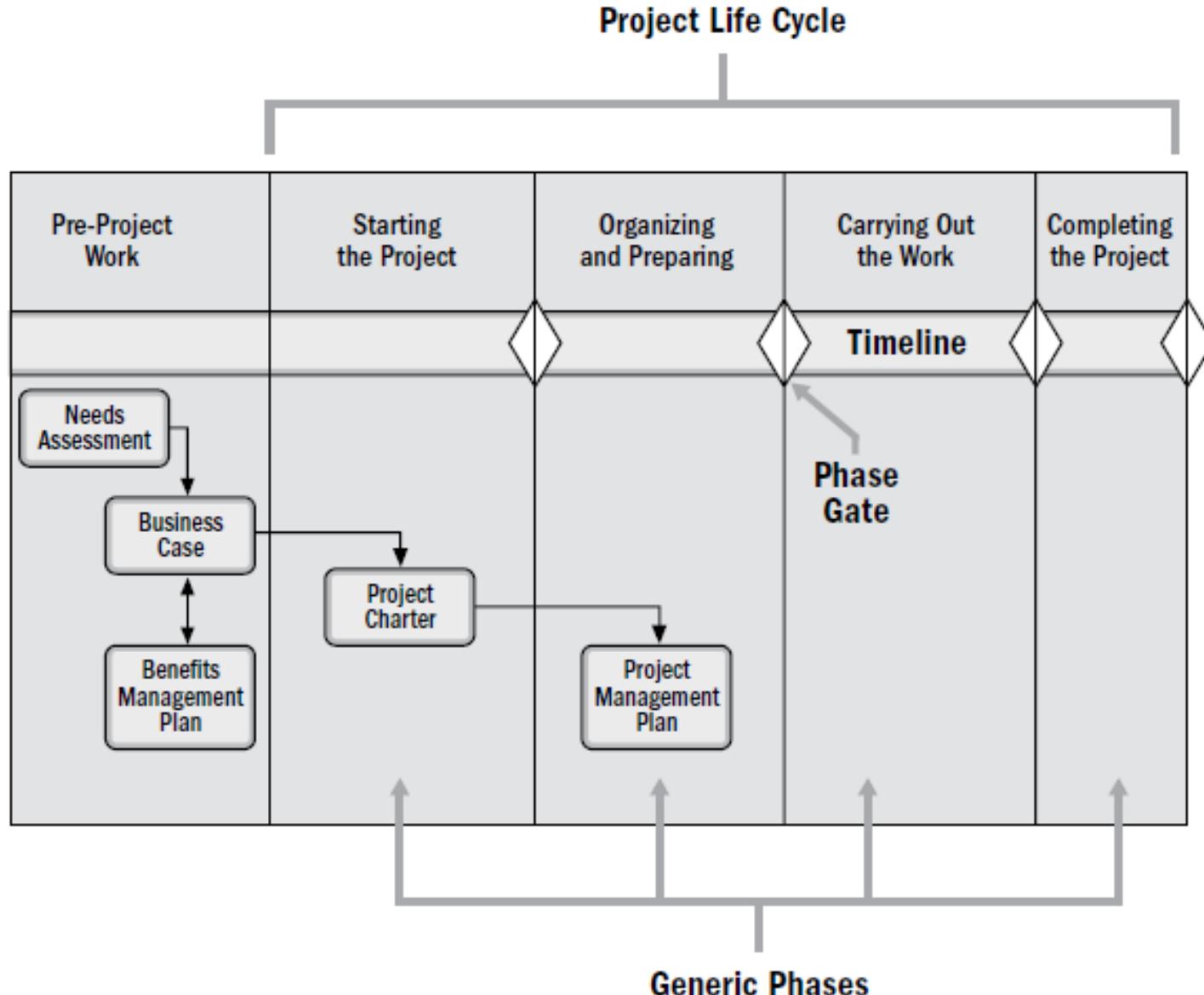


NOTE: In flow, the time it takes to complete a feature is not the same for each feature.

Hybrid Life Cycle

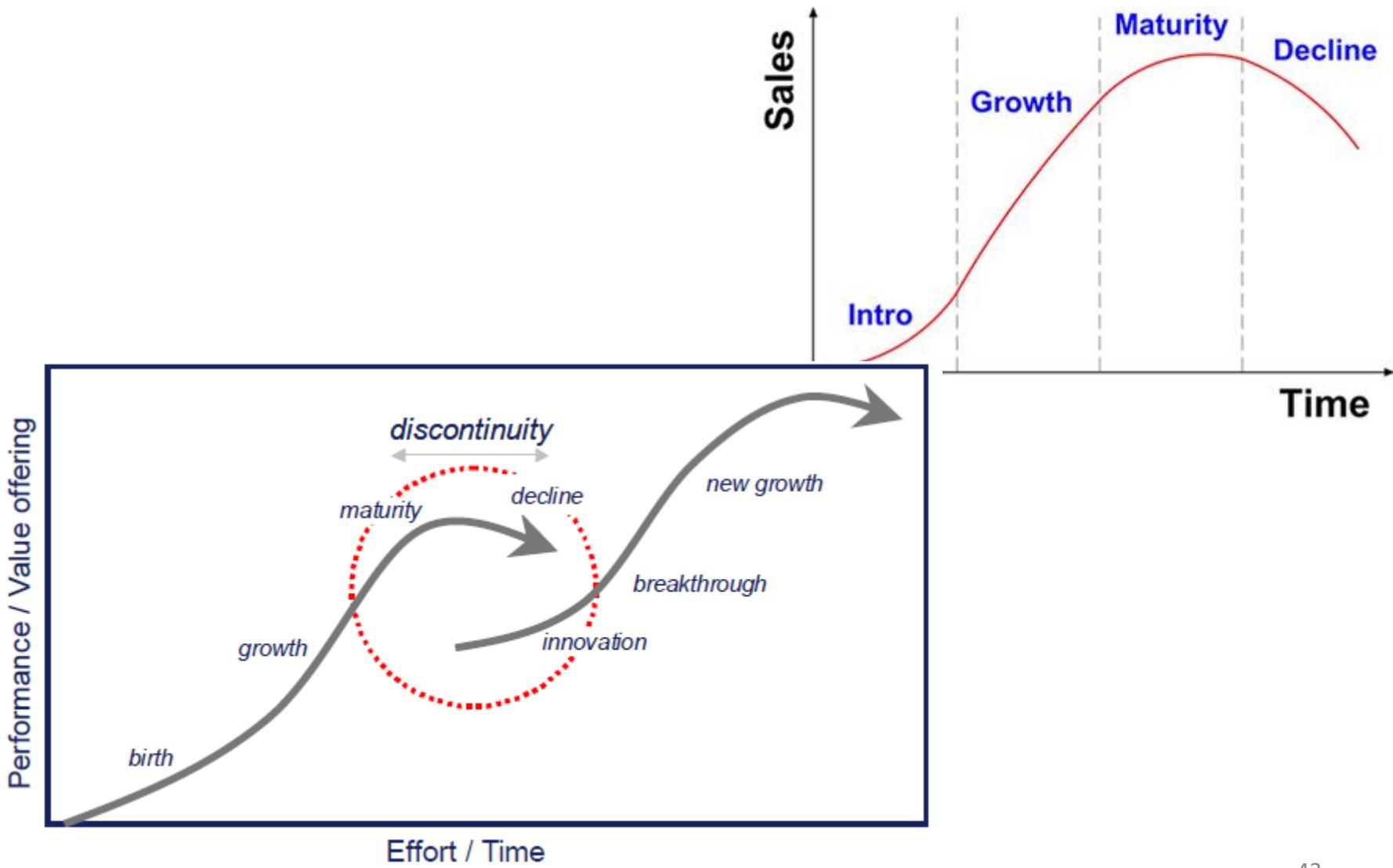


Typical Project Lifecycle

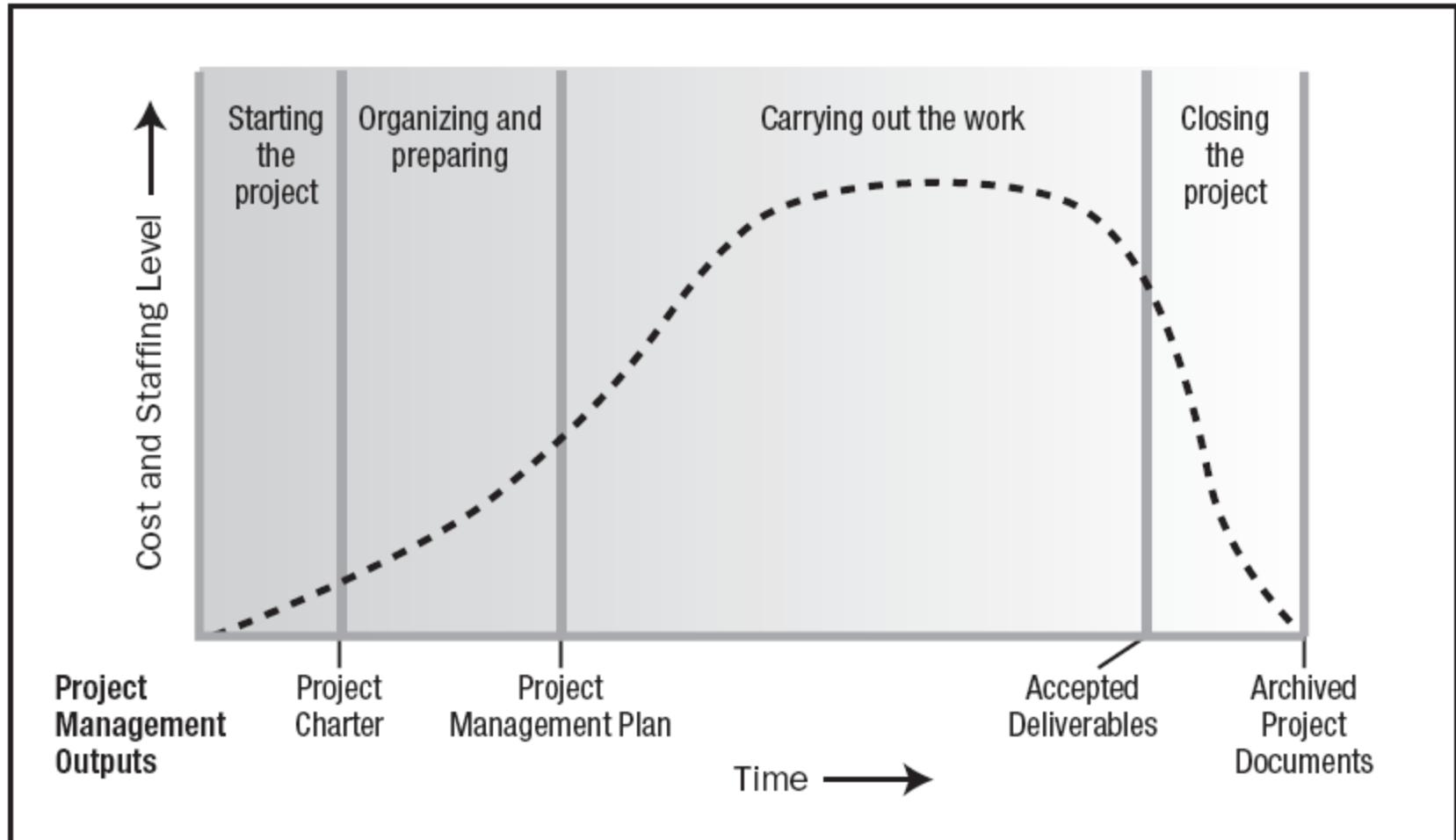


Product Life Cycle

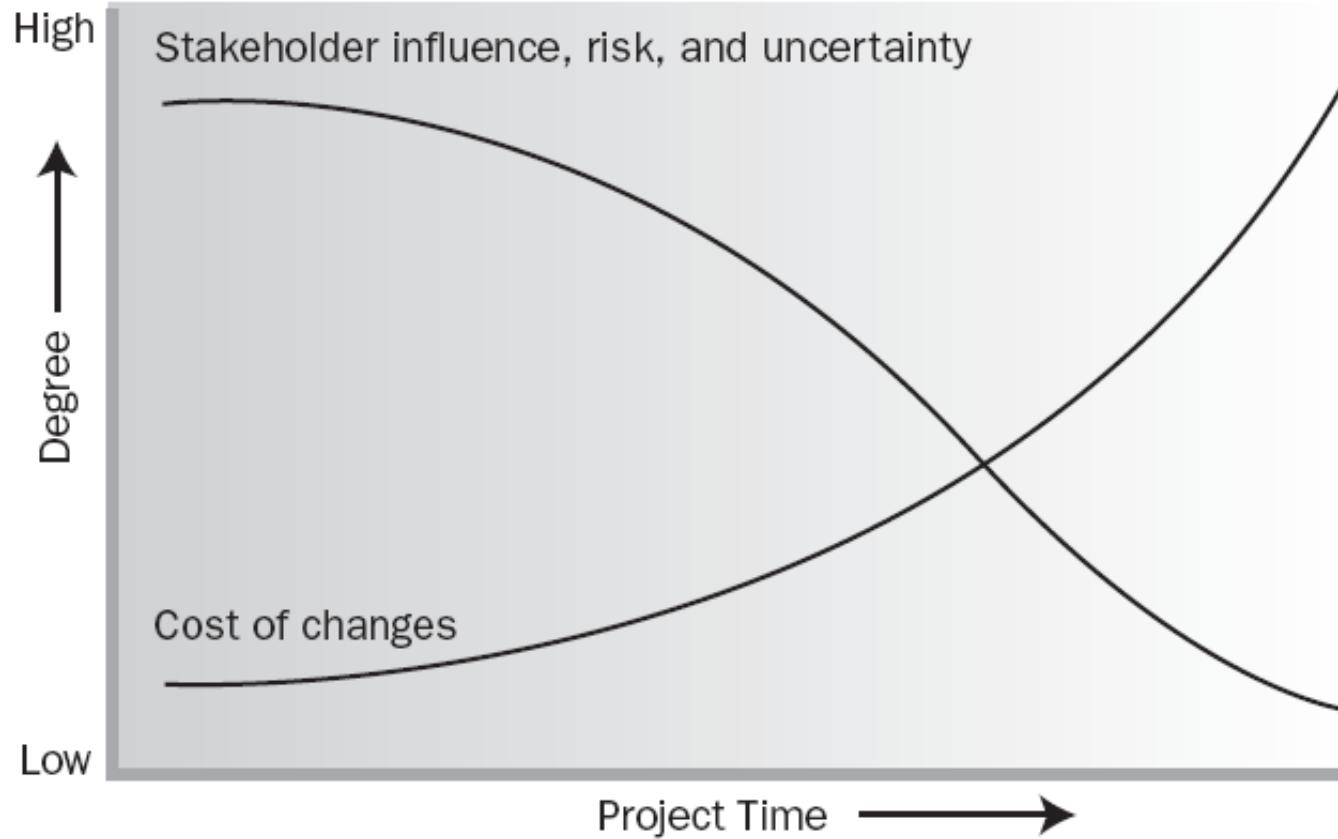
Product Life Cycle



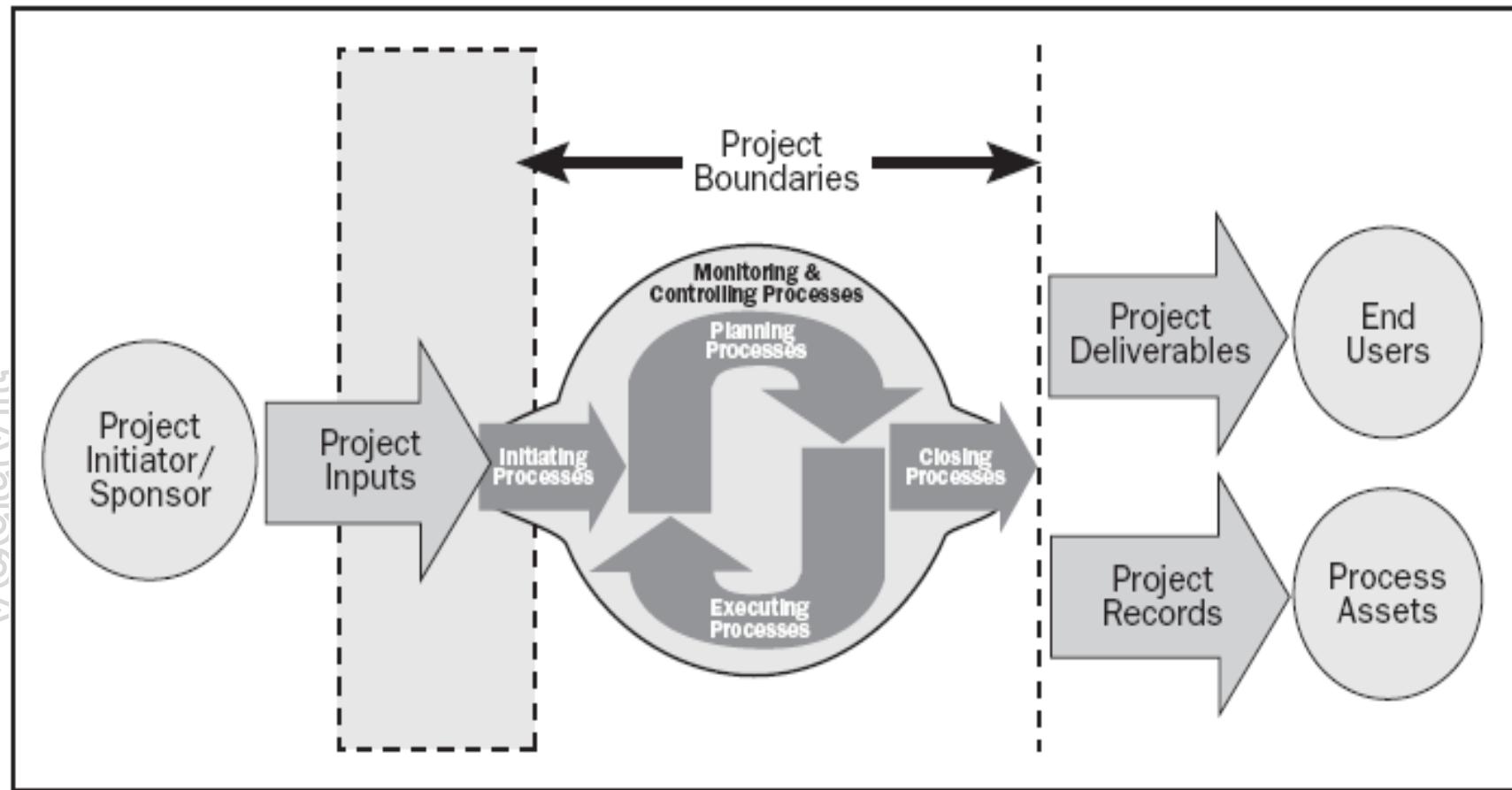
Typical Costing & Staffing across PLC



Risk, Cost of Change in PLC

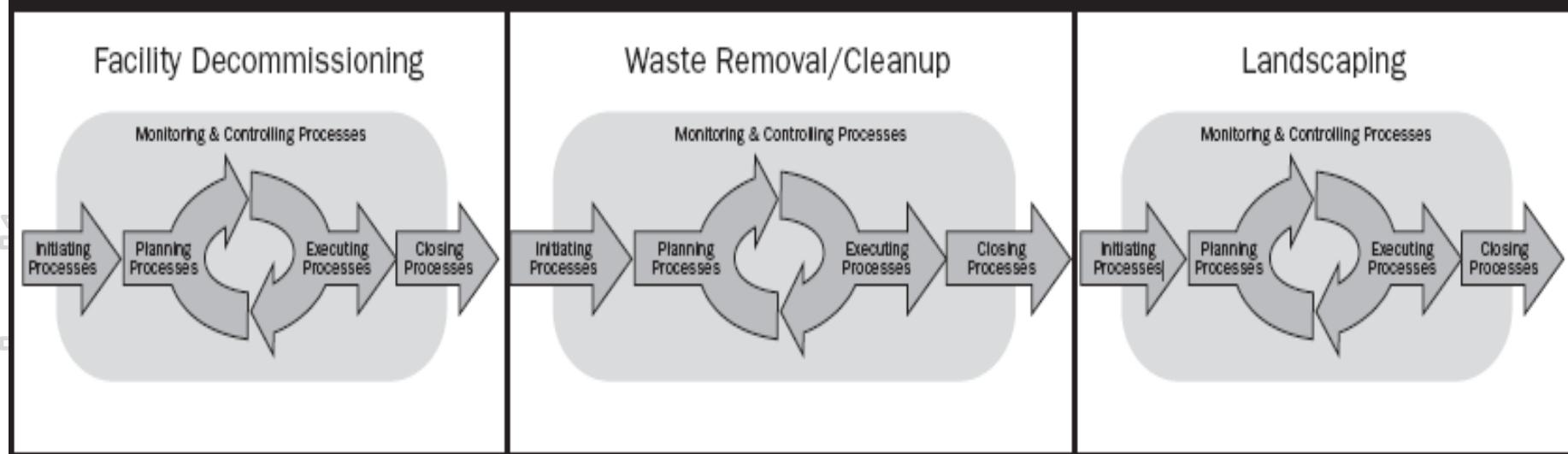


Project Boundaries are Important!



Relationship between Process Group & Phases

One Approach to Cleaning Up a Hazardous Waste Site



Project Management

The application of **knowledge, skills, tools and techniques** to project activities in order to **meet the project requirements**

What is Program?

Group of related projects managed in a coordinated way to obtain the benefits and control which will not be possible from managing them individually

Scope is least important. Benefit(s) are primary goal. Program manager is not responsible for delivery but for benefit realization.

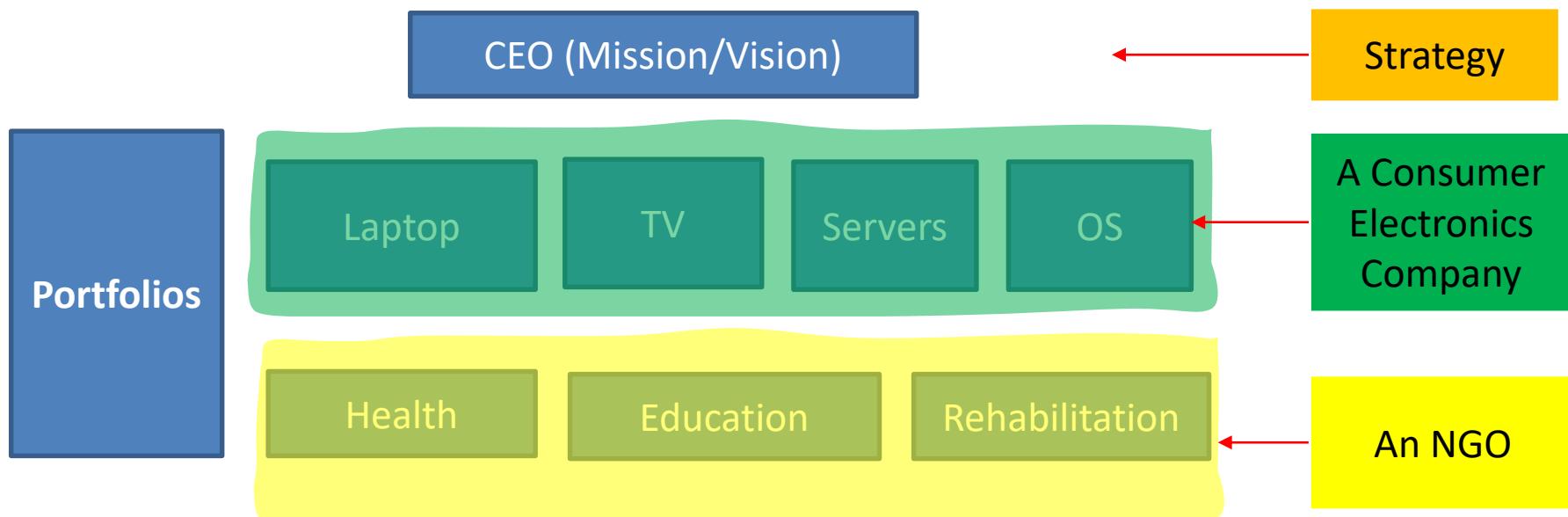
Addition/removal of projects in a program is in the hand of Program Manager

Several projects are required under a program because of different technology, different skills & different kind of teams, parallel work, different type of deliverables.

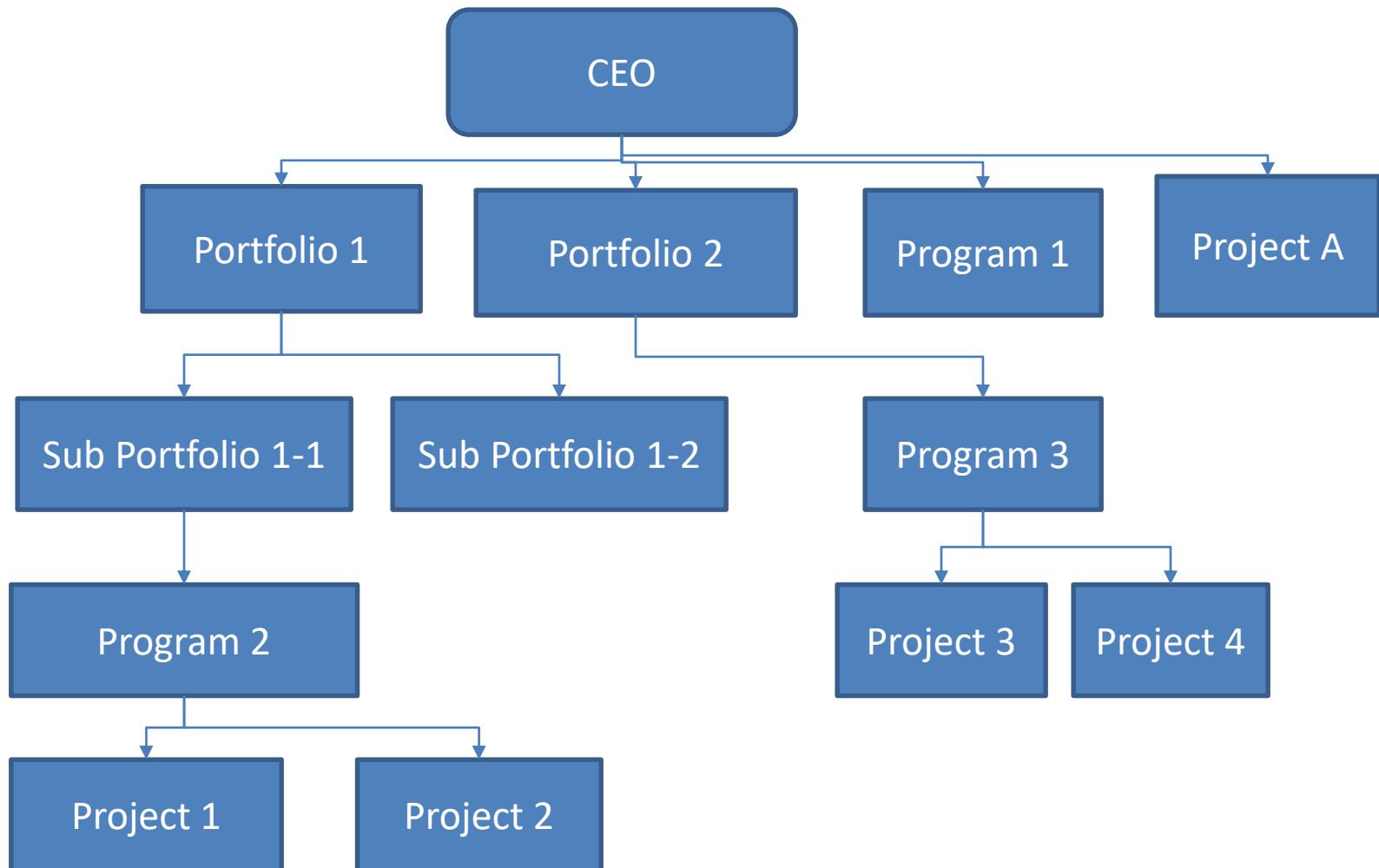
e.g. Bringing a new product (from conceptualization to Sale all project), New satellite in space, Health improvement of a cancer patient. An IT company want to enter into new market with Cloud Services for the customer.

Project Portfolio Management

Collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives



Relationship Between PPP



PPP Overview

	Project	Program	Portfolio
Definition	Temporary endeavor-unique P/S/R	Group of related projects, sub-prog, prog-activities to obtain benefits	Collection of Project/Prog/Sub-Portfolio/Operation to achieve strategic objective
Scope	Defined objective. Scope progressive elaborate.	Output and outcome of program component produce benefits to the org.	Changes with the change of org strategic objective
Change	Manage change in output	Manage changes in benefits from prog components	Manage changes in external/internal environment and impact on strategy
Planning	Plan progressively with high level plan	High level to track inter-dependencies of prog components. Guide for proj planning	Process to aggregate portfolio from program and project
Management	Project Team	Coordinating between project team to ensure program benefits	Portfolio staff which coordinate to aggregate results for portfolio
Monitoring	Monitor and Control the work which produce unique P/S/R	Monitor and Control the work which ensure program goal, objective, schedule, budget, benefits	Monitor and Control strategic change and resource allocation
Success	Cost, Time, Quality, Customer Satisfaction	Ability to deliver intended benefits in efficient way	ROI

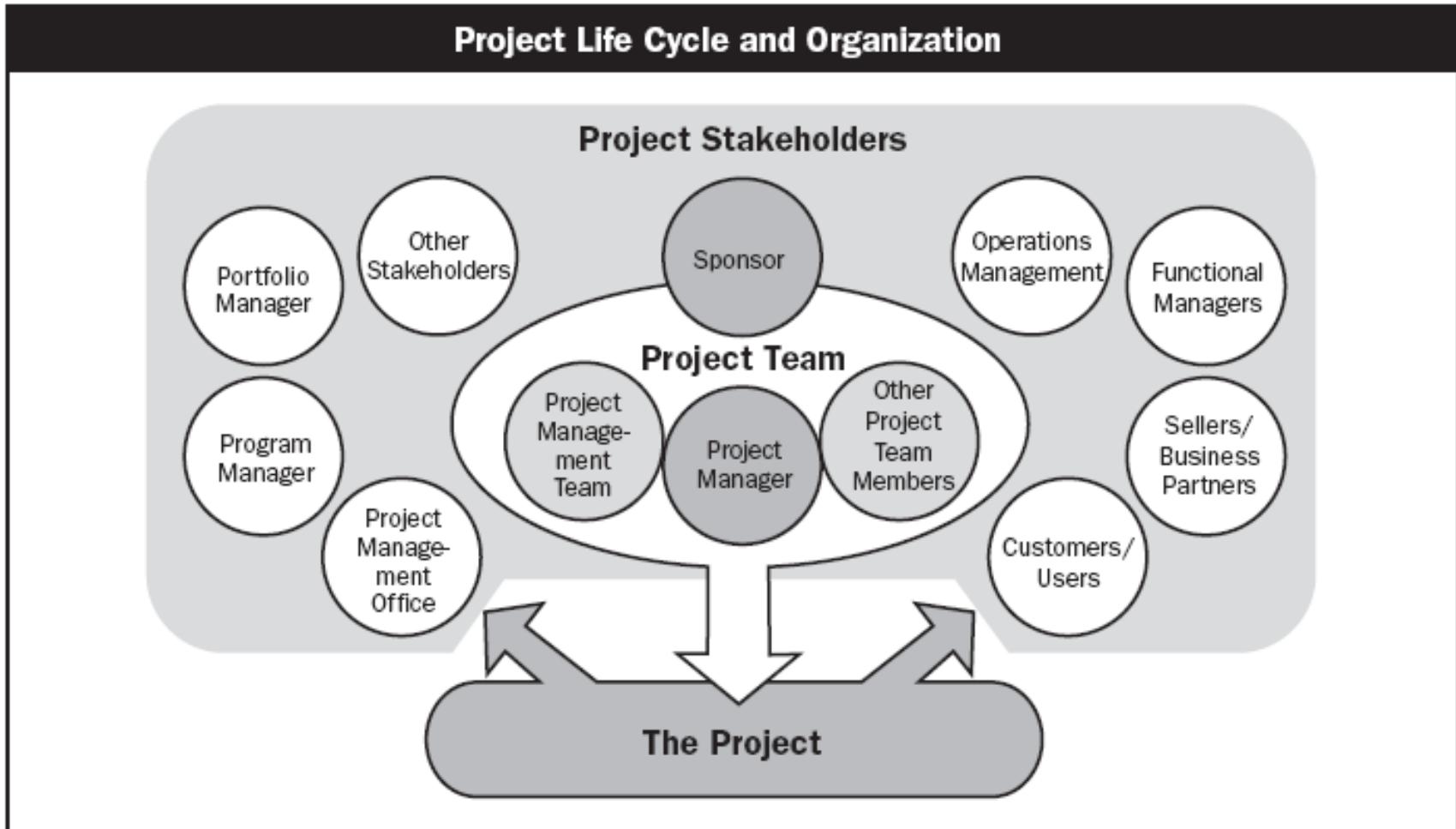
What is PMO?

- ✓ Managing shared resources across all project administered by PMO
- ✓ Identifying and developing project management methodology, best practices and standards
- ✓ Coaching, mentoring, training and oversight
- ✓ Monitoring compliance with project management standards, policies, procedures and templates via project audits
- ✓ Developing and managing project policies, procedures, templates and other shared documentation (organizational process assets), and
- ✓ Coordinating communication across projects

Who are Stakeholders?

Persons or organizations who are actively *involved* in the project or whose interests maybe positively or negatively *affected* by the performance or completion of the project

Stakeholders



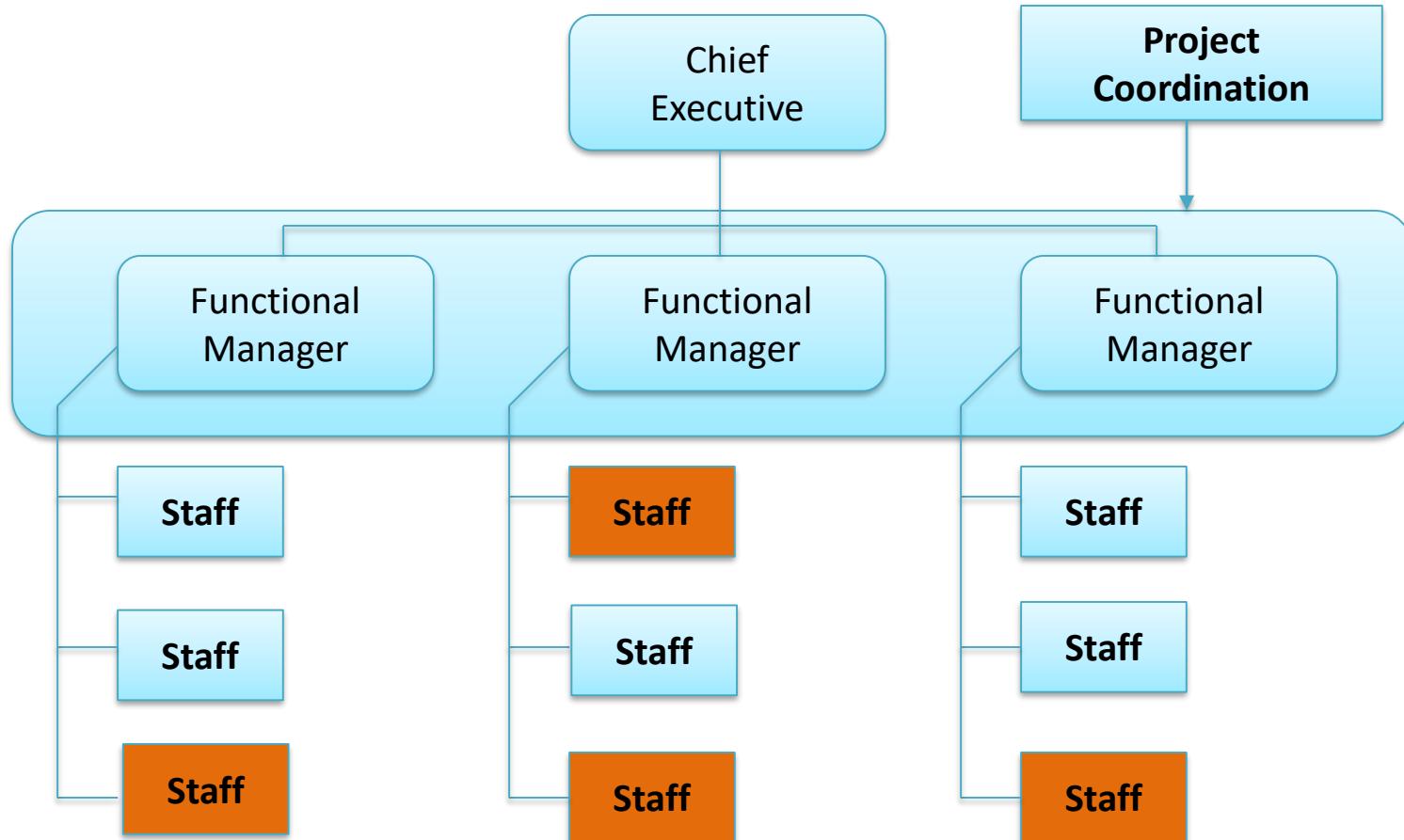
Stakeholder Register

- ID
- Name
- Department
- Internal vs External
- Designation
- Manager
- Power (1-10)
- Interest (1-10)
- Current Position (Favorable, Against, Neutral)
- Needed Position
- Person Attributes (food, philosophy, ideology etc)
- Person Preferences
- Contact Details

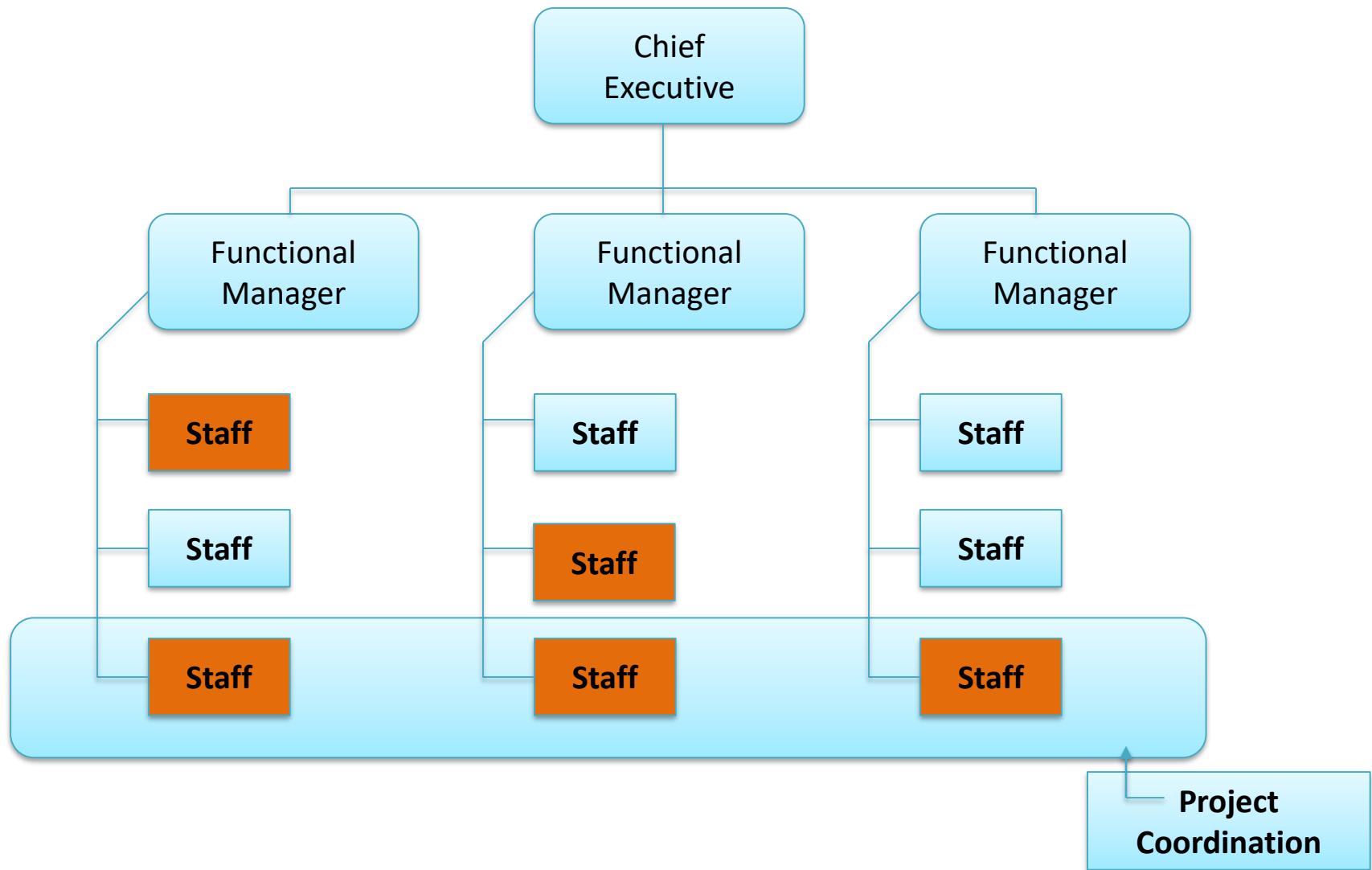
Organizational Types

- ✓ Functional
- ✓ Matrix
 - ✓ Weak Matrix
 - ✓ Balanced Matrix
 - ✓ Strong matrix
- ✓ Projectized

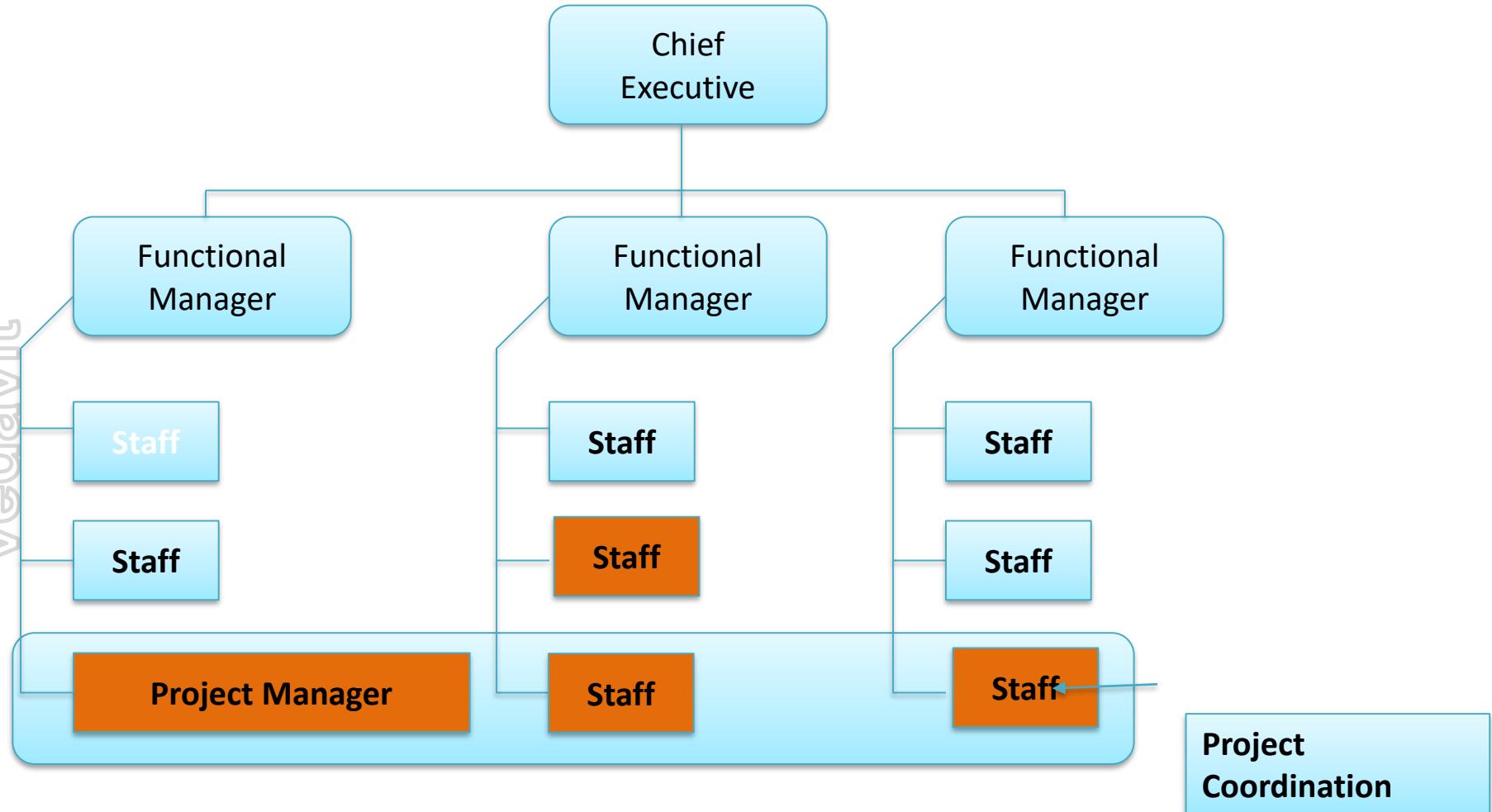
Functional



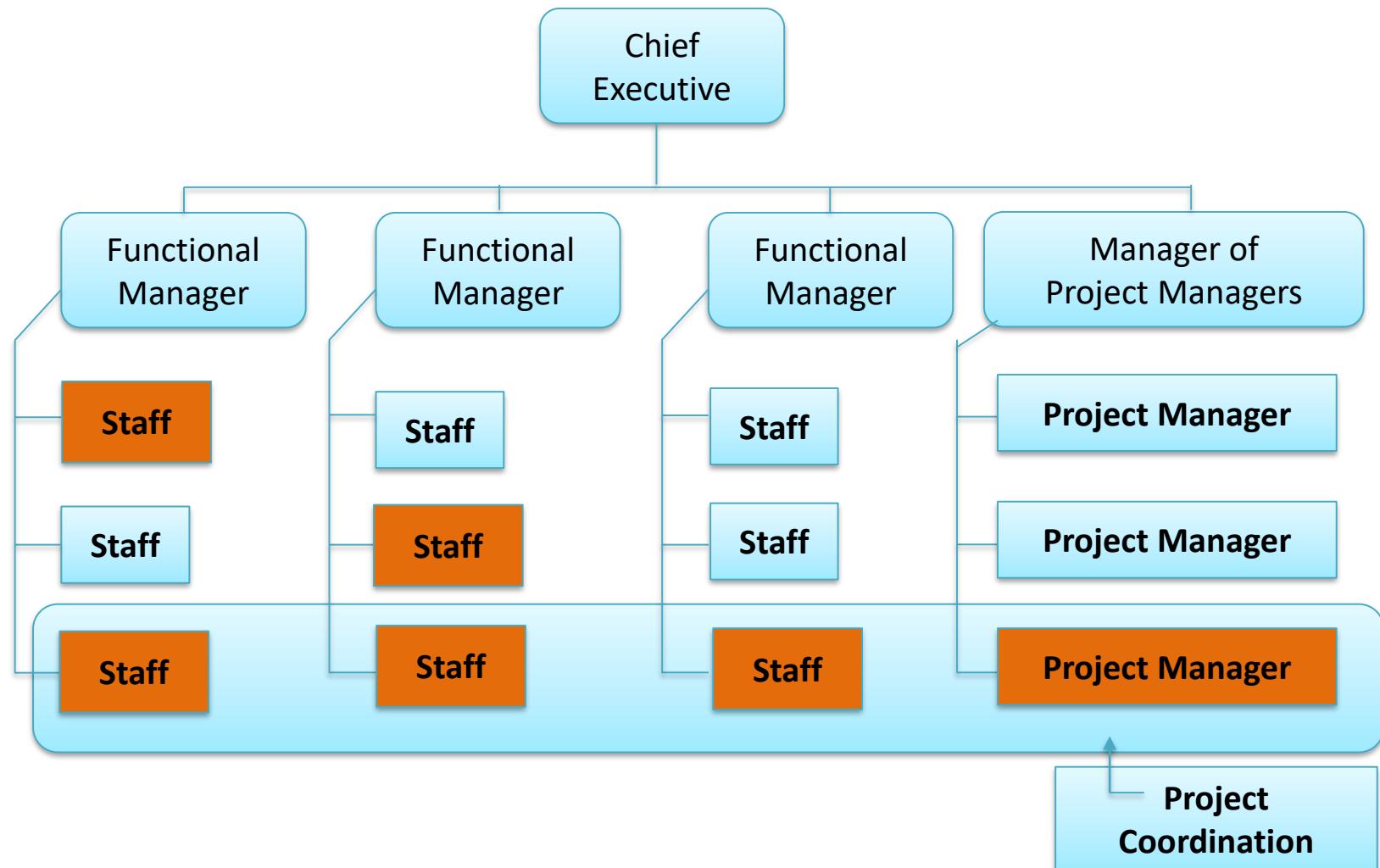
Weak Matrix



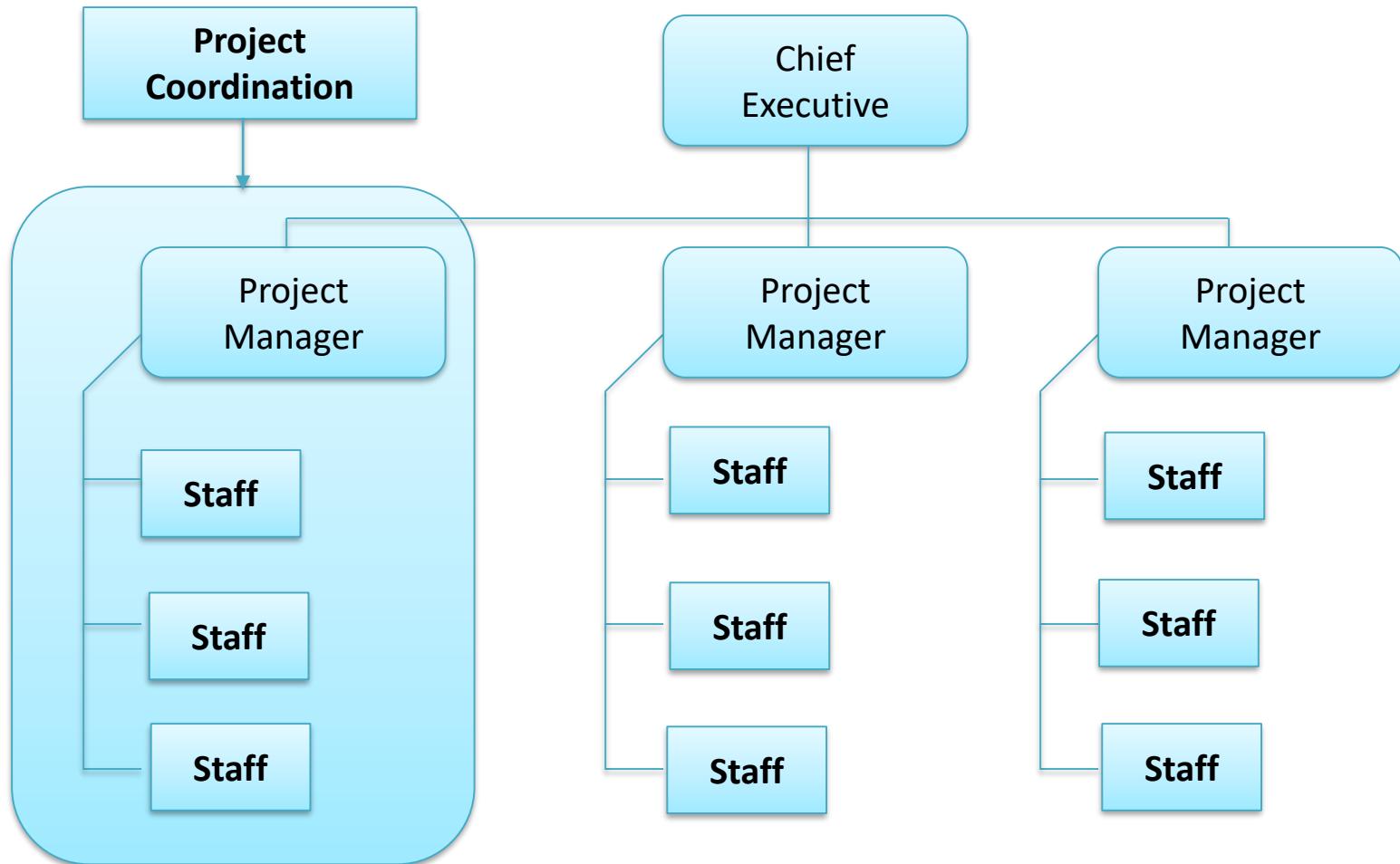
Balance Matrix



Strong Matrix



Projectized Matrix



Organizational Influence

Organizational Structure Type	Project Characteristics					
	Work Groups Arranged by:	Project Manager's Authority	Project Manager's Role	Resource Availability	Who Manages the Project Budget?	Project Management Administrative Staff
Organic or Simple	Flexible; people working side-by-side	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Owner or operator	Little or none
Functional (centralized)	Job being done (e.g., engineering, manufacturing)	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Functional manager	Part-time
Multi-Divisional (may replicate functions for each division with little centralization)	One of: product; production processes; portfolio; program; geographic region; customer type	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Functional manager	Part-time
Matrix – strong	By job function, with project manager as a function	Moderate to high	Full-time designated job role	Moderate to high	Project manager	Full-time
Matrix – weak	Job function	Low	Part-time; done as part of another job and not a designated job role like coordinator	Low	Functional manager	Part-time
Matrix – balanced	Job function	Low to moderate	Part-time; embedded in the functions as a skill and may not be a designated job role like coordinator	Low to moderate	Mixed	Part-time
Project-oriented (composite, hybrid)	Project	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time
Virtual	Network structure with nodes at points of contact with other people	Low to moderate	Full-time or part-time	Low to moderate	Mixed	Could be full-time or part-time
Hybrid	Mix of other types	Mixed	Mixed	Mixed	Mixed	Mixed
PMO*	Mix of other types	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time

Configuration Management System

- A system to manage project artifacts, project's product and project's product's components.
- It helps in versioning, naming, storing, archiving, backup, securing project and product output.
- *e.g. SVN, VSS, TFS*

Project Documents

- Documents being managed by the project team to perform the project
- Document provided by customers, vendors, government agencies, management
- Documents which are prepared by the team like Design Related, Requirement Related, Issue Register, Risk Register, Change Log
- All document must be managed using some Configuration Management Tool.

Project Documents

1. Activity attributes
2. Activity list
3. Assumption log
4. Basis of estimates
5. Change log
6. Cost estimates
7. Cost forecasts
8. Duration estimates
9. Issue log
10. Lessons learned register
11. Milestone list
12. Physical resource assignments
13. Project calendars
14. Project communications
15. Project schedule
16. Project schedule network diagrams
17. Project scope statement
18. Project team assignments
19. Quality control measurements
20. Quality metrics
21. Quality reports
22. Requirements documentation
23. Requirements traceability matrix
24. Resource breakdown structure
25. Resource calendars
26. Resource requirements
27. Risk register
28. Risk report
29. Schedule data
30. Schedule forecasts
31. Stakeholder register
32. Team charter
33. Test and evaluation documents

Project Management Plan

- Project Management Plan includes
 - All Subsidiary Plan (Configuration, Cost, Risk etc)
 - All Baselines Related to Project
 - Project Management Methodology
 - Project Lifecycle and Project Phases
 - Process Tailored List
 - Tailored Process

Project Management Plan

- 1. Scope management plan
- 2. Requirements management plan
- 3. Schedule management plan
- 4. Cost management plan
- 5. Quality management plan
- 6. Resource management plan
- 7. Communications management plan
- 8. Risk management plan
- 9. Procurement management plan
- 10. Stakeholder engagement plan
- 11. Change Management Plan
- 12. Configuration Management Plan
- 13. Performance measurement baseline
- 14. Development approach
- 15. Project life cycle description
- 16. Management Reviews
- 17. Scope baseline
- 18. Schedule baseline
- 19. Cost baseline

Business Documents

1. Agreements
2. Bid documents
3. Benefits Management Plan.
4. Independent cost estimates
5. Project charter

6. Final report
7. Make-or-buy decisions
8. Procurement statement of work
9. Procurement strategy
10. Project funding requirements
11. Team performance assessments
12. Work performance data
13. Work performance information
14. Work performance reports
15. Change requests

Project Benefits Management Plan

- **Target benefits** (e.g., the expected tangible and intangible value to be gained by the implementation of the project; financial value is expressed as net present value);
- **Strategic alignment** (e.g., how well the project benefits align to the business strategies of the organization);
- **Timeframe for realizing benefits** (e.g., benefits by phase, short-term, long-term, and ongoing);
- **Benefits owner** (e.g., the accountable person to monitor, record, and report realized benefits throughout the timeframe established in the plan);
- **Metrics** (e.g., the measures to be used to show benefits realized, direct measures, and indirect measures);
- **Assumptions** (e.g., factors expected to be in place or to be in evidence); and
- **Risks** (e.g., risks for realization of benefits).

Other Types of Outputs

1. Approved change requests
2. Closed procurements
3. Selected sellers
4. Source selection criteria

5. Deliverables
6. Verified deliverables
7. Accepted deliverables
8. Final product, service, or result transition

9. Project documents updates
10. Organizational process assets updates
11. Procurement documentation updates
12. Enterprise environmental factors updates

Subsidiary Plan

Subsidiary plan need to be developed for each aspect of the project. For every aspect (Scope, Time, Cost, Quality, Resources, Communication, Risk, Stakeholder) you need to know following

- What are the activities which need to be done?
- Who will perform these? Is any training required to perform these activities.
- When these activities will be performed?
- How will you measure success?
- What tool you will use for this?
- How will you execute the work of this aspect?
- How will you control this aspect?
- Most of these activities are related to Planning of the Plan and NOT of the planning of Execution

Organizational Process Assets

- Process Assets which created by the organization while doing the project in past
- Processes, Standards, Guidelines, Checklist, Templates standardized by the Quality Department or PMO
- Lessons learned report of the previous projects
- Consider them for project Initiation, Planning, Executing, Monitoring & Controlling and Closing. Do not reinvent the wheel in project management.
- *e.g. Time/Cost/Resource Estimation database, Risk database, Issue Register, Skills Database*

Enterprise Environmental Factors

- Constraints which are not in control of a Project Manager and the project manager has to consider them to make project successful.
- These constraints are imposed by environment of those enterprises which are involved in the project
- Consider them for project Initiation, Planning, Executing, Monitoring & Controlling and Closing
- *e.g. Skill Availability, Market Condition, Attitude of People, Organization Culture, Climatic Condition, Political Condition, Bosses etc.*

Progressive Elaboration

- Project scope unfolds during the project execution. Scope of the next phase depends upon the output or success of previous phase.
- It is Scope Management Concept.

Rolling Wave Planning

- Activities of any deliverable can be known when we know what need to delivered.
- Attribute of the activities can be known only when we know what are the activities and what is deliverable.
- It is Time Management Concept.

Project Management Information Systems (PMIS)

- **Electronic project management tools.** Project management software, meeting and virtual office support software, web interfaces, specialized project portals and dashboards, and collaborative work management tools.
- **Electronic communications management.** Email, fax, and voice mail; audio, video and web conferencing; and websites and web publishing.
- **Social media management.** Websites and web publishing; and blogs and applications, which offer the opportunity to engage with stakeholders and form online communities.

Project Selection Criteria

Project	Project name	Year 1				Year 2				Year 3				Discount Rate	10%			
		Outflow	Inflow	Inflow	Inflow	Asset Value at the End of 3rd Year	IRR Calc	IRR	PBP (Years)	PV	NPV	BCR						
P1	Start Hotel	995		200	250	900	990.48	11.50%	2.5	1029.3	34.3013	1.034474						
P2	Invest in MF	800	250	300	350	800	803.19	36.00%	2.5	1339.2	539.2186	1.674023						
P3	Invest in Green Field Tech	690		700	200	400	687.30	30.00%	2.0	1029.3	339.3013	1.491741						

Maximum IRR
(Internal Rate of Return)

Lowest PBP (Payback Period)

Highest PV (Present Value)

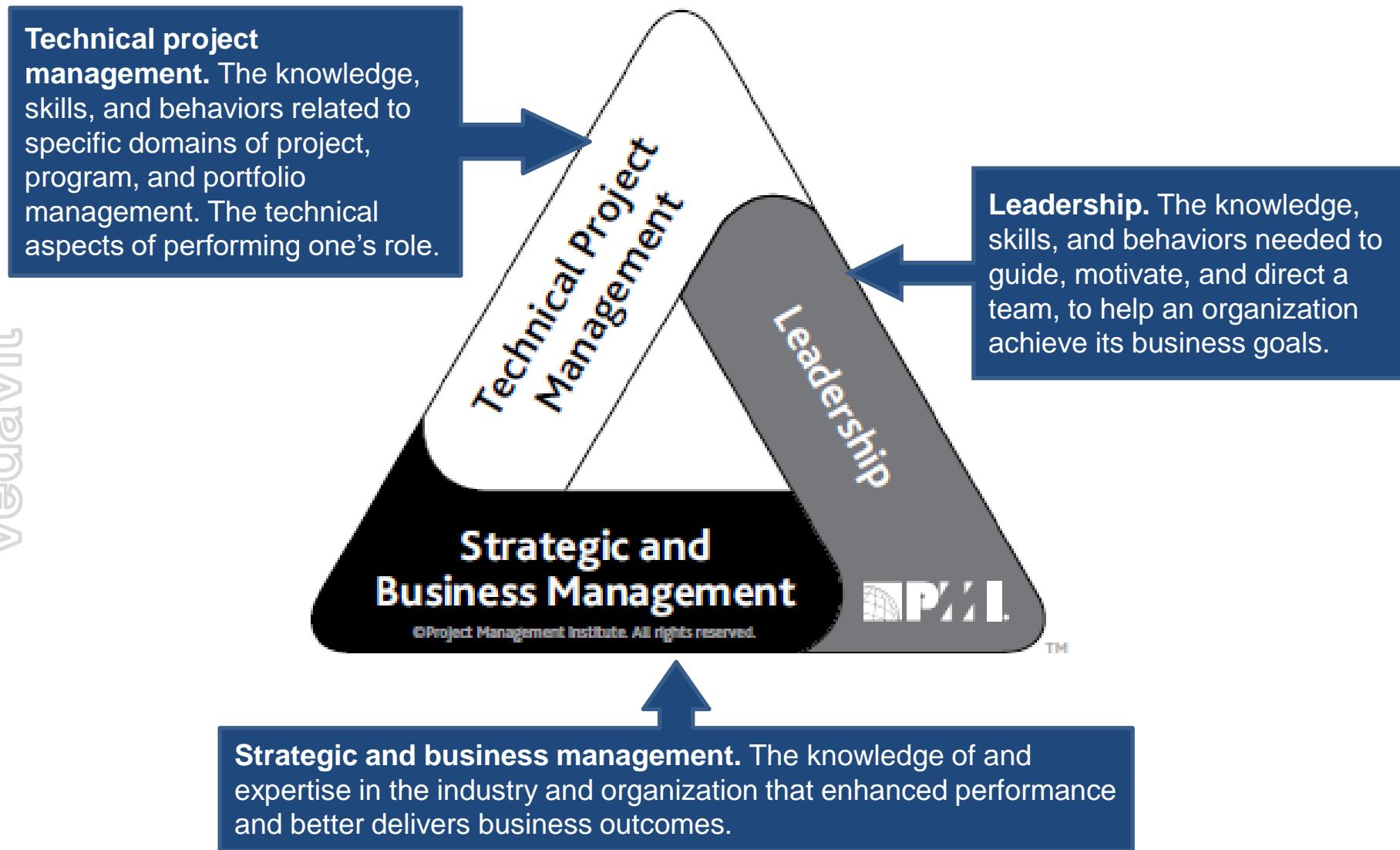
Highest NPV (Net Present Value)

High BCR (Benefit Cost Ratio)

- PBP- Payback Period is a time in which original invest is realized.
- $PV = FV / (1+r)^n$
 - PV= Present Value
 - FV= Future Value
 - r = Discount Rate
 - n = Number of Years
- $NPV = \text{Inflow} - \text{Outflow}$ (Take Positive Value)
- $IRR = \text{A discount rate at which } [Outflow - Inflow = 0]$
- $BCR = \text{Benefits (Present Value)} / \text{Cost (Output)}$

PMI Talent Triangle

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Management & Leadership

Management	Leadership
Direct using positional power	Guide, influence, and collaborate using relational power
Maintain	Develop
Administrat	Innovate
Focus on systems and structure	Focus on relationships with people
Rely on control	Inspire trust
Focus on near-term goals	Focus on long-range vision
Ask how and when	Ask what and why
Focus on bottom line	Focus on the horizon
Accept status quo	Challenge status quo
Do things right	Do the right things
Focus on operational issues and problem solving	Focus on vision, alignment, motivation, and inspiration

PM Competencies

A Framework

Project Manager Competency Development
Framework- 2nd Edition, 2007

Project Manager Responsibilities

- Estimates of size, efforts & schedule
- Risk identification, analysis, prioritization, monitoring & control
- Resource allocation, resource backup and utilization
- Scope management
- Communication- reviews, steering committee meetings, stakeholder identification and expectation management
- Stakeholder Expectation Management
- Defect free product delivery on time within budget
- Team motivation, team management, training & development, appreciation, career planning, interview
- Deliver as per contract & proposal
- Procure as per contract & proposal
- Configuration management, data backup
- Quality planning
- Cost optimization
- Presales & proposals
- Technical guidance to team – if team members are not available do their work (after project manager has completed his work & he has spare time)



Project Manager Responsibilities

- **Initiating a Project**
 - Project aligned with org objectives & customer needs
 - High-level risks, assumptions and constraints are understood
 - Stakeholders identified and their need are understood
 - Project Charter approved
- **Planning a Project**
 - Project scope agreed
 - Project schedule approved
 - Cost budget approved
 - Project team identified with roles and responsibilities agreed
 - Communication activities agreed
 - Quality management process established
 - Risk response plan approved
 - Integrated change control processes defined
 - Procurement plan approved
 - Project Plan approved

Project Manager Responsibilities

- **Executing a Project**
 - Project scope achieved
 - Project stakeholders expectations managed
 - Human resource managed
 - Quality managed against plan
 - Material resources managed
- **Monitoring & Controlling a Project**
 - Project tracked and status communicated to stakeholders
 - Project change is managed
 - Quality is monitored and controlled
 - Risk is monitored and controlled
 - Project team managed
 - Contract administered
- **Closing a Project**
 - Project outcomes accepted
 - Project resources released
 - Stakeholder perceptions measured and analyzed
 - Project formally closed

Project Manager Competencies

- Communication
- Leading
- Managing
- Cognitive Ability
- Effectiveness
- Professionalism

Widely Used Tools & Techniques in PMBOK 6th Ed

Data Gathering Tools and Techniques

1. Benchmarking
2. Brainstorming
- 3. Check-sheets**
- 4. Checklists**
- 5. Focus-groups**
6. Interviews
7. Market-research
8. Questionnaires-and-surveys
9. Statistical-sampling

Data Gathering

Defects/Date	Date 1	Date 2	Date 3	Date 4	Total
Small scratch	1	2	2	2	7
Large scratch	0	1	0	0	1
Bent	3	3	1	2	9
Missing component	5	0	2	1	8
Wrong color	2	0	1	3	6
Labeling error	1	2	1	2	6

Check-sheets

Focus groups bring together prequalified stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service, or result. A trained moderator guides the group

Commercial Building Checklist		
TO BE COMPLETED BY APPLICANT		
PUBLIC UTILITY REQUIREMENTS		
1. Show location and size of proposed swimming pool.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. If a swimming pool is proposed, show pump system (limit 50 GPM).	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ZONING REQUIREMENTS		
1. Copy of the Approved Site Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Floor plans and building elevations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
STORMWATER REQUIREMENTS		
1. Reference set of approved Site Plan and/or Infrastructure Construction Drawings	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. If in flood hazard area, identify Regulatory Flood Protection Elevation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. A Flood Study is required for any encroachment into a regulatory floodway and must be sealed by the design engineer.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TREE CONSERVATION REQUIREMENTS		
1. A copy of the latest Recorded Plat showing the tree conservation areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Show tree conservation areas on plan and reference book of maps and page where they are recorded	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FLOODPLAIN REQUIREMENTS		
1. Propose finished floor elevation of building, electrical, and mechanical equipment should be shown on architectural plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Identify Regulatory Flood Protection Elevation (RFPE) on all architectural plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Wet or Dry Flood Proofing: Provide all structural and installation details for flood proofing measures including retrofits and proposed building materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Provide Emergency Preparedness Action Plan: The plan is a document detailing how flood protection measures are to be installed and the responsible parties for floodproofed buildings. (A sample plan may be obtained from the Stormwater Engineer's office.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GENERAL PLAN REVIEW REQUIREMENTS		
1. Wind Speed - 100 MPH, Fastest wind speed three second gust	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Snow Load for Raleigh, NC - 15 lbs.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Frost Depth - 12 inches	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Checklists



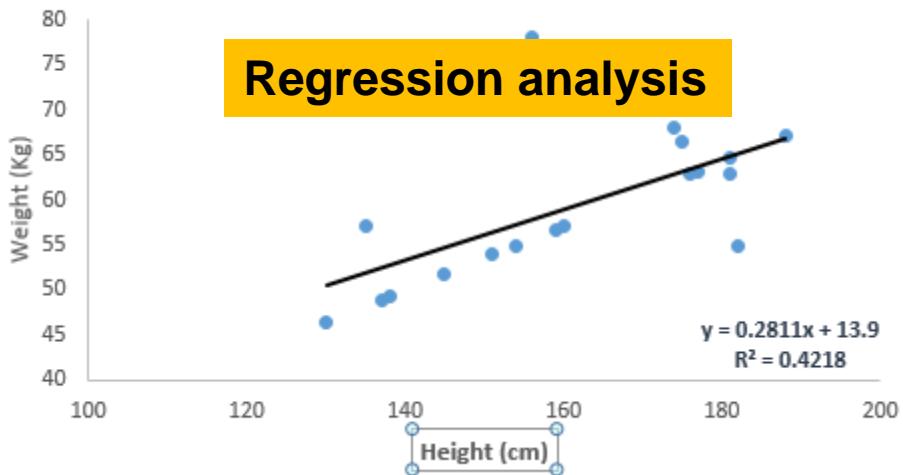
Focus-groups

Data Analysis Tools and Techniques

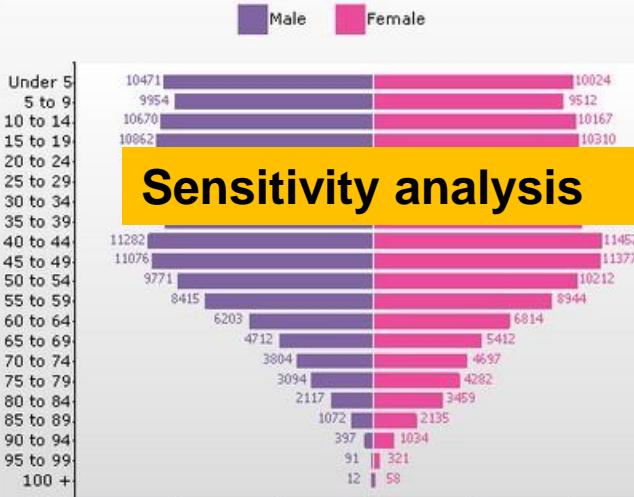
1. Alternatives-analysis
2. Assessment of other risk parameters
3. Assumption and constraint analysis
4. **Cost of quality**
5. **Cost-benefit analysis**
6. **Decision tree analysis**
7. Document analysis
8. Earned value analysis
9. **Influence diagrams**
10. **Iteration burndown chart**
11. Make-or-buy analysis
12. Performance reviews
13. Process analysis
14. Proposal evaluation
15. **Regression analysis**
16. Reserve analysis
17. Risk data quality assessment
18. Risk probability and impact assessment
19. Root cause analysis
20. **Sensitivity analysis**
21. Simulation
22. Stakeholder analysis
23. SWOT analysis
24. Technical performance analysis
25. Trend analysis
26. Variance analysis
27. What-if scenario analysis

Data Analysis

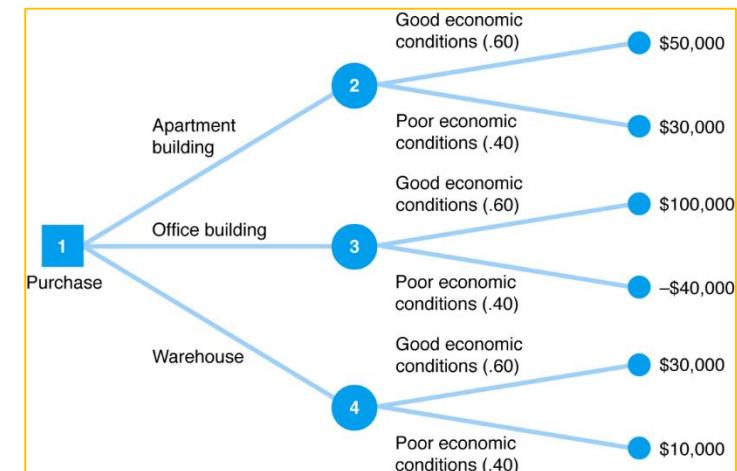
Relation B/w Weight & Height



Resident Population Projections
by Sex and Age: 2005



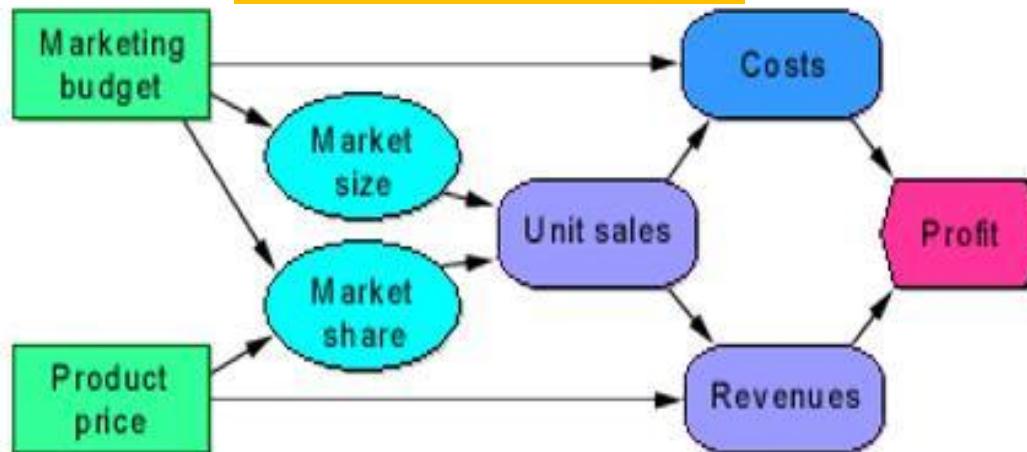
Cost of quality



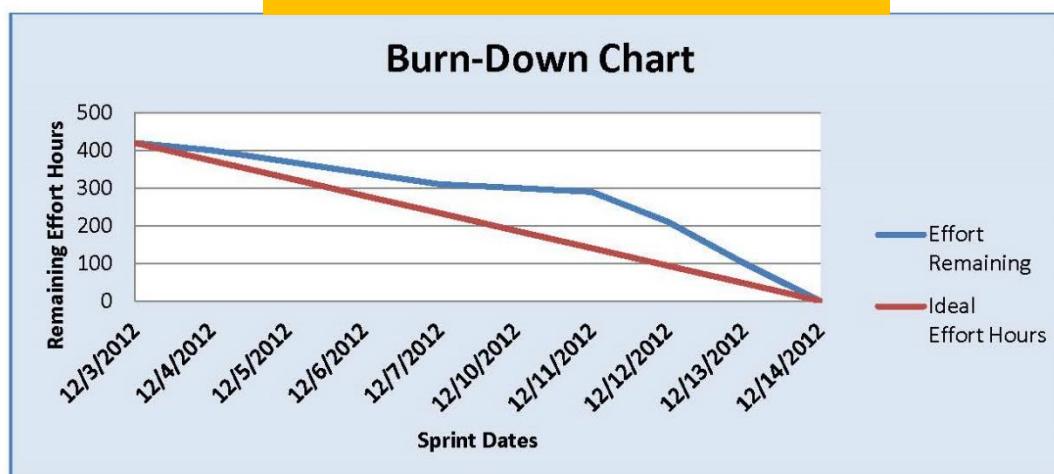
Decision tree analysis

Data Analysis

Influence diagrams



Iteration burndown chart



Data Analysis

Cost-Benefit Analysis - Automated Customer Invoicing System							
Costs	Year						
	0	1	2	3	4	5	6
Development costs	-50,000						
Operating costs		-75,000	-82,500	-90,750	-99,825	-109,808	
Total Costs	-50,000	-75,000	-82,500	-90,750	-99,825	-109,808	
Discount Factor (Discount rate = 15% p.a.)	1.00	0.87	0.76	0.66	0.57	0.50	
Present Value of Costs	-50,000	-65,217	-62,382	-59,670	-57,075	-54,594	
Cumulative PV Costs	-50,000	-115,217	-177,599	-237,269	-294,344	-348,938	-348,938
Benefits							
Tangible Benefits from new System		110,000	121,000	133,100	146,410	161,051	
Intangible Benefits from new System		10,000	11,000	12,100	13,310	14,641	10,000
Total Benefits		120,000	132,000	145,200	159,720	175,692	10,000
Discount Factor (Discount rate = 15% p.a.)	1.00	0.87	0.76	0.66	0.57	0.50	0.43
Present Value of Benefits		104,348	99,811	95,471	91,320	87,350	4,323
Cumulative PV Benefits		104,348	204,159	299,630	390,951	478,301	482,624
Cumulative PV Benefits+Costs	-50,000	-10,870	26,560	62,361	96,606	129,363	133,686

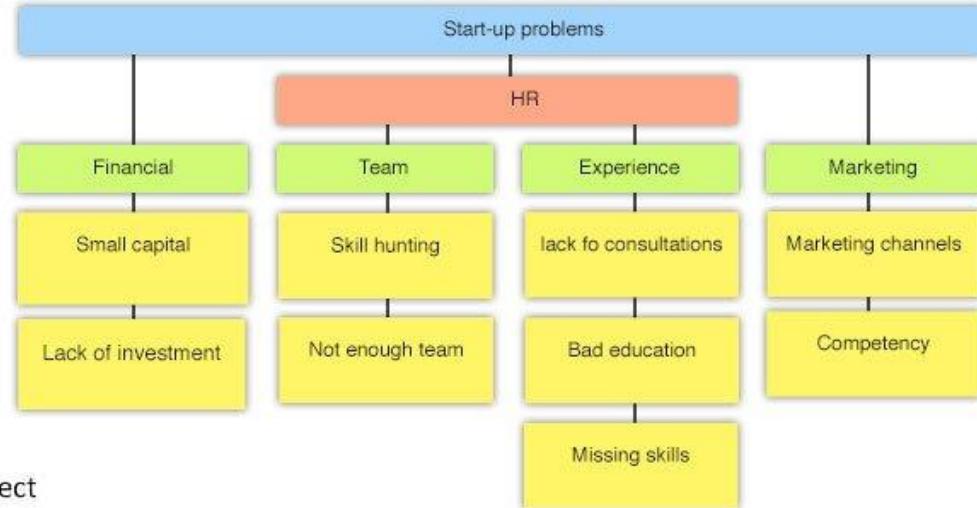
Cost-benefit analysis

Data Representation Tools and Techniques

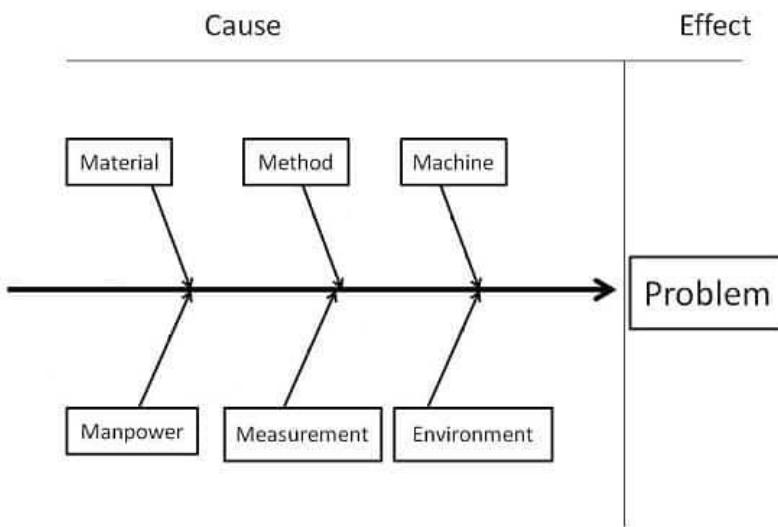
1. **Affinity diagrams**
2. **Cause-and-effect diagrams**
3. Control charts
4. Flowcharts
5. Hierarchical charts
6. Histograms
7. Logical data model
8. **Matrix diagrams**
9. Matrix-based charts
10. Mind mapping
11. Probability and impact matrix
12. Scatter diagrams
13. **Stakeholder engagement assessment matrix**
14. Stakeholder mapping/ representation
15. Text-oriented formats

Data Representation

Start-up Problems - Affinity Diagram



Cause-and-effect diagrams



Data Representation

CRUD DIAGRAM SAMPLE

Entity Process	Customer	Customer Order	Customer Account	Customer Invoice	Vendor Invoice	Product
Receive Customer Order	R	C	CR			
Process Customer Order	CRU		RU			R
Maintain Customer Order	U		U		RU	
Terminate Customer Account	U		U		RU	
Fill Customer Order	RU		RU			RU
Ship Customer Order			U		C	
Validate Vendor Invoices					R	
Pay Vendor Invoices					RU	
Invoice Customer	RU		RU	C		
Maintain Inventory						CRUD

Matrix diagrams

C-Current, D-Desired

	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder Name		C			D
Stakeholder Name	C			D	
Stakeholder Name			C	D	
Stakeholder Name				D	C
Stakeholder Name				C, D	

Stakeholder engagement assessment

Decision-Making Tools and Techniques

1. Multicriteria decision analysis

Prioritization matrix. Identify criteria. Criteria are prioritized and weighted before being applied to all available alternatives to obtain a mathematical score for each alternative.

2. Voting

Unanimity, Majority, Plurality

Communication Skills Tools and Techniques

1. Feedback

Interactive Communication like Coaching,
Mentoring, and Negotiating

2. Presentations

Interpersonal and Team Skills Tools and Techniques

1. Active listening
2. Communication styles assessment
3. Conflict management
4. Cultural awareness
5. Decision making
6. Emotional intelligence
7. Facilitation
8. Influencing
9. Leadership
10. Meeting management
11. Motivation
12. Negotiation
13. Networking
- 14. Nominal group technique**
15. Observation/conversation
16. Political awareness
17. Team building

Nominal Group Technique

The nominal group technique enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or for prioritization. The nominal group technique is a structured form of brainstorming consisting of four steps:

Question or problem
is posed, idea
silently generated

Moderator writes
down the ideas

Each recorded idea
is discussed

Individuals vote
privately to prioritize
the ideas

Expert Judgement

- Being an industry neutral, domain neutral, culture neutral standard PMBOK provides you a unique tool to deliver a successful project. This tool is called expert judgment.
- Project managers highly rely on industry specific skills, input from local market experts, those who have done similar work earlier
- *E.g. SME, A department within Organization, Industry Group, Consultants, Experienced People within Org or Industry*

Meetings

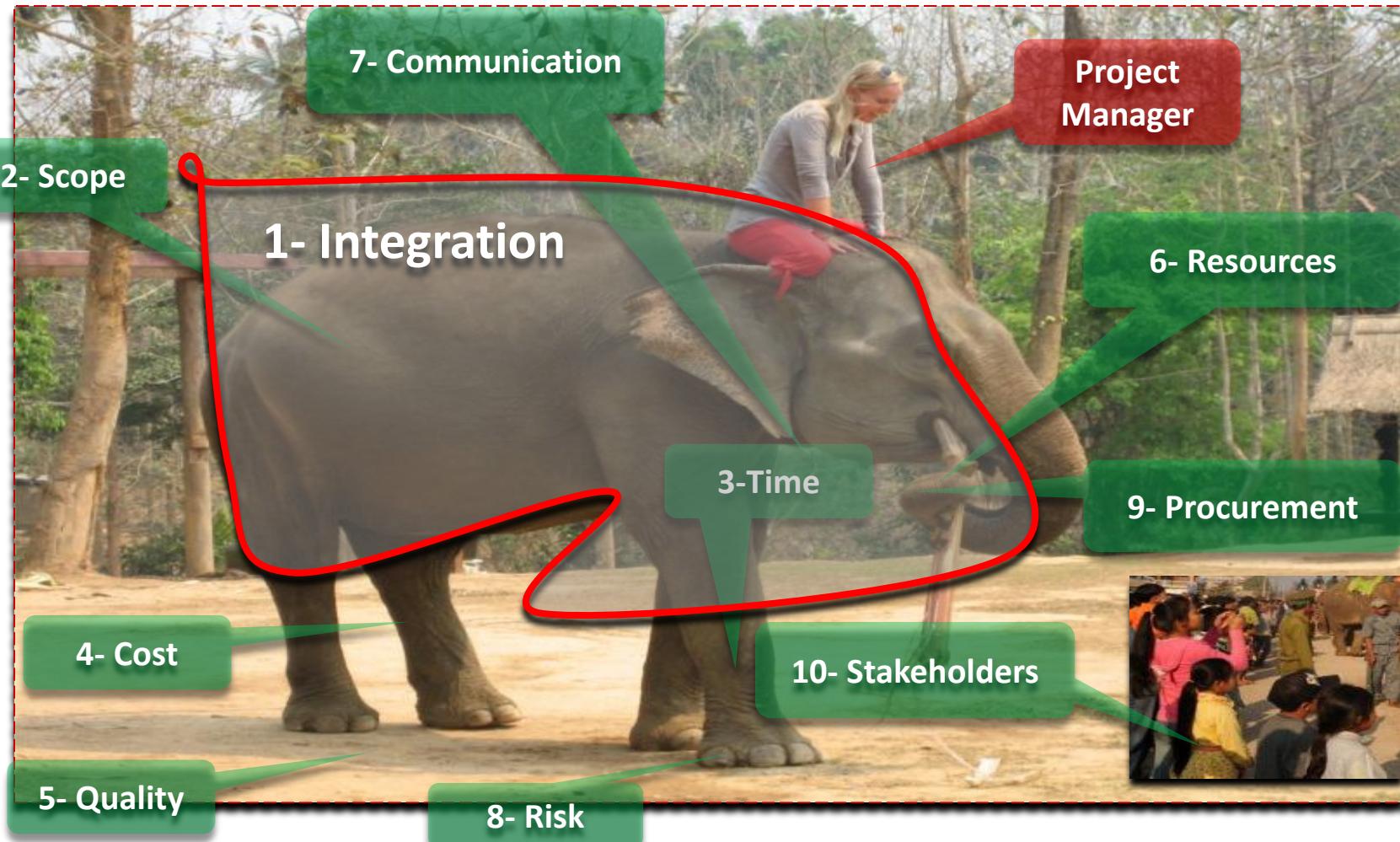
Meetings with stakeholders helps us understand their viewpoint which is critical for making decisions.

- F2F
- Virtual
- Formal
- Informal
- Standup Meeting
- Kickoff Meetings
- Adhoc Meeting
- Review Meeting
- Off-site Meetings
- On-Site Meeting



Project Management Knowledge Areas

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Process Groups

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Initiating



Planning



Executing



Monitoring &
Controlling



Closing



Process is not

- Plan (Schedule MP, Risk MP, Procurement MP etc.)
- Methodology (Agile, Lean, Scrum etc)
- Body of knowledge (PMBoK, OMBoK, BABOK etc)
- Library (ITIL)
- Model (CMMI, OPM3, ISO)
- Standard (IEEE standard)
- Checklist (Code review, Design Review, Readiness Review)
- Manual (QMS, OMS, HR Manual)
- Law (traffic law, criminal law, gravitational law)
- Framework (PRINCE2 or other technical or development)
- Knowledge area (IM, SM, TM etc)
- Process area (RD, REQM, PP, TS, VER etc)
- Best practice (Standup meeting, TDD, Requirement Prioritization, Product Backlog, Sprint Planning)
- Tailored process and OSSP are different

What is PMBOK?

- PMBOK® is a Guide. It is different from a methodology. A methodology is a system of practices, techniques, procedures, and rules used by those who work in a discipline.
- It is a foundation for organizations on which they can build methodologies, policies, procedures, rules, tools and techniques, and life cycle phases needed to practice project management

Discussions !

Project Integration Management



Framework for Project Integration Management



Project Integration Management



Definition

Processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups

Project Integration Management

1. Develop Project Charter [INITIATING]
2. Develop Project Management Plan [PLANNING]
3. Direct and Manage Project Execution [EXECUTING]
4. Manage Project Knowledge [EXECUTING]
5. Monitor and Control Project Work [M&C]
6. Perform Integrated Change Control [M&C]
7. Close Project or Phase [CLOSING]

1. Develop Project Charter



Definition

The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.



Develop Project Charter



- .1 Business documents
 - Business case
 - Benefits management plan
- .2 Agreements
- .3 EEFs
- .4 OPA



- .1 Expert judgment
- .2 Data gathering
 - Brainstorming
 - Focus groups
 - Interviews
- .3 Interpersonal and team skills
 - Conflict management
 - Facilitation
 - Meeting management
- .4 Meetings

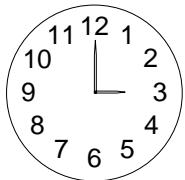


- .1 Project charter
- .2 Assumption log

Project Charter Template

1. Project purpose or justification
2. Measurable project objectives and related success criteria
3. High – Level Requirements
4. High – Level Project description
5. High – Level Risks
6. Summary milestone schedule
7. Summary Budget
8. Project approval requirements
9. Assigned project manager, responsibility, and authority level
10. Name and authority of the sponsor or other person(s) authorizing the project charter

Exercise-1



15 Minutes

- Prepare Project Charter for your Project

2. Develop Project Management Plan



Definition

The process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.



Develop Project Management Plan



- .1 Project charter
- .2 Outputs from other processes
- .3 EEFs
- .4 OPAs

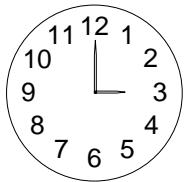


- .1 Expert judgment
- .2 Data gathering
 - Brainstorming
 - Checklists
 - Focus groups
 - Interviews
- .3 Interpersonal and team skills
 - Conflict management
 - Facilitation
 - Meeting management
- .4 Meetings



- .1 Project management plan

Exercise-2



5 Minutes

- **Write name of all type of subsidiary plans for your Project**

3. Direct & Manage Project Work



Definition

The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives



Direct and Manage Project Work



- .1 Project management plan
 - Any component
- .2 Project documents
 - Change log
 - Lessons learned register
 - Milestone list
 - Project communications
 - Project schedule
 - RTM
 - Risk register
 - Risk report
- .3 Approved change requests
- .4 EEFs
- .5 OPAs

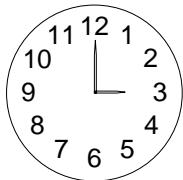


- .1 Expert judgment
- .2 PMIS
- .3 Meetings



- .1 Deliverables
- .2 Work performance data
- .3 Issue log
- .4 Change requests
- .5 PMP updates
 - Any component
- .6 Project documents updates
 - Activity list
 - Assumption log
 - Lessons learned register
 - Requirements Docs.
 - Risk register
 - Stakeholder register
- .7 OPAs Updates

Exercise-3



5 Minutes

- **Write name of Deliverables & Name of work performance information for your Project**

4. Manage Project Knowledge



Definition

The process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.



Manage Project Knowledge



.1 PMP

- All components

.2 Project documents

- Lessons learned register
- Project team assignments
- Resource breakdown structure
- Source selection criteria
- Stakeholder register

.3 Deliverables

.4 EEFs

.5 OPAs

.1 Expert judgment

.2 Knowledge management

.3 Information management

.4 Interpersonal and team skills

- Active listening
- Facilitation
- Leadership
- Networking
- Political awareness

.1 Lessons learned register

.2 PMP updates

- Any component

.3 OPAs updates

Knowledge Management

Connect people so they can work together to create new knowledge & share tacit knowledge & integrate the knowledge of diverse team members.

- Networking
- Conversations with specialists;
- Communities of practice
- Meetings
- Work shadowing and reverse shadowing;
- Discussion forums
- Knowledge-sharing events such as seminars and conferences;
- Workshops, including problem-solving sessions and learning reviews designed to identify lessons learned;
- Storytelling;
- Creativity and ideas management techniques;
- Knowledge fairs and cafés; and
- Training that involves interaction between learners.

Information management

That connect people to information. Effective for sharing simple, unambiguous, codified explicit knowledge.

- Methods for codifying explicit
- Lessons learned register
- Web searches and reading published articles;
- PMIS

5. Monitor & Control Project Work



Definition

The process of tracking, reviewing, and reporting overall progress to meet the performance objectives defined in the project management plan.



Monitor and Control Project Work



- .1 Project management plan
 - Any component
- .2 Project documents
 - Assumption log
 - Basis of estimates
 - Cost forecasts
 - Issue log
 - Lessons learned register
 - Milestone list
 - Quality reports
 - Risk register
 - Risk report
 - Schedule forecasts
- .3 Work performance information
- .4 Agreements
- .5 EEFs
- .6 OPA

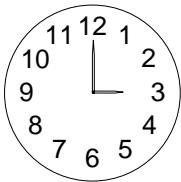


- .1 Expert judgment
- .2 Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
 - Earned value analysis
 - Root cause analysis
 - Trend analysis
 - Variance analysis
- .3 Decision making
- .4 Meetings



- .1 Work performance reports
- .2 Change requests
- .3 PMP updates
 - Any component
- .4 Project documents updates
 - Cost forecasts
 - Issue log
 - Lessons learned register
 - Risk register
 - Schedule forecasts

Exercise-4



5 Minutes

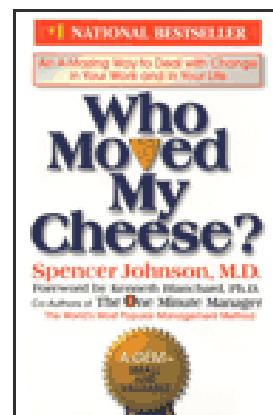
- **Write type & name of a few change requests for your Project**

6. Perform Integrated Change Control



Definition

The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating the decisions.



Perform Integrated Change Control



.1 PMP

- Change management plan
- Configuration management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.2 Project documents

- Basis of estimates
- RTM
- Risk report

.3 Work performance reports

.4 Change requests

.5 EEFs

.6 OPAs

.1 Expert judgment

.2 Change control tools

.3 Data analysis

- Alternatives analysis
- Cost-benefit analysis

.4 Decision making

- Voting
- Autocratic decision making
- Multicriteria decision analysis

.5 Meetings

.1 Approved change requests

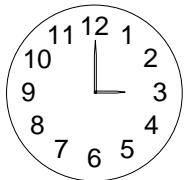
.2 PMP updates

- Any component

.3 Project documents updates

- Change log

Exercise-5



5 Minutes

- a. Write change management process for your Project
OR
- b. Prepare a format of change request report for your project

7. Close Project or Phase



Definition

The process of finalizing all activities for the project, phase, or contract.



Close Project or Phase



- .1 Project charter
- .2 Project management plan
 - All components
- .3 Project documents
 - Assumption log
 - Basis of estimates
 - Change log, • Issue log
 - Lessons learned register
 - Milestone list, • Quality reports
 - Project communications
 - Quality control measurements
 - Req. documentation
 - Risk register, • Risk report
- .4 Accepted deliverables
- .5 Business documents
 - Business case
 - Benefits management plan
- .6 Agreements
- .7 Procurement documentation
- .8 OPA

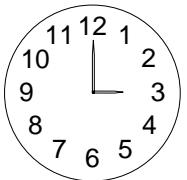


- .1 Expert judgment
- .2 Data analysis
 - Document analysis
 - Regression analysis
 - Trend analysis
 - Variance analysis
- .3 Meetings



- .1 Project documents updates
 - Lessons learned register
- .2 Final product, service, or result transition
- .3 Final report
- .4 OPA updates

Exercise-6



5 Minutes

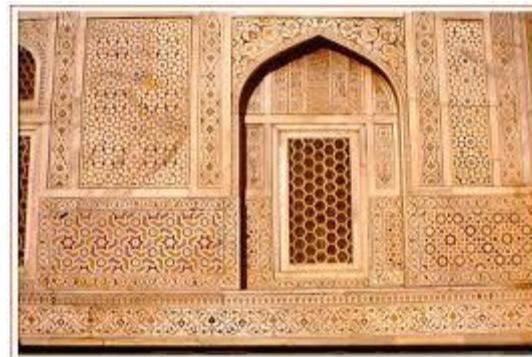
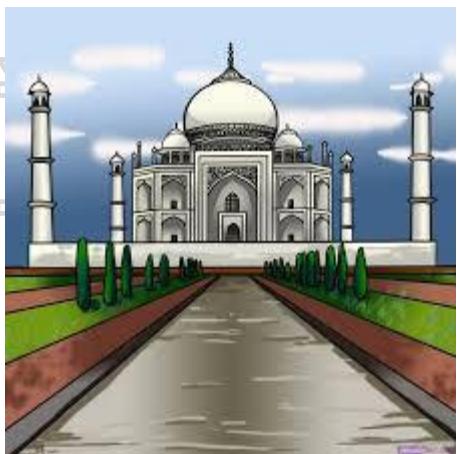
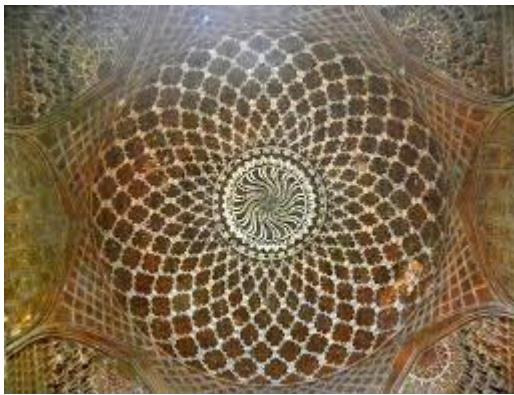
- Write name of documents submitted to organization deliveries made to customer for your Project at the end of your project or project phase.

Discussions !

Project Scope Management



Level of Detailing in Scope



How the customer explained it How the Project Leader understood it How the Analyst designed it How the Programmer wrote it How the Business Consultant described it



How the customer explained it



How the Project Leader understood it



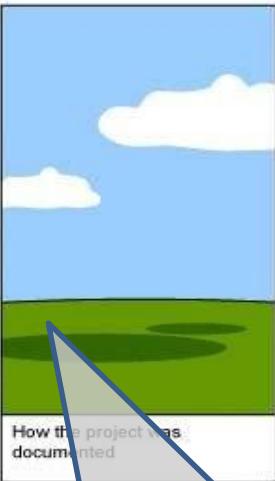
How the Analyst designed it



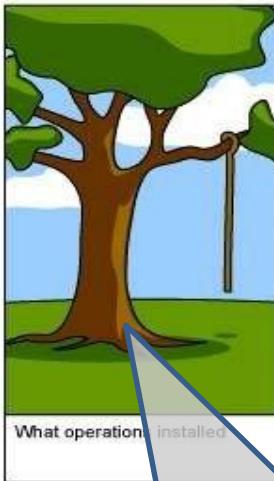
How the Programmer wrote it



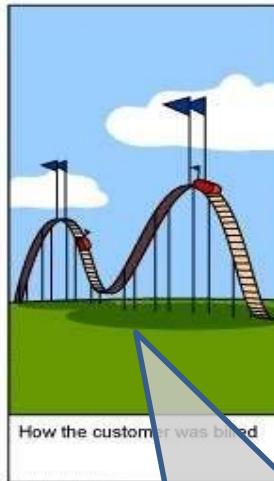
How the Business Consultant described it



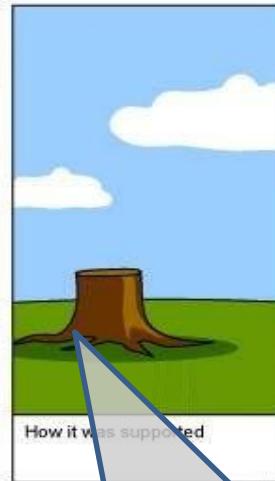
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

How the project was documented

How operations installed

How it was supported

How the customer was billed

What the customer really needed

Scope

- **Project Scope** "The work that needs to be accomplished to deliver a product, service, or result with the specified features and functions."
- **Product Scope** "The features and functions that characterize a product, service, or result."

Project Scope Management



Definition

Processes required to ensure that the project includes all the work required, and ONLY the work required to complete the project successfully

Project Scope Management

7. Plan Scope Management [PLANNING]

8. Collect Requirements [PLANNING]

9. Define Scope [PLANNING]

10. Create WBS [PLANNING]

11. Validate Scope [M&C]

12. Control Scope [M&C]

8. Plan Scope Management



Definition

Documenting how the project scope will be defined, validated and controlled

Plan Scope Management



- .1 Project charter
- .2 Project management plan
 - Quality management plan
 - Project life cycle description
 - Development approach
- .3 EEFs
- .4 OPAs



- .1 Expert judgment
- .2 Data analysis
 - Alternatives analysis
- .3 Meetings



- .1 Scope management plan
- .2 Requirements management plan

Plan Scope Management IO

- Scope Management Plan includes
 - Process for preparing project scope statement (PSS)
 - Process that enable creation of WBS from PSS
 - Process that specifies how formal acceptance be obtained
 - Process to control changes to details PSS
- Requirement Management Plan includes
 - Process of analyzing, documenting and managing requirements
 - Process of requirement prioritization
 - Product measurement metrics and their rationale
 - RTM structure
 - Configuration management activities related to product

9. Collect Requirements



Definition

The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.



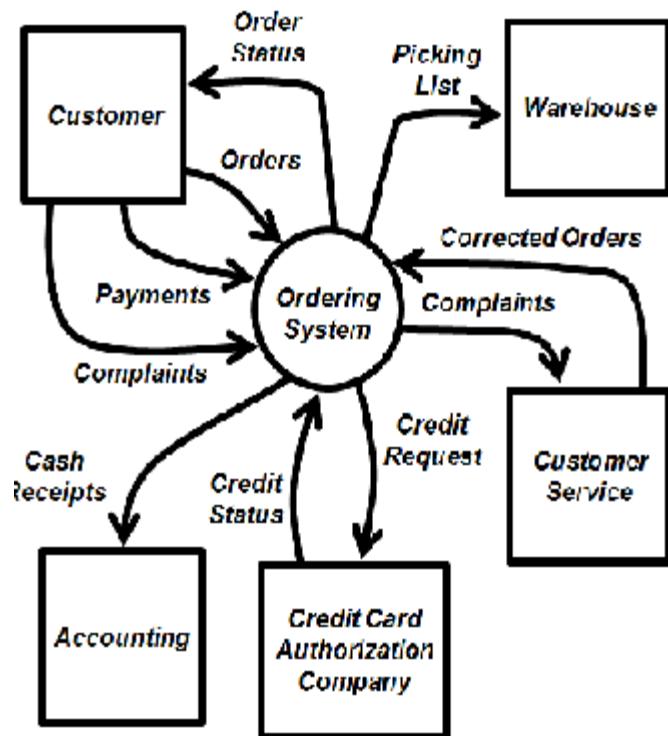
Collect Requirements



- .1 Project charter
- .2 Project management plan
 - Scope management plan
 - Requirements management plan
 - Stakeholder engagement plan
- .3 Project documents
 - Assumption log
 - Lessons learned register
 - Stakeholder register
- .4 Business documents
 - Business case
- .5 Agreements
- .6 EEFs
- .7 OPAs

- .1 Expert judgment
- .2 Data gathering
 - Brainstorming
 - Interviews
 - Focus groups
 - Questionnaires and surveys
 - Benchmarking
- .3 Data analysis
 - Document analysis
- .4 Decision making
 - Voting
 - Multicriteria decision analysis
- .5 Data representation
 - Affinity diagrams
 - Mind mapping
- .6 Interpersonal and team skills
 - Nominal group technique
 - Observation/conversation
 - Facilitation
- .7 Context diagram
- .8 Prototypes

- .1 Requirements documentation
- .2 Requirements traceability matrix



Context diagram

Requirement Traceability Matrix

- Tracing Requirements to
 - Business needs, opportunities, goals & objectives
 - Project objectives
 - Project scope/WBS deliverables
 - Product design
 - product development
 - Test strategy and test scenarios
- Traces high-level requirements to more detailed requirements.
- Attributes in RTM can be
 - Unique identifier
 - Textual description of requirement
 - Rationale for inclusion
 - Owner
 - Source
 - Priority
 - Version
 - Current Status (active, cancelled, differed, added, approved)
 - Date completed
 - Stability
 - Complexity
 - Acceptance Criteria

Requirement vs Scope

Scope and requirement are two different things.

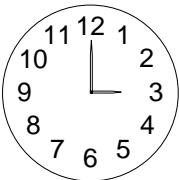
- Requirements are only those, which are in scope!
- Requirements are driven from scope
- Boundaries are defined first (using SOW), requirements are collected next

Requirement must be measurable, testable, traceable, complete, consistent and acceptable to key stakeholders.

Requirement Documentation includes

- Business need or **opportunity to be seized**, describing the limitation of the current situation and why the project has been undertaken
- Business and project **objectives** for traceability
- **Functional requirements**, describing business process, information, and interaction with the product, as appropriate which can be documented textually in a requirements list, in models, or both
- **Non-functional requirements** like SLA, performance, safety, security, compliance, supportability, retention/purge
- **Quality requirements**
- **Acceptance criteria**
- **Business rules** stating the guiding principles
- **Impacts to other** organizational areas call centre, technology centre, sales force
- Impacts to other entities inside or outside the performing organization
- **Support and training** requirements
- Requirements **assumptions and constraints**

Discussion/Exercise-7



5 Minutes

How to collect, analyze, document, prioritize, manage req; how change should be initiated and impact analysis done; Tracking changes, configuration management activities, RTM structure

**Write Requirement Management Plan for your projects
OR**

Write Columns of RTM for your project

10. Define Scope



Definition

Developing a detailed description of the project and product.



Define Scope



- .1 Project charter
- .2 Project management plan
 - Scope management plan
- .3 Project documents
 - Assumption log
 - Requirements documentation
 - Risk register
- .4 EEFs
- .5 OPAs



- .1 Expert judgment
- .2 Data analysis
 - Alternatives analysis
- .3 Decision making
 - Multicriteria decision analysis
- .4 Interpersonal and team skills
 - Facilitation
- .5 Product analysis



- .1 Project scope statement
- .2 Project documents updates
 - Assumption log
 - Requirements documentation
 - Requirements traceability matrix
 - Stakeholder register

Define Scope

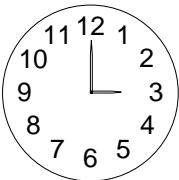
- Product Analysis
 - Product breakdown
 - System analysis
 - Requirement analysis
 - System engineering: Deals with multiple complex systems
 - Value engineering: Functions, value, cost
 - Retain the function & value and reduce the cost
 - Value analysis: Debate the function and its cost
 - Discuss the value of function vs the cost
- Alternative Identification
 - Alternative way of doing work

Scope Statement

Scope statement has following sections

- Product Scope Description
- Product Acceptance Criteria
- Project Deliverables
- Project Exclusions
- Project Constraints (budget, imposed date, scheduled milestones, contractual provisions)
- Project Assumptions
- Organizational policies
- Available skilled resources

Discussion/Exercise 8



5 Minutes

Product Scope Description, Product Acceptance Criteria, Project Deliverables
Project Exclusions, Project Constraints (budget, imposed date, scheduled milestones, contractual provisions), Project Assumptions, Organizational policies, Available skilled resources

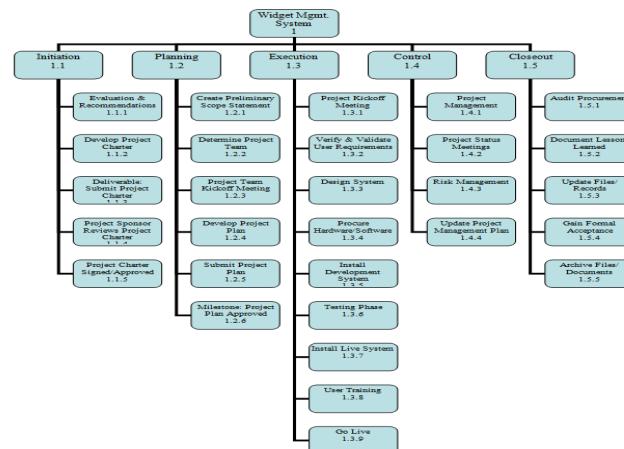
Write Project Scope Statement for your project

11. Create WBS



Definition

Subdividing project deliverables and project work into smaller, more manageable components.



Create WBS



.1 Project management plan

- Scope management plan

.2 Project documents

- Project scope statement
- Requirements documentation

.3 EEFs

.4 OPAs



.1 Expert judgment

.2 Decomposition



1 Scope baseline

.2 Project documents updates

- Assumption log
- Requirements documentation

Scope baseline

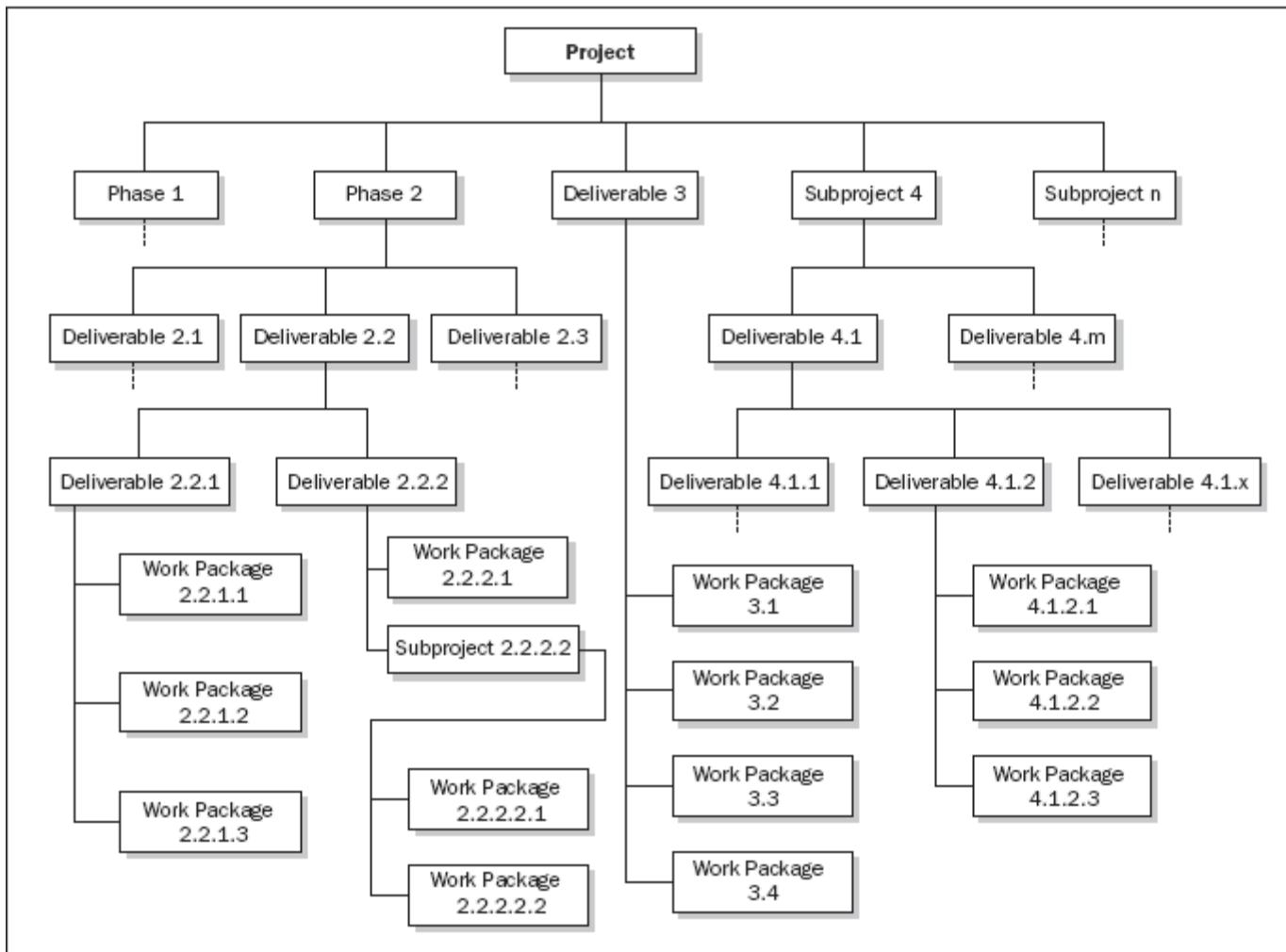
Scope baseline is part of PMP, Scope baseline includes

- Project Scope Statements
- WBS
- WBS Dictionary

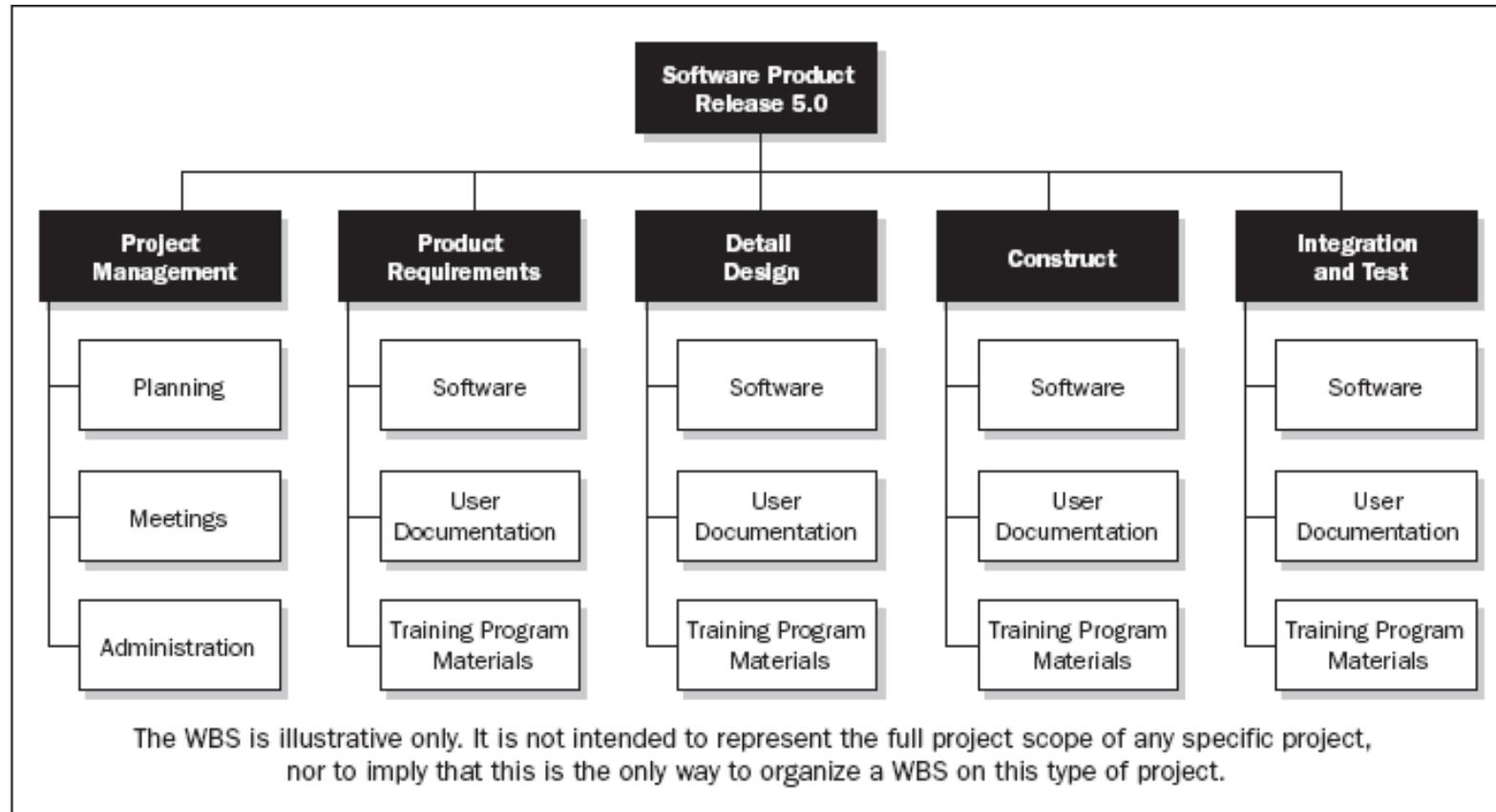
WBS Types

- Phase Driven
- Department Driven
- Milestone Driven
- Component Driven
- Location Driven
-

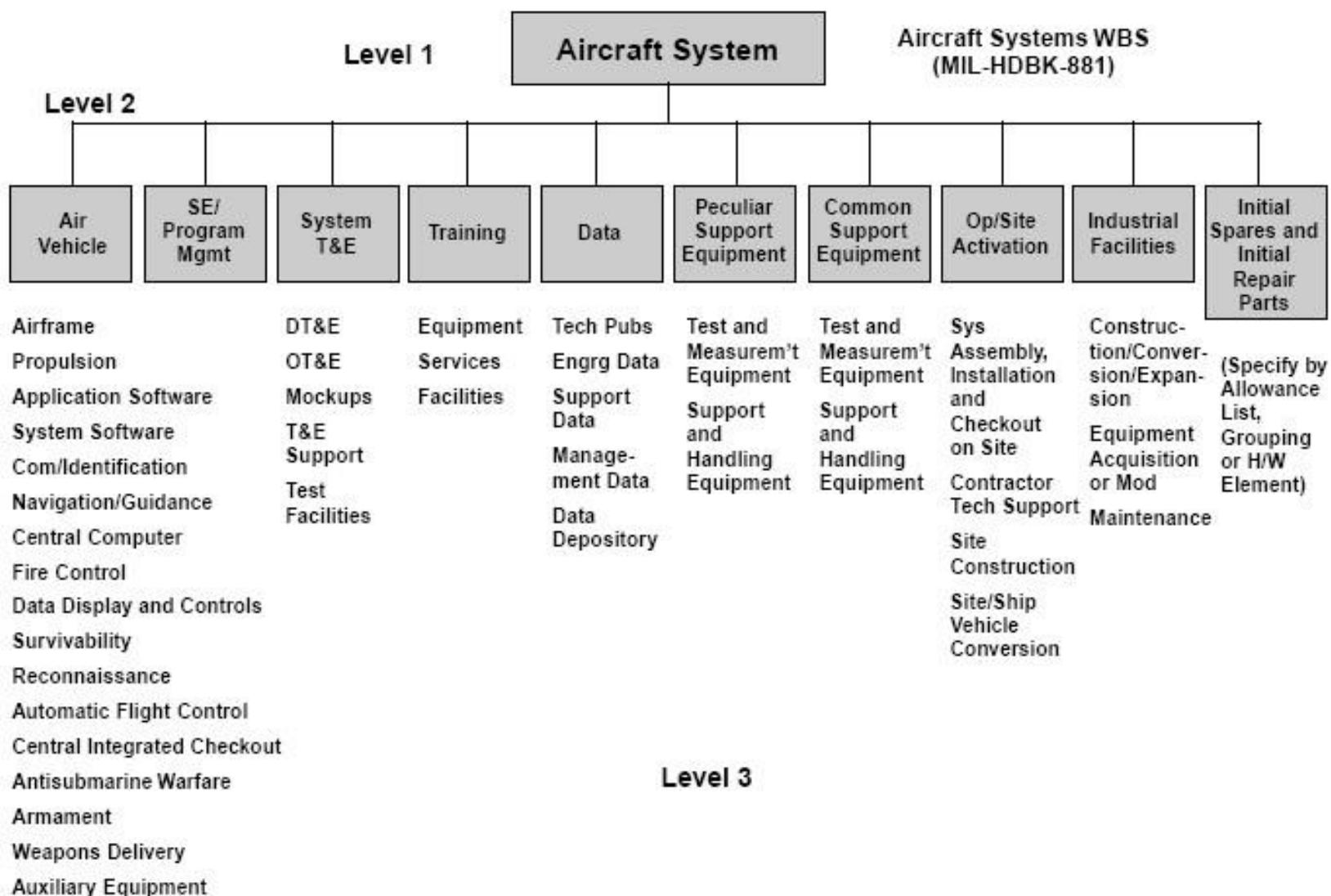
Phase oriented WBS



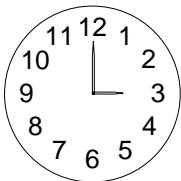
Department oriented WBS



Subproject Oriented WBS



Discussion/Exercise 9



5 Minutes

- Write 2 Level WBS & WBS Dictionary with min 5 deliverables for your project

12. Validate Scope



Definition

Formalizing acceptance of the completed project deliverables.



Validate Scope



- .1 Project management plan
 - Scope management plan
 - Requirements management plan
 - Scope baseline
- .2 Project documents
 - Lessons learned register
 - Quality reports
 - Requirements documentation
 - Requirements traceability matrix
- .3 Verified deliverables
- .4 Work performance data

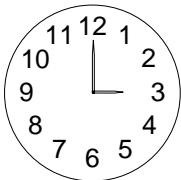


- .1 Inspection
- .2 Decision making
 - Voting



- .1 Accepted deliverables
- .2 Work performance information
- .3 Change requests
- .4 Project document updates
 - Lessons learned register
 - Requirements documentation
 - Requirements traceability matrix

Discussion/Exercise 10



5 Minutes

- Write verify scope activities for your project; also write the name of deliverables verified.

13. Control Scope



Definition

Monitoring the status of the project and product scope and managing changes to the scope baseline.



Control Scope



.1 Project management plan

- Scope management plan
- Requirements management plan
- Change management plan
- Configuration management plan
- Scope baseline
- Performance measurement baseline

.2 Project documents

- Lessons learned register
- Requirements documentation
- Requirements traceability matrix

.3 Work performance data

.4 OPAs



.1 Data analysis

- Variance analysis
- Trend analysis



.1 Work performance information

.2 Change requests

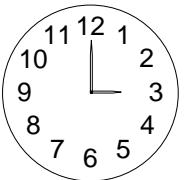
.3 PMP updates

- Scope management plan
- Scope baseline
- Schedule baseline
- Cost baseline
- Performance measurement baseline

.4 Project documents updates

- Lessons learned register
- Requirements documentation
- Requirements traceability matrix

Discussion/Exercise-11



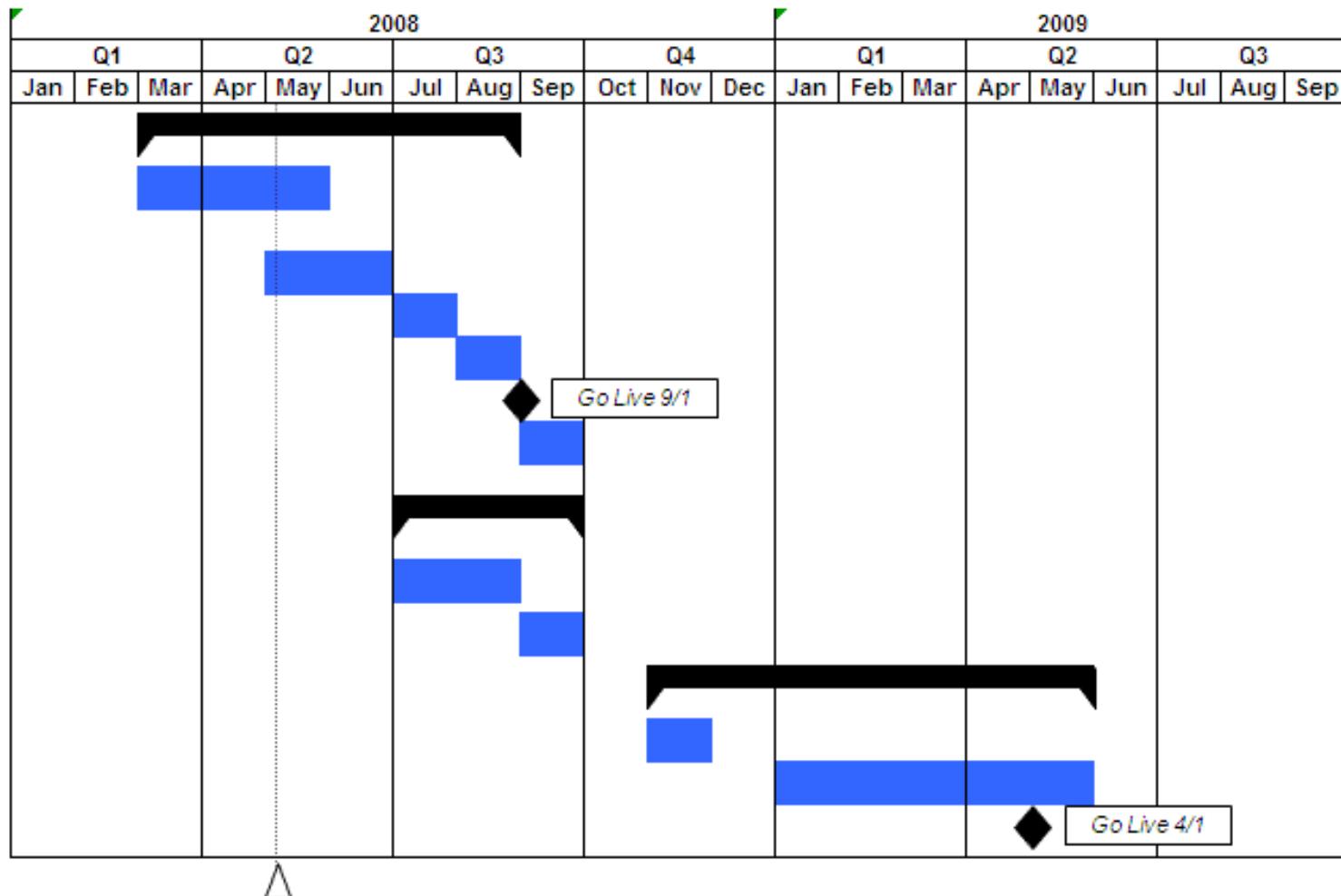
5 Minutes

- Write work performance measurement metrics and their values for your project

Discussions !

Project Schedule Management

Project Time Management



Project Time Management

"Doing your project without a plan is like watching television with someone else holding the remote control"- Peter Turla

"The bad news is time flies. The good news is you're the pilot." - Michael Altshuler

"I made this letter longer than usual because I lack the time to make it shorter." – Pascal

"Time is a great teacher, but unfortunately it kills all its pupils." - Hector Louis Berlioz

Project Time Management



Definition

Processes required to manage timely completion of the project.



Project Time Management

14.Plan Schedule Management [PLANNING]

15.Define Activities [PLANNING]

16.Sequence Activities [PLANNING]

17.Estimate Activity Durations [PLANNING]

18.Develop Schedule [PLANNING]

19.Control Schedule [M&C]

14. Plan Schedule Management



Definition

Establishing the policies, procedures and documentation for planning, developing, managing, executing, and controlling the project schedule

Plan Schedule Management



- .1 Project charter
- .2 Project management plan
 - Scope management plan
 - Development approach
- .3 EEFs
- .4 OPAs



- .1 Expert judgment
- .2 Data analysis
 - Alternatives analysis
- .3 Meetings



- 1..1 Schedule management plan

Schedule Management Plan

It includes

- Scheduling tools to be used
- Level of accuracy
- Units of measure for each resource
- Organizational procedure links
- Process of updating the progress in schedule model
- Control thresholds
- Rules of performance measurement (baselines, %complete, fixed formula etc.)
- Define scheduling reporting format

15. Define Activities



Definition

Identifying the specific actions to be performed to produce the project deliverables



Define Activities



.1 Project management plan

- Schedule management plan
 - Scope baseline
- .2 EEFs
- .3 OPAs



.1 Expert judgment

- .2 Decomposition
- .3 Rolling wave planning
- .4 Meetings



.1 Activity list

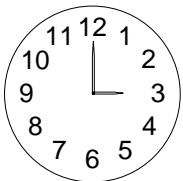
- .2 Activity attributes
- .3 Milestone list
- .4 Change requests
- .5 PMP updates
 - Schedule baseline
 - Cost baseline

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Activity Attributes

- Dependency
- Location of performance
- Type of dependency
- Level of efforts (work contour)
- Efforts required
- Related Deadline
- Related WBS account
- Critical activity
- Type of task (fixed duration, resources, work)
- Resource & skills required
- Duration
- Lead & Lag

Discussion/Exercise 12



5 Minutes

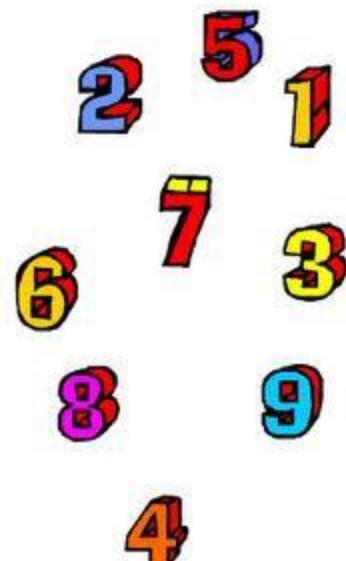
- Write activities & their attributes for previously created 2 level WBS for your project

16. Sequence Activities



Definition

Identifying and documenting relationships among the project activities.



Sequence Activities



.1 PMP

- Schedule management plan
- Scope baseline

.2 Project documents

- Activity attributes
- Activity list
- Assumption log
- Milestone list

.3 EEFs

.4 OPAs



.1 Precedence diagramming method

.2 Dependency determination and integration

.3 Leads and lags

.4 PMIS



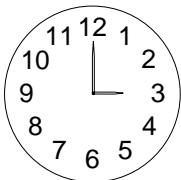
.1 Project schedule network diagrams

.2 Project documents updates

- Activity attributes
- Activity list
- Assumption log
- Milestone list

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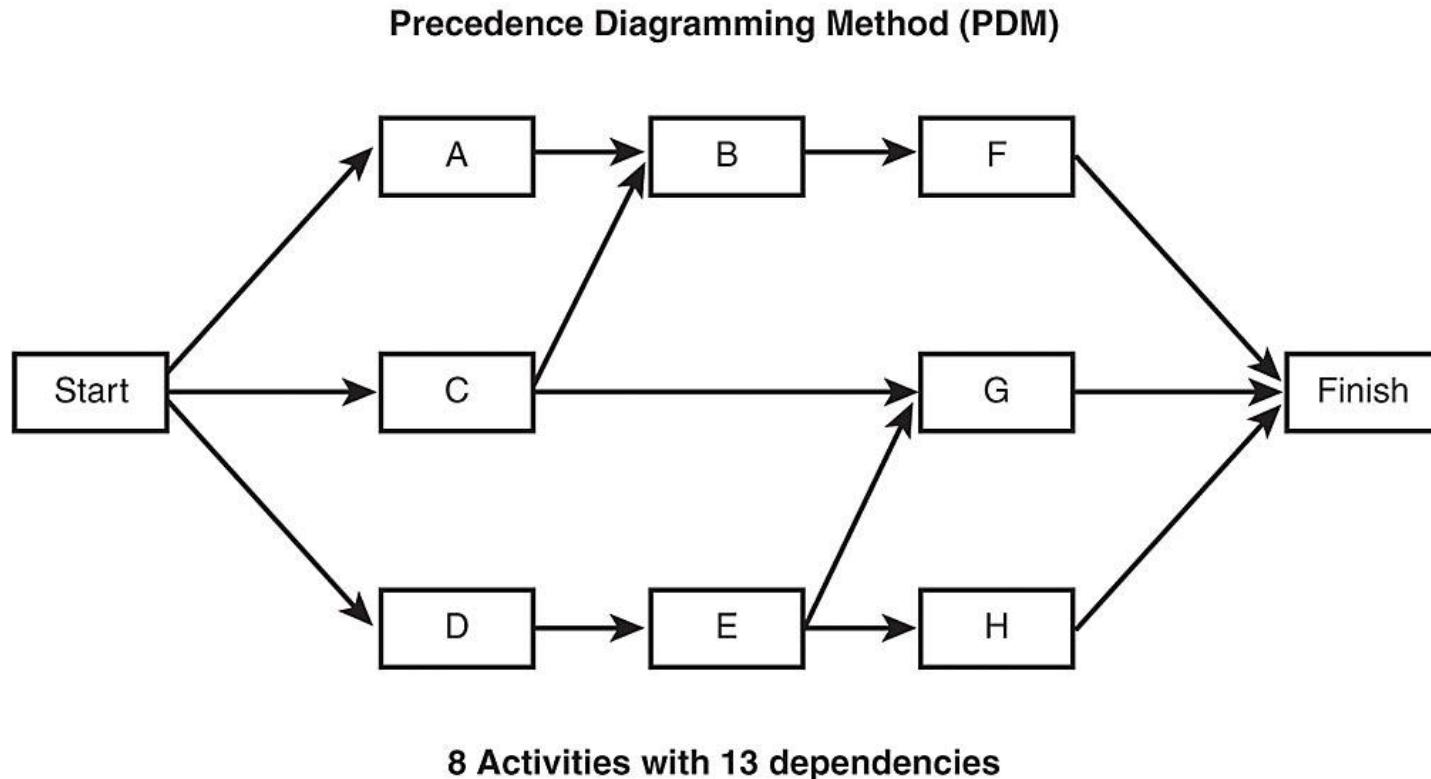
Discussion/Exercise 13



2 Minutes

- **Sequence Previously activities of your project write FS, SF, FF, SS after the activities**
- **FS- (Finish first to start the next) Documentation – Review**
- **FF- (Finish next to finish the previous) Documentation & Product**
- **SF- (Start next to finish the previous) Shift working environment, changing mortor**
- **SS- (Start next to start previous) Listening & Speaking, Start meeting & Start a topic to discuss**

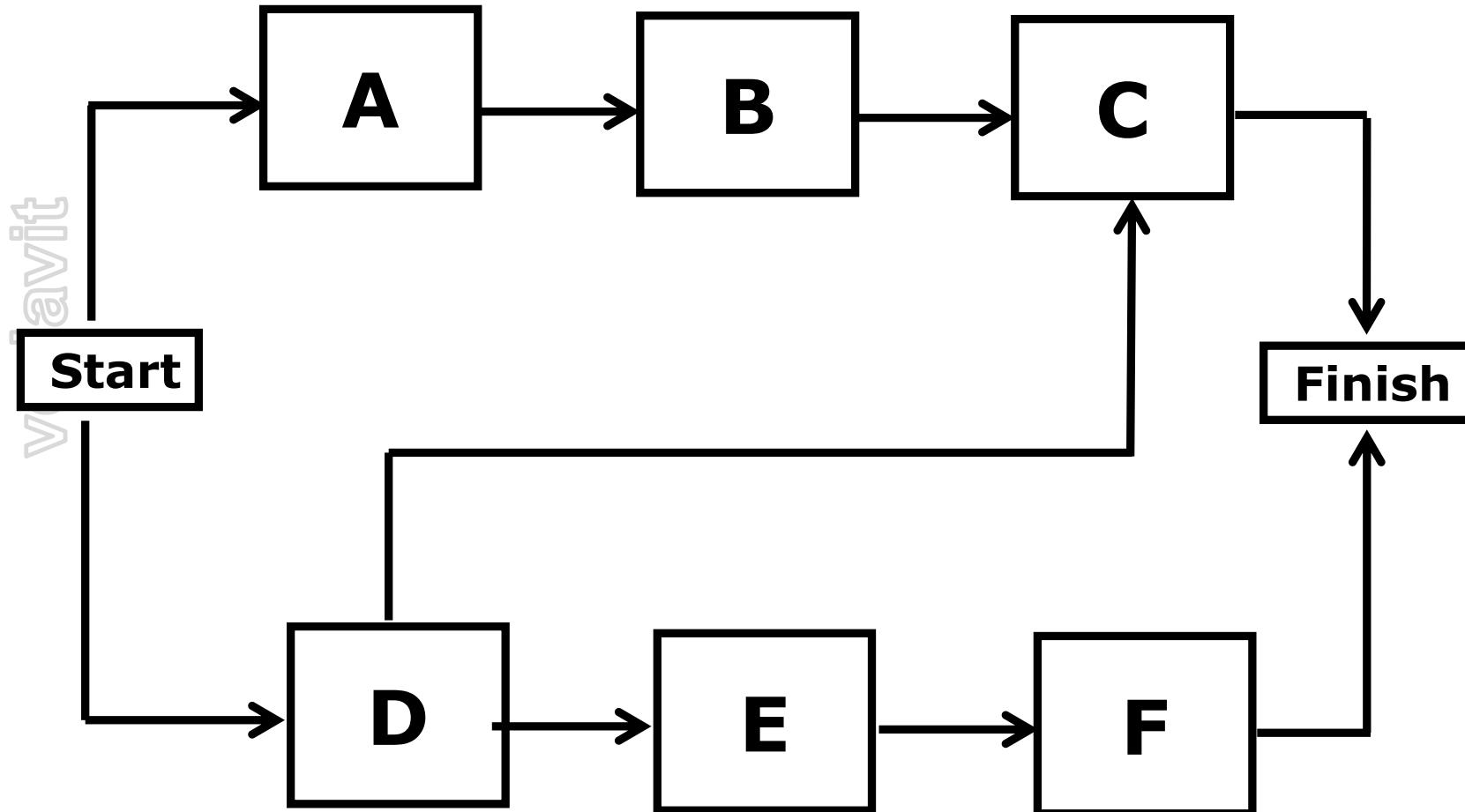
Precedence Diagramming Method (PDM)



Also known as Activity on Nodes (AON)

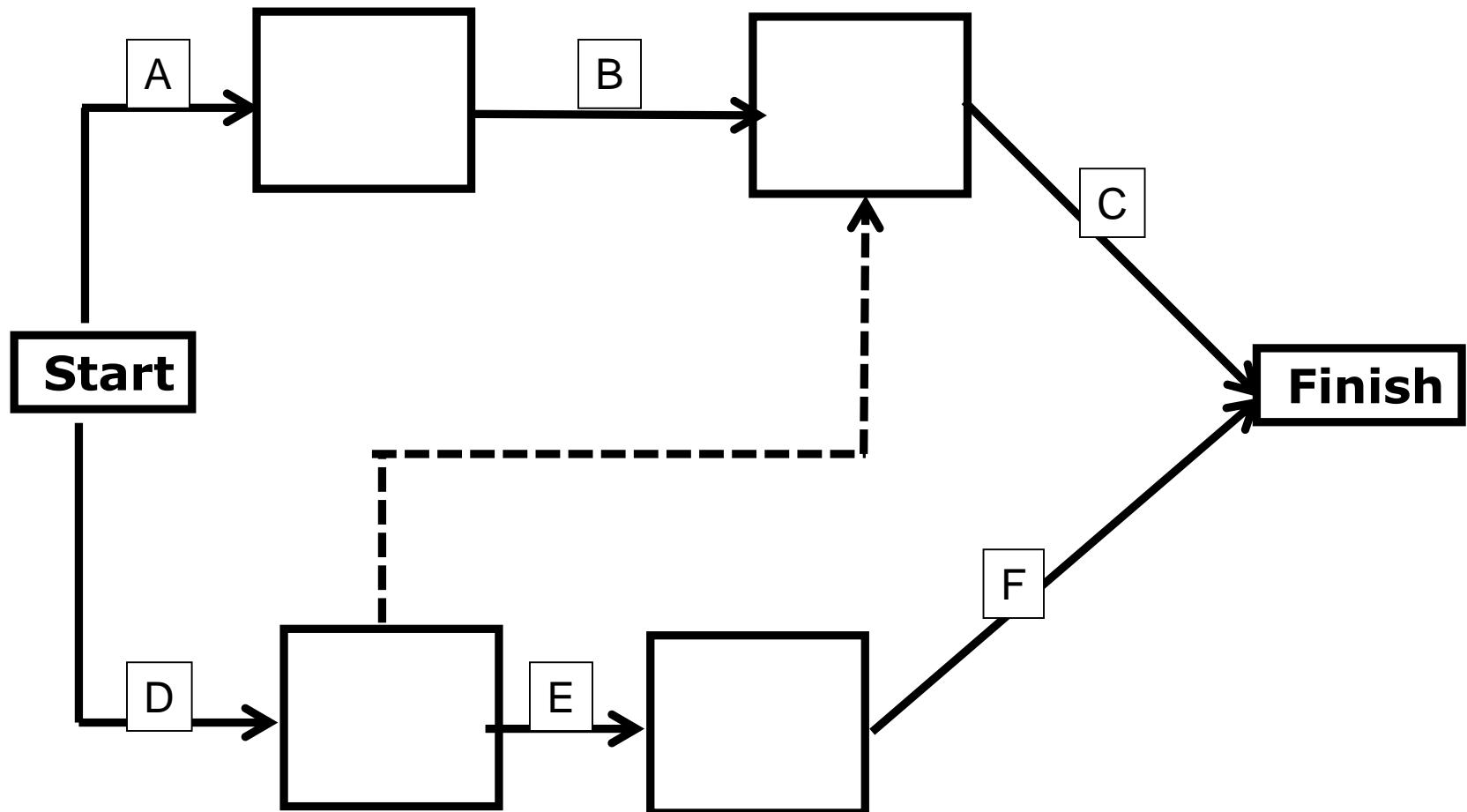
Network Development

Precedence Diagramming Method (AON)



Network Development

Precedence Diagramming Method (AOA)



17. Estimate Activity Durations



Definition

Approximating the number of work periods needed to complete individual activities with estimated resources.



Estimate Activity Durations



- .1 Project management plan
 - Schedule management plan
 - Scope baseline
- .2 Project documents
 - Activity attributes
 - Activity list
 - Assumption log
 - Lessons learned register
 - Milestone list
 - Project team assignments
 - Resource breakdown structure
 - Resource calendars
 - Resource requirements
 - Risk register
- .3 EEFs
- .4 OPAs



- .1 Expert judgment
- .2 Analogous estimating
- .3 Parametric estimating
- .4 Three-point estimating
- .5 Bottom-up estimating
- .6 Data analysis
 - Alternatives analysis
 - Reserve analysis
- .7 Decision making
- .8 Meetings



- .1 Duration estimates
- .2 Basis of estimates
- .3 Project documents updates
 - Activity attributes
 - Assumption log
 - Lessons learned register

PERT – Program Evaluation and Review Technique

Beta Distribution

- PERT Estimate $tE = (\text{Optimistic} + 4 * \text{Most Likely} + \text{Pessimistic})/6$

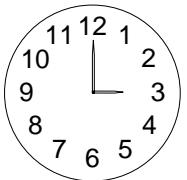
Triangular Distribution

- $tE = (\text{Optimistic} + \text{Most Likely} + \text{Pessimistic})/3$

Standard Deviation (using PERT) = $(\text{Pessimistic} - \text{Optimistic})/6$

Variance (using PERT) = $((\text{Pessimistic} - \text{Optimistic})/6)^2$

Discussion/Exercise 15



5 Minutes

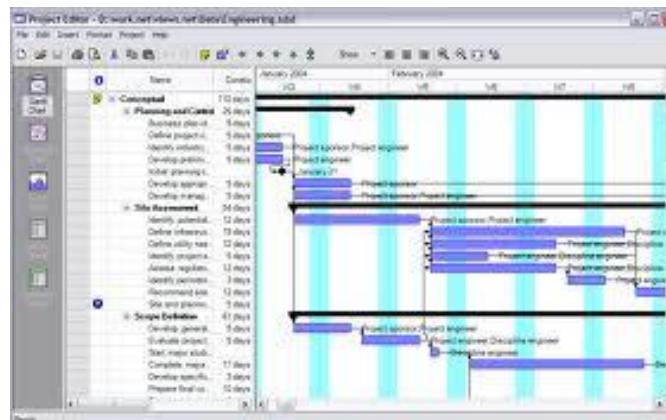
- **Estimate Activity Duration for activities where resources are identified**

18. Develop Schedule



Definition

Analyzing activity sequences, durations, resource requirements and schedule constraints to create the project schedule.



Develop Schedule



.1 Project management plan

- Schedule management plan
- Scope baseline

.2 Project documents

- Activity attributes
- Activity list
- Assumption log
- Basis of estimates
- Duration estimates
- Lessons learned register
- Milestone list
- Project schedule network diagrams
- Project team assignments
- Resource calendars
- Resource requirements
- Risk register

.3 Agreements

.4 EEFs

.5 OPAs



.1 Schedule network analysis

.2 Critical path method

.3 Resource optimization

.4 Data analysis

- What-if scenario analysis
- Simulation

.5 Leads and lags

.6 Schedule compression

.7 PMISs

.8 Agile release planning



.1 Schedule baseline

.2 Project schedule

.3 Schedule data

.4 Project calendars

.5 Change requests

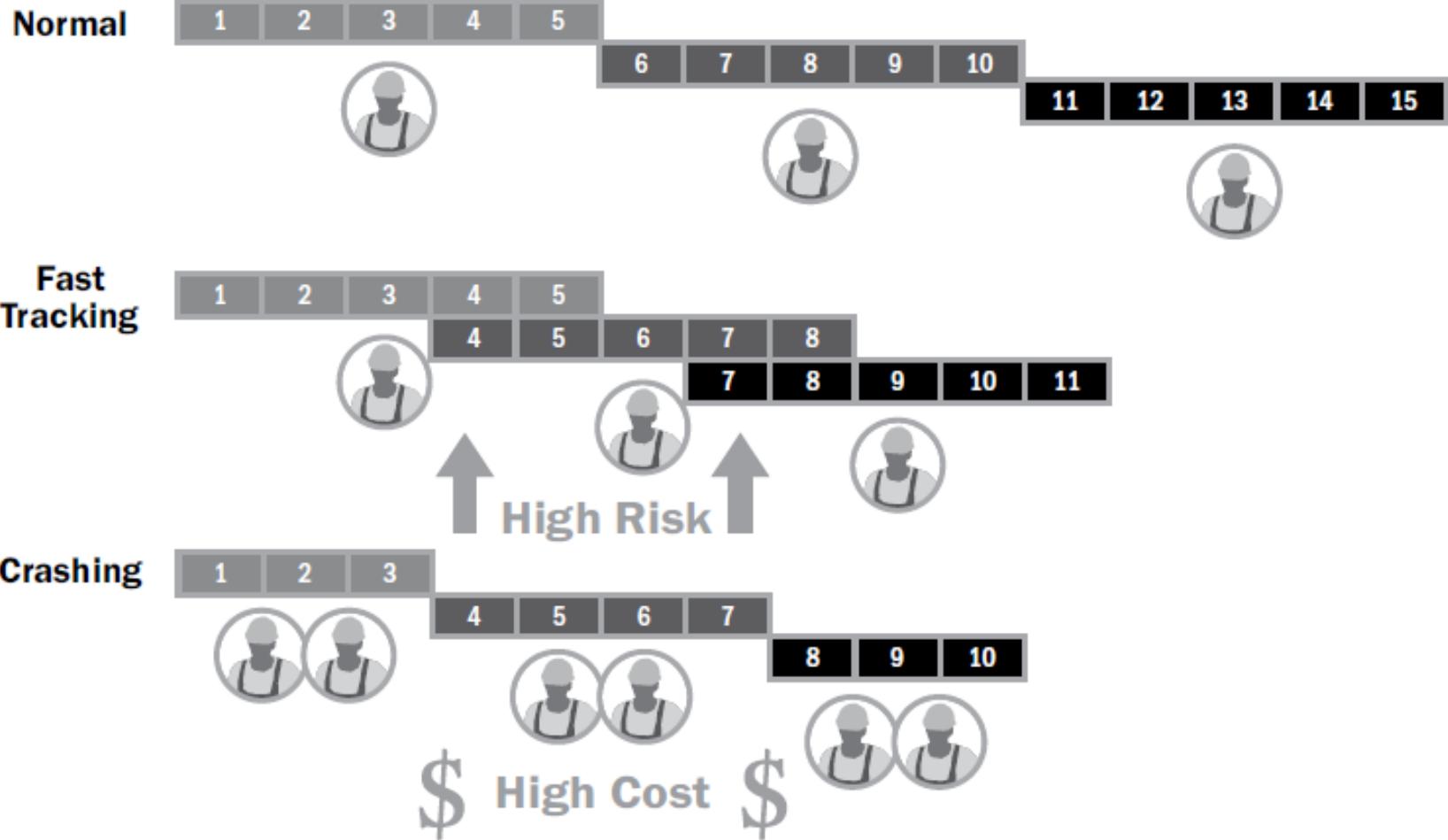
.6 PMP Updates

- Schedule management plan
- Cost baseline

.7 Project documents updates

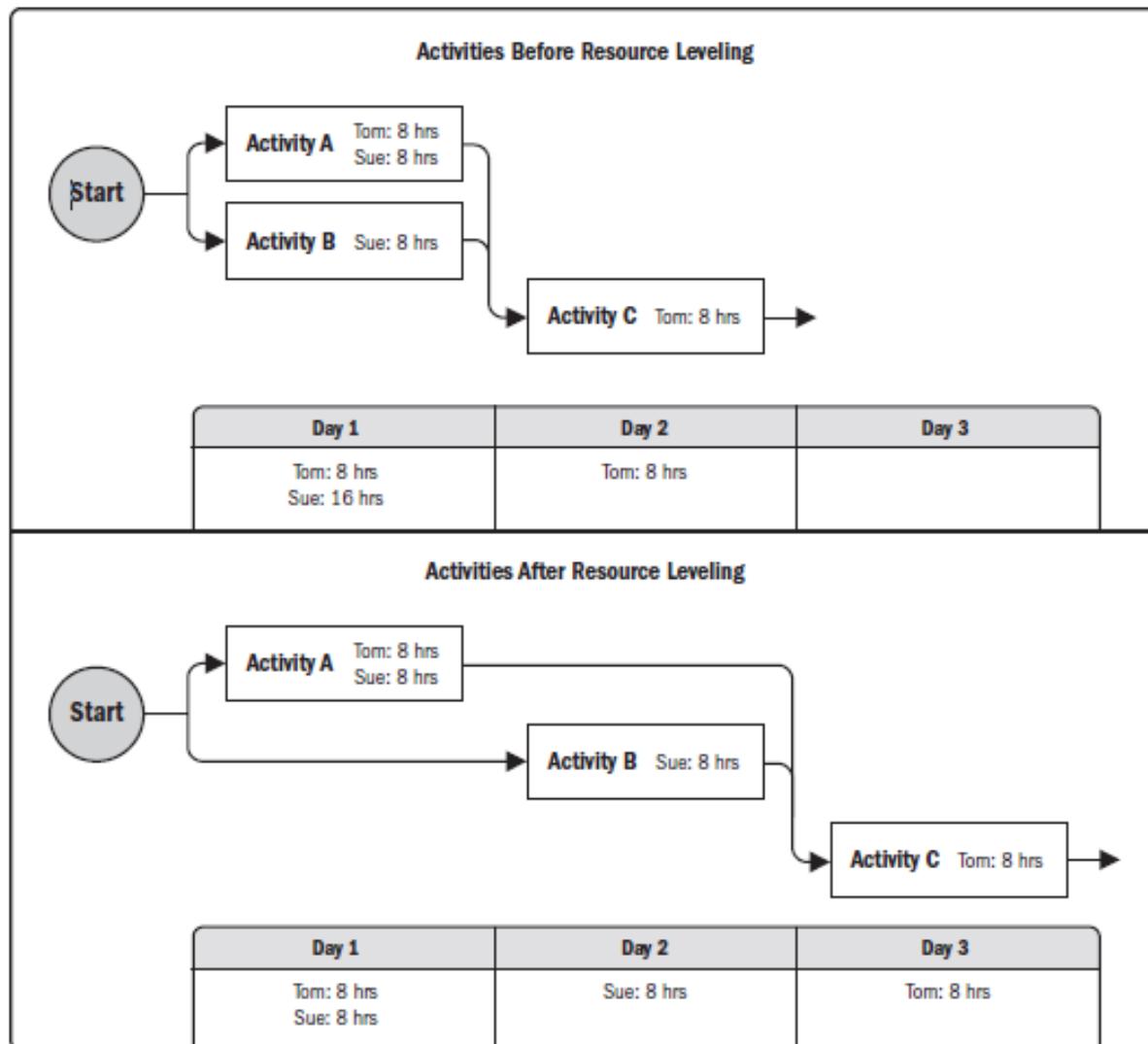
- Activity attributes
- Assumption log
- Duration estimates
- Lessons learned register
- Resource requirements
- Risk register

Schedule Compression Techniques



Resource Optimization techniques

- Resource Levelling
 - Ensure resource are not allocated more than their availability for the given project. Can lead to change in critical path.
- Resource Smoothing
 - Adjust activities in such a way that resources requirement do not exceed than defined limit. No change in critical path. Activities can be delayed within their float (free/total).



Modeling Techniques

- What if scenario analysis
 - Assess the feasibility of project schedule under adverse conditions. Prepare a contingency plan to overcome the problems. Or prepare mitigation plan to reduce the impact of unexpected situations.
- Simulation
 - Calculate multiple project duration using tools like Monte Carlo Simulation. In this case use assumptions and distribution constructed using 3 Point estimates.

19. Control Schedule



Definition

Monitoring the status of the project to update project progress and manage changes to the schedule baseline



Control Schedule



- .1 Project management plan
 - Schedule management plan
 - Schedule baseline
 - Scope baseline
 - Performance measurement baseline
- .2 Project documents
 - Lessons learned register
 - Project calendars
 - Project schedule
 - Resource calendars
 - Schedule data
- .3 Work performance data
- .4 OPAs

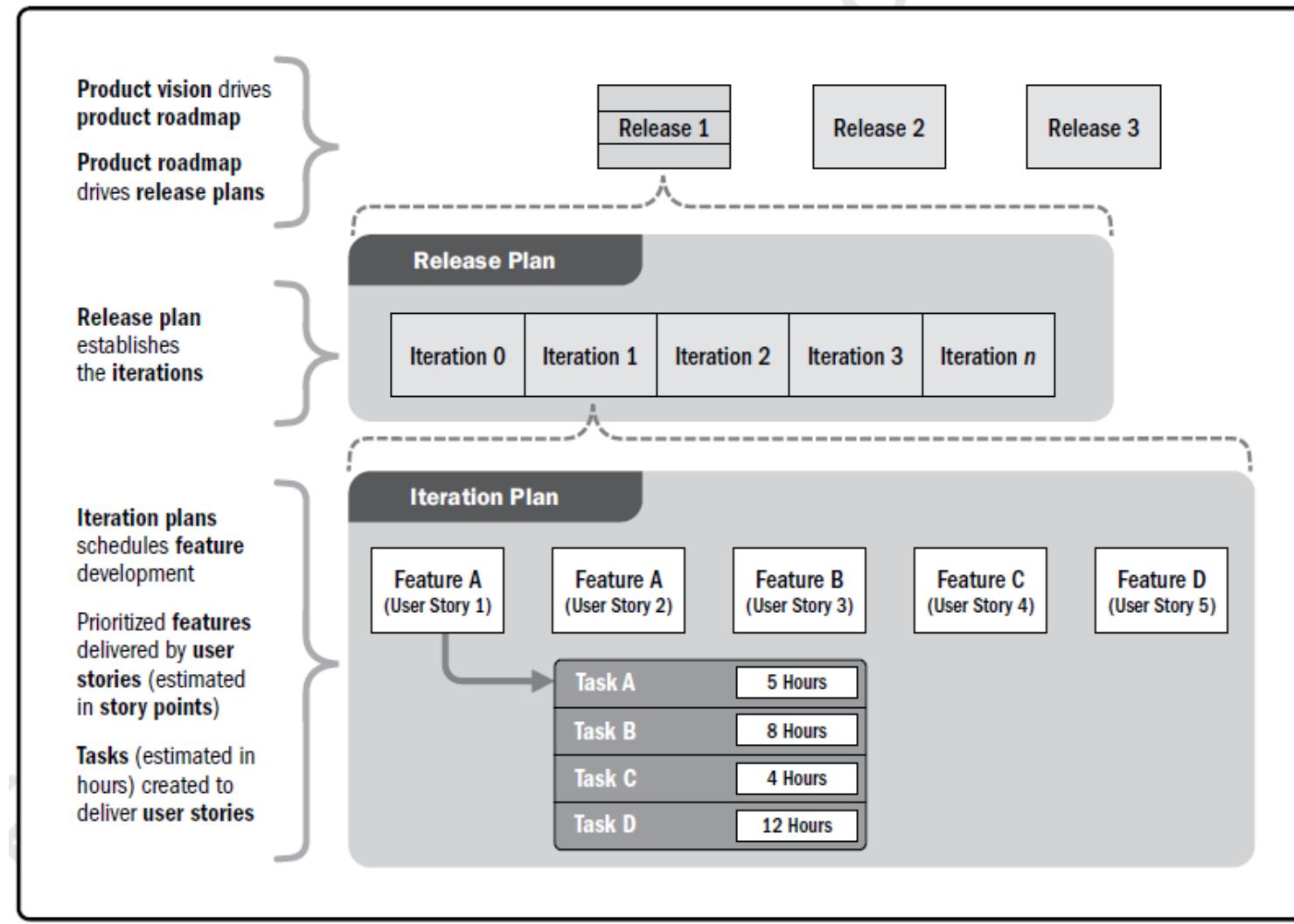


- .1 Data analysis
 - Earned value analysis
 - Iteration burndown chart
 - Performance reviews
 - Trend analysis
 - Variance analysis
 - What-if scenario analysis
- .2 Critical path method
- .3 Project management information system
- .4 Resource optimization
- .6 Leads and lags
- .7 Schedule compression

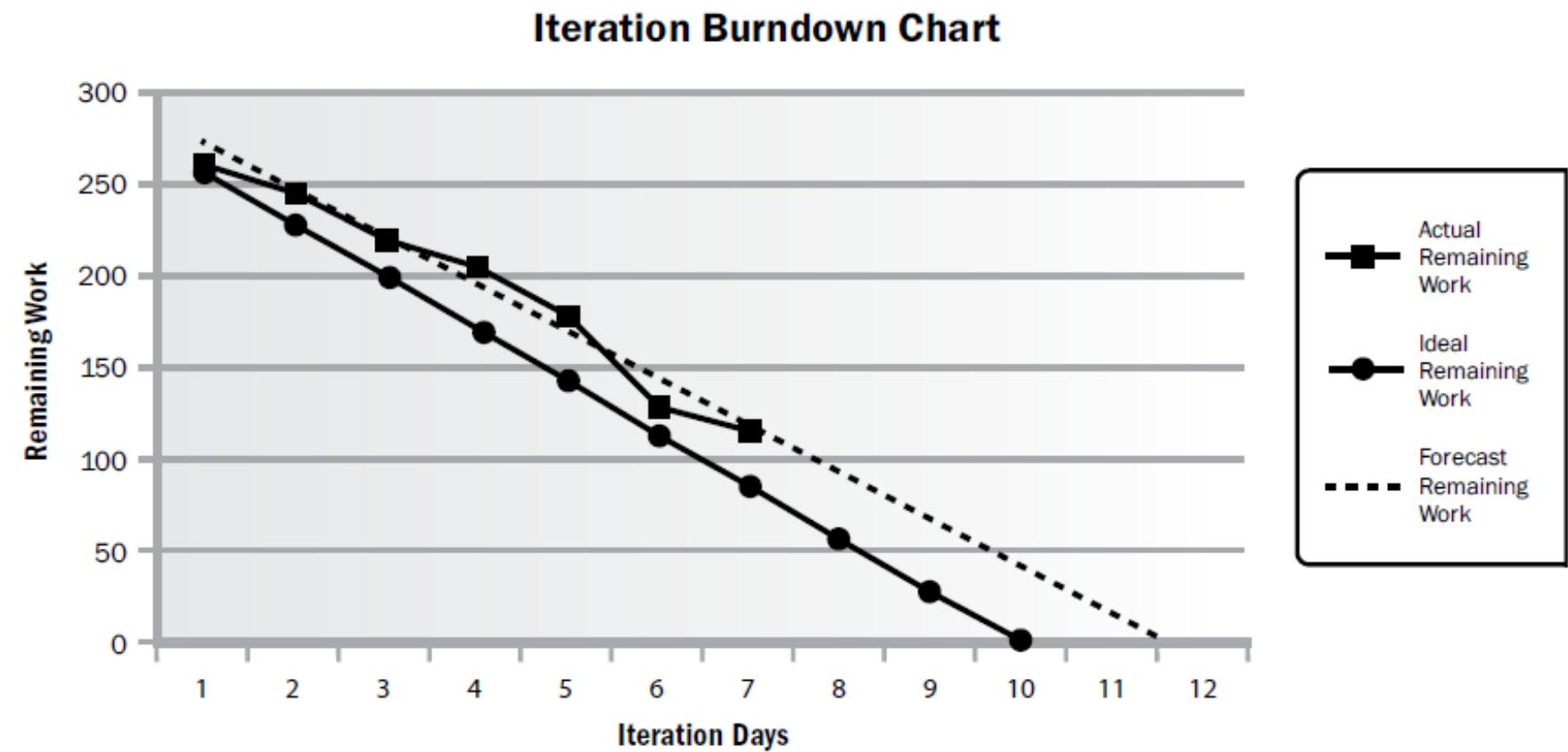


- .1 Work performance information
- .2 Schedule forecasts
- .3 Change requests
- .4 Project management plan updates
 - Schedule management plan
 - Schedule baseline
 - Cost baseline
 - Performance measurement baseline
- .5 Project documents updates
 - Assumption log
 - Basis of estimates
 - Lessons learned register
 - Project schedule
 - Resource calendars
 - Risk register
 - Schedule data

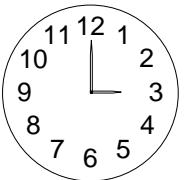
Product Vision, Release, Iteration Planning



Burndown Chart



Discussion/Exercise 17



5 Minutes

- Write work performance measures and their values of your project with respect to Schedule Management

Big Concepts

Critical Path Method (CPM)

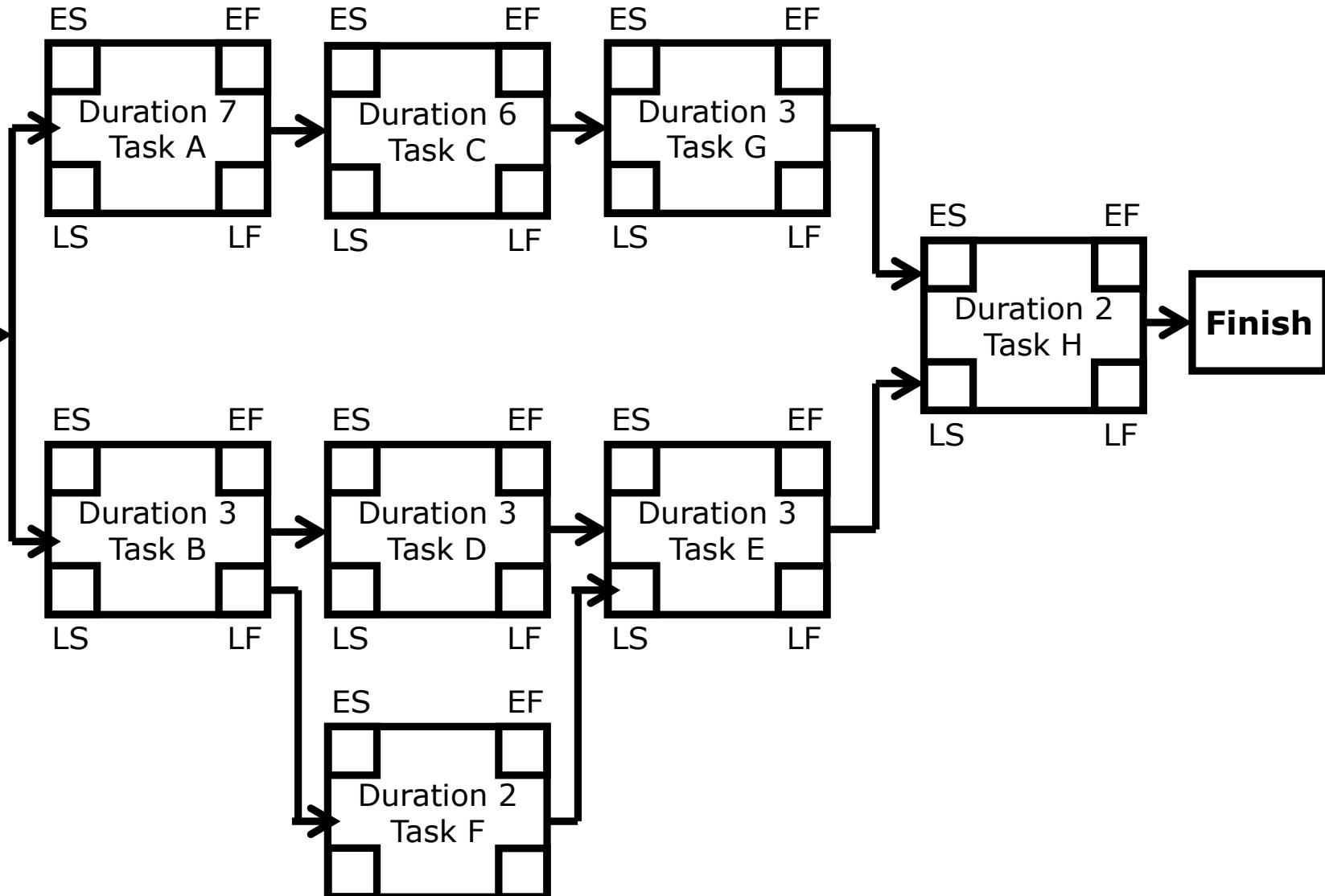
Critical Chain Method (CCM)

Critical Path Method (CPM)

Critical Path Method (CPM)

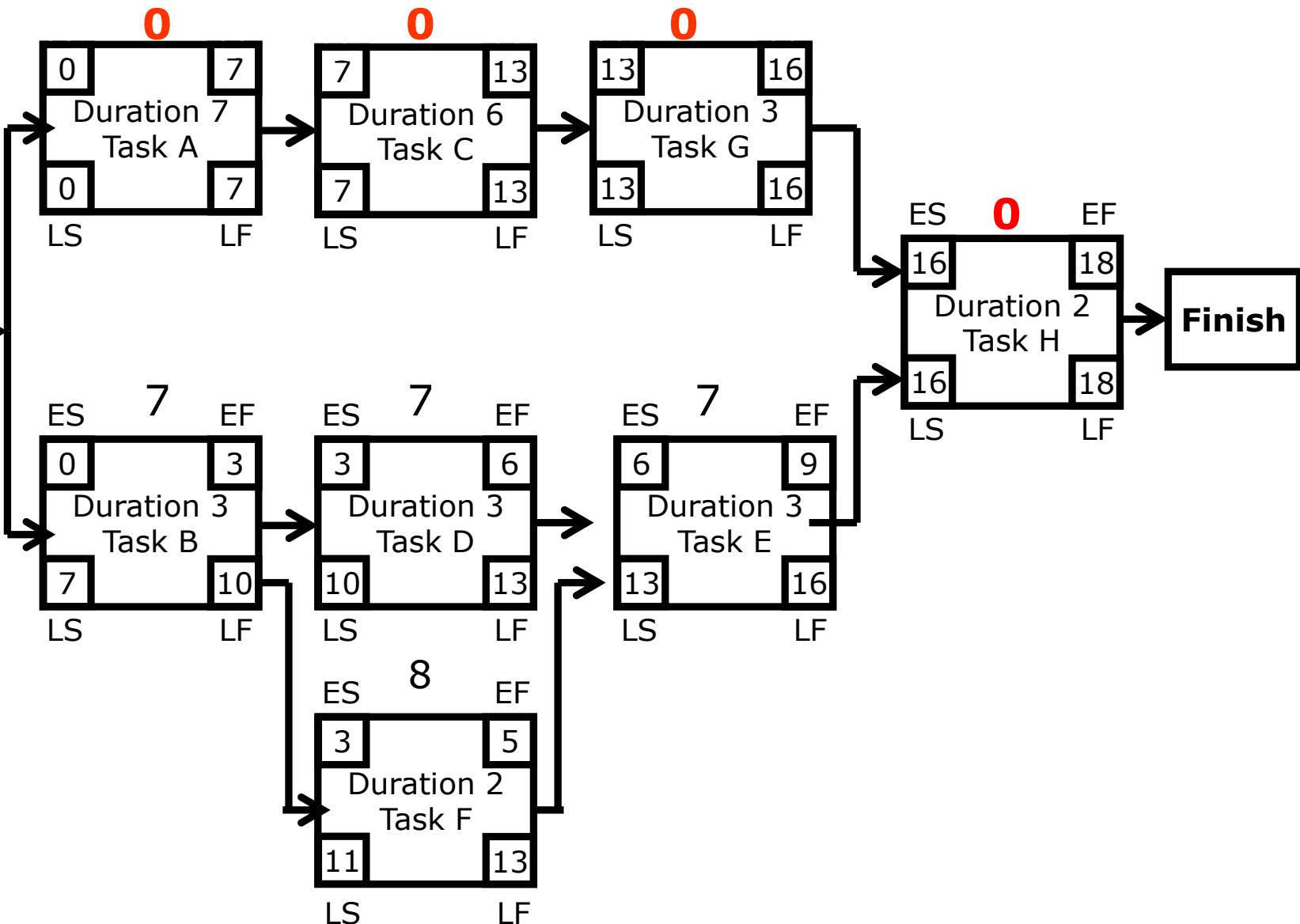
Critical Path method is a planning technique that is used to demonstrate and view the chronological activities of a program or project, and identifies any possible timing risks and can be used to establish the least amount of time to complete a project.

Critical Path

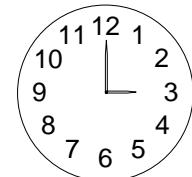


Critical Path – Longest Path, Zero Float

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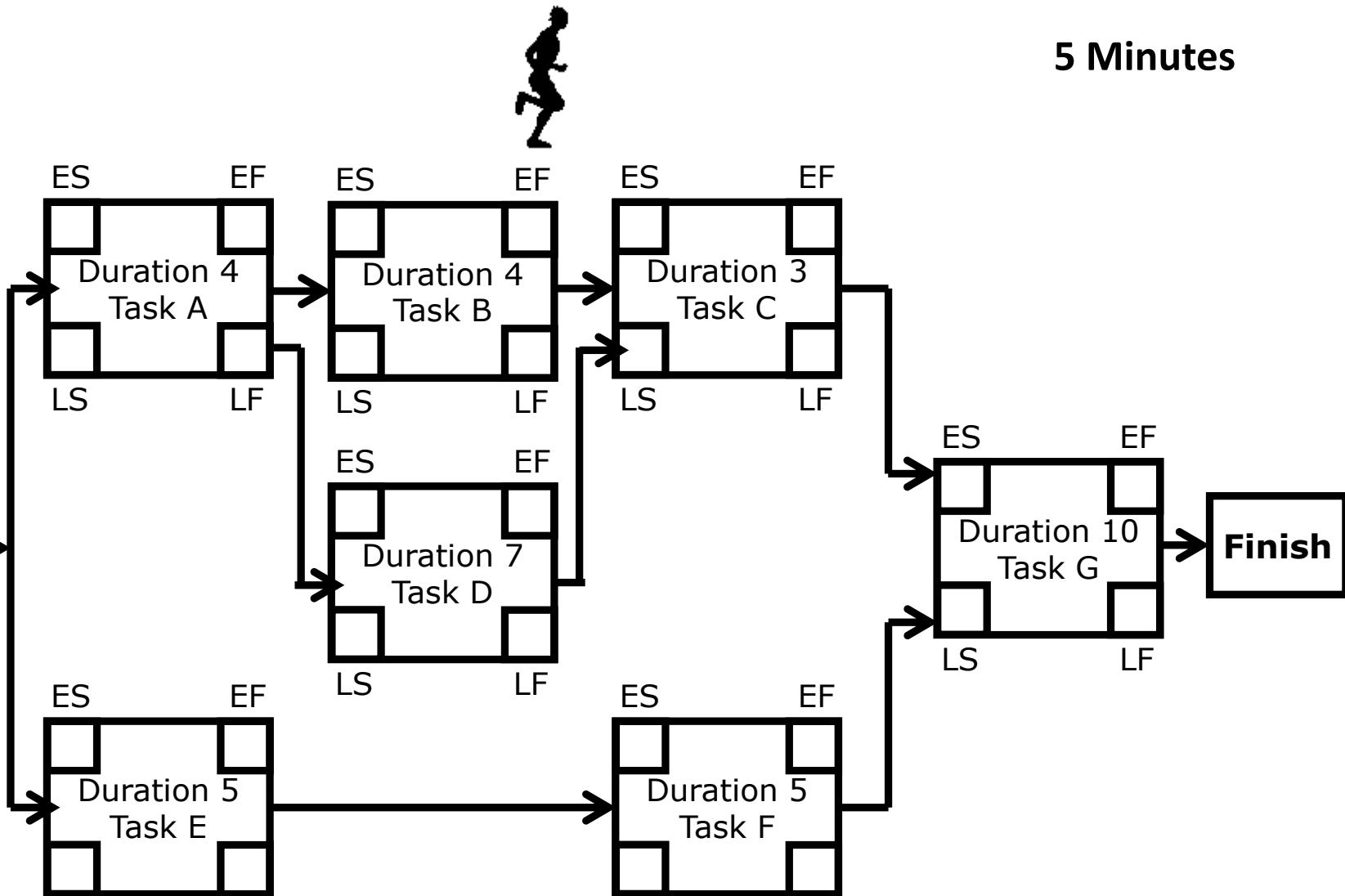


Discussion/Excercise-16



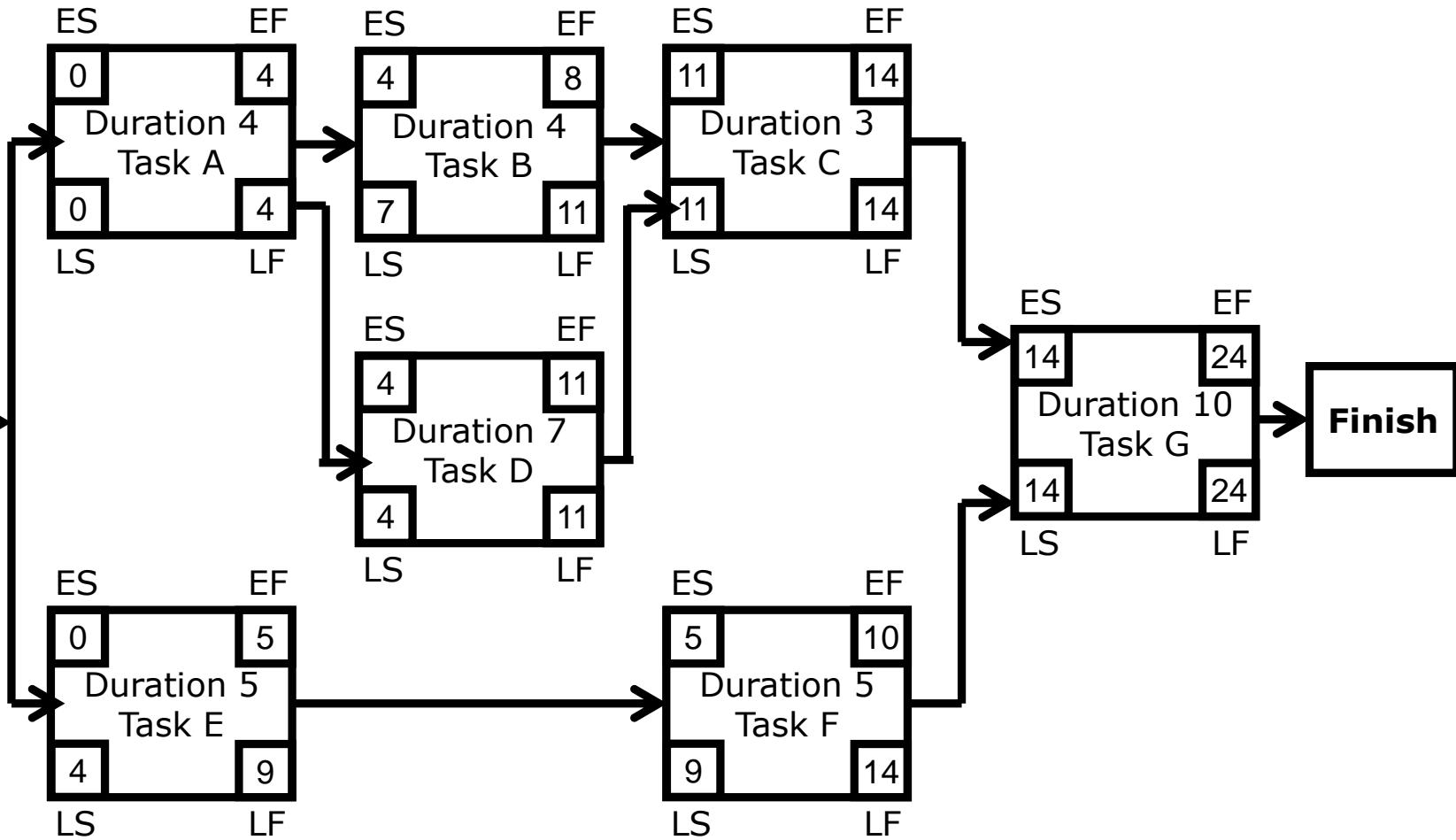
5 Minutes

Vedavit



Network Exercise - solution

Critical Path : ADCG



Facts/Tips for Critical Path

- Total Float is the amount of time the task can delayed without delaying the project finish date.
- Free float is the amount of time a task can slip without delaying the early start of any task that immediately follows it
- It is possible that a zero float activity may not be on critical path
- Longest path & shortest time possible to complete the project
- A project can multiple critical paths
- Difference between late and early is float
- Positive float (the activity can wait to start even after previous activity finishes)
- Negative float (the activity must start before previous finishes)
- Zero float (the activity must immediately start after the finish of previous one)
- Crashing activities to short the overall duration of project
- Fast-tracking activities to short the overall duration of project
- Be cautious that non-critical activity is not being delayed than the allowed free float
- Take care of sub-critical path or non-critical path
- Manage critical path resources very closely
- Do not overload critical path activity resources
- Avoid multitasking for resources working on critical path activities

Benefits of PERT/CPM

It Provides following information

- Expected Project completion time
- Probability of completion before a specified date
- The critical path activities that directly impact the completion time
- The activities that have slack time and that can lend resources to critical path activities
- Activity start and end dates

Critical Chain Method (CCM)

Background

- Eliyahu Goldratt proposed CCM
- This is developed based on the TOC framework

Why CCM is needed?

- You have CPM available why CCM is needed?
 - You can manage the delays on non-critical path using buffers/floats. BUT
 - How do you manage the delays on critical path?

Principles Behind CCM

- **Delays accumulate; gains don't advantage**
 - Sequential Steps: Resources are not available to start early
 - Parallel Steps: Three activity each takes 5 days time start in parallel. If one activity takes 10 days and other finish on time, early activities will not be able to take advantage.
 - If above sequential and parallel activities are dependent then affect is magnified
- **Other Time Wasters**
 - Multitasking
 - Student Syndrome
 - Parkinson's Law

Critical Chain Method

- CPM is developed using the belief that book as many resource as in advance and they will be available when need because it has been promised
- CCM says that if a resource is over booked on any activity he will not be available to work on that activity therefore level the resource on the project activities. Thus resource constrained critical path is critical chain.
- CPM is about hoarding, greed. Therefore over-estimation and project management laws like Parkinson law, Murphy law, Student syndrome applies here.
- CCM is about believe and assumption that it will available when needed but we need to have proper alert system in place.

CCM Concepts

- **Resource Buffer:** Notify dependent task resources that when I will finish my work on regularly basis and final notification 1-2 days before. So that resource is available to start the work.
- **Safety or project buffer** should be added at the end of critical-chain as non-activity buffer
- **Feeding buffer:** Add buffer where chain of non-critical activity joins the critical path. This way non critical task can be avoided being critical

How to estimate in CCM

- Resource will give t80, t90 estimate.
- Half them to get t50 estimate.
- Do not put end date to task and let people finish the task as early as possible.
- No penalty for finish beyond t50.
- Project Buffer should be 50% of the buffer removed from activity.

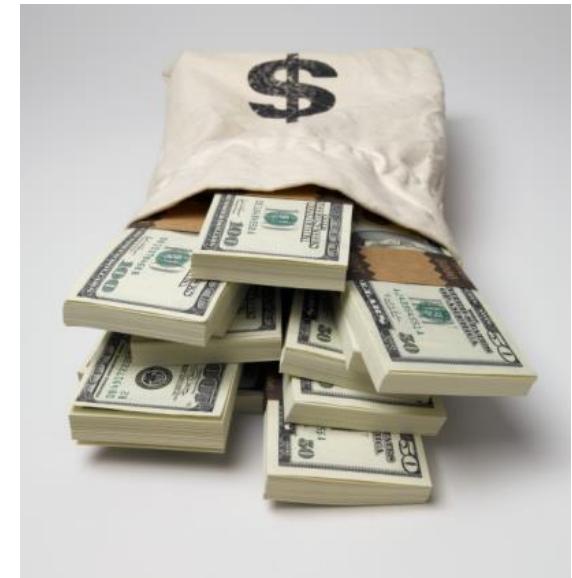
How to manage CCM

- If activity finishes late time is borrowed from project buffer.
- If activity finishes early, gained time is added to project buffer

Discussions !

Project Cost Management

Project Cost Management



Project Cost Management- A Thought

- ✓ If you don't plan, it doesn't work. If you do plan, it doesn't work either.
Why plan!
- ✓ The same work under the same conditions will be estimated differently by ten different estimators or by one estimator at ten different times. So why to estimate!
- ✓ Any project can be estimated accurately (once it's completed).
- ✓ Nothing is impossible for the person who doesn't have to do it.

Project Cost Management



Definition

**Processes involved in estimating, budgeting,
and controlling costs so that the project can be
completed within the approved budget**

Project Cost Management

20. Plan Cost Management [PLANNING]

21. Estimate Costs [PLANNING]

22. Determine Budget [PLANNING]

23. Control Costs [M&C]

Components of Contract Price

Contract Price = Material + Labor + Expenses + Overheads + Risk Management Budget + Profit Margins

Who estimates Material cost for your project?

Who estimates Labor cost for your project?

Who estimates Expenses cost for your project?

Who estimates Overhead cost for your project?

Where do you adjust the buffer?

Where do earn profit

What is the price?

Types of Cost

- ✓ Fixed Cost vs Variable Cost
- ✓ Direct vs Indirect Cost
- ✓ Material, Labour, Services
- ✓ Overhead Cost
- ✓ Sunk Cost
- ✓ Opportunity Cost

Types of Cost

- ✓ Direct cost: purchased, used, consumed in the project directly.
- ✓ Indirect cost: shared cost between project.

Types of Cost

- ✓ **Sunk Cost-** Retrospective cost/ that cannot be recovered/ Cost gone and very low value or zero value was taken out. Plant developed but not of any use now additional money is required but by that money some better work can be done, so not to invest and let already invested money sunk. Software developed but it is not of any use now due any reason.
- ✓ **Perspective Cost-** cost to be occurred in future
- ✓ **Allocated Cost-** Cost of security service is shared by all division/companies of the building. Spreading the cost among those that use it.

Types of Cost

- ✓ **Apportioned Cost-** To find apportioned cost you should know % of each appraised value (land, building, machine)
- ✓ **Value Added Cost-** Sale price of a product and cost price of material is value add
- ✓ **Transfer Cost** -Cost of transfer or transaction between two entities
- ✓ **Opportunity cost-** Value lose because of exercising an option. It is just economic cost. Does not reflect in financial books

20. Plan Cost Management



Definition

Establishing policies, procedures and documentation for planning, managing, expending and controlling project costs

Plan Cost Management



- .1 Project charter
- .2 Project management plan
 - Schedule management plan
 - Risk management plan
- .3 EEFs
- .4 OPAs



- .1 Expert judgment
- .2 Data analysis
 - Alternatives analysis
- .3 Meetings



- 1..1 Cost management plan

Cost Management Plan

It includes

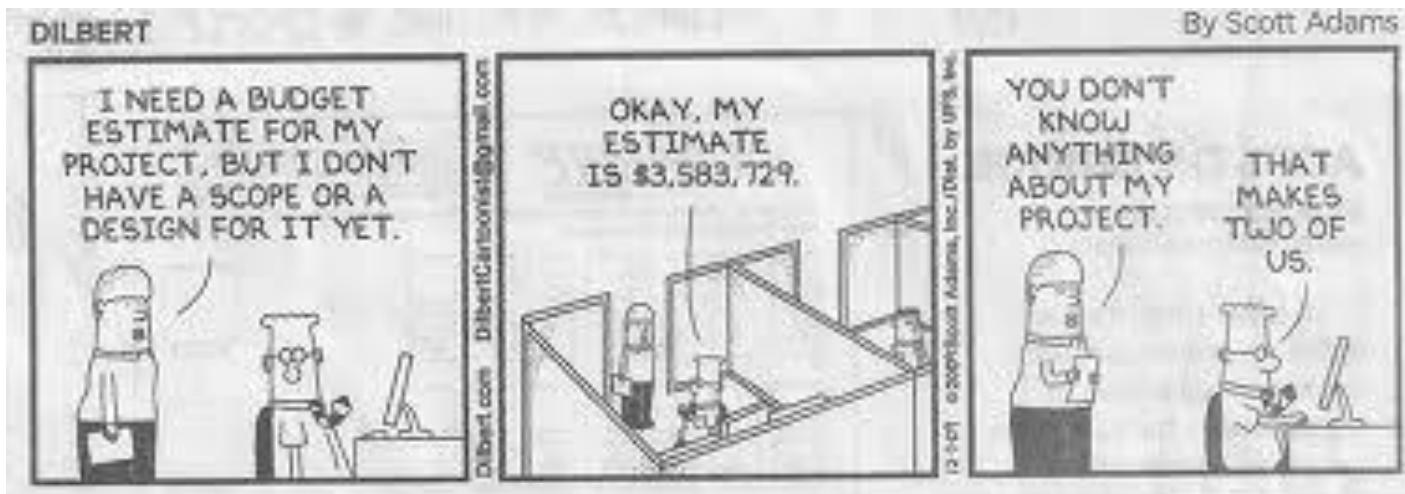
- Cost management tools to be used
- Level of accuracy (acceptable range +/- 5%)
- Level of precision (US\$ 100.01)
- Units of measure for each resource
- Organizational procedure links
- Process of updating the progress in schedule model
- Control thresholds (an allowed variation before some action need to be taken)
- Rules of performance measurement (baselines, %complete, fixed formula etc.)
- Project cost recording process
- Currency exchange rate fluctuation adjustment process
- Define scheduling reporting format

21. Estimate Costs



Definition

Developing an approximation of the costs of the resources needed to complete project activities.



Estimate Cost



.1 Project management plan

- Cost management plan
- Quality management plan
- Scope baseline

.2 Project documents

- Lessons learned register
- Project schedule
- Resources requirements
- Risk register

.3 EEFs

.4 OPAs

.1 Expert judgment

- .2 Analogous estimating
- .3 Parametric estimating
- .4 Bottom-up estimating
- .5 Three-point estimating

.6 Data analysis

- Alternatives analysis
- Reserve analysis
- Cost of quality

.7 Project management information system

.8 Decision making

- Voting

.1 Cost estimates

- .2 Basis of estimates
- .3 Project documents updates

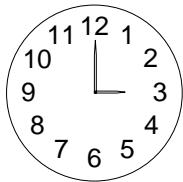
- Assumption log
- Lessons learned register
- Risk register

Project Cost Estimation Ranges

Cost estimation may include only Direct Cost or in combination of with Indirect Costs

Class Name	%	Range
Definitive	- 5 -> +5%	10%
Capital Cost	-15 -> +10%	25%
Appropriation	-25 -> +15%	40%
Budget Estimates	-10 -> +25%	35%
Feasibility	-35 -> +25%	60%
Order of Magnitude	-50 -> +50%	100%

Exercise-18



3 Minutes

Write Activity cost estimates for 5 activities and their basis of estimates for your project

Three Point Estimates

Program Evaluation Review Technique (PERT)

ESTIMATED COST = (Pessimistic + 4*(Most Likely) + Optimistic) / 6

22. Determine Budget



Definition

Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline

Determine Budget



- .1 Project management plan
 - Cost management plan
 - Resource management plan
 - Scope baseline
- .2 Project documents
 - Basis of estimates
 - Cost estimates
 - Project schedule
 - Risk register
- .3 Business documents
 - Business case
 - Benefits management plan
- .4 Agreements
- .5 EEFs
- .6 OPAs



- .1 Expert judgment
- .2 Cost aggregation
- .3 Data analysis
 - Reserve analysis
- .4 Historical information review
- .5 Funding limit reconciliation
- .6 Financing



- .1 Cost baseline
- .2 Project funding requirements
- .3 Project documents updates
 - Cost estimates
 - Project schedule
 - Risk register

Project Budget Component

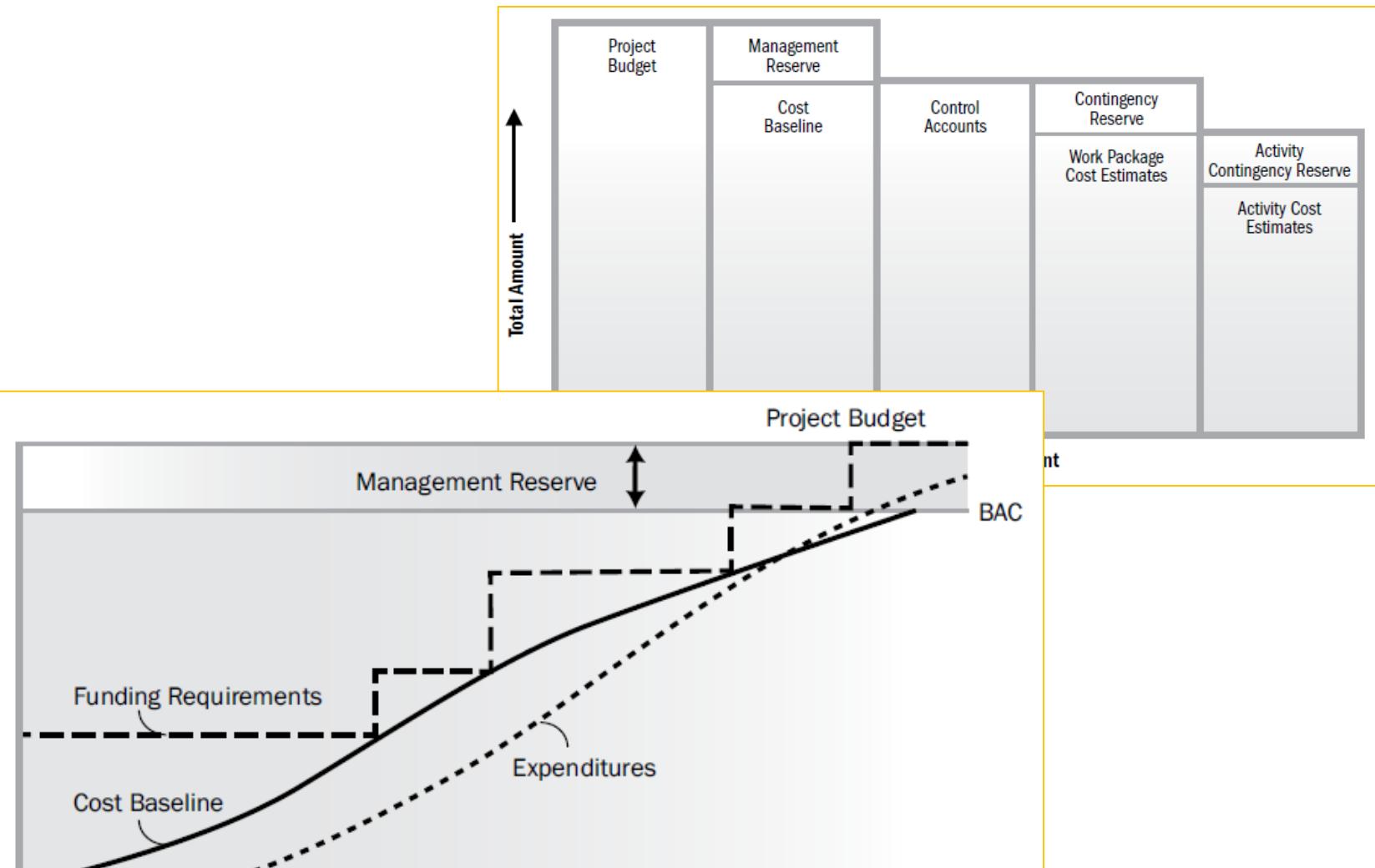
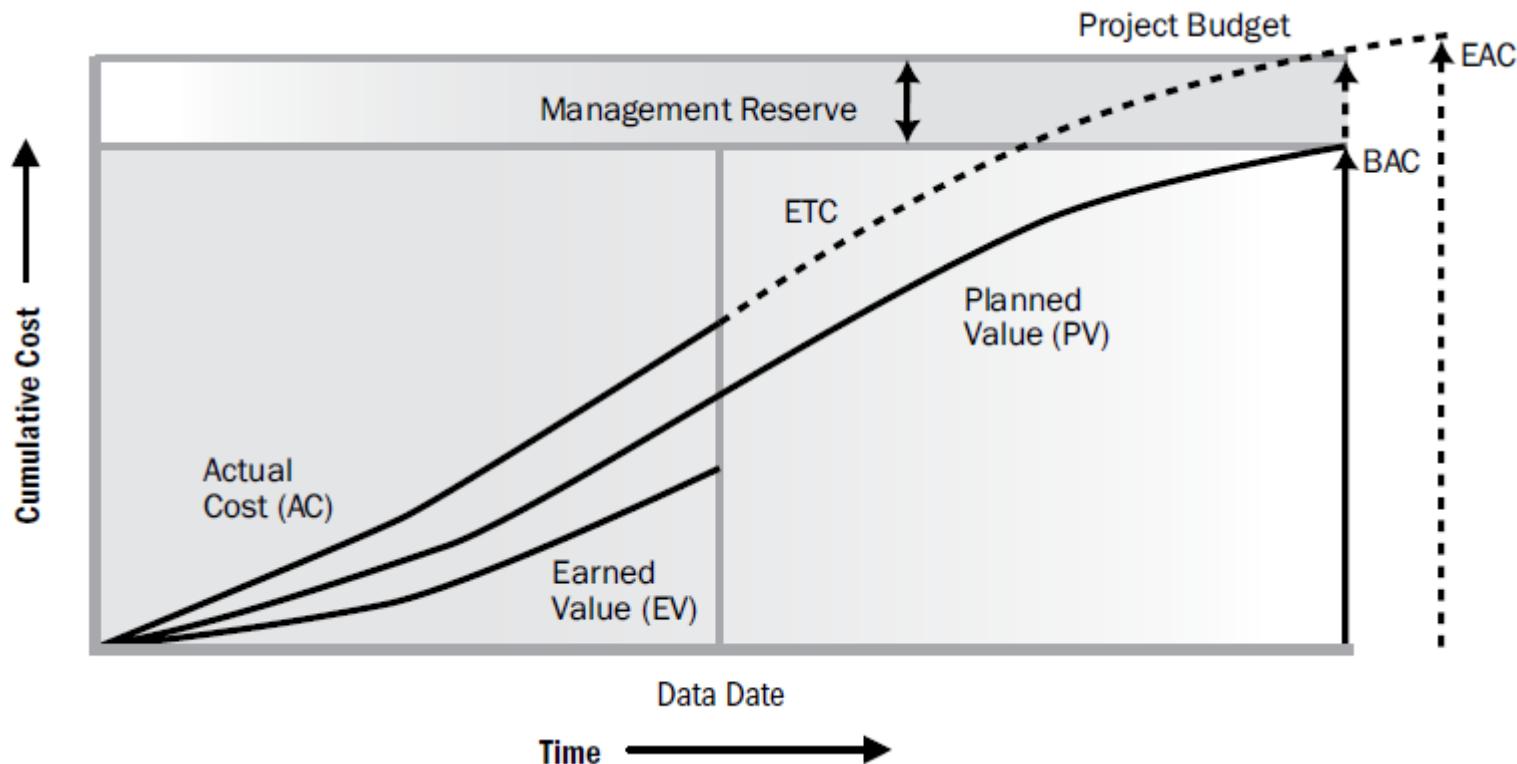


Figure 7-9. Cost Baseline, Expenditures, and Funding Requirements

EAC, ETC, PV, AC, EV



Estimation Traps

Customer: “How long will this project take?”

Project Manager: “What is the project about?”

Customer: “It is a systems upgrade project.”

Project Manager: “Can you tell me more about the project?”

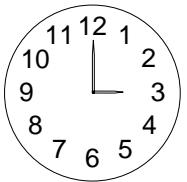
Customer: “I don’t know, we will get into that later, but just tell me how long will it take.”

Five Ways to Avoid Estimation Traps

1. Provide a range instead of number.
 - Ranges reveals level of uncertainty in the scope. Customer will appreciate it if you tell him why that kind of range is given.
 - +/- 10 or +/- 50%. You can discuss cone of uncertainty with customer
2. Highlight underlying assumptions and constraints
 - Based on this (current information) assign confidence level or probability
3. Use objective estimation techniques like 3 Point or PERT
 - Don't play estimation games like padding estimates by doubling and then customer make it halve. Next time you quadruple it. This unnecessarily creates cycle of mistrust.
4. Use a combination of techniques and solicit multiple perspectives
5. Track and compare actual results
 - Initially everybody fights for getting "accurate estimates" after that people forget about it

Next time you are asked to provide an accurate estimate, don't fall into the trap. Instead, use it as an opportunity to engage and educate your stakeholders about the reality of estimates.

Exercise-19



3 Minutes

Establish cost performance baseline for your project & write funding requirements for your project.

23. Control Costs



Definition

Monitoring the status of the project to update the project budget and managing changes to the cost baseline



Control Cost



- .1 Project management plan
 - Cost management plan
 - Cost baseline
 - Performance measurement baseline
- .2 Project documents
 - Lessons learned register
- .3 Project funding requirements
- .4 Work performance data
- .5 OPAs



- .1 Expert judgment
- .2 Data analysis
 - Earned value analysis
 - Variance analysis
 - Trend analysis
 - Reserve analysis
- .3 To-complete performance index
- .4 PMIS



- .1 Work performance information
- .2 Cost forecasts
- .3 Change requests
- .4 PMP updates
 - Cost management plan
 - Cost baseline
 - Performance measurement baseline
- .5 Project documents updates
 - Assumption log
 - Basis of estimates
 - Cost estimates
 - Lessons learned register
 - Risk register

Big Concepts

Earn Value Management

Earned Value Management – Basic Concepts

Planned Value (PV)- BCWS

Authorized budget assigned to the work to be accomplished for an activity or work breakdown structure component.

Earned Value (EV)- BCWP

Value of work performed expressed in terms of the approved budget assigned to that work for an activity or work breakdown structure component.

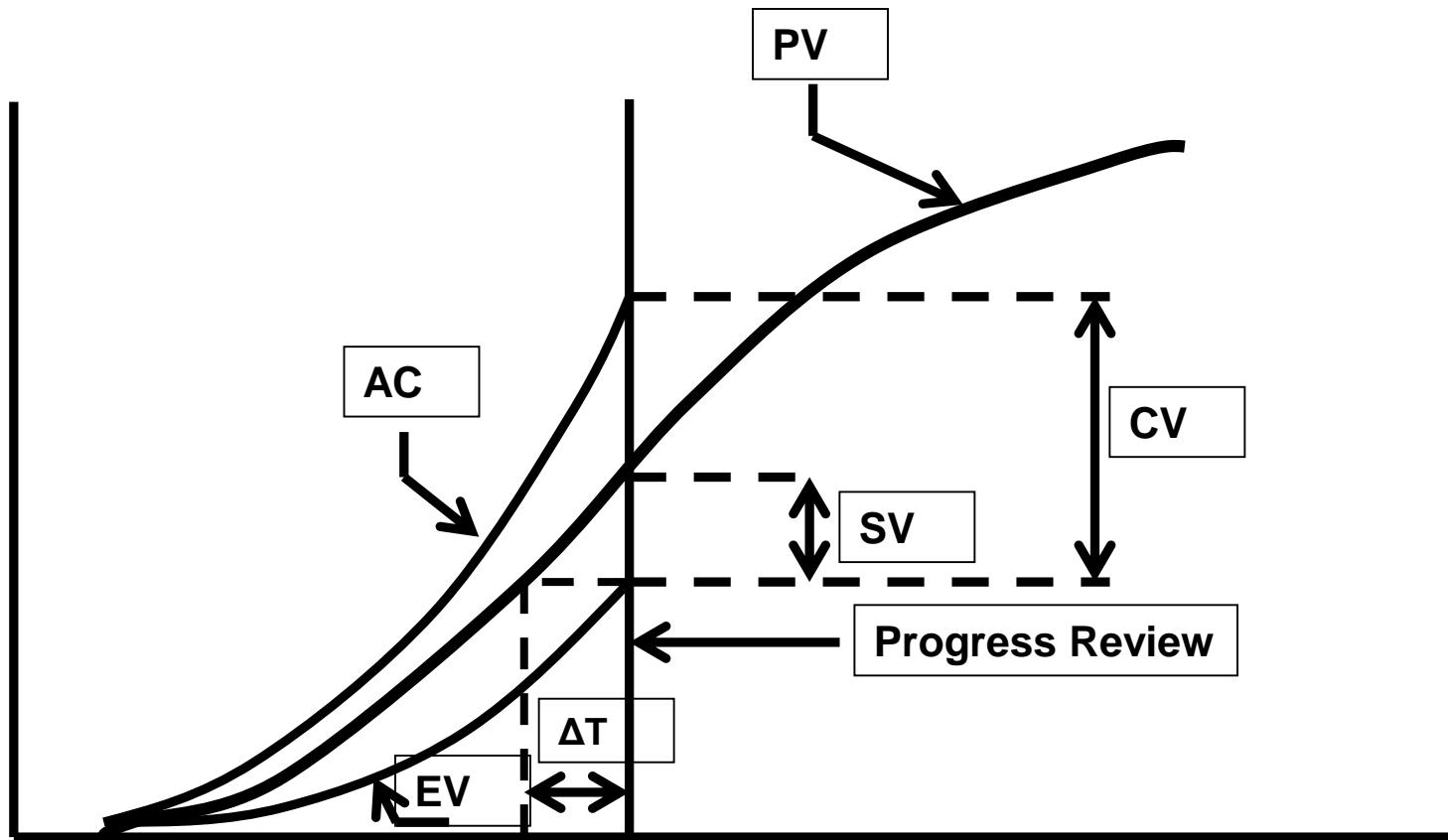
Actual Cost (AC)- ACWP

Total cost actually incurred and recorded in accomplishing work performed for an activity or work breakdown structure component.

Earn Value Rules

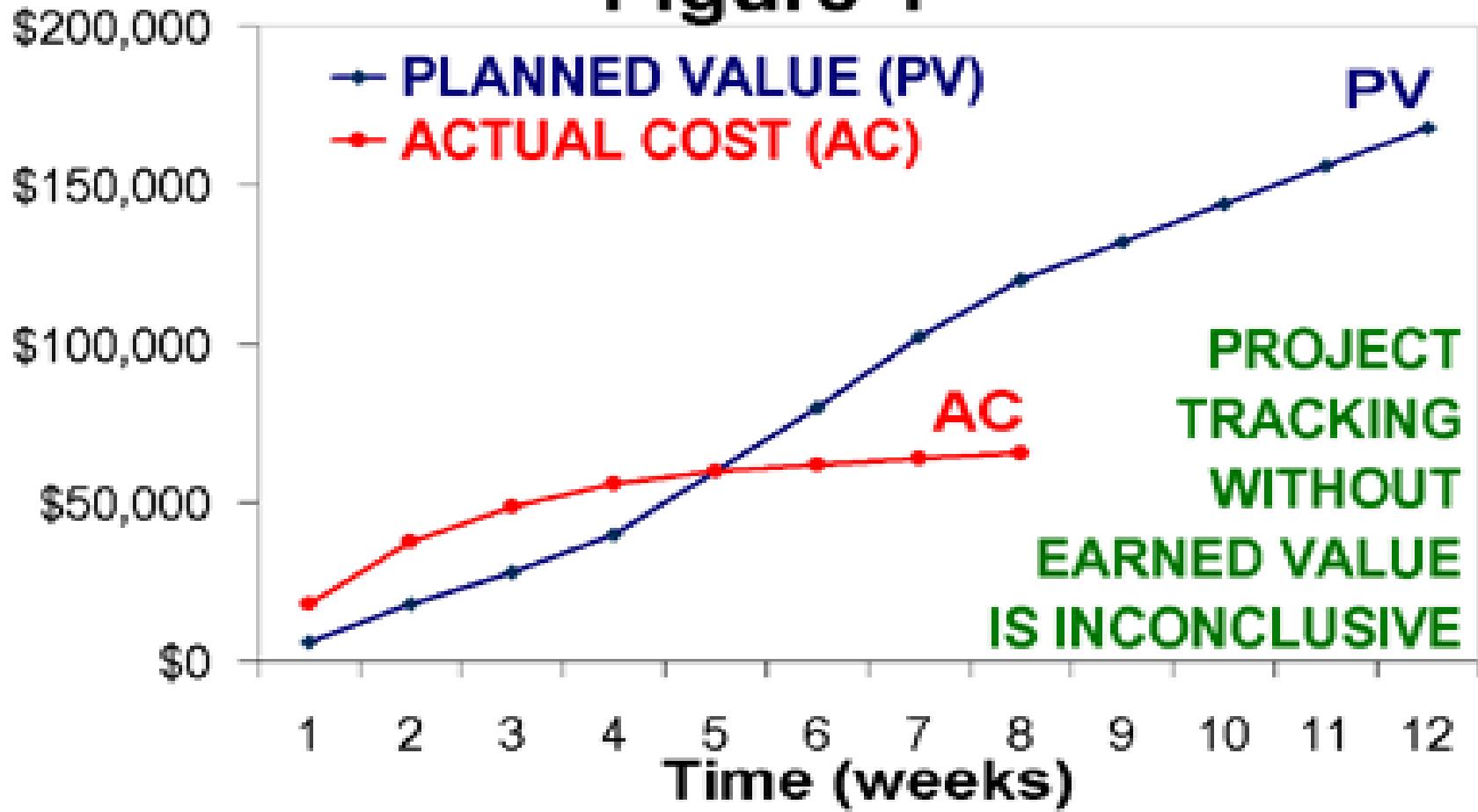
- 0% - 100%
- 50% - 50%
- 20% - 80%
- 25% - 75%

Earned Value Management – S Curve



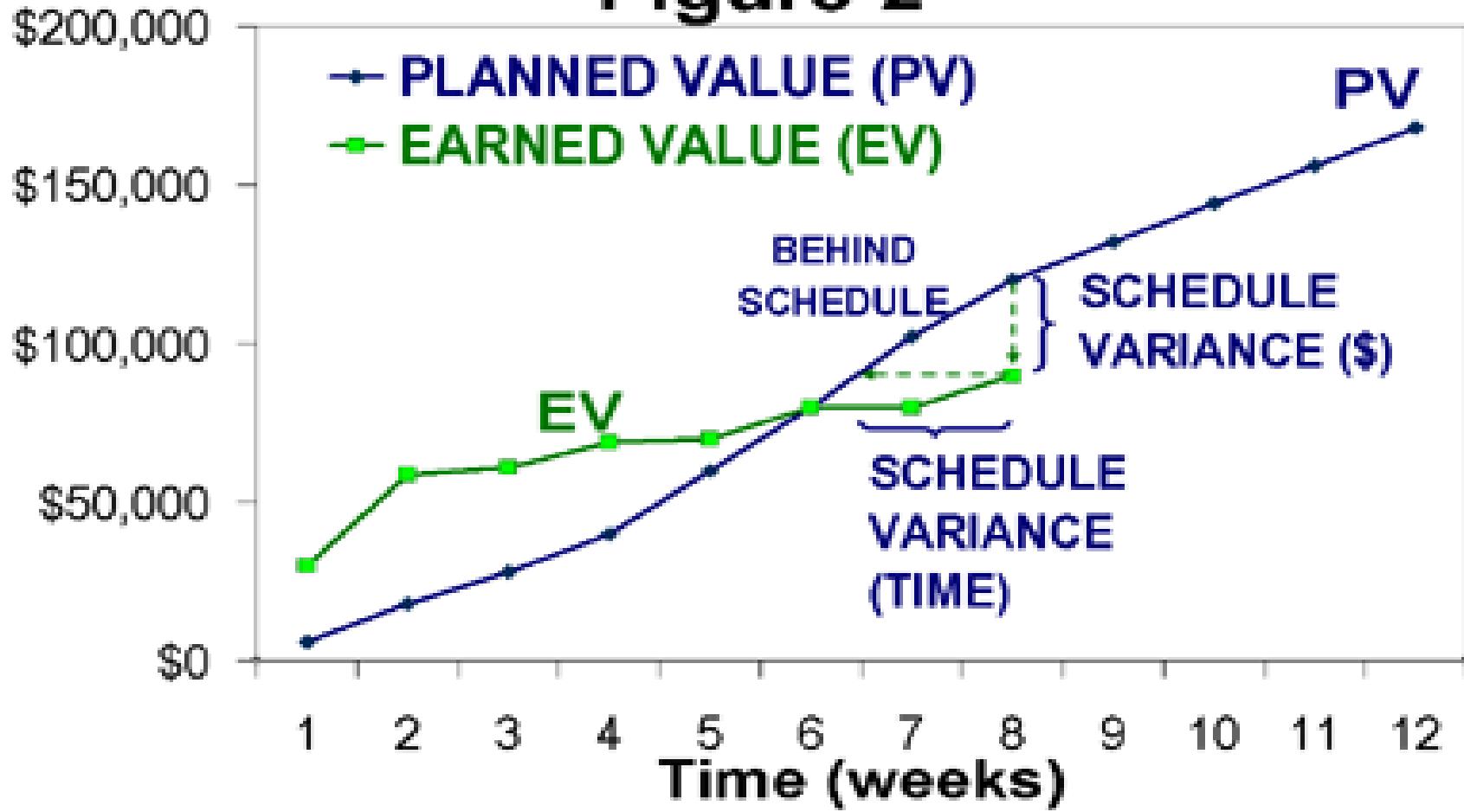
How project is progressing?

Figure 1



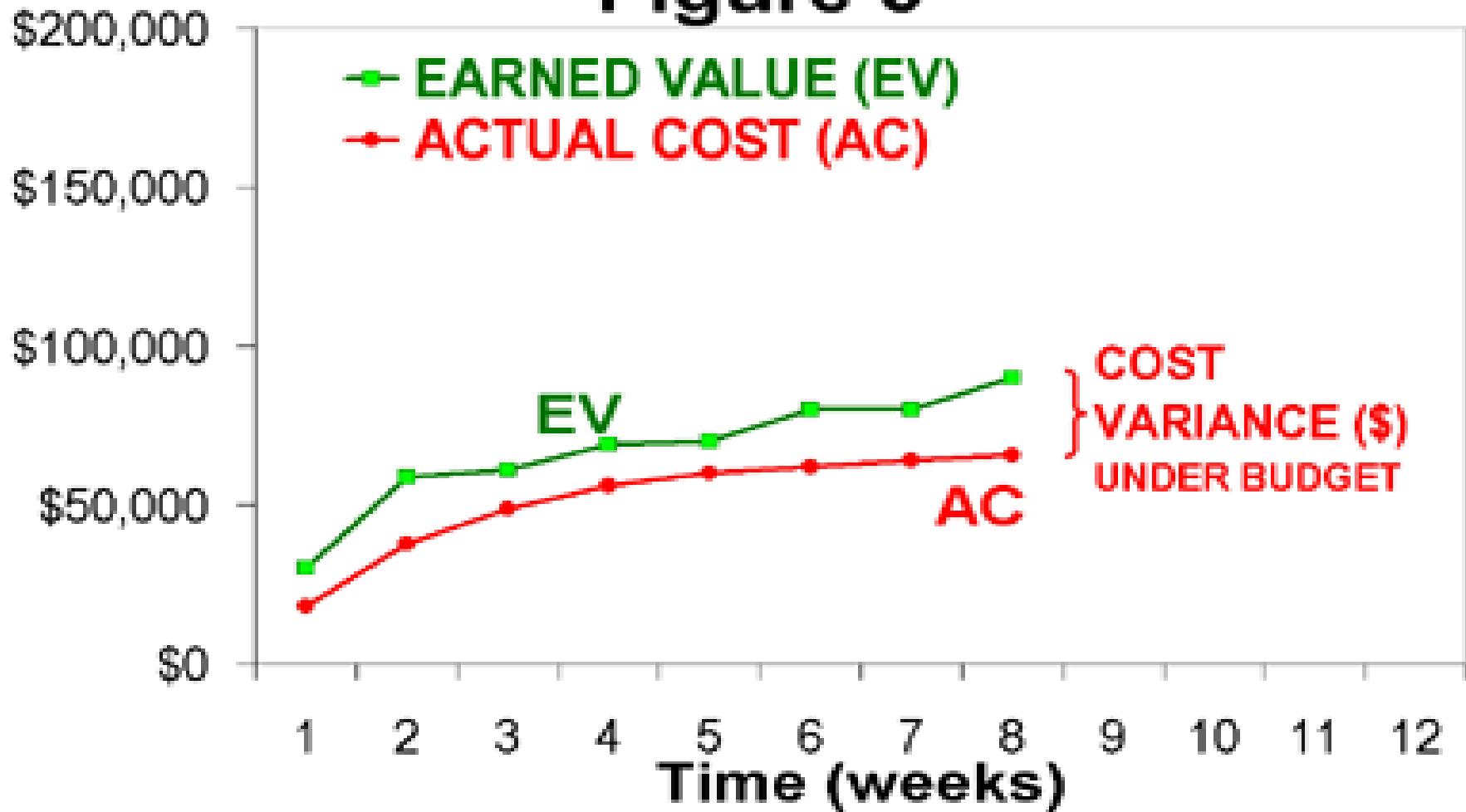
How project is progressing?

Figure 2



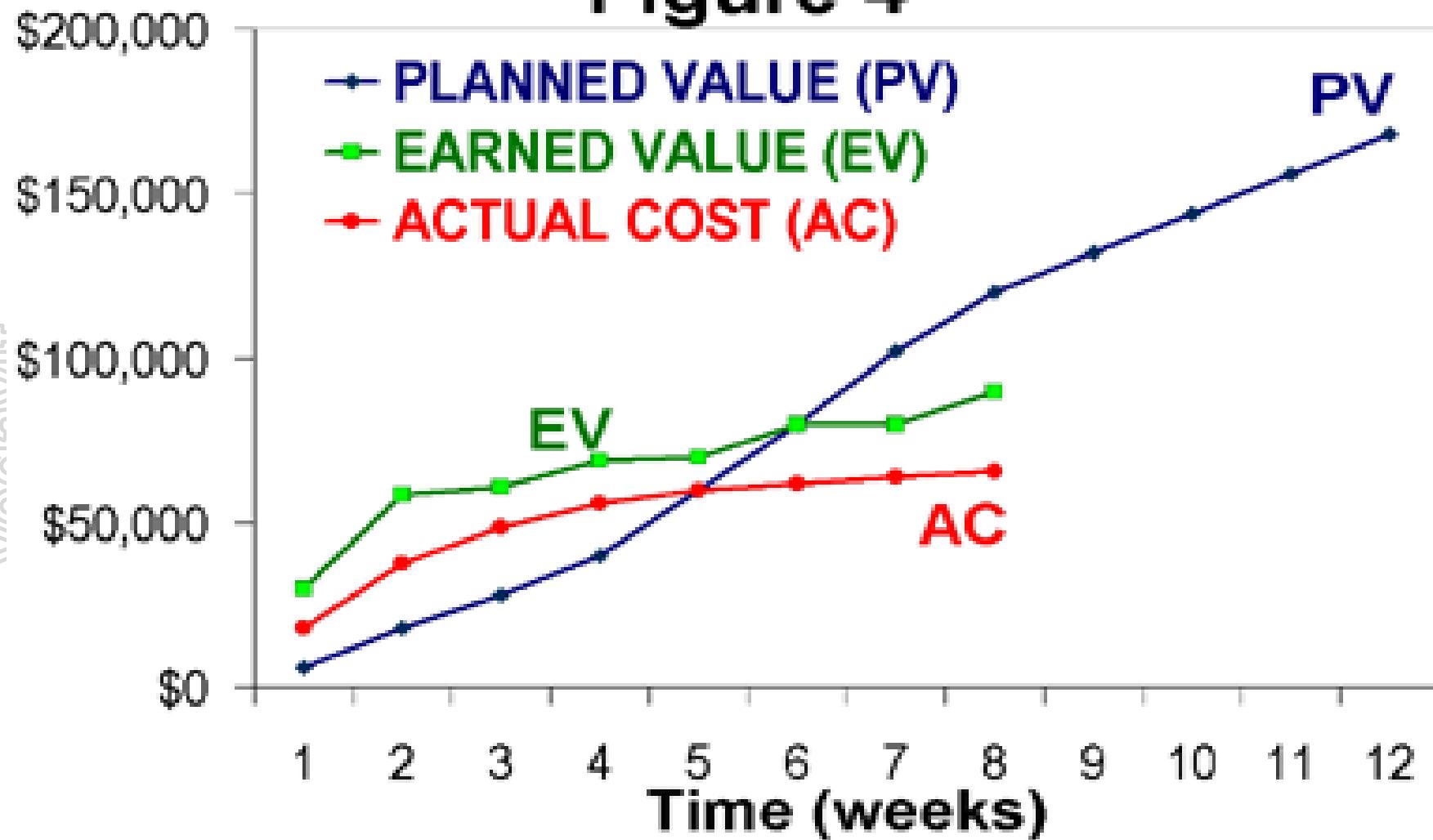
How project is progressing?

Figure 3



How project is progressing?

Figure 4



EVM-Variances

$$CV (\text{Cost Variance}) = EV - AC$$

$CV = 0 \Rightarrow$ the Project is proceeding as per plan on cost

$CV < 0 \Rightarrow$ the Project is over budget

$CV > 0 \Rightarrow$ the Project is under budget

$$SV (\text{Schedule Variance}) = EV - PV$$

$SV = 0 \Rightarrow$ the project is on plan, time-wise

$SV < 0 \Rightarrow$ the project is BEHIND schedule

$SV > 0 \Rightarrow$ the project is AHEAD of schedule

EVM- Indexes

CPI (Cost Performance Index) tells you how much worth of job you are getting for every \$ being spent.

$$CPI = EV/AC$$

CPI = 1 => the project is on plan, cost wise

CPI < 1 => the project is over budget or under performing

CPI > 1 => the project is under budget or over performing

SPI tells the PM how much worth of job has been completed against planned work

$$SPI = EV / PV$$

SPI = 1 => the project is on schedule

SPI < 1 => the project is BEHIND schedule

SPI > 1 => the project is AHEAD of schedule

EVM- Critical Ratio

CR tells the PM the overall shape of your project

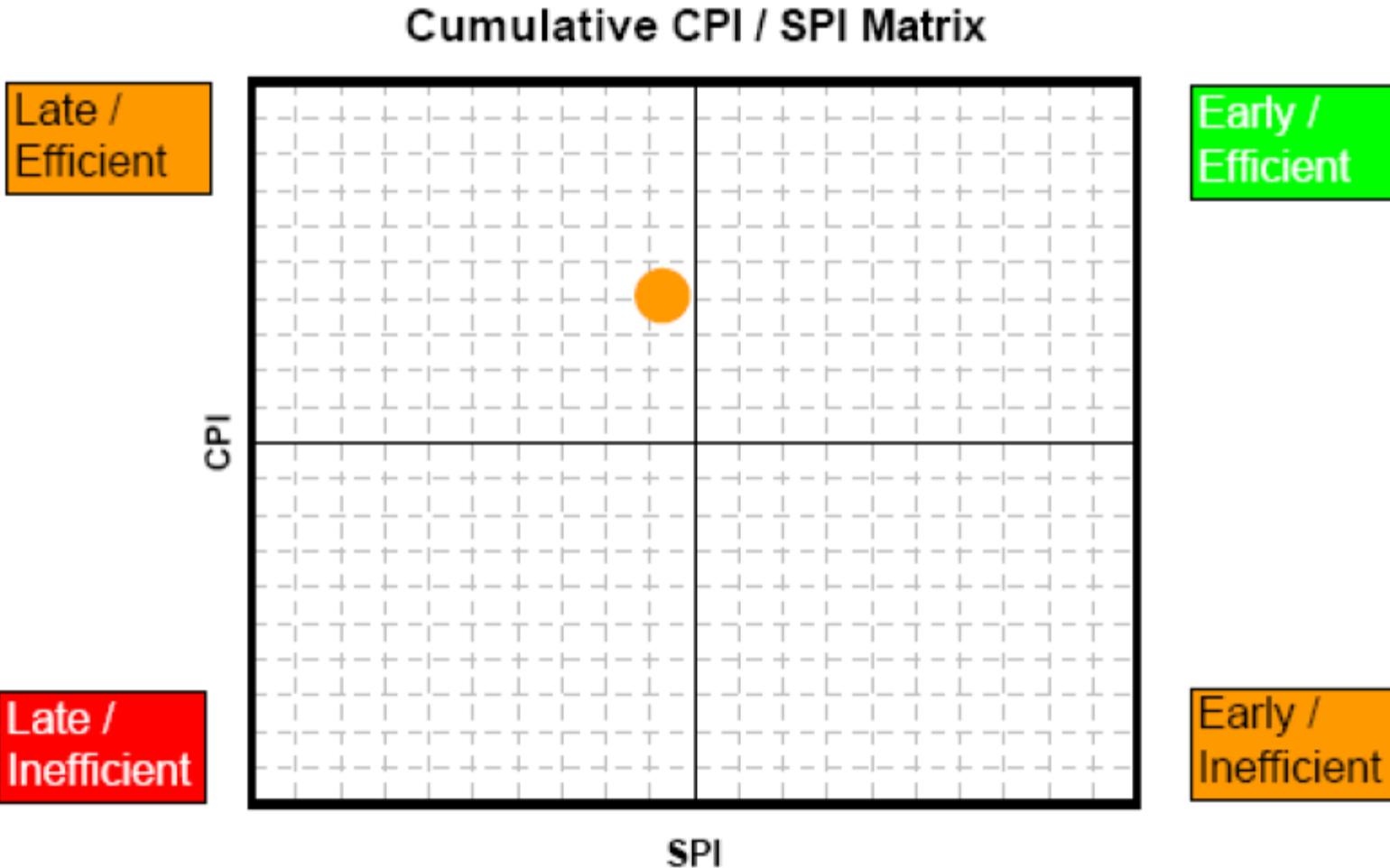
$$CR = CPI \times SPI$$

CR = 1 => the project is on schedule & within budget

CR < 1 => the project is BEHIND schedule or budget or both

CR > 1 => the project is AHEAD of schedule or budget or both

CPI & SPI Summary



Forecasting- ETC

- *Recalculate it, if original estimate are no longer valid now.*
- *Calculate it manually based on the progress, if original estimates are still valid*
 - $ETC = BAC - EV$

Forecasting- EAC

Estimate at Completion(EAC)

1. $EAC \text{ (atypical)} = AC + ETC \text{ (Re-estimated)}$

2. $EAC \text{ (atypical)} = AC + BAC - EV$ (*Estimated based on Progress*)

3. $EAC \text{ (typical considering CPI & SPI)} = AC + ETC / (CPI \times SPI)$

4. $EAC \text{ (typical)} = AC + ETC / CPI = BAC / CPI$

If you feel that you will be able to complete the project on time in spite of current delay then you can consider SPI as 1. In that case CR= SPI

Forecasting- Variance at Completion

- Variance at Completion (VAC)

$$VAC = BAC - EAC$$

- *Variance at Completion (%)*

$$PVAC= (BAC-EAC)/BAC$$

Forecasting: TCPI

TCPI (To complete Performance Index) can be calculated using BAC or EAC

- TCPI using BAC = $(BAC-EV) / (BAC-AC)$
- TCPI using EAC = $(BAC-EV) / (EAC-AC)$

Case Study – Case 1

- PV = \$ 500
- EV = \$ 500
- AC = \$ 500

This is the ideal situation where everything goes as per plan.



Case Study – Case 2

- PV = \$ 1,800
- EV = \$ 1,500
- AC = \$ 1,700
- CV = EV – AC = - \$ 200
- SV = EV – PV = - \$ 300
- CPI = EV/AC = 0.88
- SPI = EV/PV = 0.83
- PV = \$ 2,900
- EV = \$ 2,700
- AC = \$ 2,500
- SV = -200
- SPI = 0.92
- CV = 200
- CPI = 1.08

Calculate CV, SV,
SPI, SPI

EVM- Case 3

- PV = \$ 1,700
- BAC = \$ 5000
- EV = \$ 1,800
- AC = \$ 1,600
- CV = 200
- SV = 100
- CPI = 1.125
- SPI = 1.058
- EAC = BAC/ CPI = \$4444
- ETC = EAC-AC = $4444 - 1600 = \$2844$ (Org Estimate Incorrect)
- ETC = BAC-EV = $5000 - 1800 = \$3200$ (Org Estimate Correct)
- VAC = BAC – EAC= \$556
- TCPI using BAC = $5000-1800/5000-1600 = 0.941$
- TCPI using EAC = $5000-1800/4444-1600 = 1.125$

Calculate CV, SV,
CPI, SPI, EAC
(Typical), ETC, VAC,
TCPI

Discussions !

Project Quality Management

Project Quality Management



Quality Definitions from Quality Gurus

1. 'Quality is Predictability'- Deming
2. 'Conformance to requirements' - Crosby
3. 'Fitness for use' - Juran
4. 'Customer's opinion'- Feigenbaum
5. 'The totality of characteristics of an entity that bear on its ability to satisfy stated and implied need' - ISO 8402:1994
6. Conformance to "Valid Requirements".
7. Customers' perception of the value of the suppliers' work output.
8. A perceived degree of excellence with a minimum, usually set forth by the customer.
9. Best value for money.

Quality Gurus

1. **Philip B Corssby**- Popularized concept of Zero Defect. He eliminate defects completely not only reduce it to acceptable quality level
2. **Dr. Eliyahu M Goldratt**- Theory of Constraints. Focus on single element on process chain which can address 99% problems.
3. **Dr. Edward Deming**- Deming Cycle (85% Quality Problems are related to Management)
4. **Dr. Joseph M Juran**- Developed Quality Trilogy (Q-Planning, Q-Improvement, Q-Control)
5. **Dr. Walter Shewhart**- PDCA (Theory of process control or Shewart Transformation Process)
6. **Dr. Genichi Taguchi**- Taguchi Methodology or Designing in Quality (Making a design which is less sensitive to variation rather than control the manufacturing variation)
7. **Dr. Kaoru Ishikawa**- Philosophy of Total Quality, Ishikawa Diagram
8. **Shigeo Shingo**- Developed lean concepts, refined JIT (lean manufacturing)
9. **Taiichi Ohno**- Developed concept of Seven Wastes; this is used to identify non-value-added activity
10. **Armand V Feigenbaum**: Developed Idea of Total Quality Control

Project Quality Management



Definition

Processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken

Project Quality Management

24.Plan Quality Management [PLANNING]

25.Manage Quality [EXECUTING]

26.Control Quality [M&C]

24. Plan Quality Management



Definition

Identifying quality requirements and/or standards for the project and product, and documenting how the project will demonstrate compliance.

Plan Quality Management



.1 Project charter

.2 PMP

- Requirements management plan
- Risk management plan
- Stakeholder engagement plan
- Scope baseline

.3 Project documents

- Assumption log
- Requirements documentation
- Requirements traceability matrix
- Risk register
- Stakeholder register

.4 EEFs

.5 OPAs



.1 Expert judgment

.2 Data gathering

- Benchmarking
- Brainstorming
- Interviews

.3 Data analysis

- Cost-benefit analysis
- Cost of quality

.4 Decision making

- Multicriteria decision analysis

.5 Data representation

- Flowcharts
- Logical data model
- Matrix diagrams
- Mind mapping

.6 Test and inspection planning

.7 Meetings



.1 Quality management plan

.2 Quality metrics

.3 PMP updates

- Risk management plan
- Scope baseline

.4 Project documents updates

- Lessons learned register
- Requirements traceability matrix
- Risk register
- Stakeholder register

Cost of Quality

Cost of Conformance

Prevention Costs

(Build a quality product)

- Training
- Document processes
- Equipment
- Time to do it right

Appraisal Costs

(Assess the quality)

- Testing
- Destructive testing loss
- Inspections

**Money spent during the project
to avoid failures**

Cost of Nonconformance

Internal Failure Costs

(Failures found by the project)

- Rework
- Scrap

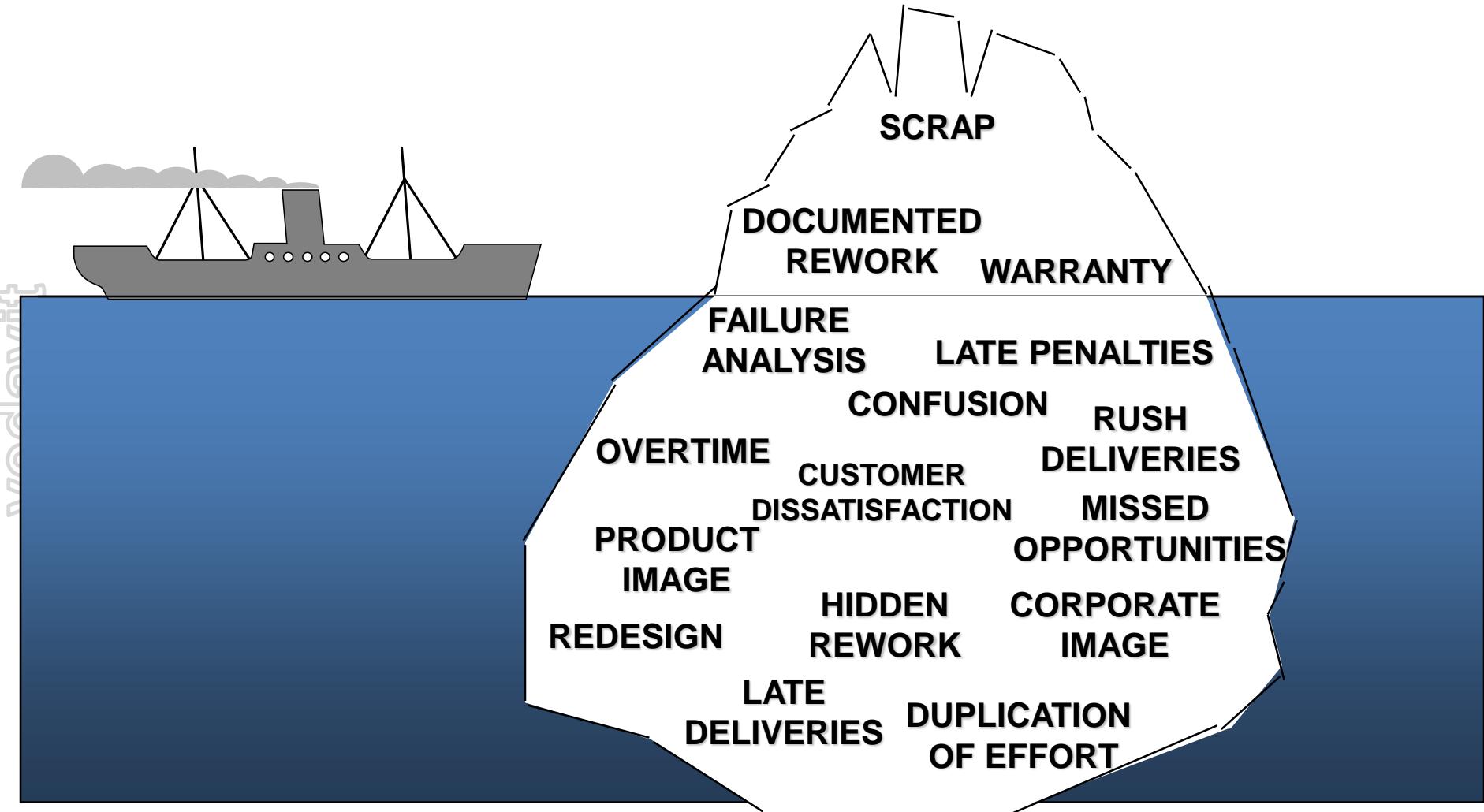
External Failure Costs

(Failures found by the
customer)

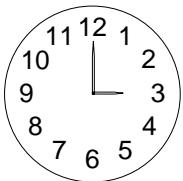
- Liabilities
- Warranty work
- Lost business

**Money spent during and after the project
because of failures**

Cost of Nonconformance- Iceberg



Exercise-21



5 Minutes

- a. Write sections of QMP of your project OR
- b. Write Quality Metrics for your projects, their goal, and threshold values OR
- c. Identify the name of checklists used in your project

25. Manage Quality



Definition

The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.

Manage Quality



.1 PMP

- Quality management plan

.2 Project documents

- Lessons learned register
- Quality control measurements
- Quality metrics
- Risk report

.3 OPAs

.1 Data gathering

- Checklists

.2 Data analysis

- Alternatives analysis
- Document analysis
- Process analysis
- Root cause analysis

.3 Decision making

- Multicriteria decision analysis

.4 Data representation

- Affinity diagrams
- Cause-and-effect diagrams
- Flowcharts
- Histograms
- Matrix diagrams
- Scatter diagrams

.5 Audits

.6 Design for X

.7 Problem solving

.8 Quality improvement methods

.1 Quality reports

.2 Test and evaluation documents

.3 Change requests

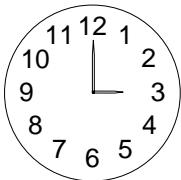
.4 PMP updates

- Quality management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.5 Project documents updates

- Issue log
- Lessons learned register
- Risk register

Exercise-22



5 Minutes

- a. Write the number of NCs were discovered in your project corresponding to the processes
- b. Who is responsible to close NCs and report their status
- c. List the corrective or preventive actions suggested by auditors

26. Control Quality



Definition

Monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.

Control Quality



- .1 PMP
 - Quality management plan
- .2 Project documents
 - Lessons learned register
 - Quality metrics
 - Test and evaluation documents
- .3 Approved change requests
- .4 Deliverables
- .5 Work performance data
- .6 EEFs
- .7 OPAs



- .1 Data gathering
 - Checklists
 - Check sheets
 - Statistical sampling
 - Questionnaires and surveys
- .2 Data analysis
 - Performance reviews
 - Root cause analysis
- .3 Inspection
- .4 Testing/product evaluations
- .5 Data representation
 - Cause-and-effect diagrams
 - Control charts
 - Histogram
 - Scatter diagrams
- .6 Meetings



- .1 Quality control measurements
- .2 Verified deliverables
- .3 Work performance information
- .4 Change requests
- .5 PMP updates
 - Quality management plan
- .6 Project documents updates
 - Issue log
 - Lessons learned register
 - Risk register
 - Test and evaluation documents

Data Analysis

Cause & Effect Diagram



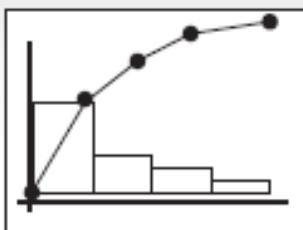
Flowcharts



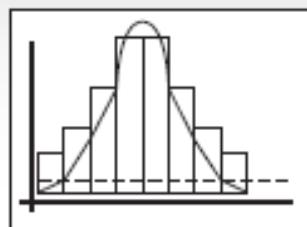
Checklists

Category	Strokes	Frequency
Attribute 1		
Attribute 2		
Attribute \vdash		
Attribute n		

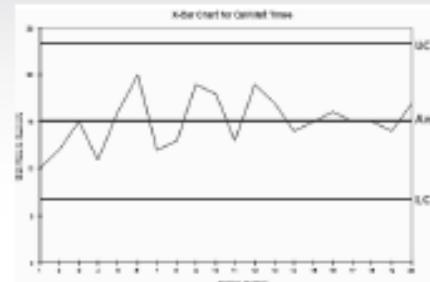
Pareto Diagrams



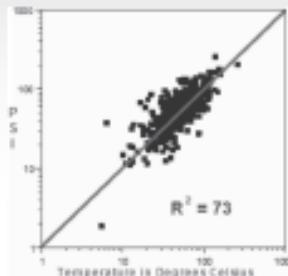
Histograms



Control Charts



Scatter Diagrams

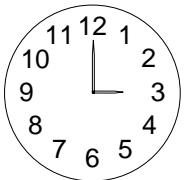


Sigma Values

Sigma	Yield	Defects in Millions
+/-2	95.44%	45600
+/-3	99.73%	2700
+/-6	99.9999997%	0.002

Sigma level (with 1.5 sigma shift)	DPMO	Percentage yield
1	691,462	30.8550%
2	308,538	69.1462%
3	66,807	93.3193%
4	6,210	99.3790%
5	233	99.9770%
6	3.4	99.99966%
7	0.019	99.999966%

Exercise-23



5 minutes

- a. Write the Quality control activities on your project
- b. List the values of various quality control measures on your project.
- c. List the validated deliverables

Discussions !

Project Resource Management

Project Resource Management



Definition

Includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.

Project Resource Management

27. Plan Resource Management [PLANNING]

28. Estimate Activity Resources [PLANNING]

29. Acquire Resources [EXECUTING]

30. Develop Team [EXECUTING]

31. Manage Team [EXECUTING]

32. Control Resources [M&C]

27. Plan Resource Management



Definition

The process of defining how to estimate, acquire, manage, and utilize physical and team resources.

Plan Resource Management



- .1 Project charter
- .2 Project management plan
 - Quality management plan
 - Scope baseline
- .3 Project documents
 - Project schedule
 - Requirements documentation
 - Risk register
 - Stakeholder register
- .4 EEFs
- .5 OPAs



- .1 Expert judgment
- .2 Data representation
 - Hierarchical charts
 - Responsibility assignment matrix
 - Text-oriented formats
- .3 Organizational theory
- .4 Meetings



- .1 Resource management plan
- .2 Team charter
- .3 Project documents updates
 - Assumption log
 - Risk register

Human Resource Management Plan

- Roles & Responsibilities (Role, Authority, Responsibility, Competency)
- Project organization chart
- Staffing management plan
 - Staff acquisition plan: From where and when the people will come, at what location they will come to work, what are the cost associated with each expertise, what kind of assistance is required from HR and functional manager of the resource
 - Resource calendar: When the recruitment should start, resource availability (resource histogram),
 - Staff release plan: When and how to release resources for smooth transition, so that resource cost is not counted in the project
 - Training need
 - Recognition & rewards
 - Complying with union contracts, government regulation or other HR policies

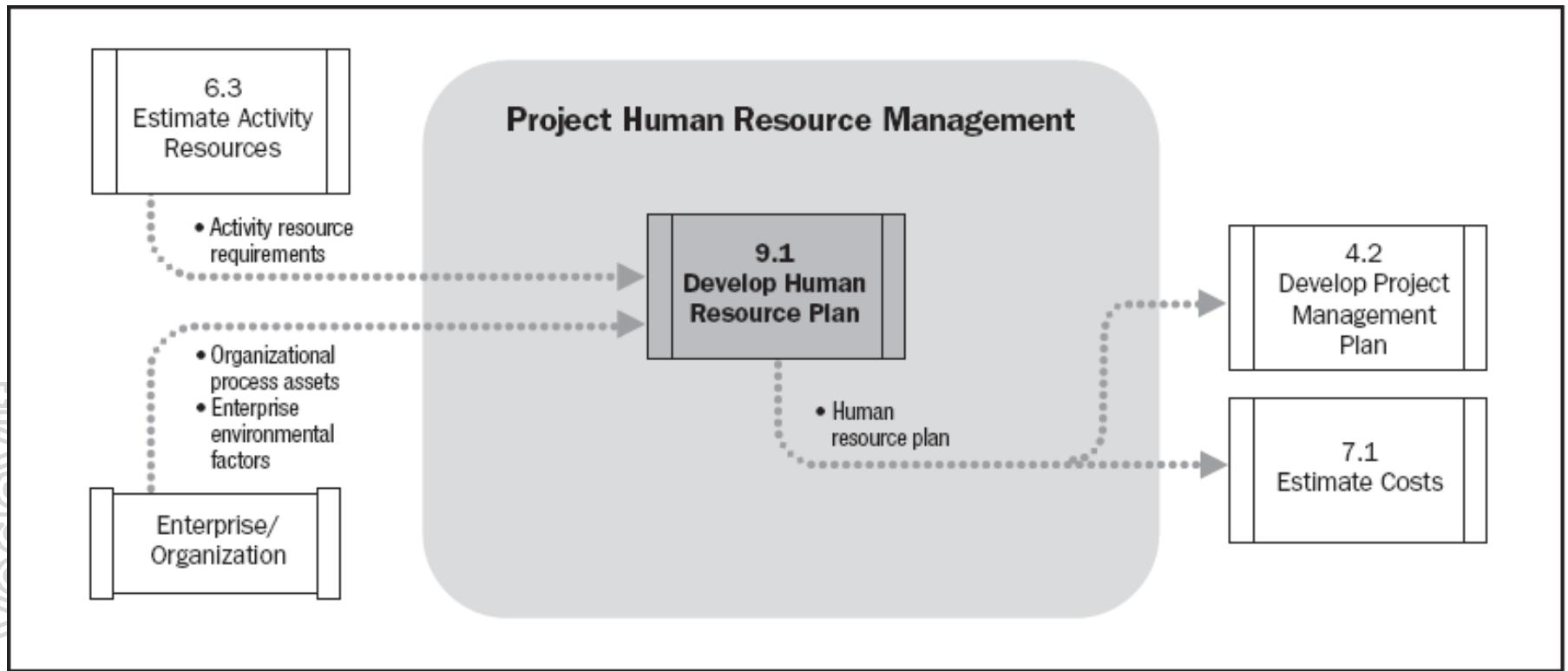


Figure 9-3. Develop Human Resource Plan Data Flow Diagram

Responsibility Assignment Matrix - RAM

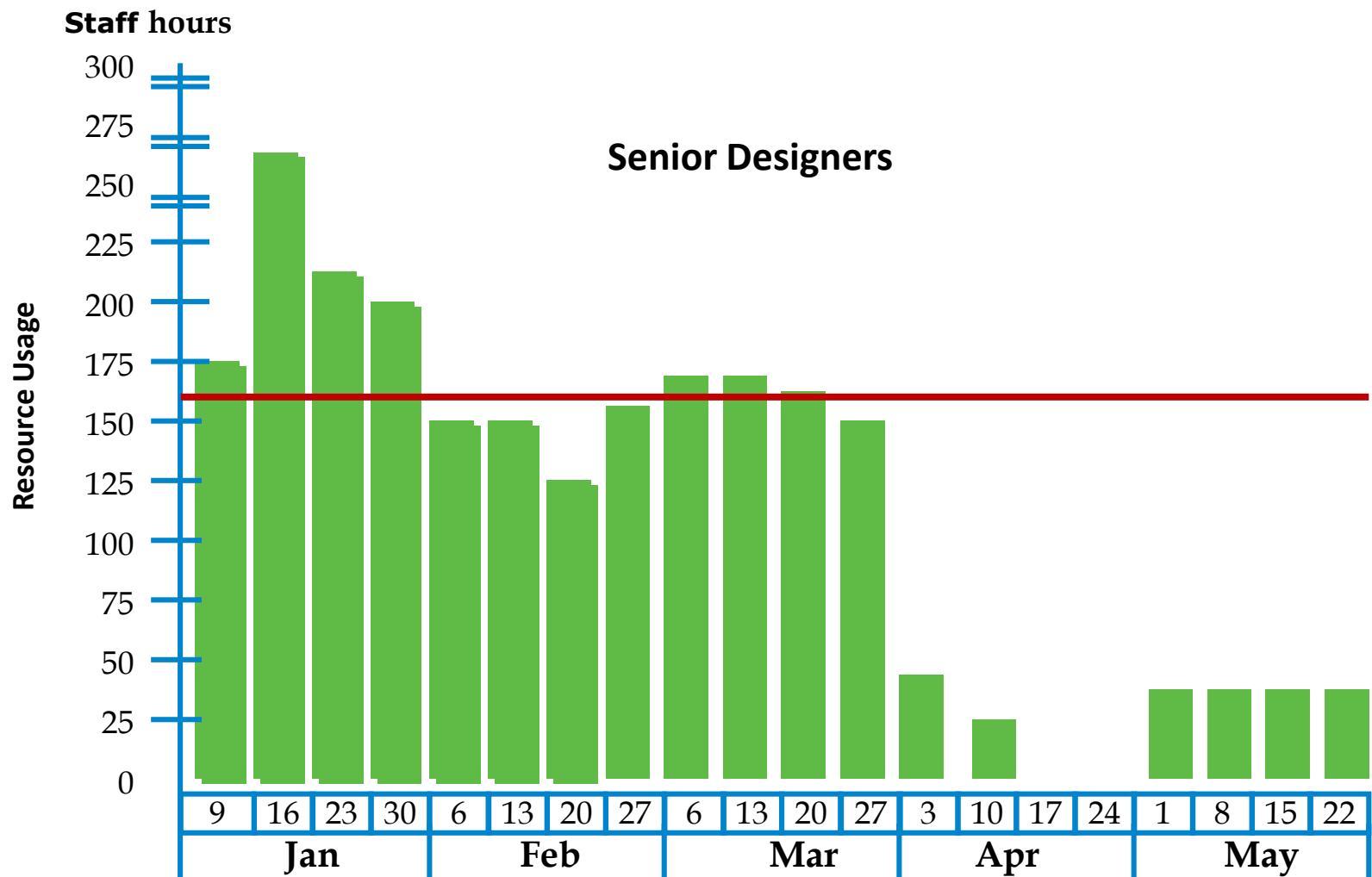
PHASE \ PERSON	Shiv	Ram	Jim	Karl	Rita	Mohan	...
Requirements	S	R	A	P	P		
Functional	S		A	P		P	
Design	S		R	A	I		P
Development		R	S	A		P	P
Testing			S	P	I	A	P

P = Participant A = Accountable R = Review required

I = input required S = Sign-off required

Resource Histogram

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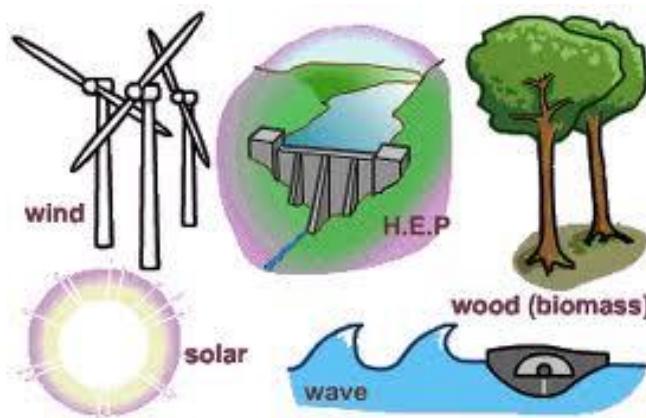


28. Estimate Activity Resources



Definition

Estimating the type and quantities of material, people, equipment or supplies required to perform each activity.



Estimate Activity Resources



.1 Project management plan

- Resource management plan

- Scope baseline

.2 Project documents

- Activity attributes

- Activity list

- Assumption log

- Cost estimates

- Resource calendars

- Risk register

.3 EEFs

.4 OPAs

.1 Expert judgment

.2 Bottom-up estimating

.3 Analogous estimating

.4 Parametric estimating

.5 Data analysis

- Alternatives analysis

.6 PMIS

.7 Meetings

.1 Resource requirements

.2 Basis of estimates

.3 Resource breakdown structure

.4 Project documents updates

- Activity attributes

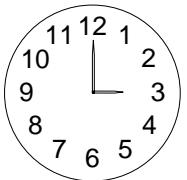
- Assumption log

- Lessons learned register

Resource Breakdown Structure

Project ABC RBS											
Labor										Material	Expenses
PM (1)	Config Mgmt		Technical Leadership			Dev Team			Test Team		
	Config Mgr	Release Mgr	Arch (1)	UIExpert (1)	DBA (1)	Sr.Dev (4)	Jr.Dev (3)	TL (1)	Tester (4)	Laptop (10 Units)	Procurement Team
										Desktop (Units)	Systems Team
										Leaseline (2 Mpbs)	Travel Cost (3 People)
										Servers (2 Units)	Boarding Lodging Cost (60 Days)
											HR

Discussion/Exercise 14



2 Minutes

- **Estimate Activity Resources for previously sequenced activities of your project**

29. Acquire Resources



Definition

Confirming human resource availability and obtaining the team necessary to complete project assignments

Acquire Resources



.1 PMP

- Resource management plan
- Procurement management plan
- Cost baseline

.2 Project documents

- Project schedule
- Resource calendars
- Resource requirements
- Stakeholder register

.3 EEFs

.4 OPAs

.1 Decision making

- Multicriteria decision analysis

.2 Interpersonal and team skills

- Negotiation

.3 Pre-assignment

.4 Virtual teams

.1 Physical resource assignments

.2 Project team assignments

.3 Resource calendars

.4 Change requests

.5 PMP updates

- Resource management plan
- Cost baseline

.6 Project documents updates

- Lessons learned register
- Project schedule
- Resource breakdown structure
- Resource requirements
- Risk register
- Stakeholder register

.7 EEFs updates

.8 OPAs updates

30. Develop Team



Definition

Process of improving competencies, team interaction, and the overall team environment to enhance project performance.

Develop Team



.1 Project management plan

- Resource management plan

.2 Project documents

- Lessons learned register
- Project schedule
- Project team assignments
- Resource calendars
- Team charter

.3 EEFs

.4 OPAs



.1 Colocation

.2 Virtual teams

.3 Communication technology

.4 Interpersonal and team skills

- Conflict management
- Influencing
- Motivation
- Negotiation
- Team building

.5 Recognition and rewards

.6 Training

.7 Individual and team assessments

.8 Meetings



1. Team performance assessments

.2 Change requests

.3 PMP updates

- Resource management plan

.4 Project documents updates

- Lessons learned register
- Project schedule
- Project team assignments
- Resource calendars
- Team charter

.5 EEFs updates

.6 OPAs updates

Team Performance Assessment..

- Skills acquired which increased productivity
- Reduced turnover rate
- Perform better within team
- Increased cohesiveness- sharing info/ openness

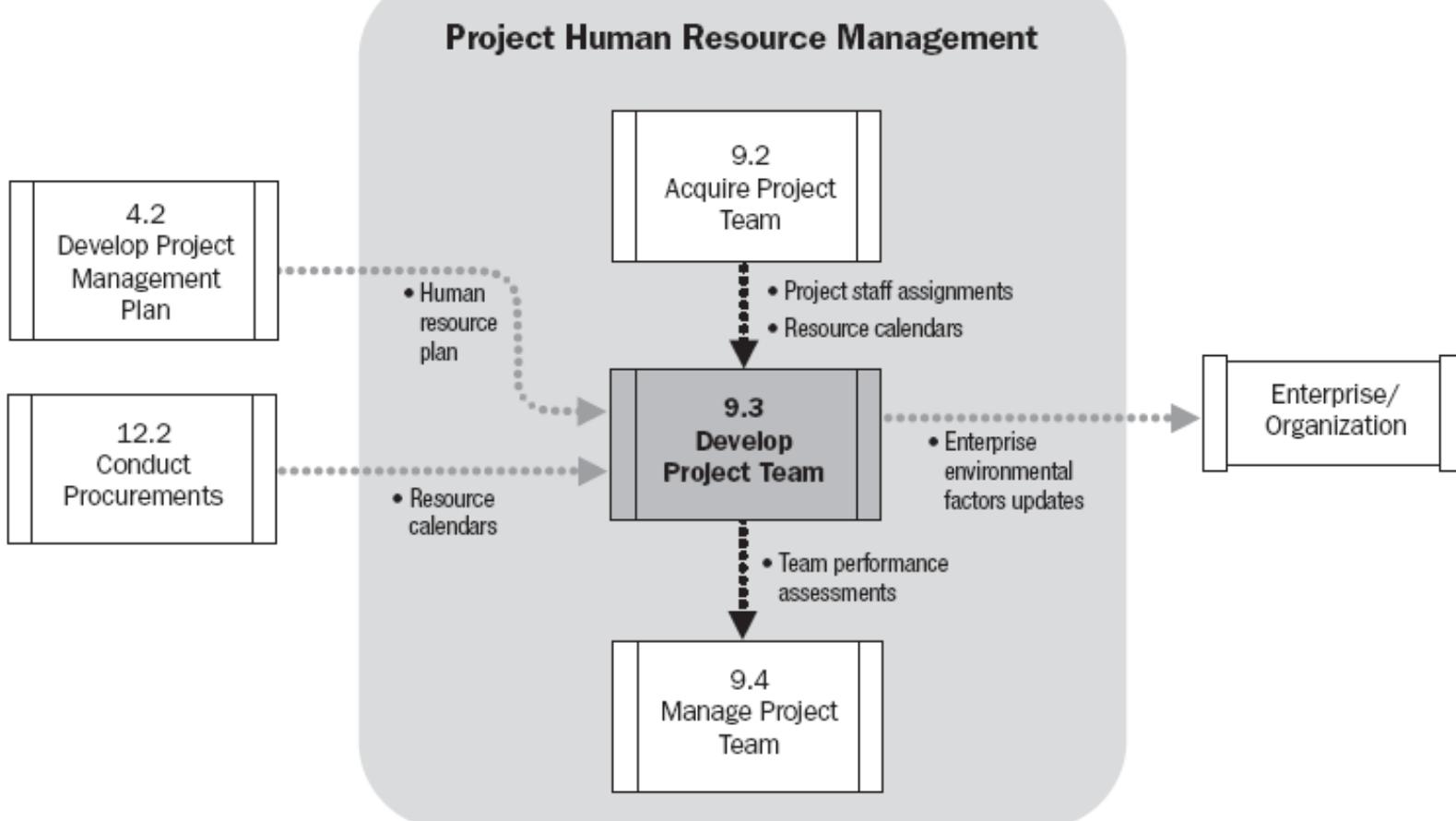


Figure 9-10. Develop Project Team Data Flow Diagram

31. Manage Team



Definition

Tracking team member performance, providing feedback, resolving issues and managing changes to optimize project performance.

Manage Team



- .1 Project management plan
 - Resource management plan
- .2 Project documents
 - Issue log
 - Lessons learned register
 - Project team assignments
 - Team charter
- .3 Work performance reports
- .4 Team performance assessments
- .5 EEFs
- .6 OPAs



- .1 Interpersonal and team skills
 - Conflict management
 - Decision making
 - Emotional intelligence
 - Influencing
 - Leadership
- .2 PMIS



- .1 Change requests
- .2 PMP updates
 - Resource management plan
 - Schedule baseline
 - Cost baseline
- .3 Project documents updates
 - Issue log
 - Lessons learned register
 - Project team assignments
- .4 EEFs updates

Types of Power

- ✓ Formal – positional, granted by organizational/upper mgmt
- ✓ Expert – power earned through a recognized level of knowledge or skill in a specific area
- ✓ Reward – the power to give a positive consequences, like promotions, salary rise etc.
- ✓ Penalty – the power to provide negative consequences, like suspension, termination, reprimands
- ✓ Referent – power gained when team members admire, and willingly follow an individual as a role model

Team Development / Tuckman Model

✓ Five Stages of Team development

- ✓ **Forming** – Members of the group get to know each other and try to set up some ground rules about behavior
- ✓ **Storming** – Conflicts arise as various members of the group try to exert leadership and the methods of operation are being established
- ✓ **Norming** – Conflicts are largely settled and a feeling of group identity emerges
- ✓ **Performing** – Emphasis now is the task at hand
- ✓ **Adjourning** – The group disbands

Sequence is followed for each individual/group

32. Control Resources



Definition

The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual use of resources, and performing corrective action as necessary

Control Resources



- .1 Project management plan
 - Resource management plan
- .2 Project documents
 - Issue log
 - Lessons learned register
 - Physical resource assignments
 - Project schedule
 - Resource breakdown structure
 - Resource requirements
 - Risk register
- .3 Work performance data
- .4 Agreements
- .5 OPAs



- .1 Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
 - Performance reviews
 - Trend analysis
- .2 Problem solving
- .3 Interpersonal and team skills
 - Negotiation
 - Influencing
- .4 PMIS



- .1 Work performance information
- .2 Change requests
- .3 PMP updates
 - Resource management plan
 - Schedule baseline
 - Cost baseline
- .4 Project documents updates
 - Assumption log
 - Issue log
 - Lessons learned register
 - Physical resource assignments
 - Resource breakdown structure
 - Risk register

Big Concepts

Conflict Resolution
Motivational Theories
Leadership Styles
Management Theories

Conflict Management

Conflicts - good or bad ???

Traditional view – Conflicts are bad, created by people and to be avoided

Current view – Conflicts are good and need to be confronted in order to bring out real issues and resolve them

Conflict Management

Sources of conflict

- ❖ Schedules
- ❖ Project Priorities
- ❖ Technical Issues
- ❖ Personality Conflict
- ❖ Cost
- ❖ Scarce resources
- ❖ Personal work styles
- ❖ Administrative Procedures

Conflict Management

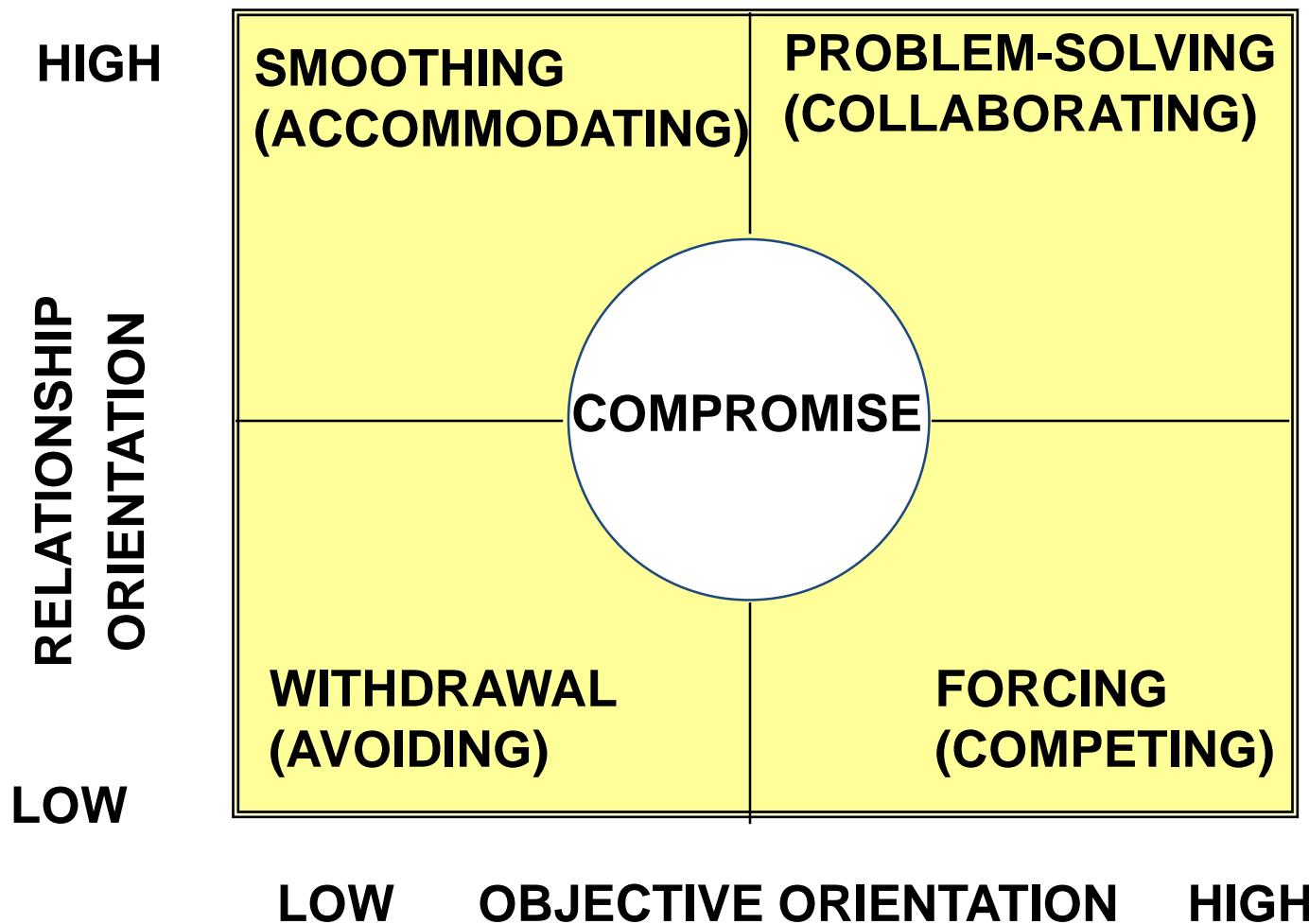
Characteristics of conflict

- ❖ Conflict is natural and forces a search for alternatives
- ❖ Conflict is team issue
- ❖ Openness resolves conflict
- ❖ Conflict resolution should focus on issues, not personalities
- ❖ Conflict resolution should focus on the present not on the past

Conflict Resolution

- ❖ Withdrawal – avoiding, giving up, stop gap, passive reaction, buying time, appropriate for “cooling off” time, no solution. Lose-lose outcome
- ❖ Smoothing – grudging agreement, avoids conflict, appeasing, friendly atmosphere. No lasting solution, lose outcome
- ❖ Compromising – bargaining, acceptable agreement, some satisfaction to each party, not ideal solution, trade off, a form of definitive solution. Lose outcome.
- ❖ Confronting/Problem Solving – approached as an issue to be solved by examining alternatives.
Give and take attitude, open dialog – direct approach, pinpoints problem, develops alternatives, objectively resolves issues, time consuming, ultimate solution, Win-Win outcome
- ❖ Collaborating – leading to consensus and commitment by incorporating multiple viewpoints and insights from differing perspectives.
- ❖ Forcing – Uses power, used as a last resort, ill feeling may result, Win-lose outcome. Win-Lose outcome

Conflict Resolution



Motivational Theories



Motivational Theories

1. Frederick Herzberg's Hygiene & Motivation Factors
2. Abraham Maslow's Hierarchy of Needs
3. Expectancy Theorem of Motivation by Victor Vroom
4. Job characteristics model of Oldham-Hackman
5. Theory X & Y of McGregor

Motivational Theories

Frederick Herzberg - Hygiene Factors and Motivating Agents (1954)

Hygiene factors

- ✓ Supervision
- ✓ Company policy and administrator
- ✓ Positive working Condition
- ✓ Interpersonal relations
- ✓ Job Security
- ✓ Status
- ✓ Compensation
- ✓ Personal life

Motivating factors

- ✓ Achievements
- ✓ Recognitions
- ✓ Work Itself
- ✓ Responsibility
- ✓ Advancement
- ✓ Possibility for growth

Motivation will not work without Hygiene

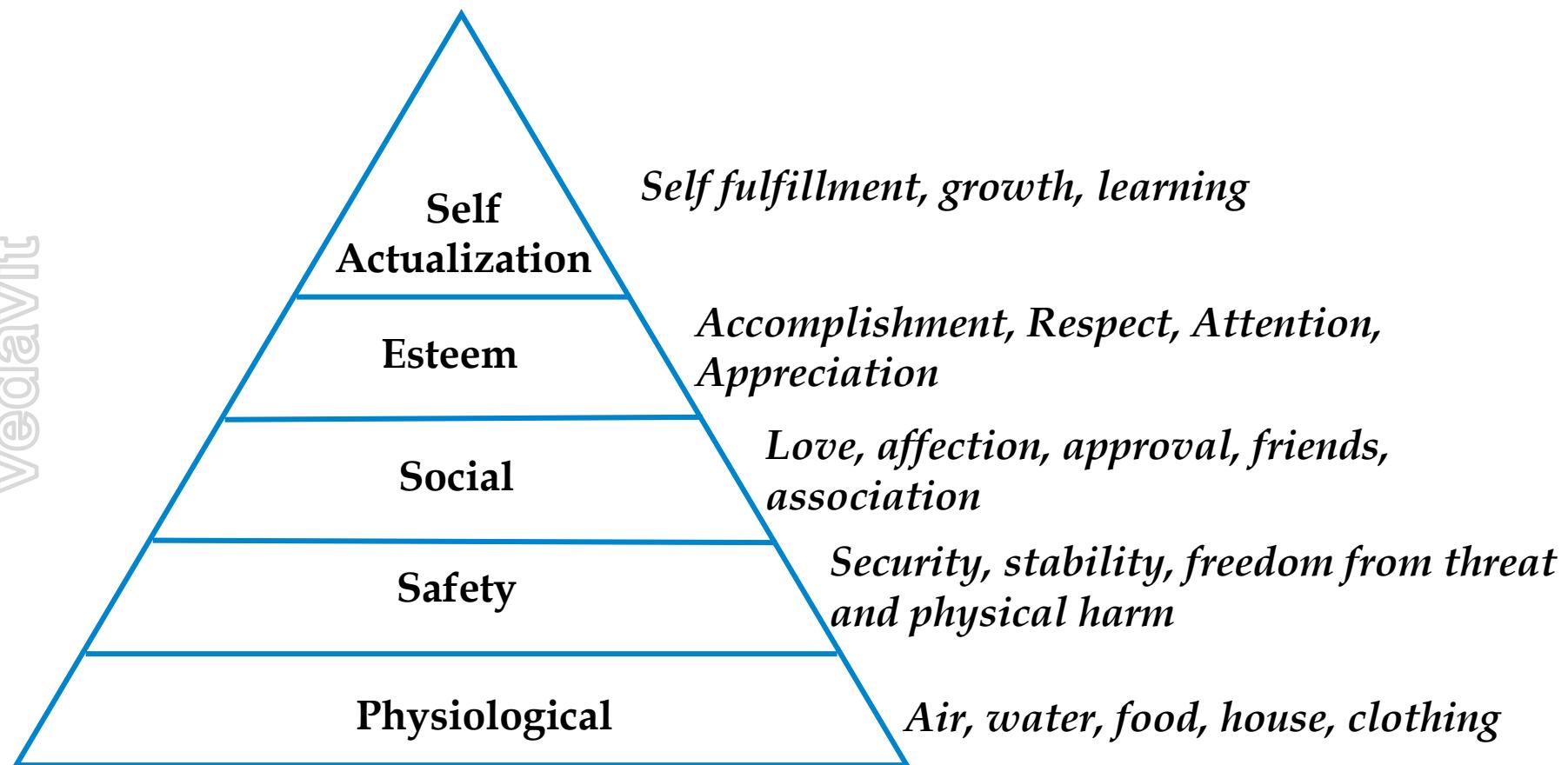
Presence will not guarantee higher productivity

Absence will result in poor productivity

Motivational Theories

Abraham Maslow's Hierarchy of Needs (1954)

(In order of priority)



Motivational Theories

Expectancy Theorem of Motivation by Victor Vroom

The extent to which an individual is motivated...

The level of expectation of their efforts will result in a desired outcome (effort performance linkage)

(Is the work important?)

The expectation that good work will be rewarded (Performance-reward linkage)

(Will I be rewarded?)

Attractiveness of the reward

(What is the value of the reward?)

Motivation will be high when all three factors are high

Motivational Theories

The Oldham-Hackman job characteristics model

- ✓ **Skill Variety** – the number of job skills that the job holder has the opportunity to exercise
- ✓ **Task Identity** – the degree to which your work and its result are identifiable as belonging to you
- ✓ **Task Significance** – the degree to which your job has an influence on others
- ✓ **Autonomy** – the discretion you have about the way that you do the job
- ✓ **Feedback** – the information that you get back about the result of your work

Motivational Theories

McGregor's Theory X

- ✓ The average worker is inherently lazy and needs supervisions
- ✓ The average worker dislikes work and avoids work whenever possible
- ✓ To induce adequate effort, the supervisor must threaten punishment and exercise careful supervision
- ✓ The average worker avoids increased responsibility and seeks to be directed

Theory X relies on Strict Rules, Performance incentives, Rewards, Threats to job security

Motivational Theories

McGregor's Theory Y

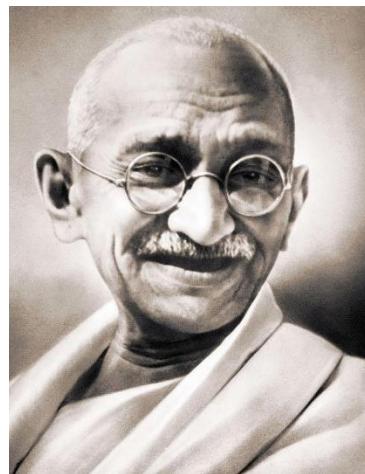
- ✓ Workers are willing to do the job without continuous supervision
- ✓ The average worker wants to be active and finds the physical and mental effort on the job satisfying
- ✓ Greatest results come from willing participation which will tend to produce self-direction towards goals without coercion and control
- ✓ The average worker seeks opportunity for personal improvement and self respect

Theory Y relies on worker participation in decisions, cordial manager-worker relationships, worker designed job methodology, worker individualism

Leadership

- ✓ Human Engineering
- ✓ Business
- ✓ Investment
- ✓ Military
- ✓ Nationalism

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Personality

Personality refers to the individual differences in characteristic patterns of thinking, feeling, and behaving

- **Authentic** (e.g., accepts others for what and who they are, show open concern);
- **Courteous** (e.g., ability to apply appropriate behavior and etiquette);
- **Creative** (e.g., ability to think abstractly, to see things differently, to innovate);
- **Cultural** (e.g., measure of sensitivity to other cultures including values, norms, and beliefs);
- **Emotional** (e.g., ability to perceive emotions and the information they present and to manage them; measure of interpersonal skills);
- **Intellectual** (e.g., measure of human intelligence over multiple aptitudes);
- **Managerial** (e.g., measure of management practice and potential);
- **Political** (e.g., measure of political intelligence and making things happen);
- **Service-oriented** (e.g., evidence of willingness to serve other people);
- **Social** (e.g., ability to understand and manage people); and
- **Systemic** (e.g., drive to understand and build systems)

Leadership Style Depends..

The style a project manager selects may be a personal preference, or the result of the combination of multiple factors like

- Leader characteristics (e.g., attitudes, moods, needs, values, ethics);
- Team member characteristics (e.g., attitudes, moods, needs, values, ethics);
- Organizational characteristics (e.g., its purpose, structure, and type of work performed); and
- Environmental characteristics (e.g., social situation, economic state, and political elements).

Leadership Types

- **Laissez-faire** (e.g., allowing the team to make their own decisions and establish their own goals, also referred to as taking a hands-off style);
- **Transactional** (e.g., focus on goals, feedback, and accomplishment to determine rewards; management by exception);
- **Servant leader** (e.g., demonstrates commitment to serve and put other people first; focuses on other people's growth, learning, development, autonomy, and well-being; concentrates on relationships, community and collaboration; leadership is secondary and emerges after service);
- **Transformational** (e.g., empowering followers through idealized attributes and behaviors, inspirational motivation, encouragement for innovation and creativity, and individual consideration);
- **Charismatic** (e.g., able to inspire; is high-energy, enthusiastic, self-confident; holds strong convictions); and **Interactional** (e.g., a combination of transactional, transformational, and charismatic).

Leadership Theories

Theory Z Proposed by William Ouchi

According to Theory Z, people who don't fit either Theory X or Theory Y are really a combination of the two.

People who develop a leadership style based on Theory Z, use different styles of leadership with different people, depending on the situation.

Leadership Theories

Contingency Theory of Fred Fiedler

- ✓ No theory is best theory. Because best depends upon individual manager and organization.
- ✓ Built on a combination of Theory Y behaviors and the Hygiene Theory
- ✓ People are motivated to achieve level competency and will continue to be motivated by this need even after competency is reached

Key to Successful Team Management

- Listens to subordinates to diagnose or solve problems
- Sets goals and develops short- and long- range action plans
- Gives directions about who is to do which tasks to what standards
- Provides feedback on task performance
- Rewards or disciplines task performance and personal characteristics
- Develops subordinates

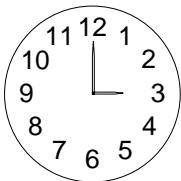
Key to Successful Team Management

- ✓ Understanding that team is an Integral Unit of Organization
- ✓ A team mission, objective, goals, strategy and role definition
- ✓ A leader and an organizational support system
- ✓ Managers responsive to needs of team members
- ✓ Encourage participation and effective communication
- ✓ Foster an atmosphere of trust among team members
- ✓ Provide feedback effectively
- ✓ A collective culture and style
- ✓ Motivate team members with challenges & rewards

Halo effect

The halo effect is the assumption that because the person is good at a technology they'd also be good at managing a project. (Which may be wrong assumption).

Exercise-24



5 Minutes

1. Prepare Human Resource Management Plan Including

- Staffing Management Plan for your project
- Project Organization Structure
- Ground Rules for working in project
- Prepare Project Calendar
- Prepare a training plan
- Prepare a hiring plan
- Appraisal and Feedback Plan

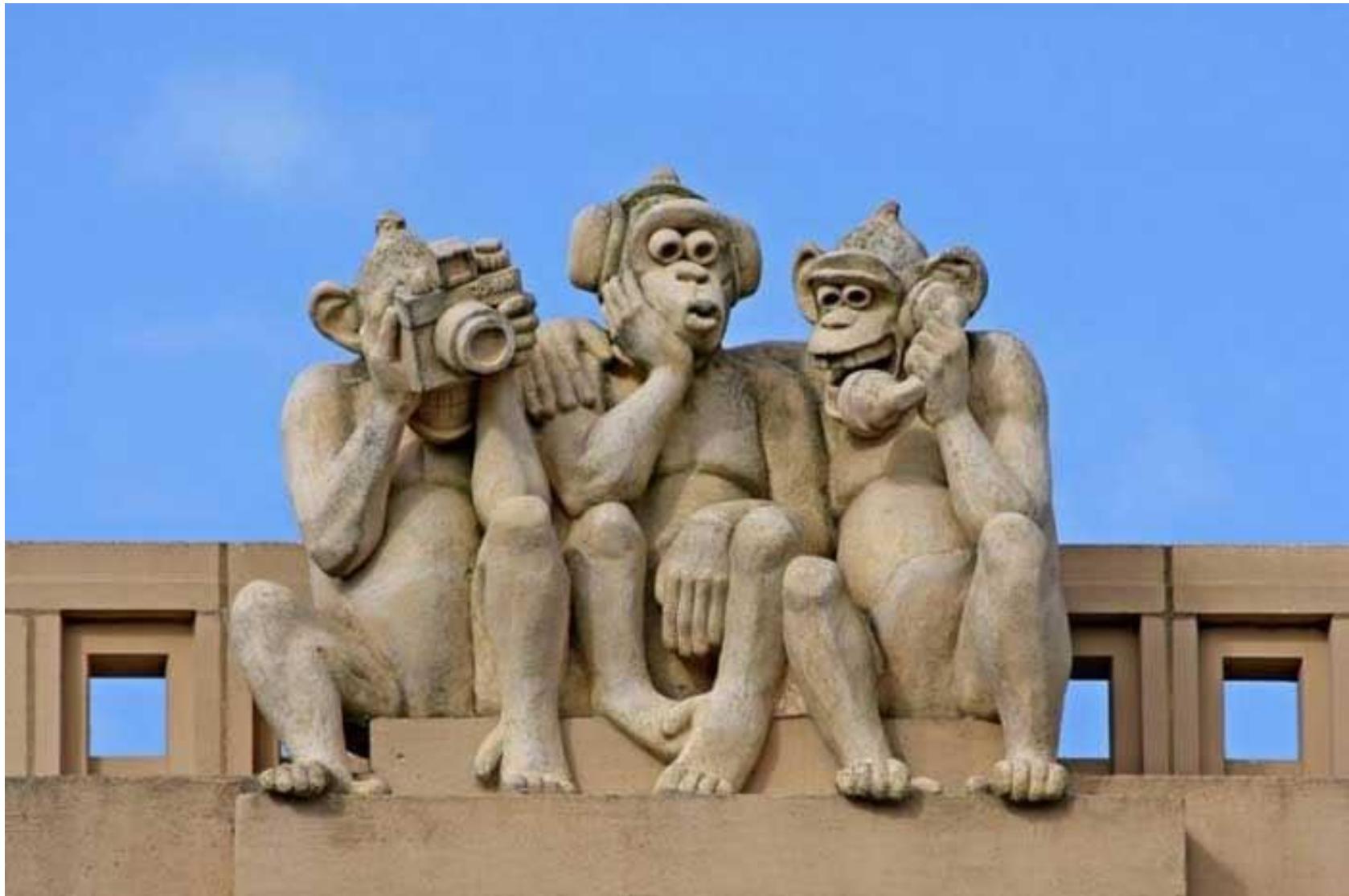
2. Discuss servant Leadership

Discussions !

Project Communication Management

Project Communications Management

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Project Communication Management



Definition

**Processes required to ensure timely and
appropriate generation, collection, distribution,
storage, retrieval and ultimate disposition of
project information.**

Project Communications Management

33. Plan Communications [PLANNING]

34. Manage Communication[EXECUTING]

35. Monitor Communications[M&C]

33. Plan Communications



Definition

Determining the project stakeholder information needs and defining a communication approach.

Plan Communication Management



- .1 Project charter
- .2 Project management plan
 - Resource management plan
 - Stakeholder engagement plan
- .3 Project documents
 - Requirements documentation
 - Stakeholder register
- .4 EEFs
- .5 OPAs

- .1 Expert judgment
- .2 Communication requirements analysis
- .3 Communication technology
- .4 Communication models
- .5 Communication methods
- .6 Interpersonal and team skills
 - Communication styles assessment
 - Political awareness
 - Cultural awareness
- .7 Data representation
 - Stakeholder engagement assessment matrix
- .8 Meetings

- .1 Communications management plan
- .2 PMP updates
 - Stakeholder engagement plan
- .3 Project documents updates
 - Project schedule
 - Stakeholder register

Communication Requirements Analysis

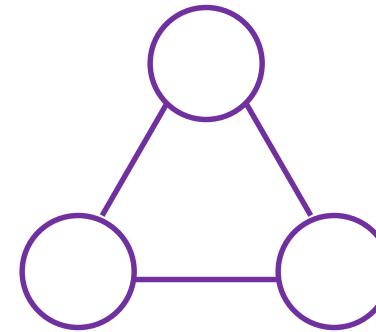
- ❖ Project resources should be expended only on communicating ***information that contributes to success*** or where a ***lack of communication can lead to failure.***
- ❖ Depends upon the responsibilities and relationship between performing organization and stakeholder.
- ❖ Depends upon disciplines, departments, and specialties involved in the project.
- ❖ Depends upon logistics of how many individuals will be involved with the project and at which locations.
- ❖ Depends upon internal and External communication needs

Number of Communication Channels

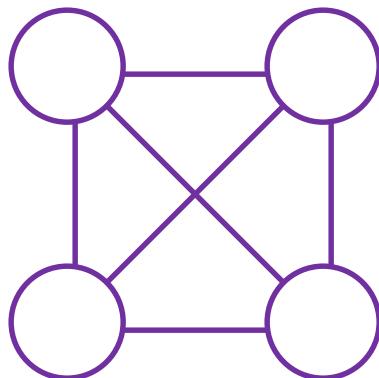
$$N(N-1)/2$$



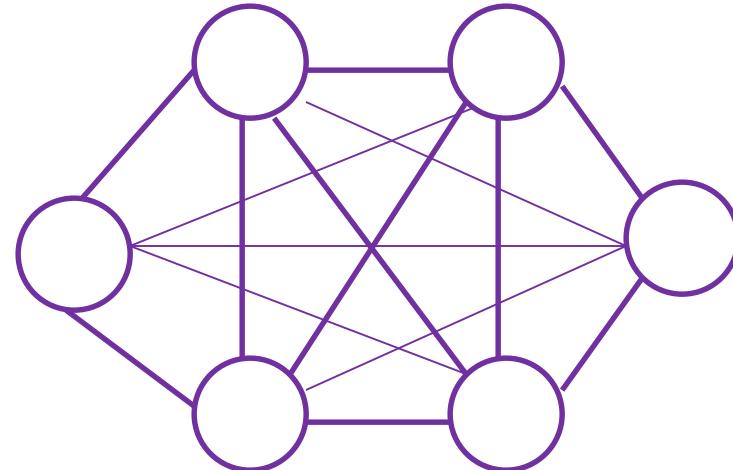
Two People, One Channel



Three People, Three Channel



Four People, Six Channel



Six People, Fifteen Channel

Communication Methods

Which communication technology should be used depends upon what communication method is the needed

Three Communication Methods

- Interactive Communication

Phone, audio/video conferences, moderator lead discussion, workshop

- Push Communication

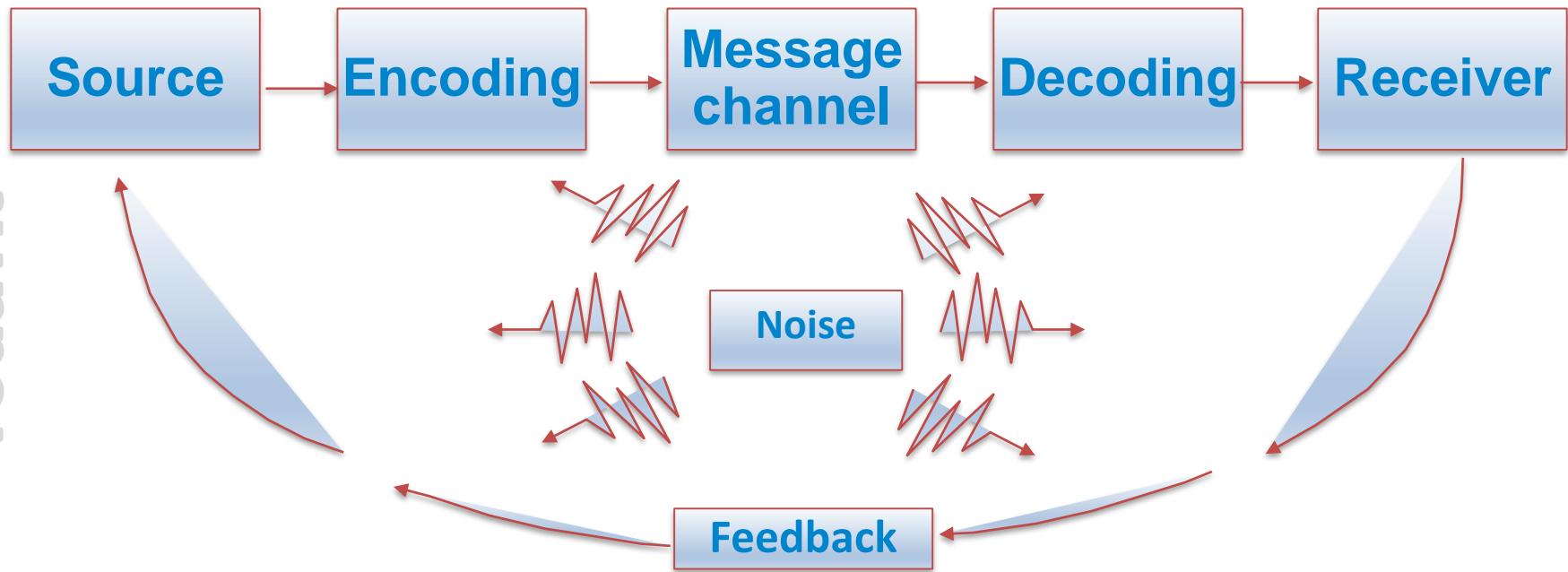
Letters, memos, reports, emails, faxes, voice mail, press releases

- Pull Communication

e-learning, knowledge repository, unknown people

Communication Model

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34. Manage Communication



Definition

As per the communication management plan creating, collecting, distributing, storing, retrieving and ultimate disposition of project information

Manage Communications



.1 Project management plan

- Resource management plan
- Communications management plan
- Stakeholder engagement plan

.2 Project documents

- Change log
- Issue log
- Lessons learned register
- Quality report
- Risk report
- Stakeholder register

.3 WPR

.4 EEFs

.5 OPAs

.1 Communication technology

.2 Communication methods

.3 Communication skills

- Communication competence
- Feedback
- Nonverbal
- Presentations

.4 PMIS

.5 Project reporting

.6 Interpersonal and team skills

- Active listening
- Conflict management
- Cultural awareness
- Meeting management
- Networking
- Political awareness

.7 Meetings

.1 Project communications

.2 PMP updates

- Communications management plan
- Stakeholder engagement plan

.3 Project documents updates

- Issue log
- Lessons learned register
- Project schedule
- Risk register
- Stakeholder register

.4 OPAs updates

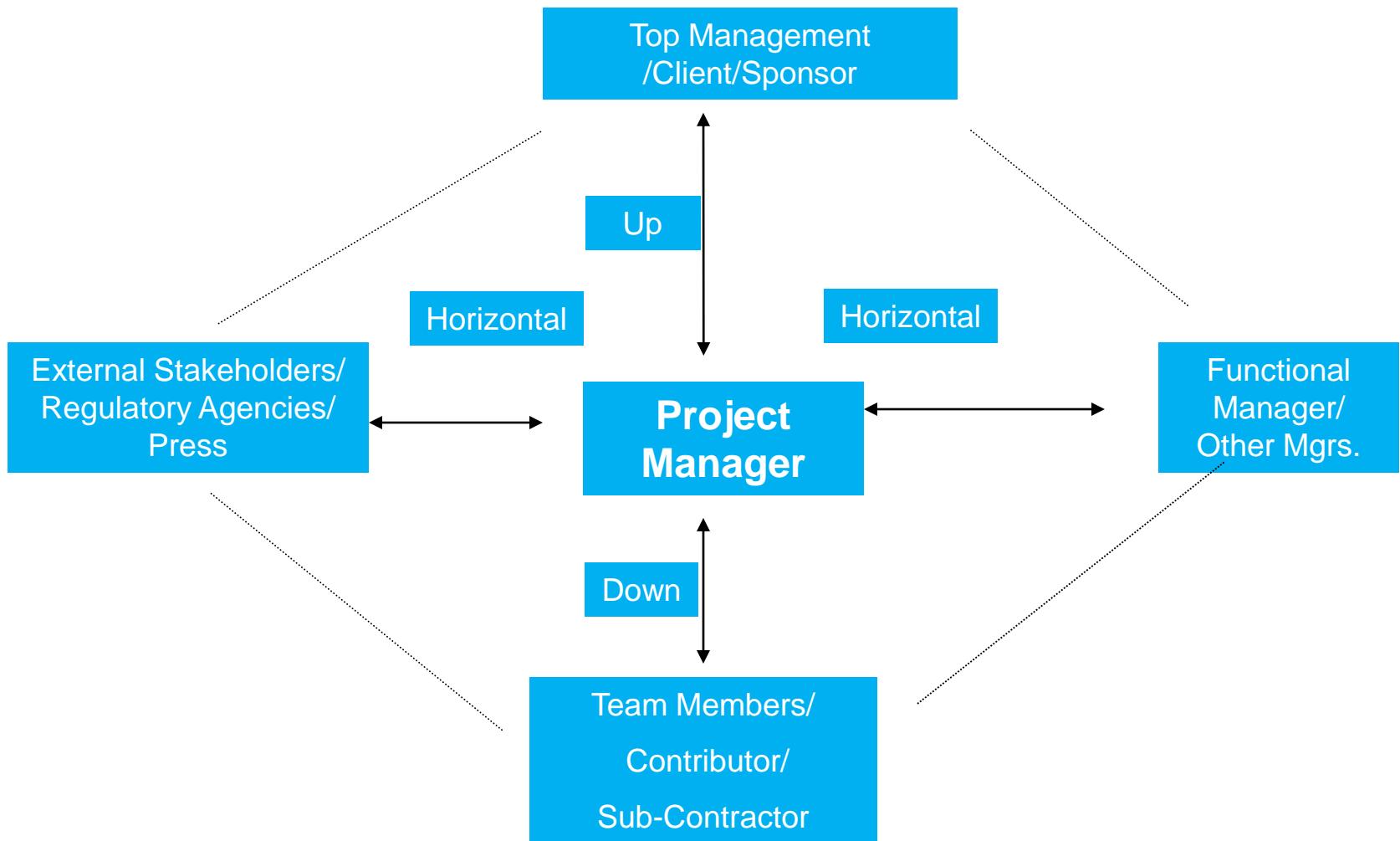
Communication Methods

- Individual Meetings
- Group Meetings
- Audio & Video conferences
- Computer chats
- Remote communication methods

Information distribution tools

- Hardcopy distribution, manual filing systems, press released, shared access to electronic database
- Electronic communication & conferencing tool: email, fax, voice mail, telephone, video, web conferencing, websites and web publishing
- Electronic tools for project management web interfaces to scheduling and project management software, meeting and virtual office software, portals and collaborating work management tool

Distribute Information



35. Monitor Communications



Definition

Ensuring the information needs of the project and its stakeholders are met.

Monitor Communications



- .1 Project management plan
 - Resource management plan
 - Communications management plan
 - Stakeholder engagement plan
- .2 Project documents
 - Issue log
 - Lessons learned register
 - Project communications
- .3 Work performance data
- .4 EEFs
- .5 OPAs



- .1 Expert judgment
- .2 PMIS
- .3 Data analysis
 - Stakeholder engagement assessment matrix
- .4 Interpersonal and team skills
 - Observation/conversation
- .5 Meetings



- .1 Work performance information
- .2 Change requests
- .3 PMP updates
- Communications management plan
- Stakeholder engagement plan
- .4 Project documents updates
 - Issue log
 - Lessons learned register
 - Stakeholder register

Communication Types

Informal	Meeting, Conversation	Email, Status Update, Memos
Formal	Speech, Presentation	Project Plan, Contract, Charter
	Verbal	Written

Communication Management

- ✓ Filtering – A phenomenon that occurs when a large portion of the message is lost in vertical/horizontal communication
- ✓ Nonverbal communication carries 55% of the message
- ✓ Progress Reports generally show problems after they have occurred.
- ✓ A communication matrix is an excellent tool to identify the stakeholders and their requirements for communication.

Communication Management

Probable Factors

- ✓ Sender's reputation
- ✓ Sender's status within the organization
- ✓ Environmental Background
- ✓ Dysfunctional emotional behaviors
- ✓ Situational Consideration – Predefined Mindset
- ✓ Historical Consideration in message interpretation

Other Factors

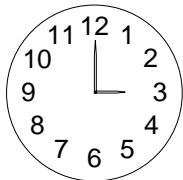
- ✓ Ambiguity in language
- ✓ Culture
- ✓ Semantics
- ✓ Knowledge Base
- ✓ Message Content – hidden agendas
- ✓ Use of idiomatic language
- ✓ Use of abbreviations

Cross Cultural Problems

Project may require inputs from individual and groups from different countries. Concerns related to communication are

- ✓ Differences in culture
- ✓ Differences in project environments.
- ✓ Attitude – perceiving others using one's own standards rather than other's.
- ✓ Stereotypes – sticking to a particular culture to apply in any situation
- ✓ Thought patterns – differing culture across geographical distances/organizations
- ✓ Time sense – differing sense of urgency

Exercise 25



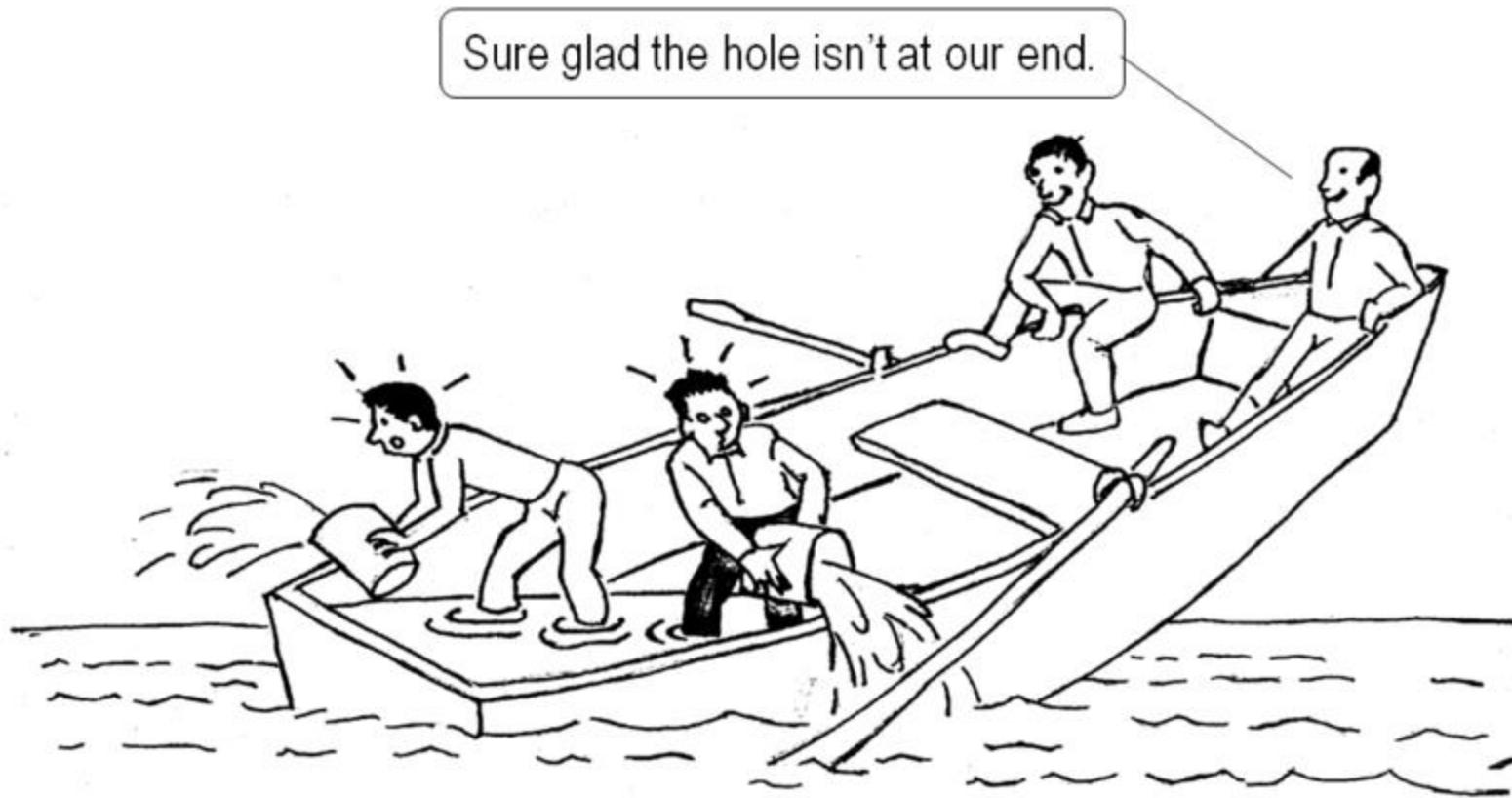
30 Min

- Prepare Communication Management Plan for your project
 - Information to be shared
 - Report formats (Name & Identifiers)
 - Reporting frequency
 - Reporting Technology
 - Purpose of Communication
 - Presenter
 - Audience (Name & Number)
- Prepare different reporting formats
 - Progress Reports
 - Status Reports
 - Forecast Reports

Discussions !

Project Risk Management







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Project Risk Management



Definition

Processes for conducting risk management planning, identification, analysis, response planning and monitoring and control on a project.

Project Risk Management

36. Plan Risk Management [PLANNING]
37. Identify Risks [PLANNING]
38. Perform Qualitative Risk Analysis [PLANNING]
39. Perform Quantitative Risk Analysis [PLANNING]
40. Plan Risk Responses [PLANNING]
41. Implement Risk Responses [EXECUTING]
42. Control Risks [M&C]

Personal Attitude to Risk

- Individuals fall into one of the three categories
 - ❖ Risks Averse
 - ❖ Risk Seeking
 - ❖ Risk Neutral

Assumption, Constraint, Dependency & Risk

Project Level		Requirement Level
Assumption	Software package can be used out of the box with no customization.	Software package can be configured to display 2 decimal places with no rounding.
Corresponding Risk	If the software package cannot be used out of the box, we will have to spend additional time and money customizing the software package to meet our needs.	If the software package cannot be configured to display 2 decimal places with no rounding, then our accounting may not be accurate.
Constraint	The software package must be used out of the box with no custom coding.	No custom coding will be done to format the currency field to 2 decimal places with no rounding.
Corresponding Risk	If the software package cannot be used out of the box, we will have to spend additional time and money customizing the software package to meet our needs, or source another product.	If the software package cannot be configured to display 2 decimal places with no rounding, then our accounting may not be accurate.
Dependency	We cannot begin project XYZ until project ABC is completed.	Requirements 1.6 and 2.1 must be implemented together.
Corresponding Risk	If project ABC is not completed by Dec 31, then project XYZ will be delayed.	If both requirements 1.6 and 2.1 are not implemented successfully at the same time, the calculations will not be accurate.

36. Plan Risk Management



Definition

Defining how to conduct risk management activities for a project .

Plan Risk Management

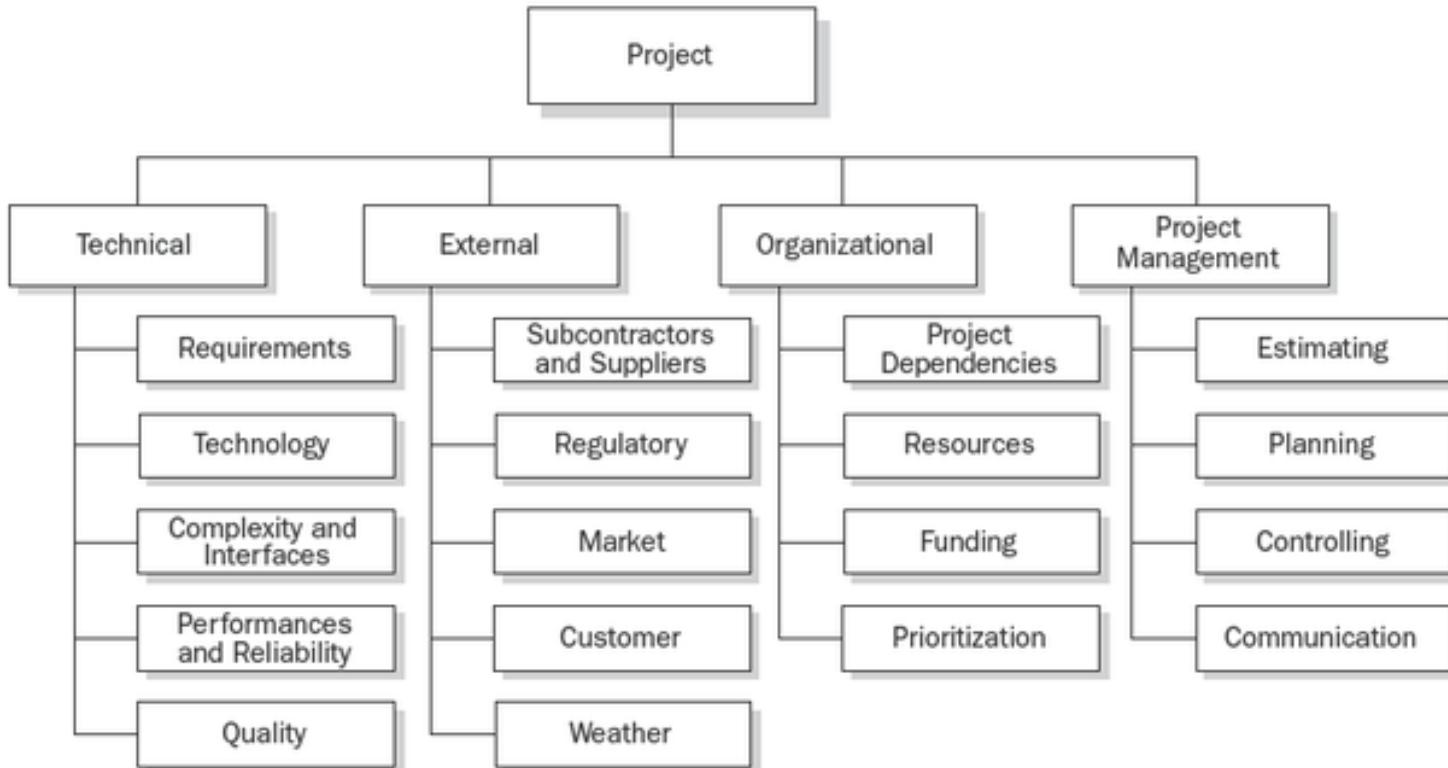


- .1 Project charter
- .2 Project management plan
 - All components
- .3 Project documents
 - Stakeholder register
- .4 EEFs
- .5 OPAs

- .1 Expert judgment
- .2 Data analysis
 - Stakeholder analysis
- .3 Meetings

- 1..1 Risk management plan

Risk Breakdown Structure



The Risk Breakdown Structure (RBS) lists the categories and sub-categories within which risks may arise for a typical project. Different RBSs will be appropriate for different types of projects and different types of organizations. One benefit of this approach is to remind participants in a risk identification exercise of the many sources from which project risk may arise.

Source : PMI PMBOK® *Fourth Edition*

Definition of Impact

Defined Conditions for Impact Scales of a Risk on Major Project Objectives
(Examples are shown for negative impacts only)

Project Objective	Relative or numerical scales are shown				
	Very low /.05	Low /.10	Moderate /.20	High /.40	Very high /.80
Cost	Insignificant cost increase	<10% cost increase	10-20% cost increase	20-40% cost increase	>40% cost increase
Time	Insignificant time increase	<5% time increase	5-10% time increase	10-20% time increase	>20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.

37. Identify Risks



Definition

Determining which risks may affect the project and documenting their characteristics

Identify Risks



.1 PMP

- Req MP, Sc-MP, CMP, QMP, Res-MP, Rk-MP
- Scope baseline
- Schedule baseline
- Cost baseline

.2 Project documents

- Assumption log, • Cost estimates
- Duration estimates, • Issue log
- Lessons learned register,
- Requirements documentation
- Resource requirements
- Stakeholder register

.3 Agreements

.4 Procurement documentation

.5 EEFs

.6 OPAs

.1 Expert judgment

.2 Data gathering

- Brainstorming
- Checklists
- Interviews

.3 Data analysis

- Root cause analysis
- Assumption and constraint analysis
- SWOT analysis
- Document analysis

.4 Interpersonal and team skills

- Facilitation

.5 Prompt lists

.6 Meetings

.1 Risk register

.2 Risk report

.3 Project documents updates

- Assumption log
- Issue log
- Lessons learned register

Diagramming Techniques

- Cause and effect diagrams
- System or process flow charts
- Influence Diagram

38. Perform Qualitative Risk Analysis



Definition

Prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

Perform Qualitative Risk Analysis



.1 Project management plan

- Risk management plan

.2 Project documents

- Assumption log
- Risk register
- Stakeholder register

.3 EEFs

.4 OPAs



.1 Expert judgment

.2 Data gathering

- Interviews

.3 Data analysis

- Risk data quality assessment
- Risk probability and impact assessment
- Assessment of other risk parameters

.4 Interpersonal and team skills

- Facilitation

.5 Risk categorization

.6 Data representation

- Probability and impact matrix
- Hierarchical charts

.7 Meetings



.1 Project documents updates

- Assumption log
- Issue log
- Risk register
- Risk report

Probability Impact Matrix

Probability and Impact Matrix											
Probability	Threats						Opportunities				
	0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04	
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03	
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02	
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01	
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05	

Impact (relative scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Define Threshold

High risk ("red condition")

Medium risk ("yellow condition")

Low risk ("green condition")

Source : PMI PMBOK® Fourth Edition

39. Perform Quantitative Risk Analysis



Definition

Numerically analyzing the effect of identified risks on overall project objectives.

Perform Quantitative Risk Analysis



.1 PMP

- Risk management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.2 Project documents

- Assumption log, • Basis of estimates, • Cost estimates, • Cost forecasts, • Duration estimates, • Milestone list, • Resource requirements, • Risk register, • Risk report, • Schedule forecasts

.3 EEFs

.4 OPAs

.1 Expert judgment

- .2 Data gathering
 - Interviews
- .3 Interpersonal and team skills
- .4 Representations of uncertainty

.5 Data analysis

- Simulations
- Sensitivity analysis
- Decision tree analysis
- Influence diagrams

.1 Project documents updates

- Risk report

PQnRA- Tools & Techniques

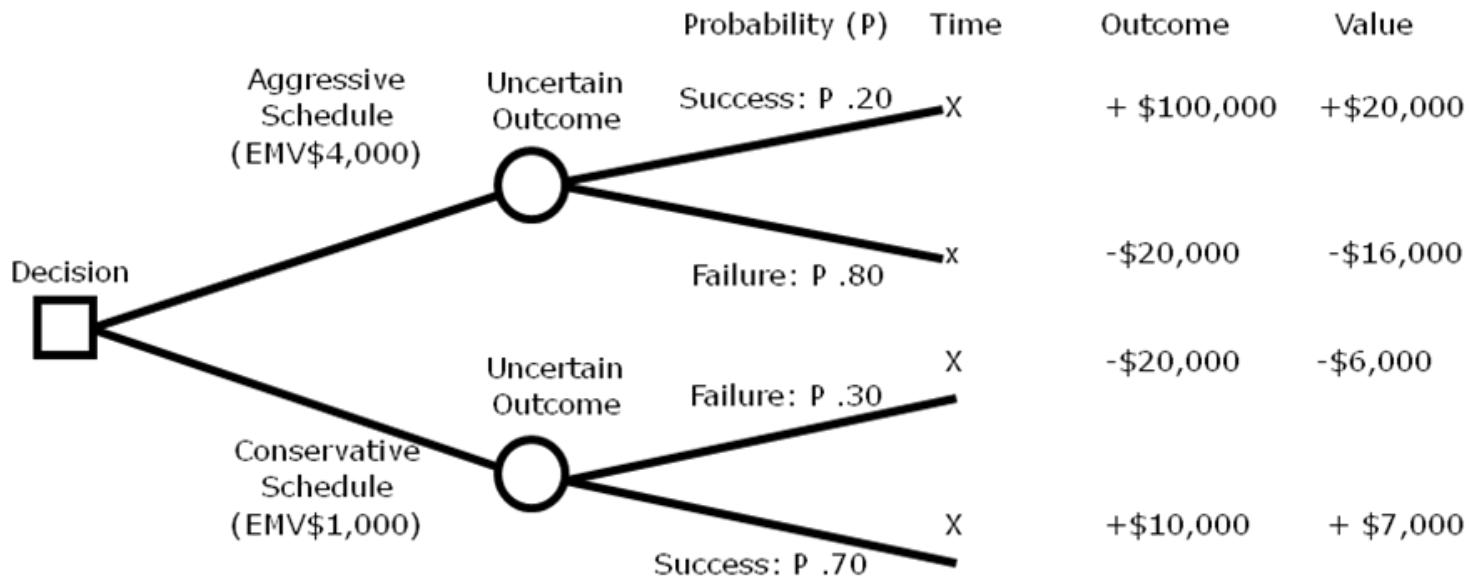
- ✓ Data Gathering & Representation Techniques
 - ✓ Interview
 - ✓ Probability Distribution (Normal, Beta, Triangular)
- ✓ Quantitative Risk Analysis Modeling Techniques
 - ✓ Sensitivity analysis- helps to determine which risks have the most potential impact- Tornado diagrams (compare relative importance and impact of variables of high degree of uncertainty)
 - ✓ Expected monetary value analysis (EMV)- Calculates average outcome of future scenarios that may or may not happen
 - ✓ Modeling & Simulation- Monte Carlo techniques

Formulae

- Probability = Number of Occurrences / Total Number occurrences
 = Frequency of Related Events / Total Number of Events
- Probability = Frequency of Related Events /
 Total Number of Possible Events
- Expected Monetary Value (EMV) = Risk Event Probability X
 Risk Event Value
- The sum of their probabilities of occurrence is 1.0

Decision Tree

A decision tree is a diagram that describes a decision under consideration and the implications of choosing one or other available alternatives

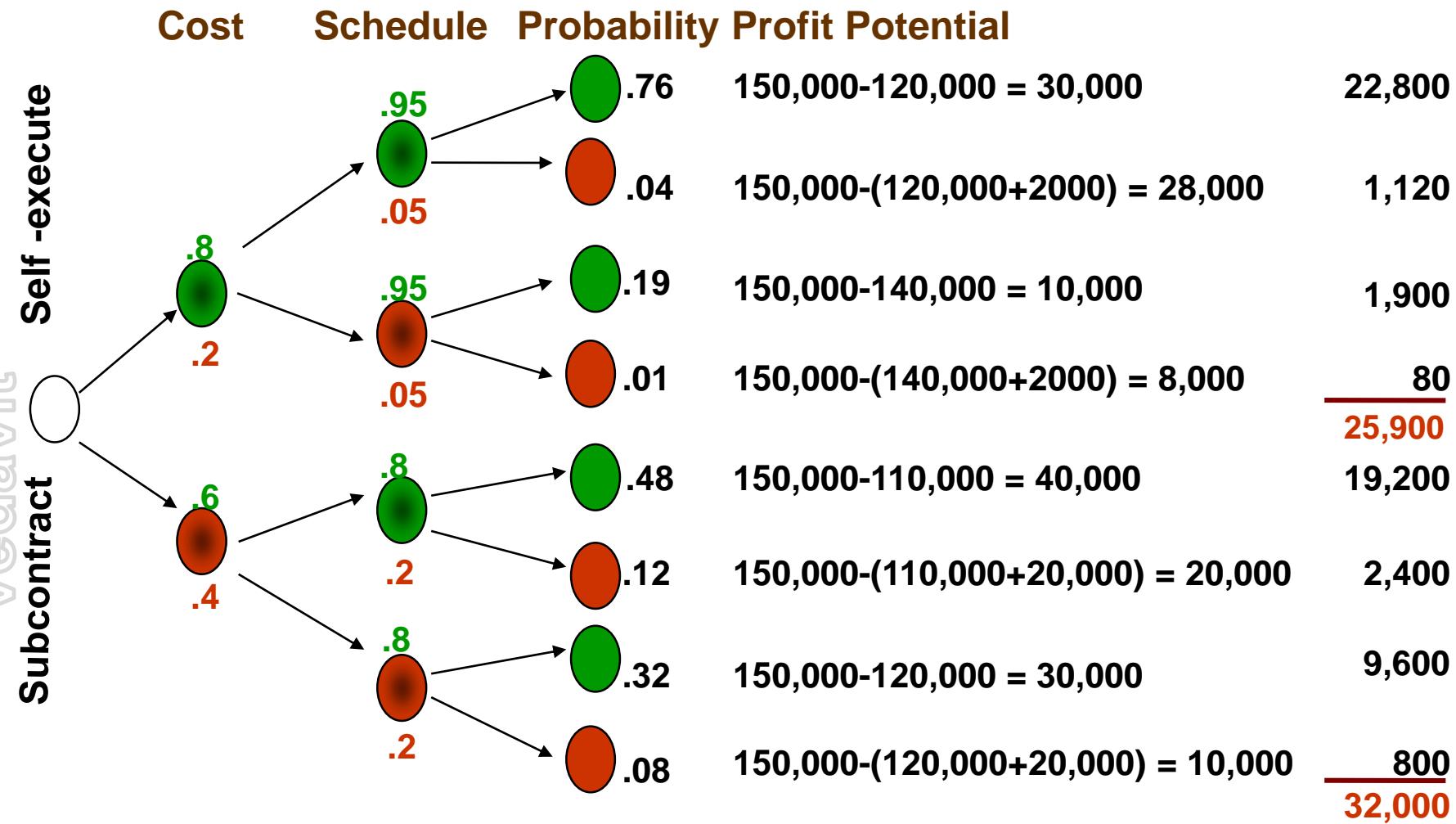


- Expected monetary value (EMV) of result Outcome x Probability of that outcome
- Expected monetary value of a decision sum of EMVs of all Outcomes stemming from that decision
- Aggressive schedule has expected monetary value of \$4,000 and is “preferred” over conservative schedule with expected monetary value of \$1,000

Decision Tree

- A Fixed Price Contract worth \$150,000 has a clause of \$1000 penalty per day of schedule delay. The following estimates for Cost and Schedule are provided:
- Self-execute
 - Cost can vary : with a likelihood 80% ↗ 120,000 vs. with a likelihood of 20% ↗ 140,000
 - Schedule: can vary : 95% on time, 5% possibility of 2 days delay
- Subcontract
 - Cost can vary : with a likelihood of 60% ↗ 110,000 vs. with a likelihood of 40% ↗ 120,000
 - Schedule can vary:: 80% on time, 20% possibility of 20 days delay

Decision Tree- Solution



40. Plan Risk Response



Definition

Developing options and actions to enhance opportunities and reduce threats to project objectives.

Plan Risk Response



.1 Project management plan

- Resource management plan
- Risk management plan
- Cost baseline

.2 Project documents

- Lessons learned register
- Project schedule
- Project team assignments
- Resource calendars
- Risk register
- Risk report
- Stakeholder register

.3 EEFs

.4 OPAs



.1 Expert judgment

.2 Data gathering

- Interviews

.3 Interpersonal and team skills

- Facilitation

.4 Strategies for threats

.5 Strategies for opportunities

.6 Contingent response strategies

.7 Strategies for overall project risk

.8 Data analysis

- Alternatives analysis
- Cost-benefit analysis

.9 Decision making

- Multicriteria decision analysis



.1 Change requests

.2 PMP updates

- ScMP, CMP, QMP, Res-MP, PrMP

- Scope baseline

- Schedule baseline

- Cost baseline

.3 Project documents updates

- Assumption log

- Cost forecasts

- Lessons learned register

- Project schedule

- Project team assignments

- Risk register

- Risk report

Risk Response Strategies

Negative Risk or Threats

- **Escalate**
- **Avoid** (remove the cause of threat)
- **Mitigate** (reduce the probability or impact)
- **Transfer** (Shifting ownership)
- **Acceptance**

Positive Risk or Opportunities

- **Escalate**
- **Exploit** (ensure the opportunity is realized)
- **Enhance** (enhance the probability or impact)
- **Share** (Transferring ownership)
- **Acceptance**

Negative Risk Responses

Avoid

Removing the cause of a threat, extending the schedule, changing the project strategy, or reducing scope. Some risks can be avoided by clarifying requirements, obtaining information, improving communication, or acquiring expertise.

Mitigate

Designing redundancy into a system may reduce the impact from a failure of the original component.

Transfer

Transfer ownership of a specific risk. Buy insurance, performance bonds, warranties, guarantees.

Accept

Acceptance can be either active or passive. The most common active acceptance strategy is to establish a contingency reserve. Passive acceptance involves no proactive action apart from periodic review.

Positive Risk Responses

Exploit

Examples: if you are getting some good quality resources at lower cost at certain location then offloading work to that location.

Enhance

Examples: if you are getting some good quality resources at lower cost at certain location then assigning offloading more and more work to that location.

Share

Examples: If you have some business opportunity which you cannot fulfill because of your know-how limitation then you can partner with company and you both can explore to work together to realize the benefits

Accept

Acceptance can be either active or passive. The most common active acceptance strategy is to establish a contingency reserve. Passive acceptance involves no proactive action apart from periodic review.

Understanding Reserves

Contingency reserves : Known – Unknown

- It is designed for use only if certain events occur or only under certain predefined conditions, provided there is sufficient warning to implement the response.
- Examples of events that may trigger the contingency response include missing intermediate milestones or gaining higher priority with a supplier.
- Events triggering the contingency response should be triggered and tracked.

Management reserves: Unknown – Unknown

It is defined for use only if ‘the events that occur or only under certain conditions’, where information about the event & its occurrence is absolutely NOT available.

41. Implement Risk Responses



Definition

The process of implementing agreed-upon risk response plans.

Implement Risk Responses



.1 Project management plan

- Risk management plan

.2 Project documents

- Lessons learned register
- Risk register
- Risk report

.3 OPAs

.1 Expert judgment

.2 Interpersonal and team skills

- Influencing

.3 PMIS

.1 Change requests

.2 Project documents updates

- Issue log
- Lessons learned register
- Project team assignments
- Risk register
- Risk report

42. Monitor Risks



Definition

The process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

Control Risks



.1 Project management plan

- Risk management plan

.2 Project documents

- Issue log
- Lessons learned register
- Risk register
- Risk report

.3 Work performance data

.4 Work performance reports



.1 Data analysis

- Technical performance analysis
- Reserve analysis

.2 Audits

.3 Meetings



.1 Work performance information

.2 Change requests

.3 PMP updates

- Any component

.4 Project documents updates

- Assumption log
- Issue log
- Lessons learned register
- Risk register
- Risk report

.5 OPAs updates

Risk Management Terms

✓ **Contingency Reserve**

- ✓ A separately planned quantity used to allow for future situations which may be planned for only in part (sometimes called “Known-unknowns”)
- ✓ Intended to reduce the impact of missing cost or schedule objectives
- ✓ Normally included in the project costs

✓ **Management Reserves**

- ✓ “A separately planned quantity used to allow for future situations which are impossible to predict (sometimes called “Unknown- unknowns”)
- ✓ Intended to reduce the risk of missing cost or schedule objectives
- ✓ Use of Management reserves requires a change to the project’s cost baseline

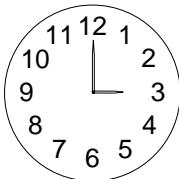
✓ **Residual Risks**

- ✓ Residual risks are those that remain after response measures have been taken.
- ✓ Include minor risks that have been accepted and addressed. E.g., By adding contingency amounts to the cost or by allowing time

✓ **Secondary risks**

- ✓ Risks that arise as a result of implementing risk response
- ✓ Should be identified and responses planned

Exercise 26



30 Min

- Prepare Risk Management Plan for your project
 - Setup a template to capture all the information to manage risk
 - Training content for risk awareness
 - Training audience
 - Roles & Responsibilities for Risk Management Activities
 - Risk assessment techniques & tools
 - Risk Manager, Risk Audits Frequency, Risk Auditor
 - Define Impact Table
 - Define Probability and Impact Table/ Risk Tolerances of Stakeholders
- Prepare Risk Register
 - Analyse Assumptions, Constraints, Dependencies of your project
 - Identify Risk for your projects
- Prepare Risk Response Plan
 - Prepare Risk Response Strategy for every risk which cannot be tolerated
 - Establish Contingency Fund
 - Discuss Unknown-Unknown and Management Reserve

Discussions !

Project Procurement Management



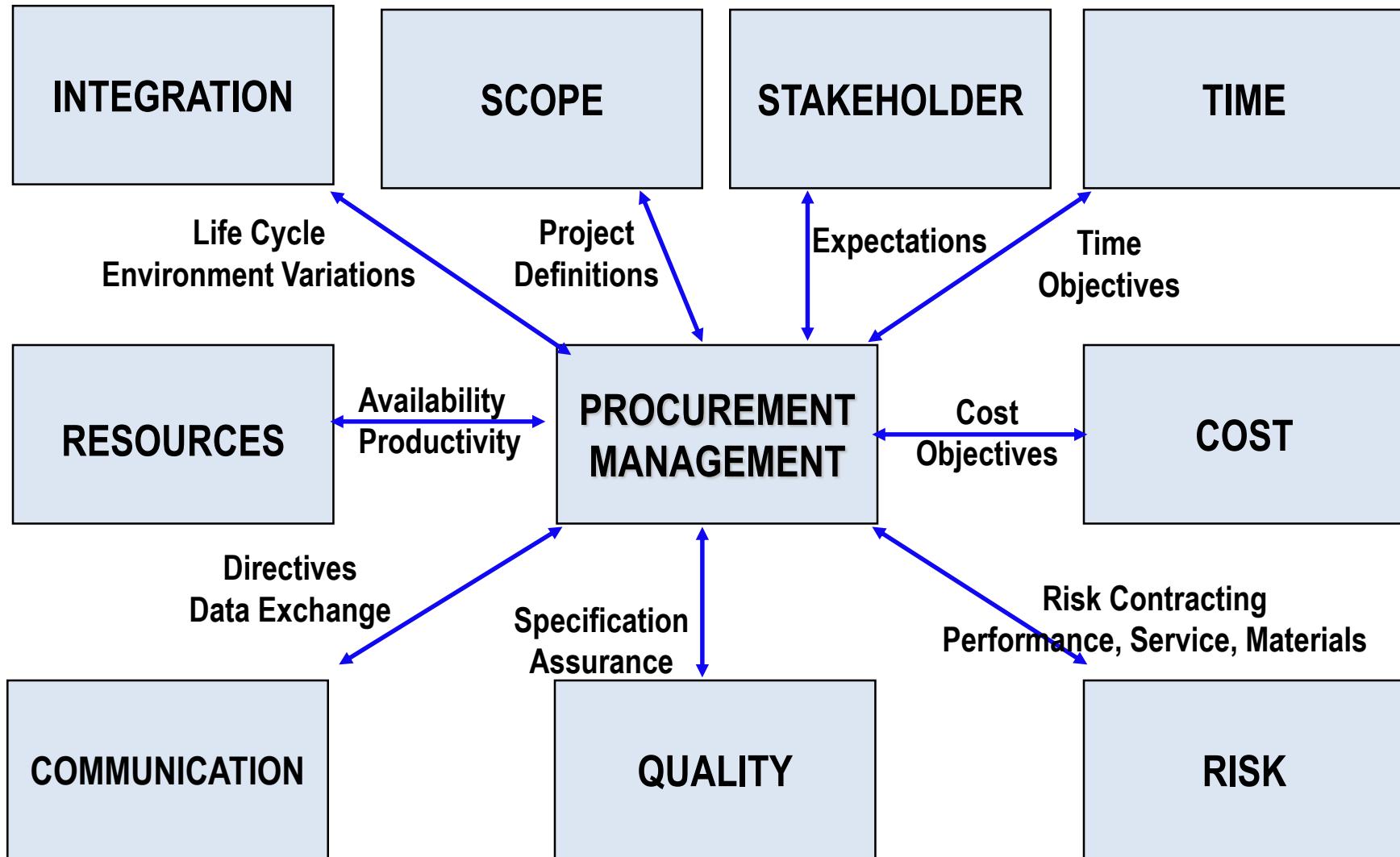
Project Procurement Management



Definition

Processes necessary to purchase or acquire products, services or results needed from outside the project team.

Another look @ Procurement Management



Project Procurement Management

43. Plan Procurement Management [PLANNING]

44. Conduct Procurements [EXECUTING]

45. Control Procurements [M&C]

Project Manager's Role

- ✓ Identifying project procurement needs
- ✓ Determine contract types and potential providers
- ✓ Identify/select procurement source
- ✓ Assessing quality and completeness of contract
- ✓ Verify product/service acceptance
- ✓ Structured review of the procurement process

43. Plan Procurement Management



Definition

Documenting project purchasing decisions, specifying the approach and identifying potential sellers.

Plan Procurement



- .1 Project charter
- .2 Business documents
 - Business case
 - Benefits management plan
- .3 PMP
 - SMP, • QMP, • Res-MP
 - Scope baseline
- .4 Project documents
 - Milestone list
 - Project team assignments
 - Req. Doc, • RTM, • RR, • SR
 - Resource requirements
- .5 EEFs
- .6 OPAs



- .1 Expert judgment
- .2 Data gathering
 - Market research
- .3 Data analysis
 - Make-or-buy analysis
- .4 Source selection analysis
- .5 Meetings



- .1 Procurement management plan
- .2 **Procurement strategy**
- .3 Bid documents
- .4 Procurement statement of work
- .5 Source selection criteria
- .6 Make-or-buy decisions
- .7 Independent cost estimates
- .8 Change requests
- .9 Project documents updates
 - Lessons learned register
 - Milestone list, • RR, • SR
 - Requirements documentation
 - Requirements traceability matrix
- .10 OPAs

Procurement Strategy

To determine the project delivery method, the type of legally binding agreement(s), and how the procurement will advance through the procurement phases.

Delivery methods

Service: Subcontracting allowed / not-allowed/ JV

Construction: design build (DB), design bid build (DBB), design build operate (DBO), build own operate transfer (BOOT)

Contract payment types

Procurement phases

Procurement Management Plan



Definition

Describes how the procurement processes will be managed

- ✓ Types of Contracts to be used
- ✓ Managing Multiple Providers
- ✓ Coordination with other project aspects

Source selection criteria

- Understanding of need
- Overall or life-cycle cost
- Technical capability
- Risk
- Management Approach
- Technical Approach
- Warranty
- Financial Capacity
- Production Capacity and interest
- Business size and type
- Past performance of sellers
- References
- Intellectual property rights
- Proprietary rights

44. Conduct Procurements



Definition

Process involves obtaining seller responses, selecting a seller and awarding a contract.

Conduct Procurement



- .1 Project management plan
 - SMP, • Req-MP, • CoMP,
 - RMP, • PrMP, • ConMP
 - Cost baseline
- .2 Project documents
 - Lessons learned register
 - Project schedule
 - Requirements documentation
 - Risk register
 - Stakeholder register
- .3 Procurement documentation
- .4 Seller proposals
- .5 EEFs
- .6 OPAs



- .1 Expert judgment
- .2 Advertising
- .3 Bidder conferences
- .4 Data analysis
 - Proposal evaluation
- .5 Interpersonal and team skills
 - Negotiation



- .1 Selected sellers
- .2 Agreements
- .3 Change requests
- .4 PMP Updates
 - Req-MP, • QMP, • CoMP, • RMP,
 - PrMP
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- .5 Project documents updates
 - Lessons learned register
 - Requirements documentation
 - RTM, • RR, • SR
 - Resource calendars
- .6 OPAs

TOC of Agreement

- Procurement statement of work or major deliverables;
- Schedule, milestones, or date by which a schedule is required;
- Performance reporting;
- Pricing and payment terms;
- Inspection, quality, and acceptance criteria;
- Warranty and future product support;
- Incentives and penalties;
- Insurance and performance bonds;
- Subordinate subcontractor approvals;
- General terms and conditions;
- Change request handling; and
- Termination clause and alternative dispute resolution mechanisms.

45. Control Procurement



Definition

Managing procurement relationships,
monitoring contract performance and making
changes and corrections as needed.

Control Procurement



.1 Project management plan

- ReqMP, • RMP, • PrMP
- Change management plan
- Schedule baseline

.2 Project documents

- Assumption log
- Lessons learned register
- Milestone list
- Quality reports
- Requirements documentation
- RTM, RR, SR

.3 Agreements

- .4 Procurement documentation
- .5 Approved change requests
- .6 Work performance data
- .7 EEFs
- .8 OPAs

.1 Expert judgment

.2 Claims administration

.3 Data analysis

- Performance reviews
- Earned value analysis
- Trend analysis

.4 Inspection

.5 Audits

.1 Closed procurements

.2 Work performance information

.3 Procurement documentation updates

.4 Change requests

.5 PMP updates

- Risk management plan
- Procurement management plan
- Schedule baseline
- Cost baseline

.6 Project documents updates

- Lessons learned register
- Resource requirements
- RTM, RR, SR

.7 OPAs updates

Claim Administration

- Contested changes or potential constructive changes are those requested changes where buyer and seller cannot reach to an agreement for payment.
- Settle through negotiation
- Follow the ADR (alternative dispute resolution) method established in contract.

Procurement: Tips for PMP® Exam

- ✓ Questions are written from buyer's perspective
- ✓ Seller is not supplying people to adjunct the buyer's team (seller remains external to the project team)
- ✓ Contracts require formality
- ✓ All product and project management requirements should be specifically stated in the contract
- ✓ If it is not in a contract, it can be done if a change is issued
- ✓ If it is in the contract, it must be done or a change order, signed by both parties issued
- ✓ Changes must be in writing

Procurement: Tips for PMP® Exam

- ✓ Contracts are legally binding
- ✓ Contracts should help diminish project risk
- ✓ Most governments back all contracts by providing a court system for dispute resolution
- ✓ Questions are written by government contracting specialists of USA
- ✓ In many parts of the world (including India), contracts are informal and relationships between parties is more important than the contract
- ✓ It is important to take a more formal approach to the procurement process when answering questions

Big Concepts

- Contract Structure
- Contract Types
- Legal Requirement on Contracts
- Contract Change Control

Contract Structure

Sections of Contract

- ✓ SOW or Deliverables
- ✓ Schedule Baseline
- ✓ Performance Reporting
- ✓ Period of Performance
- ✓ Roles & Responsibilities
- ✓ Seller's Place of Performance
- ✓ Pricing
- ✓ Payment Terms
- ✓ Place of delivery
- ✓ Inspection and acceptance criteria

Sections of Contract

- ✓ Warranty
- ✓ Product Support
- ✓ Limitation of liability
- ✓ Fees and retainage
- ✓ Penalties
- ✓ Incentives
- ✓ Insurance and performance bonds
- ✓ Subordinate subcontractors approvals
- ✓ Change request handling
- ✓ Termination and alternative dispute resolution Mechanism

Contract Types

Procurement Contract Types



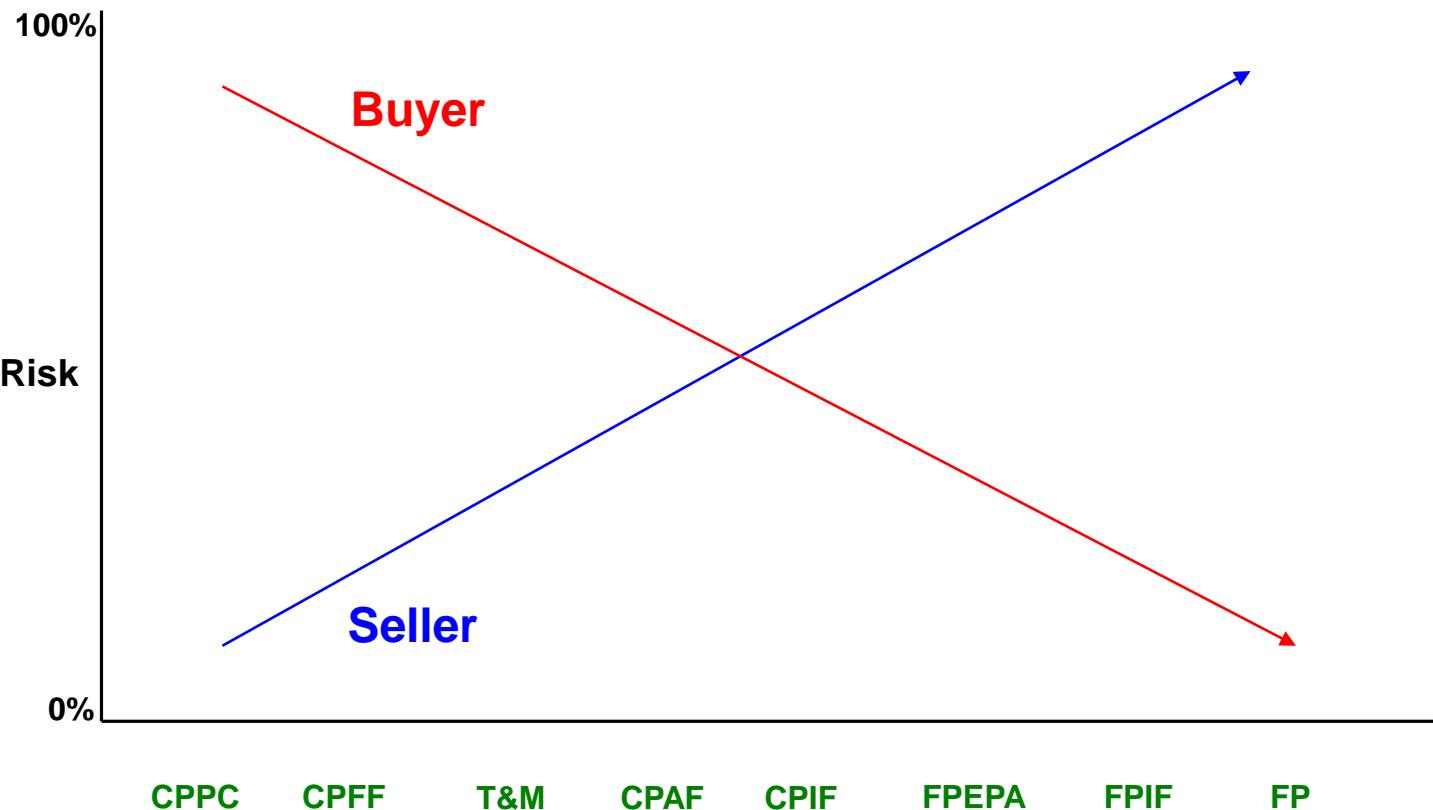
Definition

Different types of contracts are more or less appropriate for different types of purchases.

- ❖ Time and material contracts
- ❖ Unit Price contracts
- ❖ Fixed Price or lump sum contracts
- ❖ Cost reimbursable contracts

Contract type & Risk

vedavit



Types of Contracts

T & M – Time & Materials

The seller is paid for the amount of time it takes to accomplish the work & also reimbursed for the materials to complete the work

Unit Price – Fixed Price

The seller is paid a fixed price for an agreed upon Unit of Supply

Types of Contracts- Fix Price Plus

—FFP – Firm Fixed Price

—Lump sum/firm Fixed Price. Seller at most risk

•FPIF – Fixed Price Incentive Fee

•Most difficult to administer. It contains a number of cost/profit schemes like, cost, target profit, target price, ceiling price and share ratio. if seller maximizes profits, an incentive is offered to reduce costs and improve efficiency price, seller effort. but no profit

•FP-EPA— Fixed Price with Economic Price Adjustment

•The seller is paid a fixed price. The contract is reviewed at pre-defined intervals in the project for adjustments to the contract price based on certain parameters

Types of Contracts- Cost Plus

CPFF— Cost Plus Fixed Fee

Not desirable from buyer's point of view.

The contractor is reimbursed its cost + a fixed fee

CPAF-Cost Plus Award Fee

Not desirable from buyer's point of view. The contractor is influenced to increase costs.

CPIF— Cost Plus Incentive Fee

Seller is reimbursed for an agreed upon performance cost along with a pre established fee plus an incentive bonus. The buyer and seller share the uncertainty to a certain degree

Contract Examples

&

Exercises

Contract type Example: Fixed Price

✓ Fixed Price (FP)

- ✓ Contract = \$1,100,000
- ✓ It is fixed regardless of any other information

✓ Fixed Price Economic Price Adjustment (FPEPA)

- ✓ Contract = \$1,100,000 but a price increase will be allowed in year two based on the U.S. Consumer Price Increase report for year one; or
- ✓ Contract = \$1,100,000 but a price increase will be allowed in year two to account for increases in specific material costs

Fixed Price Incentive Fee (FPIF)

- **Simple Case**

- Contract = \$1,100,000. For every month early the project is completed, an additional \$10,000 is paid to the seller. For every month late the project is completed a penalty of \$20,000 is levied on the seller
- If project is completed 2 months early, Contract = \$1,120,000
- If project is completed 2 months late, Contract = \$1,060,000

- **Complex Case**

- PTA is a point on cost line upto where buyer pays the money for the service which buyer is buying. If Cost is more then PTA Profit starts dipping because customer is not paying any cost. So profits starts dipping and after some profit washes away and seller start making loss.
- $\text{PTA} = [\text{Ceiling Price} - \text{Target Price}] / \text{Buyer's Ratio} + \text{Target Cost}$

Note: Target Price = Target Cost + Target Profit

Point of Total Assumption

Calculation of Point of Total Assumption (FPIF contracts)

The case when "BAC exceeds PTA" is shown



CPIF- Complex Case

Input Data for Question

- Target Cost = \$ 300,000 (Finish the work in this budget)
- Target Profit = \$ 50,000 (if seller do then he gets \$50,000 for his good work)
- Target Price = Target Cost + Target Profit
- Ceiling Price = \$ 370,000 (Seller will not spend more than in any condition else he has to bare the every extra from his pocket)
- Share/Buyer-Seller Ratio = 70/30 (Share the profit or over expense in this ratio until they are below ceiling price)

If actual cost of the project is \$335,000 then how much is the profit?

Calculations

- PTA= ((Ceiling Price – Target Price)/buyer's Share Ratio) + Target Cost
- PTA = $(370,000 - 350,000) / .7 + 300,000 \Rightarrow 328,571$
- Cost over run above PTA = PTA – Target Cost = 28,571
- Between Target Cost and PTA spending (cost) will be split between the parties like this
- Buyer's share (70% of 28,571) = 20,000 , Seller's share (30% of 28,571) = 8,571
- Seller has to pay for extra spending over PTA ie. Actual Cost- PTA = $335,000 - 328,571 = 6,429$
- Profit will dip by Seller's Share of Loss + Over Spending above PTA = $8,571 + 6,429 = 15000$
- **Final Profit = 50,000 – 15,000 = \$35,000**

Contract type Example: Cost Reimbursable

✓ Cost-Plus-Percentage of Cost (CPPC)

- ✓ Contract = Cost plus 12% of costs as fee
- ✓ If seller cost = 1,000,000
 - ✓ Then, Contract = \$1,120,000

✓ Cost-Plus-Fixed-Fee (CPFF)

- ✓ Contract = Cost plus a fee of \$100,000
- ✓ If seller cost = 1,000,000
 - ✓ Then, Contract = \$1,100,000

Contract type Example: Cost Reimbursable

✓ Cost-Plus-Incentive-Fee (CPIF)

- ✓ If ceiling price is not defined then

Final payout = Target cost + Fixed fee + Buyer share ratio * (Actual Cost - Target Cost)

- ✓ If ceiling price is defined then

Final payout = Target cost + Fixed fee + Buyer share ratio * (Ceiling Price - Target Cost)

- ✓ Fixed fee (Target Profit) \$100,000. Target cost of \$1,000,000, the buyer to seller benefit/cost share ratio is 60/40. Minimum fee is \$75,000, Maximum fee is \$150,000.
- ✓ If project is completed at a cost of \$900,000, Final Payout = \$1,040,000.
- ✓ If project is completed at a cost of \$1,100,000, Final Payout = \$1,175,000.

Note: “Target Profit” and “Fixed Fee” are interchangeable words

CPIF Example

Final payout = Target cost + Fixed fee + Buyer share ratio * (Actual Cost - Target Cost)				
Final payout = Target cost + Fixed fee + Buyer share ratio * (Ceiling Price - Target Cost)				
Minimum Fee: nnn, Maximum Fee: mmm				
Min Fee	NA	NA	50	NA
Max Fee	NA	NA	90	NA
Ceiling Price	NA	1100	NA	NA
Target Cost	1000	1000	1000	1000
Fixed Feed (Target Profit)	100	100	100	100
Buyer/Seller Benefit/cost sharing	80% /20%	80% /20%	80% /20%	60% / 40%
Actual Cost	900	900		900
Contract Value	1020	1020		1040
Profit	120	120		140
Actual Cost	1200	1200	1200	1100
Contract Value	1260	1100	1190	1160
Profit/Loss	60	-160	-70	60

Contract type Example: Time & Material

Contract = Material \$1000/CuM of concrete,
Labour \$200/CuM of concrete

- If actual quantity 100 CuM then Contract = \$120,000
- If actual quantity 75 CuM then Contract = \$90,000

Legal Requirements on Contracts

–Performing the promises in the contract between seller and buyer

Essential elements of a contract

- ✓ Offer – clearly stated in a manner that can be understood by a reasonable person
- ✓ Contract must be between competent persons (mental state, age)
- ✓ Contract must have lawful objectives

Legal Requirements on Contracts

- ✓ Acceptance by the buyer, based on genuine assent of both parties
- ✓ Consideration – Most important part of the contract.
It means something of value is received by the seller in exchange for meeting the promise
- ✓ Follows all laws where the contract execution occurs

Procurement Management: Few More Concepts

- Acronyms
 - IFB- Invitation for Bid,
 - RFB- Request for Bid,
 - LOI- Letter of Intent,
 - RFQ- Request for Quotation
 - RFP- Request for Proposal
- IFB or RFB/P :
 - Single Price,
 - High \$ Value
- RFQ used :
 - Per Item/Hour Price,
 - Lower \$ Value,
 - May be used to develop info in RFP.

Procurement Management: Few More Concepts

- ✓ T& M Used when you must begin work immediately without a procurement statement of work
- ✓ If seller need to do more work in cost plus fixed fee contract then he should negotiate to change in contract. Otherwise seller will not get more than fixed fee, no matter how much he works.
- ✓ An IFB is typically a request for a sealed document that lists the seller's firm price to complete the detailed work.
- ✓ A letter of intent is not binding in a court of law, it does make the seller feel more comfortable about expending funds before a contract is signed.

Contract Change Control System (CCCS)

- ✓ CCCS is a process for modifying the contract.
- ✓ Contract change control system (CCCS) is part of integrated change control system
- ✓ PM should focus on Buyer Seller relationship
- ✓ Following are part of CCCS
 1. Paperwork
 2. Tracking Systems
 3. Dispute resolution processes
 4. Approval Levels necessary for authorizing changes

Discussions !

Project Stakeholder Management

Project Stakeholder Management

44. Identify Stakeholders [INITIATING]

45. Plan Stakeholder Engagement [PLANNING]

46. Manage Stakeholder Engagement [EXECUTING]

47. Monitor Stakeholder Engagements [M&C]

46. Identify Stakeholders



Definition

Identifying all people, group or organizations that could be impacted by the project and documenting relevant information regarding their interests, involvement and impact on project success.

Identify Stakeholders



- .1 Project charter
- .2 Business documents
 - Business case
 - Benefits management plan
- .3 PMP
 - CoMP, StEP
- .4 Project documents
 - Change log
 - Issue log
 - Req. documentation
- .5 Agreements
- .6 EEFs
- .7 OPAs



- .1 Expert judgment
- .2 Data gathering
 - Questionnaires and surveys
 - Brainstorming
- .3 Data analysis
 - Stakeholder analysis
 - Document analysis
- .4 Data representation
 - Stakeholder mapping/
representation
- .5 Meetings



- .1 Stakeholder register
- .2 Change requests
- .3 PMP updates
 - ReqMP, CoMP, RMP, StEP
- .4 Project documents updates
 - Assumption log
 - Issue log
 - Risk register

Sample Stakeholder Analysis Matrix

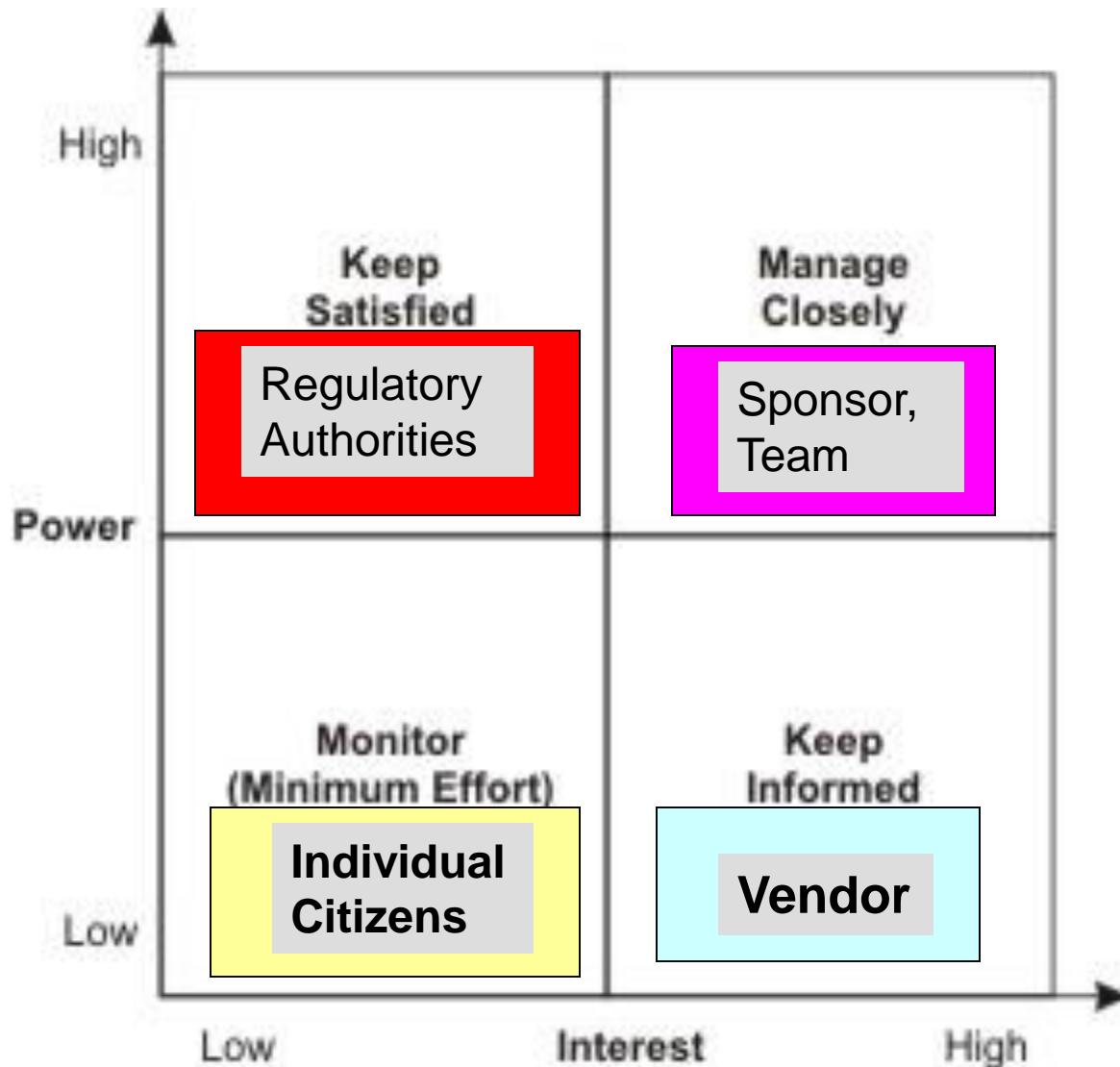
	Stakeholders				
	Ahmed	Susan	Erik	Mark	David
Organization	Internal Senior Management	Project team	Project Team	Hardware Vendor	Project manager for other internal project
Role on project	Sponsor of project and one of the company's founder	DBA sequencing expert	Lead Programmer	Supplies some instrument hardware	Competing for company resources
Unique Facts	Demanding, likes details, business focus, Stanford MBA	Very smart, Ph.D. in biology, easy to work with, has a toddler	Best Programmer I know, weird sense of humor	Start-up company, he knows we can make him rich if this works	Nice guy, one of oldest people at company, has 3 kids in college
Level of interest	Very high	Very high	High	Very high	Low to medium
Level of Influence	Very high, can call the shots	SME, critical to success	High; hard to replace	Low; other vendors available	Low to medium
Suggestions on managing relationship	Keep informed, let him lead conversations, do as he says and quickly	Make sure she reviews specifications and leads testing; can do some work from home	Keep him happy so he stays; emphasize stock options; likes Mexican food	Give him enough leads time to deliver hardware	He knows his project takes a back seat to this one, but can learn from him

Sample Stakeholder Analysis Matrix

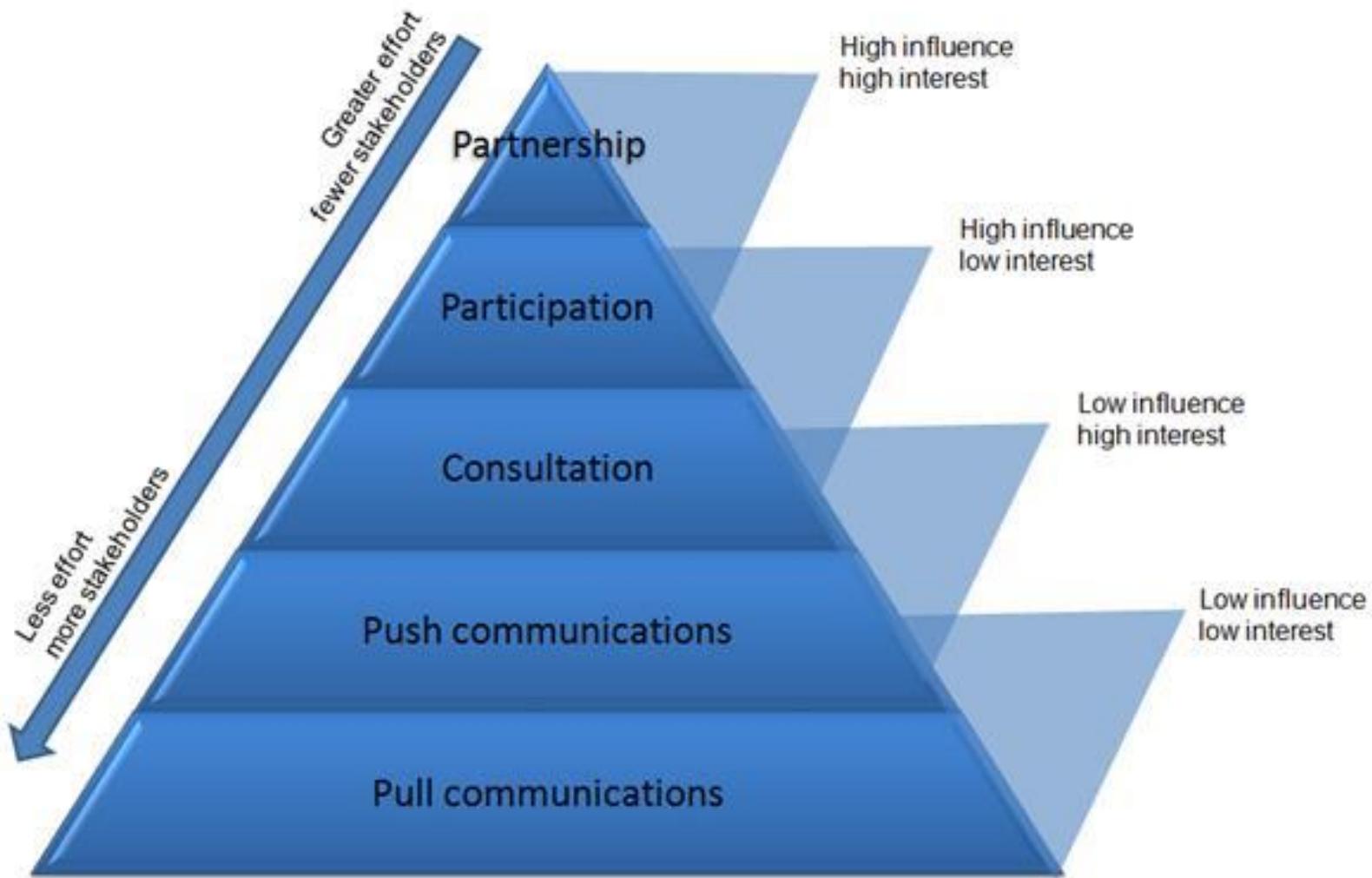
Stakeholder	Stakeholder Interest(s) in the Project	Assessment of Impact	Potential Strategies for Gaining Support or Reducing Obstacles

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Power/Interest Grid with stakeholders



Level of Stakeholder Engagements



Engagement Approaches

- | | | |
|--|---|--|
| <ul style="list-style-type: none">• Advisory committees• Blog• Conferences/large meetings• Displays and exhibits• Door knocks• Email• Facebook• Focus groups• Formal memos• Forums• Games• Google +• Google groups• Hoardings (construction site perimeter fences)• Infographics• Information hotline | <ul style="list-style-type: none">• Interviews - 1 to 1s• Leaflets• Letters (addressed)• Linkedin Companies• Linkedin Groups• Listening post/surgeries• Magazines• Media / news items• Meetings• Memos• Newsletters• One-off Circulars/leaflets/newsletter• Online collaboration• Online video• Open house/open day• Petitions• Phone calls• Podcast | <ul style="list-style-type: none">• Polls• Project meetings/briefings• Public meetings• Section/article in existing circular/leaflet/newsletter• Skype calls or similar• Social media• Socialising/corporate hospitality• Surgeries for individuals with specific questions• Surveys• Teleconferencing• Twitter• Video conferencing• Videos• Walking tour/site tour• Webinars• Website• Workshops and focus groups• You tube or Vimeo |
|--|---|--|

Stakeholder Engagement Matrix

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder A	C			D	
Stakeholder B		C	D		
Stakeholder C				C	D
Stakeholder D			C D		

47. Plan Stakeholder Engagement



Definition

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Developing appropriate management strategies to effectively engage stakeholders throughout the project lifecycle

Plan Stakeholders Engagement



- .1 Project charter
- .2 PMP
 - ResMP, • CoMP, • RMP
- .3 Project documents
 - Assumption log
 - Change log
 - Issue log
 - Project schedule
 - RR, • SR
- .4 Agreements
- .5 EEFs
- .6 OPAs

- .1 Expert judgment
- .2 Data gathering
 - Benchmarking
- .3 Data analysis
 - Assumption and constraint analysis
 - Root cause analysis
- .4 Decision making
 - Prioritization/ranking
- .5 Data representation
 - Mind mapping
 - Stakeholder engagement assessment matrix
- .6 Meetings

- .1 Stakeholder engagement plan

48. Manage Stakeholder Engagements



Definition

Process of communicating and working with stakeholders to meet their needs and addressing issues as they occur.



Manage Stakeholders Engagements



.1 PMP

- CoMP, RMP, StEP
- Change management plan

.2 Project documents

- Change log
- Issue log
- Lessons learned register
- Stakeholder register

.3 EEFs

.4 OPAs

.1 Expert judgment

.2 Communication skills

- Feedback

.3 Interpersonal and team skills

- Conflict management
- Cultural awareness
- Negotiation
- Observation/conversation
- Political awareness

.4 Ground rules

.5 Meetings

.1 Change requests

.2 PMP updates

- Communications management plan
- Stakeholder engagement plan

.3 Project documents updates

- Change log
- Issue log
- Lessons learned register
- Stakeholder register

49. Monitor Stakeholder Engagements



Definition

Monitoring overall project stakeholder relationships and adjusting strategies and plans to engage stakeholders.

Monitor Stakeholder Engagements



.1 PMP

- ResMP, • CoMP, • StEP

.2 Project documents

- Issue log
- Lessons learned register
- Project communications
- Risk register
- Stakeholder register

.3 Work performance data

.4 EEFs .5 OPAs



.1 Data analysis

- Alternatives analysis, • Root cause analysis, • Stakeholder analysis

.2 Decision making

- Multicriteria decision Analysis, • Voting

.3 Data representation

- Stakeholder engagement assessment matrix

.4 Communication skills

- Feedback, • Presentations

.5 Interpersonal and team skills

- Active listening, • Cultural awareness, • Leadership
- Networking, • Political awareness

.6 Meetings



.1 Work performance information

.2 Change requests

.3 PMP updates

- ResMP, • CoMP,
- Stakeholder EP

.4 Project documents updates

- Issue log
- Lessons learned register
- RR, • SR

Discussions !

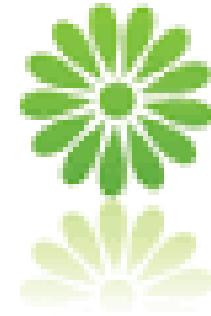


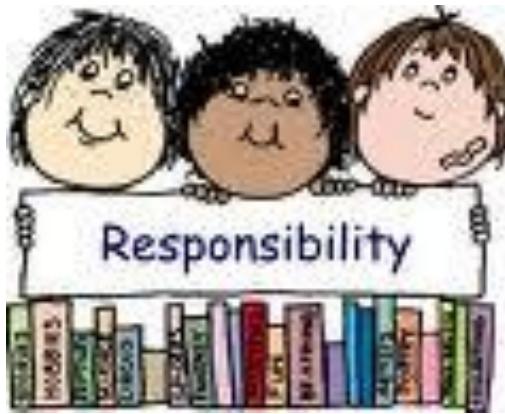
Professional Responsibility

As

Integrated part of
Complete project
life cycle

Every Project Exists in an Environment





Honesty

Honesty is our duty to understand the truth and act in a Truthful manner both in our communication and in our conduct

1. We earnestly seek to understand the truth
2. We are truthful in our communications and conduct and provide in timely manner
3. We make commitments and promises in good faith (implied & explicit)
4. We do not engage on or condone behavior that is designated to deceive others
5. We do not engage in dishonest behavior with the intention of personal gain or at the expense of other.

Responsibility

Responsibility is our duty to take ownership for the decisions we make or fail to make, the actions we take or fail to take & the consequences that result

1. Make decisions and take actions based on the BEST interests of society, Public safety and the environment
2. We accept those assignments that are consistent with our background, experience, skills and qualifications
3. We inform ourselves and uphold the policies, rules and regulations and laws that governs our work, professional and volunteer activities
4. We report unethical or illegal conduct to appropriate management & if necessary to those affected by the conduct
5. We bring violations of this Code to the attention of the appropriate body for resolution. We only file ethics complaints when they are substantiated by facts.

Respect

Respect is our duty to show a high regard for ourselves, others and the resources entrusted to us

1. We inform ourselves about norms and customs of others and avoid engaging in behaviors they might consider disrespectful
2. We listen to others points of view , seeking to understand them
3. We approach directly those persons with whom we have conflict
4. We conduct ourselves in a professional manner
5. We negotiate in good faith, do not exercise the power of our expertise or position to influence decisions

Fairness

Fairness is our duty to make decisions and act impartially & Objectively. Our conduct must be free from competing self interest , Prejudice and favoritism.

1. We demonstrate transparency in decision making and constantly re-examine our impartiality .
2. We provide equal access to information to those authorized & equal opportunities to qualified candidates
3. We do not discriminate against others based on, but not limited to , Gender, Race, Age, Religion, Disability, Nationality or Sexual orientation.

Fairness

Conflict of Interest:

1. We proactively and fully disclose any real or potential conflicts of interest to the appropriate stakeholders.
2. When we realize that we have a real or potential conflict of interest :
 - We refrain from engaging in the decision making process or otherwise
 - attempting to influence outcomes, unless or until we have made full
 - disclosure to the affected stakeholders.
3. We do not hire or fire, reward or punish, or award or deny contracts based on personal considerations. Including but not limited to Favoritism, Nepotism, or Bribery.

Ethics Quick Test

Texas Instruments “Ethics Quick Test” for making ethical decisions

- ✓ Is the action legal?
- ✓ Does it comply with your understanding of company values?
- ✓ If you do it, will you feel bad?
- ✓ How will it look in the newspaper?
- ✓ If you know it is wrong, do not do it.
- ✓ If you are not sure, ask.
- ✓ Keep asking until you get an answer.

Project Manager's Oath of Professional Responsibility

Professional Responsibility

- ✓ Ensure individual integrity
- ✓ Adhere to legal requirements and ethical standards
- ✓ Protect Stakeholders
- ✓ Share lessons learned and other relevant information
- ✓ Build capabilities of colleagues
- ✓ Advance project management professionalism
- ✓ Improve competencies as project manager
- ✓ Balance stakeholder interests in project
- ✓ Respect cultural ethnic and personal differences
- ✓ Ensure collaborative project management environment
- ✓ Comply with all organizational rules and policies

Professional Responsibility

- ✓ Provide accurate and truthful representations in cost estimates
- ✓ Provide accurate and truthful representations in project reports
- ✓ Report violations of policies, procedures and code of ethics
- ✓ Strive for fair resolutions
- ✓ Satisfy competing needs and objectives
- ✓ Interact with others in a professional manner
- ✓ Be responsible for satisfying the complete scope and objectives of customer requirements
- ✓ Maintain and respect confidential information

Professional Responsibility

- ✓ Ensure that a conflict of interest does not interfere with professional judgment
- ✓ Disclose conflict of interest to customer
- ✓ Disclose circumstances that could be construed as conflicts of interest
- ✓ Refrain from offering or accepting inappropriate payments, gifts, or other forms of compensation
- ✓ Adhere to all applicable laws or customs of the country where services are being provided
- ✓ Respect intellectual property developed or owned by others
- ✓ Act in an accurate, truthful and competent manner

Free Mock PMP® Exam Questions

No.	Question Banks	URL	Question No.
1	<u>Oliver Lehmann (Online)</u>	http://www.oliverlehmann.com/pmp-self-test/75-free-questions.htm	75Q
2	<u>HeadFirst PMP® Mock Exam</u>	http://www.headfirstlabs.com/PMP/free_exam/	200Q
3	<u>Free PM Exam Simulator (Free 7-day Trial)</u>	http://nanacast.com/vp/10002461/490529/20501/	170Q
4	<u>Simplilearn Free PMP® Mock Exam</u>	https://www.simplilearn.com/pmp-exam-prep-free-practice-test	200Q
5	<u>Oliver Lehmann (Downloadable PDF)</u>	http://www.oliverlehmann.com/contents/free-downloads/175_PMP_Sample_Questions.pdf	175Q
6	<u>Edwel Mock Exam</u>	http://edwel.com/Free-Resources/PMP-Certification-Practice-Exam.aspx	75Q

Discussions !



Thank you!

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