Principles of Project Management

David Radkovich, PMP, EVP
Subsystem Technologies
david.g.radkovich.ctr@mail.mil

Karen Jordan, PMP
Subsystem Technologies
karen.f.jordan.ctr@mail.mil
About today's group

• How many of you are attending your first EVM conference?
• How many of you are new to EVM?
• How many of you are Project Managers? Earned Value Analyst?
• Any Project Management Professionals (PMP’s)?
• Any Earned Value Professionals (EVP’s)
• Does anyone have over three years experience in EVM?
• How many of you support the Government? Other industries?
Agenda

• Brief introduction to Project Management and PMI
• Brief Intro to Earned Value
• Some Examples of how EVM can help with Project Management
• Basic introduction to PMI’s Project Management processes and how they relate to EVM
• We will cover as many of PMI’s 42 processes as we have time, but I suspect we will not get through them all
Who is PMI and CPM

• PMI
  – PMI is the world’s leading not-for-profit membership association for the project management profession, with more than half a million members and credential holders in more than 185 countries. Our worldwide advocacy for project management is supported by our globally-recognized standards and credentials, our extensive research program, and our professional development opportunities.

• College of Performance Management
  – We are an international, non-profit professional organization dedicated to the disciplines of project management and performance measurement. We assist the earned value professional and project manager in professional growth and promote the application of earned value management. We are a growing body of professionals dedicated to managing projects on time and on budget.
# PMI Facts

## PMI Fact File

**NEARLY 4 MILLION! PMBOK Guide editions now in circulation!**

**STATISTICS THROUGH 30 September 2012**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
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<tr>
<td><strong>Total Members</strong></td>
<td>390,279</td>
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<tr>
<td>% increase September 2012/2011</td>
<td>6.0%</td>
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<tr>
<td><strong>New Members</strong></td>
<td></td>
</tr>
<tr>
<td>September 2012</td>
<td>10,786</td>
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<td><strong>Credentials—Total Active Holders of:</strong></td>
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<tr>
<td>Certified Associate in Project Management (CAPM)® certificate</td>
<td>19,201</td>
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<td>PMI Scheduling Professional (PMI-SP)® credential</td>
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<tr>
<td>PMI Agile Certified Practitioner (PMI-ACP)™ certificate</td>
<td>1,416</td>
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**www.pmi.org**

| September 2012 Visitors | 348,790 |
| YTD Total              | 3,060,614 |

**Publishing**

- **PMBOK® Guide—Fourth Edition placed in circulation**: 22,045
- **September 2012**: 22,045
- **Total copies in circulation**: 1,213,502
- **Total copies of all editions of the PMBOK® Guide in circulation**: 3,912,023

*Includes PMI-published translations*
What is a Project?

• **PMI’s definition:**
  – It’s a temporary group activity designed to produce a unique product, service or result.
  – A project is *temporary* in that it has a defined beginning and end in time, and therefore defined scope and resources.

• **From Wikipedia**
  – the discipline of planning, organizing, securing, and managing resources to achieve specific goals. A project is a temporary endeavor with a defined beginning and end (usually time-constrained, and often constrained by funding or deliverables),[^1] undertaken to meet unique goals and objectives,[^2] typically to bring about beneficial change or added value. The temporary nature of projects stands in contrast with *business as usual (or operations)*,[^3] which are repetitive permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies.
What is Project Management?

- The application of knowledge, skills and techniques to execute projects effectively and efficiently. It’s a strategic competency for organizations, enabling them to tie project results to business goals — and thus, better compete in their markets.

Portfolio, Program, and Project Management?

Portfolio
Ford manufactures and sells different cars

Program
Ford manufactures different models of Mustang

Project
Ford has a project to manufacture Mustang GT
## Type of organizations?

<table>
<thead>
<tr>
<th>Project Characteristic</th>
<th>Functional</th>
<th>Matrix</th>
<th>Projectized</th>
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<tbody>
<tr>
<td>Project manager’s authority</td>
<td>None to little</td>
<td>Limited to high</td>
<td>High to full</td>
</tr>
<tr>
<td>Project manager’s role</td>
<td>Part-time</td>
<td>Part-time / full-time</td>
<td>Full-time</td>
</tr>
<tr>
<td>PM Administrative staff</td>
<td>None to part-time</td>
<td>Part-time / full-time</td>
<td>Full-time</td>
</tr>
<tr>
<td>Project budget controlled by</td>
<td>Functional Manager</td>
<td>Functional Manager, Project Manager or both</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Resource availability</td>
<td>None to little</td>
<td>Limited to high</td>
<td>High to full</td>
</tr>
</tbody>
</table>
Represents generally recognized good practices in the profession while reflecting project management’s continually evolving knowledge

First developed as a white paper in the 1983 PMI Ethics, Standards and Accreditation Report, the *PMBOK® Guide* has become the foremost global standard for the practice of project management.
Introduction to the PMBOK

• Members of PMI get access to electronic copy, but anyone can buy it.

• Please keep in mind the PMBOK is all about **What to Do**, not How to do it.

• Many third party study guides available.

• Example of a source for templates
  – /OHA/admin/bpm/pmo/docs/PCoE_PMBOK_4TH_EDITION_TEMPLATES.doc
Introduction to the PMBOK

- 42 Processes
  - 5 Process groups
  - 9 Knowledge area
  - All have:
    - Inputs
    - Tool and Techniques
    - Outputs
    - Key points
Knowledge Area’s

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management
Example ITTO

**Inputs**
1. Project Scope Statement
2. Cost Management Plan
3. Schedule Management Plan
4. Communications Management Plan
5. EEFs
6. OPAs

**Tools & Techniques**
1. Planning meetings and analysis

**Outputs**
1. Risk Management Plan

Plan Risk Management Process

PMBOK 4th Ed, P. 274
Definition of EVM

- PMI - Earned Value Management (EVM) - Management methodology for integrating scope, schedule, and resources for objectively measuring project performance and progress.
- Wikipedia - a project management technique for measuring project performance and progress in an objective manner.
- Dave’s – Basic project management with an emphasis on cost and schedule control.
EVMS Introduction: we must compare...

BCWS
Plan Budget
Planned Value (PV)
“Should Do”

BCWP
Status Performance
Earned Value (EV)
“Did Do”

ACWP
Actual Costs (AC)
“Cost”

EAC
Estimate At Complete
Latest Revised Estimate

BAC
Budget At Complete
Total Budget & Work

Schedule Variance (SV) = BCWP – BCWS
SV% = SV / BCWS
SPI = BCWP / BCWS

Cost Variance (CV) = BCWP – ACWP
CV% = CV / BCWP
CPI = BCWP / ACWP

EAC – ACWP = Estimate To Complete (ETC)

Variance At Complete = BAC - EAC
TCPI = BAC – BCWP cum
EAC – ACWP cum


Project managers are expected to know the progress of their project at all times. Are you meeting expectations? Staying within budget? Staying on schedule? These can be tough questions to answer without the use of Earned Value Management (EVM).

What PMBOK Knowledge area’s involve EVM?

• Project Integration Management
• Project Scope Management
• Project Time Management
• Project Cost Management
• Project Quality Management
• Project Human Resource Management
• Project Communications Management
• Project Risk Management
• Project Procurement Management
Example of Process Flow diagram

Control Cost Process

Figure 7-8. Control Costs Data Flow Diagram

PMBOK page 180
Example of Using EVM in Project Management

- CPI and SPI
- Cancellation of A-12 contract
- Example for Project David worked on
• **CPI = 1.322**
  For every $1.00 we spent we got $1.32 worth of work done

• **SPI = 0.815**
  For every $1.00 of work we had scheduled we got $.81 worth of work done
Help!!!

My SPI is bad, I need to fix it. Can you help?
### Sept 2012 Values:
- DA Obligation goal: 95%
- % Planned work (PV): 97%
- % Spent (AC): 96%
- % Complete (EV): 91%
- CPI: 0.956
- CV: -$73K
- SPI: 0.945
- SV: -$93K
A-12 Contract – Actual Cost vs. EAC

- Contractor and PM EACs both imply no cost accrual for several years during key manufacturing/test phases
- Realistic EAC “off the chart”
Example from “real” project

In August 2006 BAC (Contract) was $30,063K

When Program was terminated in October 2009 contract value was $54,900K with over $1,000K in additional change requests submitted

Was SCI-based EAC a reasonable floor? (SCI=CPI*SPI) (BAC/CPI*SPI)

<table>
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<tr>
<th>Completion Data</th>
<th>Statistical &amp; Independent Forecast Data (K)</th>
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<tr>
<td>BAC ($K)</td>
<td>LRE ($K)</td>
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<tr>
<td>30,062.70</td>
<td>38,744.7</td>
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<td>LAST THREE MONTHS</td>
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<td>30,062.80</td>
<td>37,371.5</td>
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<tr>
<td>30,062.80</td>
<td>35,801.40</td>
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<tr>
<td>30,062.80</td>
<td>34,270.70</td>
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Figures from August 2006 WinSight Report
Some Certifications

• Project Management Professional (PMP)
  – Project Management Institute (PMI) (www.pmi.org)

• Earned Value Professional (EVP)
  – AACEi (www.aacei.org)
  – AACEi has several other certifications around cost estimating

• CPM’s Certificate Program
  – http://www.mycpm.org/about-us/professional-education-program/
PMP Requirements

<table>
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<tr>
<th>Educational Background</th>
<th>Project Management Experience</th>
<th>Project Management Education</th>
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<tbody>
<tr>
<td>Secondary degree</td>
<td>Minimum five years/60 months unique non-overlapping professional project management experience during which at least 7,500 hours were spent leading and directing project tasks*</td>
<td>35 contact hours of formal education</td>
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<tr>
<td>(high school diploma, associate’s degree or global equivalent)</td>
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<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four-year degree</td>
<td>Minimum three years/36 months unique non-overlapping professional project management experience during which at least 4,500 hours were spent leading and directing project tasks*</td>
<td>35 contact hours of formal education</td>
</tr>
<tr>
<td>(bachelor’s degree or global equivalent)</td>
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<td></td>
</tr>
</tbody>
</table>

*Leading and directing project task as identified in the Project Management Professional Examination Specification. You should have experience in all five process groups across all your project management experience submitted on the application. However, on a single project, you do not need to have experience in all five process groups.

- 200 Question 4 hour exam

PMI’s PMP Handbook

EVP Requirements

- **Experience requirements**
  At least 8 full years of professional experience, of which up to 4 years may be substituted by a college/university degree. Related degrees include: engineering, building construction, construction technology, business, economics, accounting, construction management, architecture, computer science, mathematics, etc.

- **Submit application and fees**
  AACE Members US$350.00 Non-Members US$500.00 for the regular fee, subtract $50 for the early fee. Submit the application, work/education verification and fees, at least 40 days before the next exam date to be scheduled at an exam site.

- **Document experience/education**
  Applications are reviewed and verified. Please submit a copy of college degree(s) with your application, plus any letters that could expedite the verification process.

- **Pass the examination**
  To become EVP™ certified, an overall passing score must be achieved, as determined by the Certification Board. Parts II, III and IV consist of a combination of compound questions and multiple choice questions; all must be answered.”

Project Integration Management – Chapter 4

- Develop Project Charter (4.1)
- Develop Project Management Plan (4.2)
- Direct and Manage Project Execution (4.3)
- Monitor and Control Project Work (4.4)
- Perform Integrated Change Control (4.5)
- Close Project or Phase (4.6)
Develop Project Charter 4.1

**Inputs**
- Project Statement of Work
- Business Case
- Contract
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment

**Outputs**
- Project Charter
Develop Project Charter 4.1

Importance Of The Project Charter

- “Authorizes” The Project
  - Documents Scope = Purpose / Justification
  - Measurable Objectives
  - Requirements / Description / Risks / Schedule / Budget
  - Initial Resources Committed
  - Identifies Internal/External Stakeholders = Client
  - Establishes A Due Date
  - Explains Why This Product Is Needed
  - Defines How This Product Will Be Delivered (i.e. Resources)

- Assigns & Establishes Project Manager’s (PM) Authority
  - Budget
  - Access To Resources
  - Establishes PM’s Accountability
  - Defines PM’s Reporting Relationships
Develop Project Management Plan 4.2

**Inputs**
- Project Charter
- Outputs from Planning Processes
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment

**Outputs**
- Project Management Plan
The Project Management Plan

- Documents Actions To Define, Prepare, Integrate, & Coordinate All Subsidiary Plans
- How Is The Project Going To Be Executed, Monitored & Controlled
- Selected PM Processes & Tools
- Change Control & Configuration Management
- Communications – Requirements & Techniques
Direct and Manage Project Execution 4.3

**Inputs**
- Project Management Plan
- Approved Change Requests
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment
- Project Management Information Systems

**Outputs**
- Deliverables
- Work Performance Information
- Change Requests
- Project Management Plan Updates
- Project Document Updates
During the Executing processes, you should continually compare and monitor project performance against the baseline so that corrective actions can be taken and implemented at the right time to prevent disaster.

The PMBOK Guide says, this process also requires implementing corrective actions to bring the work of the project back into alignment with the project plan, preventive actions to reduce the probability of negative consequences, and defect repairs to correct product defects discovered during the quality processes.
Monitor and Control Project Work 4.4

Inputs
- Project Management Plan
- Performance Reports
- Enterprise Environmental Factors
- Organizational Process Assets

Tools & Techniques
- Expert Judgment

Outputs
- Change Requests
- Project Management Plan Updates
- Project Document Updates
Monitor and Control Project Work 4.4

- The process is concerned with monitoring all the processes in the Initiating, Planning, Executing, and Closing process groups.

- Using this process, you’ll collect data, measure results, and report on performance information.
Perform Integrated Change Control 4.5

**Inputs**
- Project Management Plan
- Work Performance Information
- Change Requests
- Enterprise Environmental Factors

**Tools & Techniques**
- Expert Judgment
- Change Control Meetings

**Outputs**
- Change Requests Status Updates
- Project Management Plan Updates
- Project Document Updates
Perform Integrated Change Control 4.5

- Integrated Change Control
  - Change Control Board
  - Maintain Integrity Of All Baselines
  - Maintenance Of Project Management Plan, Scope Statement, & Other Deliverables
- Identify Need For A Change
  - Manage The Process For Reviewing & Approving Changes
  - Ensure Only Approved Changes Are Implemented (Out of Scope / Feasible?)
  - Document Changes/Baseline Updates & Communicate To Stakeholders
Close Project or Phase 4.6

**Inputs**
- Project Management Plan
- Accepted Deliverables
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment

**Outputs**
- Final Product, Service, or Result Transition
- Organizational Process Assets Updates
Collect Requirements (5.1)

Define Scope (5.2)

Create WBS (5.3)

Verify Scope (5.4)

Control Scope (5.5)
Why do we need scope Management?
Why do we need Scope Management?

- Processes to ensure the project includes all the work required and only the work required to complete the project successfully
  - Alleviates “gold plating,” which increases variability and risk
- Primarily concerned with defining and controlling what is and is not included in the project
- The term scope refers to project and product scope
- The 100% rule – WBS represents all the work and nothing but the work that is required. All the work packages must roll up to the higher levels.

This is where most projects fail!
Collect Requirement 5.1

**Inputs**
- Project Charter
- Stakeholder Register

**Tools & Techniques**
- Interviews
- Focus Groups
- Facilitated Workshops
- Group Creativity Techniques
- Group Decision Making Techniques
- Questionnaires and Surveys
- Observations
- Prototypes

**Outputs**
- Requirements Documentation
- Requirements Management Plan
- Requirements Traceability Matrix
Define Scope 5.2

Inputs
- Project Charter
- Requirements Documentation
- Organizational Process Assets

Tools & Techniques
- Expert Judgment
- Product Analysis
- Alternative Identification
- Facilitated Workshops

Outputs
- Project Scope Statement
- Project Document Updates
Create WBS 5.3

Inputs
- Project Scope Statement
- Requirements Documentation
- Organizational Process Assets

Tools & Techniques
- Decomposition

Outputs
- WBS
  - WBS Dictionary
  - Scope Baseline
  - Project Document Updates
Control Account Level

ACME Housing Corporation

House Building Project

Level 1

Level 2

Level 3

Concrete

Framing

Plumbing

Electrical

Interior

Roofing

Level 4

Concrete

Framing

Plumbing

Electrical

Interior

Roofing

Pour Foundation

Frame Exterior Walls

Install Water Lines

Install Wiring

Install Drywall

Install Felt

Install Patio

Frame Interior Walls

Install Gas Lines

Install Outlets/ Switches

Install Carpets

Install Shingles

Stairway

Install Roofing Trusses

Install B/K Fixtures

Install Fixtures

Install Painting

Install Vents

Work Package / Planning Package Level
Verify Scope 5.4

**Inputs**
- Project Management Plan
- Requirements Documentation
- Requirements Traceability Matrix
- Validated Deliverables

**Tools & Techniques**
- Inspection

**Outputs**
- Accepted Deliverables
- Change Request
- Project Document Updates
Control Scope 5.5

Inputs
- Project Management Plan
- Work Performance Information
- Requirements Documentation
- Requirements Traceability Matrix
- Organizational Process Assets

Tools & Techniques
- Variance Analysis

Outputs
- Work Performance Measurements
- Organizational Process Assets Updates
- Change Requests
- Project management Plan Updates
- Project Document Updates
Improper (WBS/OBS interface too low)
欲达到更高WBS和OBS层级，值得研究
Project Time Management
Overview – Chapter 6

- Define Activities (6.1)
- Sequence Activities (6.2)
- Estimating Activity Resources (6.3)
- Estimating Activity Duration (6.4)
- Develop Schedule (6.5)
- Control Schedule (6.6)
Define Activities 6.1

**Inputs**
- Scope Baseline
- Enterprise Environmental Factors

**Tools & Techniques**
- Decomposition
- Rolling Wave Planning
- Templates
- Expert Judgment

**Outputs**
- Activity List
- Activity Attributes
- Milestone list
Sequence Activities 6.2

**Inputs**
- Activity List
- Activity Attributes
- Milestone List
- Project Scope Statement
- Organizational Process Assets

**Tools & Techniques**
- Precedence Diagramming Method (PDM)
- Dependency Determination
- Apply Leads and Lags
- Schedule Network Templates

**Outputs**
- Project Schedule Network Diagrams
- Project Document Updates
Sample Network diagram

I Recommend: CPM-300-B
Critical Path Scheduling Techniques
Harry Sparrow
Estimate Activity Resources 6.3

**Inputs**
- Activity List
- Activity Attributes
- Resource Calendar
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment
- Alternative Analysis
- Published Estimating Data
- Bottom-Up Estimating
- Project Management Software

**Outputs**
- Activity Resource Requirements
- Resource Breakdown Structure
- Project Document Updates
Estimate Activity Durations 6.4

**Inputs**
- Activity list
- Activity Attributes
- Activity Resource Requirements
- Resource Calendars
- Project Scope Statement
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment
- Analogous Estimating
- Parametric Estimating
- Three-Point Estimating
- Reserve Analysis

**Outputs**
- Activity Duration Estimates
- Project Document Updates
### Develop Schedule 6.5

#### Inputs
- Activity List
- Activity Attributes
- Project Schedule Network Diagrams
- Activity Resource Requirements
- Resource Calendars
- Activity Duration Estimates
- Project Scope Statement
- Enterprise Environmental Factors
- Organizational Process Assets

#### Tools & Techniques
- Schedule Network Analysis
- Critical Path Method
- Critical Chain Method
- Resource Leveling
- What-if scenario analysis
- Applying leads and lags
- Schedule compression
- Scheduling tool

#### Outputs
- Project schedule
- Schedule baseline
- Schedule data
- Project document updates

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[CPM] College of Performance Management
Control Schedule 6.6

**Inputs**
- Project Management Plan
- Project schedule
- Work Performance information
- Organizational process assets

**Tools & Techniques**
- Performance reviews
- Variance analysis
- Project management software
- Resource leveling
- What-if scenario analysis
- Adjusting leads and lags
- Schedule compression
- Scheduling tool

**Outputs**
- Work performance measurement
- Organizational process assets
- Change requests
- Project management plan updates
- Project document updates
Project Cost Management Overview – Chapter 7

- Estimate Costs (7.1)
- Determine Budgets (7.2)
- Control Costs (7.3)
Estimate Costs 7.1

**Inputs**
- Scope baseline
- Project schedule
- Human Resource Plan
- Risk Register
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Expert Judgment
- Analogous Estimating
- Parametric Estimating
- Bottom-Up Estimating
- Three-Point Estimates
- Reserve Analysis
- Cost of Quality
- Project Management Estimating Software
- Vendor Bid Analysis

**Outputs**
- Activity Cost Estimates
- Basis of Estimates
- Project Document Updates
Determine Budget 7.2

**Inputs**
- Activity Cost Estimates
- Basis of Estimates
- Scope Baseline
- Project Schedule
- Resource Calendars
- Contracts
- Organizational Process Assets

**Tools & Techniques**
- Cost Aggregation
- Reserve Analysis
- Expert Judgment
- Historical Relationships
- Funding Limit Reconciliation

**Outputs**
- Cost Performance Baseline
- Project Funding Requirements
- Project Document Updates
Control Costs 7.3

**Inputs**
- Project Management Plan
- Project Funding Requirements
- Work Performance Information
- Organizational Process Assets

**Tools & Techniques**
- Earned Value Management
- Forecasting
- To-Complete Performance Index (TCPI)
- Performance Reviews
- Variance Analysis
- Project Management Software

**Outputs**
- Work Performance Measurements
- Budget Forecasts
- Organizational Process Assets Updates
- Change requests
- Project Management Plan Updates
- Project Document Updates
Project Quality Management Overview – Chapter 8

Plan Quality (8.1)

Perform Quality Assurance (8.2)

Perform Quality Control (8.3)
“The cost of quality.”

It’s a term that’s widely used – and widely misunderstood.

The “cost of quality” isn’t the price of creating a quality product or service. It’s the cost of NOT creating a quality product or service.

Source: http://www.asq.org/learn-about-quality/cost-of-quality/overview/overview.html
Plan Quality 8.1

Inputs
- Scope Baseline
- Stakeholder Register
- Cost Performance Baseline
- Schedule Baseline
- Risk Register
- Enterprise Environmental Factors
- Organizational Process Assets

Tools & Techniques
- Cost-Benefit Analysis
- Cost of Quality
- Control Charts
- Benchmarking
- Design of Experiments
- Statistical Sampling
- Flowcharting
- Proprietary Quality Management Methodologies
- Additional Quality Planning Tools

Outputs
- Quality Management Plan
- Quality Metrics
- Quality Checklists
- Process Improvement Plan
- Project Document Updates
Perform Quality Assurance 8.2

Inputs
- Project Management Plan
- Quality Metrics
- Work Performance Information
- Quality Control Measurements

Tools & Techniques
- Plan Quality and Perform Quality Control Tools and Techniques
- Quality Audits
- Process Analysis

Outputs
- Organizational Process Assets Updates
- Change Request
- Project Management Plan Updates
- Process Improvement Plan
- Project Document Updates
Perform Quality Control 8.3

**Inputs**
- Project Management Plan
- Quality Metrics
- Quality Checklist
- Work Performance Measurements
- Approved Change requests
- Deliverables
- Organizational Process Assets

**Tools & Techniques**
- Cause and Effect Diagrams
- Control Charts
- Flowcharting
- Histogram
- Pareto Chart
- Run Chart
- Scatter Diagram
- Inspection
- Approved Change Requests

**Outputs**
- Quality Control Measurements
- Validated Changes
- Validated Deliverable
- Organizational Process Assets Updates
- Change Requests
- Project Management Plan
- Project Document Updates
• Any Point outside limits (Upper or Lower) indicates a problem
• Rule of Seven – Indicates problem if seven consecutive points are above or below the average

Source: http://syque.com/quality_tools/toolbook/Control/example.htm
Pareto Chart Example

What Questions The Pareto Chart Answers

- What are the largest issues facing our team or business?
- What 20% of sources are causing 80% of the problems (80/20 Rule)?
- Where should we focus our efforts to achieve the greatest improvements?

Source: http://www.isixsigma.com/library/content/c010527a.asp
Project Human Resource Management
Overview – Chapter 9

Develop Human Resource Management (9.1)
Acquire Project Team (9.2)

Develop Project Team (9.3)
Manage Project Team (9.4)
Develop Human Resource Plan 9.1

**Inputs**
- Activity Resource Requirements
- Enterprise Environmental Factors
- Organizational Process

**Tools & Techniques**
- Organizational Charts and Position Descriptions
- Networking
- Organizational Theory

**Outputs**
- Human Resource Plan
Acquire Project Team 9.2

**Inputs**
- Project Management Plan
- Enterprise Environmental Factors
- Organizational Process

**Tools & Techniques**
- Pre-Assignment
- Negotiations
- Acquisition
- Virtual Teams

**Outputs**
- Project Staff Assignments
- Resource Calendars
- Project Management Plan Updates
Develop Project Team 9.3

**Inputs**
- Project Staff Assignments
- Project Management Plan
- Resource Calendars

**Tools & Techniques**
- Interpersonal Skills
- Training
- Team-Building Activities
- Ground Rules
- Co-Location
- Recognition and Rewards

**Outputs**
- Team Performance Assessments
- Enterprise Environmental Factors Updates
- Project Management Plan Updates
Manage Project Team 9.4

**Inputs**
- Project Staff Assignments
- Project Management Plan
- Team Performance Assessments
- Performance Reports
- Organizational Process Assets

**Tools & Techniques**
- Observation and Conversation
- Project Performance Appraisals
- Conflict Management
- Issue Log
- Interpersonal Skills

**Outputs**
- Enterprise Environmental Factors Updates
- Organizational Process Assets Updates
- Change Requests
- Project Management Plan Updates
Project Communications Management
Overview – Chapter 10

- Identify Stakeholders (10.1)
- Plan Communications (10.2)
- Distribute Information (10.3)
- Manage Stakeholder Expectations (10.4)
- Report Performance (10.5)
• 90% of a Project Managers job is communication

• 65% to 70% of our communications is transmitted non-verbally.
  – It’s not what you say but how you say it – most listeners will believe the non-verbal actions over the verbal.
  – Paralanguage: Pitch and tone of voice. It is a powerful form of non-verbal communication that conveys attitude, intentions and emotions.
Identify Stakeholders 10.1

**Inputs**
- Project Charter
- Procurement Documents
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Stakeholders Analysis
- Expert Judgment

**Outputs**
- Stakeholder Register
- Stakeholder Management Strategy
Stakeholder Analysis Quadrant

- **POWER**
  - High
    - Stakeholders: Keep Satisfied (A)
    - Stakeholders: Manage Closely (B)
  - Low
    - Stakeholders: Monitor (Minimum Effort) (G)
    - Stakeholders: Keep Informed (C)

- **INTEREST**
  - High
    - Stakeholders: (H)
  - Low
    - Stakeholders: (D)

Example: Power / Interest Grid with Stakeholders
Plan Communications 10.2

**Inputs**
- Stakeholder Register
- Stakeholder Management Strategy
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Communications Requirements Analysis
- Communication Technology
- Communication Models
- Communication Methods

**Outputs**
- Communications Management Plan
- Project Document Updates
Distribute Information 10.3

Inputs
- Project Management Plan
- Performance Reports
- Organizational Process Assets

Tools & Techniques
- Communication Methods
- Information Distribution Tools

Outputs
- Organizational Process Assets Updates
Manage Stakeholders Expectations 10.4

Inputs

- Stakeholder Register
- Stakeholder Management Strategy
- Project Management Plan
- Issue Log
- Change Log
- Organizational Process Assets

Tools & Techniques

- Communication Methods
- Interpersonal Skills
- Management Skills

Outputs

- Organizational Process Assets Updates
- Change Requests
- Project Management Plan Updates
- Project Document Updates
Report Performance 10.5

**Inputs**
- Stakeholder Register
- Stakeholder Management Strategy
- Project Management Plan
- Issue Log
- Change Log
- Organizational Process Assets

**Tools & Techniques**
- Communication Methods
- Interpersonal Skills
- Management Skills

**Outputs**
- Organizational Process Assets Updates
- Change Requests
- Project Management Plan Updates
- Project Document Updates
Project Risk Management Overview – Chapter 11

Plan Risk Management (11.1)

Identify Risks (11.2)

Perform Qualitative Risk Analysis (11.3)

Perform Quantitative Risk Analysis (11.4)

Plan Risk Responses (11.5)

Monitor and Control Risks (11.6)
Project Risk Management

- Project risk management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project; (PMBOK 4th Ed, P. 273).

  - The objectives of project risk management are to
    - Increase the probability and impact of positive events
    - Decrease the probability and impact of negative events
What is Risk?

- Project Risk is an uncertain event or condition that can have a positive or negative affect on the project objective.
- It includes both threats to the project objective as well as opportunities to improve on the objective.
- It’s origins are in the uncertainty that is in all projects.

Can anyone give me an example of a positive risk?
Plan Risk Management 11.1

**Inputs**
- Project Scope Statement
- Cost Management Plan
- Schedule Management Plan
- Communications Management Plan
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Planning Meetings and Analysis

**Outputs**
- Risk Management Plan
Identify Risks 11.2

**Inputs**
- Risk Management Plan
- Activity Cost Estimates
- Activity Duration Estimates
- Scope Baseline
- Stakeholder Register
- Cost Management Plan
- Quality Management Plan
- Project Documents
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Documentation Reviews
- Information Gathering Techniques
- Checklist Analysis
- Assumptions Analysis
- Diagramming Techniques
- SWOT Analysis
- Expert Judgment

**Outputs**
- Risk Register
Identify Risks 11.2

- Developing a list of what could go wrong – within reason (but seriously, dude, the rain will never get that bad)
  - Risk Register
    - List of identified risks
    - List of potential responses
    - Root causes of the risk
    - Updated risk categories
Identify Risks 11.2

- Technology
- Contractor capability
- Regulations
- Number of participants
- Resource skill level
- Funding
- Site location, ownership
- Safety
- Errors and omissions

- Time
- Interfaces
- Environment issues
- Political issues
- Labor productivity
- Quality requirements
- Magnitude of assumptions and constraints
Perform Qualitative Risk Analysis 11.3

**Inputs**
- Risk Register
- Risk management Plan
- Project Scope Statement
- Organizational Process Assets

**Tools & Techniques**
- Risk Probability and Impact Assessment
- Probability and Impact matrix
- Risk Data Quality Assessment
- Risk Categorization
- Risk Urgency Assessment
- Expert Judgment

**Outputs**
- Risk Register Updates
## Risk Score

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<th>Probability of Occurrence</th>
<th>Impact of Occurrence</th>
<th>Risk Score</th>
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<tr>
<td>Risk B</td>
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<td>0.32</td>
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<tr>
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<td>0.20</td>
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<td>Risk D</td>
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<tr>
<td>Risk E</td>
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<td>Probability</td>
<td>Impact 0.20</td>
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<tr>
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Perform Quantitative Risk Analysis 11.4

**Inputs**
- Risk Register
- Risk management Plan
- Cost Management Plan
- Schedule Management Plan
- Organizational Process Assets

**Tools & Techniques**
- Data Gathering and Representation Techniques
- Quantitative Risk Analysis and Modeling Techniques
- Expert Judgment

**Outputs**
- Risk Register Updates
Plan Risk Responses 11.5

**Inputs**
- Risk Register
- Risk Management Plan

**Tools & Techniques**
- Strategies for Negative Risks or Threats
- Strategies for Positive Risks or Opportunities
- Contingent Response Strategies
- Expert Judgment

**Outputs**
- Risk Register Updates
- Risk-Related Contract Decisions
- Project Management Plan Updates
- Project Document Updates
We know something is going to happen.
  > We’re not sure when but we know it will hurt when it happens

So what are we going to do when the risk event occurs
  > Make it “hurt” less – Mitigate
  > Make it go away faster – Mitigate
  > Make it someone else’s problem – Transfer
  > Don’t do the thing that is most likely to cause it – Avoid
  > Suffer the pain – Acceptance

Have a plan – Contingency response strategy
Monitor & Control Risks 11.6

**Inputs**
- Risk Register
- Project Management Plan
- Work Performance Information
- Performance Reports

**Tools & Techniques**
- Risk Assessment
- Risk Audits
- Variance and Trend Analysis
- Technical Performance Measurement
- Reserve Analysis
- Status Meetings

**Outputs**
- Risk Register Updates
- Organizational Process Assets Updates
- Change requests
- Project Management Plan Updates
- Project Documents Updates
Monitor & Control Risks 11.6

• We’ve figured it all out, we have a plan, now it’s time to watch, observe, and be ready to act
  – Identify, analyze and plan for new risks
  – Monitor triggers to see if a risk event has occurred
  – Monitor the execution of our risk response plans to make sure that they really are having the intended effect
  – Determine if we need to change how we are managing risk
Project Procurement Management
Overview – Chapter 12

- Plan Procurements (12.1)
- Conduct Procurements (12.2)
- Administer Procurements (12.3)
- Close Procurements (12.4)
What is a Contract?

- A contract is a legally binding agreement between two or more parties
  - Non-verbal
  - Verbal
  - Written
- A contract has certain key elements
  - Offer
  - Consideration
  - Acceptance
Plan Procurements 12.1

**Inputs**
- Scope baseline
- Requirements Documentation
- Teaming Agreements
- Risk Register
- Risk-Related Contract Decisions
- Activity Resource Requirements
- Project Schedule
- Activity Cost Estimates
- Cost Performance Baseline
- Enterprise Environmental Factors
- Organizational Process Assets

**Tools & Techniques**
- Make-or-Buy Analysis
- Expert Judgment
- Contract Types

**Outputs**
- Procurement Management Plan
- Procurement Statements of Work
- Make-or-Buy Decisions
- Procurement Documents
- Source Selection Criteria
- Change Requests
Contract types – Fixed Price

- **Firm Fixed Price (FFP)**
  - Most commonly used contract type
  - Any cost increase is the responsibility of the seller

- **Fixed Price Incentive Fee (FPIF)**
  - Gives buyer and seller some flexibility
  - All costs above the price ceiling are the responsibility of the seller

- **Fixed Price with Economic Price Adjustment (FP-EPA)**
  - Used when period spans a considerable period of years
  - Protects both buyer and seller from external conditions
Contract types – Cost Reimbursable

- **Cost Plus Fixed Fee (CPFF)**
  - Seller is reimbursed for allowable costs for performing work
  - Received a fixed fee payment calculated as a % of initial estimated project costs

- **Cost Plus Incentive Fee (CPIF)**
  - Seller is reimbursed for allowable costs for performing work
  - Received a predetermined incentive fee based on achieving certain performance objectives

- **Cost Plus Award Fee (CPAF)**
  - Seller is reimbursed for all legitimate costs
  - Majority of fee is earned based on satisfaction of performance criteria defined in contract
Contract types – Time and Materials

- Hybrid of both cost-reimbursable and fixed-price contracts
- Resemble cost-reimbursable
  - can be left open ended and increase in contract value
- Resemble fixed unit price arrangements
  - when specified in contract not-to-exceed
Conduct Procurement 12.2

**Inputs**
- Project Management Plan
- Procurement Documents
- Source Selection Criteria
- Qualifies Seller List
- Seller Proposals
- Project Proposals
- Make-or-Buy Decisions
- Teaming Agreements
- Organizational Process Assets

**Tools & Techniques**
- Bidder Conferences
- Proposal Evaluation Techniques
- Independent Estimates
- Expert Judgment
- Advertising
- Internet Search
- Procurement Negotiations

**Outputs**
- Selected Sellers
- Procurement Contract Award
- Resource Calendars
- Change Requests
- Project Management Plan Updates
- Project Document Updates
Administer Procurements 12.3

**Inputs**
- Procurement Documents
- Project Management Plan
- Contract
- Performance Reports
- Approved Change Requests
- Work Performance Information

**Tools & Techniques**
- Contract Change Control System
- Procurement Performance Reviews
- Inspections and Audits
- Performance Reporting
- Payment Systems
- Claims Administration
- Records Management System

**Outputs**
- Procurement Documentation
- Organizational Process assets Updates
- Change Requests
- Project Management Plan Updates
Close Procurements 12.4

**Inputs**
- Project Management Plan
- Procurement Documentation

**Tools & Techniques**
- Procurement Audits
- Negotiated Settlements
- Records Management System

**Outputs**
- Closed Procurements
- Organizational Process assets Updates
Questions???