

Project Management Professional (PMP®) Exam PMBOK® Guide – Fifth Edition Aligned

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Copyrights</h1> <ul style="list-style-type: none"> <li>• PMP®: “PMP” and the PMP logo are certification marks of the Project Management Institute which are registered in the United States and other nations <li>• PMBOK®: “PMBOK” is a trademark of the Project Management Institute, Inc. which is registered in the United States and other nations <li>• Note: The PMBOK is the primary source for this slide deck. When other sources are references, citations are provided. 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Introductions & Course Expectations</h1> <ul style="list-style-type: none"> • Personal Background <ul style="list-style-type: none"> – Name – Organization, Title – Formal Education • Project Management Experience • Expectations for this course 				
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Course Syllabus



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Workshop Approach</h1> <ul style="list-style-type: none"> <li>• Instructor presentation & guided discussion <li>• Student presentation (based on the Rita Mulcahy PMP® Exam Prep Textbook chapter tests) <li>• Presentations should include: <ul style="list-style-type: none"> <li>– The questions with the correct answers highlighted <li>– A justification for the correct answers <li>– An explanation for why the distracters were not the appropriate choice <li>– Sources for each question <li>• In-class exam review and discussion <ul style="list-style-type: none"> <li>– Random selection 😊 				
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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Student Presentations

- Let's go the syllabus (last page...)
- Student presentations are based on learning from the following:
 - The PMBOK® required reading for the knowledge area
 - Rita Mulcahy PMP® Exam Prep textbook required reading & practice exams
 - Hot Topics flashcards
 - Additional research as appropriate
- Candidates are encouraged to provide copies of their presentations to all members of the class after their presentations (either hard copy or electronic copy is acceptable)

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Knowledge Area

Student Presentations: Assignments

- Integration
- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

- Integration Management
 - Instructor assigned
 - Chapter 4
- Scope Management
 - Instructor assigned
 - Chapter 5
- Time Management
 - Instructor assigned
 - Chapter 6
- Cost Management
 - Instructor assigned
 - Chapter 7
- Quality Management
 - Instructor assigned
 - Chapter 8
- Human Resource Management
 - Instructor assigned
 - Chapter 9
- Communications Management
 - Instructor assigned
 - Chapter 10
- Risk Management
 - Instructor assigned
 - Chapter 11
- Procurement Management
 - Instructor assigned
 - Chapter 12
- Stakeholder Management
 - Instructor assigned
 - Chapter 13
- Ethics & Prof Responsibility
 - Instructor assigned
 - Chapter 14

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Knowledge Area

Integration

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Procurement

Stakeholder

The Test



- 200 questions
 - 25 are “pretest” questions that do not effect score – randomly placed throughout the exam
 - Passing rate is 106 of 175 scored questions (~ 61%)
- 4 hours
 - Preceded by a 15 minute tutorial (not part of your time)
- Pass/Fail indication immediately after submission
 - Diagnostic report will show breakdown of performance within each domain (5 process + professional responsibility)
- Cost:
 - PMI Members: \$405/\$275
 - Non-Members: \$555/\$375

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- Knowledge Area
- Integration
- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

EXAM CONTENT OUTLINE

The following table identifies the proportion of questions from each domain that will appear on the examination. These percentages are used to determine the number of questions related to each domain and task that should appear on the multiple-choice format examination.

Domain	Percentage of Items on Test
I. Initiating the Project	13 %
II. Planning the Project	24 %
III. Executing the Project	30 %
IV. Monitoring and Controlling the Project	25 %
V. Closing the Project	8 %
Total	100%

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Knowledge Area

Study Time Commitment (PMPath™)

Source: Dr. Robert Amason, PMP

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

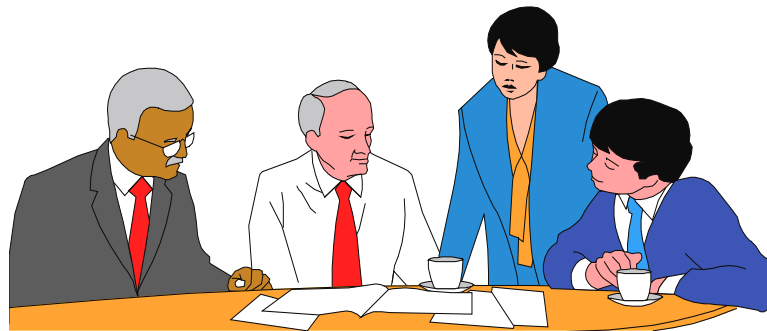
Procurement

Stakeholder

	Total Course Time Calculation (Hours)			
Study Element	Most Likely	Optimistic	Pessimistic	PERT
Integration	17.75	13.31	35.5	20.0
Scope	13.40	10.05	26.8	15.1
Quality	15.10	11.33	30.2	17.0
Time	16.70	12.53	33.4	18.8
Cost	16.30	12.23	32.6	18.3
HR	25.00	18.75	50	28.1
Communications	13.30	9.98	26.6	15.0
Risk	14.70	11.03	29.4	16.5
Procurement	13.20	9.9	26.4	14.9
Stakeholder	13.30	9.97	26.6	15.0
Professional Responsibility	11.70	8.77	23.4	13.2
TOTALS	169.45	127.84	340.9	191.8

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Study Groups



Application Process



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PMP Application

Step 1: Application

- Contact Address
- Contact E-mail, Phone
- Attained Education
- Requirements
- Optional Information
- Certificate
- Agreement
- Review & Submit

Step 2: Schedule Exam

Step 3: Exam Results

Step 1: Application | Review Mailing Address

Please enter your address information below. You can change your preferred mailing or billing address by clicking "Set as Mailing" or "Set as Billing". If your addresses are not listed below, please add them by using the "Add Home" or "Add Work" buttons.

When you are done, click "Next".

My Default Address

[Edit](#)

(Work)
 Humana
 501 West Main
 Louisville, KY, USA, 40202
(Preferred Mailing Address)
(Preferred Billing Address)

Add Home Address

« Back

Next »

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Application Process



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PMP Application

Step 1: Application

Contact Address

Contact E-mail, Phone

Attained Education

Requirements

Optional Information

Certificate

Agreement

Review & Submit

Step 2: Schedule Exam

Step 3: Exam Results

Step 1: Application | Review Attained Education

Please indicate your highest level of education attained at the time of application below using the drop down menu and complete all applicable contact information for your school, college or university.

* Highest level of education attained: or global equivalency

* Year degree awarded:

* School/University:

* Address:

* City:

State/Province/Territory:

Zip/Postal Code:

* Country:

* Field of Study:

* indicates a required field.

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Support/FAQs

Your education attained will determine which category you are applying for.



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Application Process



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PMP Application

Step 1: Application

- [Contact Address](#)
- [Contact E-mail, Phone](#)
- [Attained Education](#)
- [Requirements](#)**
- [Overview](#)
- Worksheet**
- [PM Experience](#)
- [PM Education](#)
-
- [Optional Information](#)
- [Certificate](#)
- [Agreement](#)
- [Review & Submit](#)

Step 2: Schedule Exam

Step 3: Exam Results

Step 1: Application | Eligibility Worksheet

You can use the following worksheet to track your progress. Qualified requirements must equal or exceed the required totals before the application may be submitted to PMI for review and approval.

	Required	Qualified	Still Need
PM Experience Months:	36	0	36
PM Experience Hours:	4500.00	0.00	4500.00
PM Education Hours:	35.00	0.00	35.00

Meeting the requirements:

- You can update your [Project Management Work Experience](#).
- Or update your [Project Management Education](#).

[« Back](#) [Next »](#)

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Knowledge Area	
Integration	
Scope	
Time	
Cost	
Quality	
HR	
Communications	
Risk	
Procurement	
Stakeholder	

Louisville Testing Locations

<p>Thomson Prometric Test Center</p> <p>7400 New La Grange Road, Suite #110</p> <p>Louisville, KY 40222</p> <p>Phone: (502) 423-0478</p> <p>Site Code: 1101</p>	<p>U of L Belknap Campus</p> <p>106 East Brandeis</p> <p>Louisville, KY 40208</p> <p>Phone: (502) 852-6607</p> <p>Site Code: 1102</p>
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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

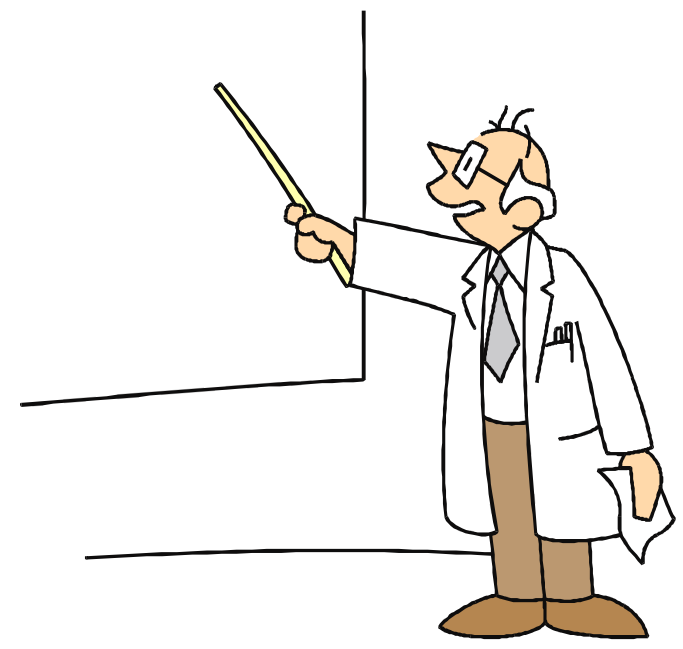
Risk

Procurement

Stakeholder


Our roles...

- I am here as a facilitator
- You are the PMP® exam candidates!



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Want the Answers Before the Test?</h1> <ul style="list-style-type: none"> <li>• Best practices and lessons learned from experienced faculty members, and even more important... <li>• PMP Exam candidates fresh from the fight 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>17</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Note Taking</h1> <ul style="list-style-type: none"> • Purposefully no “slide deck” once we move into the knowledge areas <ul style="list-style-type: none"> – The PMBOK® is your note taking guide...get into the source!  <ul style="list-style-type: none"> – Note the slide headers; they guide you to the applicable sections of the PMBOK® 				
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PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition

An Introduction to Project Management

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Knowledge Area

Integration

Scope

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1.2 What is a Project?

- Defined in terms of distinctive characteristics – a project is a **temporary** endeavor undertaken to create a **unique** product or service
 - A product (end item or component)
 - A capability to perform a service
 - A result (outcome or document)
- **Progressive elaboration**
 - Developed in steps and continuing by increments
- Operations and project similarities
 - Performed by people
 - Constrained by limited resources
 - Planned, executed, and controlled
- Program – A group of interrelated projects in which management is coordinated



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>1.3 Managing a Project</h1> <ul style="list-style-type: none"> • Identify requirements • Assess & address stakeholder needs, concerns & expectations throughout the duration of the project • Constrained <ul style="list-style-type: none"> – Scope – Quality – Schedule – Budget – Resources – Risks 				
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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

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Stakeholder

Definitions

- **Project Management:** The application of management methods (knowledge, skills, tools, techniques) to project activities (planning, scheduling and controlling) to deliver the product of the project
- **Project Management** provides process or task focus; it provides specifics of who, what, when, and how



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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

1.4 Projects & Programs Defined

- Project
 - Temporary
 - Undertaken to create a unique product or service
 - Defined starting point
 - Defined objectives (determines end point)
- Program
 - Group of related projects
 - Coordinated management
 - Obtain benefits and/or control not possible if managed individually



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Project Management</h1>				
Integration	<p style="text-align: center;">Project Initiation (Proposal, CE, Approval, etc...)</p> <p style="text-align: center;">Monitoring & Control</p> <p style="text-align: center;">Project Planning (Charter, WBS, etc...)</p> <p style="text-align: center;">Project Execution</p> <p style="text-align: center;">Project Closure</p>				
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Program Management</h1>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Knowledge Area
 Integration
 Scope
 Time
 Cost
 Quality
 HR
 Communications
 Risk
 Procurement
 Stakeholder

Program vs Project: Important Differentiators



Program	Project
Deliver long term business benefit	Deliver: T, C, Q, and Scope
Focus on ongoing support and full transition	Ends when deliverables are provided
Focus on benefit realization	Goal is to satisfy users
Produce results	Produce product or service

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Knowledge Area

Integration

Scope

Time

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Quality

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Communications

Risk

Procurement

Stakeholder

Program vs Multi-Project: Important Differentiators



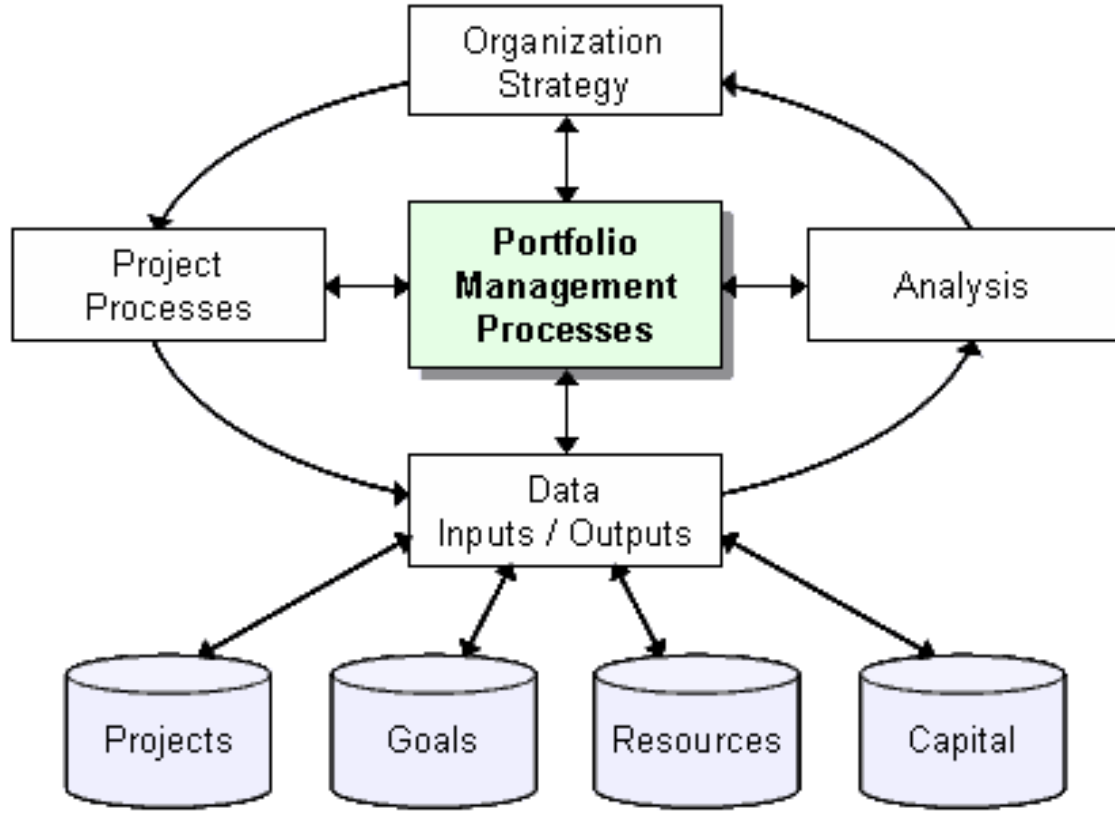
Program	Multi-project
Management of a group of interrelated projects	Manage several projects independently
Program level responsibility and manages project managers for component projects	Fully accountable for each individual project
Optimize resources across program	Manage resources assigned to tasks for projects
Manage multiple stakeholders; complex communications	Focused on meeting needs for different project stakeholders
Balanced time across program related activities	Balance between concurrent projects competing for time

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Knowledge Area
 Integration
 Scope
 Time
 Cost
 Quality
 HR
 Communications
 Risk
 Procurement
 Stakeholder

Portfolio Management

Source: www.projectmasters.com



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area					
Integration					
Scope					
Time	<p>Projects focus on delivering a product or service</p>				
Cost					
Quality	<p>Programs focus on benefit realization</p>				
HR					
Communications	<p>Portfolios demonstrate investment strategy</p>				
Risk					
Procurement					
Stakeholder					

Projects focus on delivering a product or service

Programs focus on benefit realization

Portfolios demonstrate investment strategy

Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

1.4.4 The “PMO”

- Management structure that standardizes project governance processes
 - Coordinate planning
 - Prioritization
 - Coordination communication
 - Resource sharing
 - Methodologies, tools & techniques
 - Responsibilities ranging from support to direct management



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>PMO Structures</h1> <ul style="list-style-type: none"> • Supportive – Consultative, provide templates, share best practices, coordinate training, collect/manage lessons learned • Controlling – Compliance with methodologies, governance (moderate control) • Directive – Directly manage projects (high control) 				
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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

1.5 Project vs Operations Management

- Operations
 - On-going activities
 - Business process or operations management
 - Product life cycle vs project life cycle
 - Intersection points (product enhancements, new product development, product close-out or disposal, etc...)
- Similarities
 - Performed by people
 - Limited by constraints
 - Planned, executed, monitored & controlled
 - Achieve organizational goals & contributes to strategic plans

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area	<h1>1.6 Business Value</h1> <ul style="list-style-type: none"> <li>• Sum of all tangible & intangible assets <li>• Created through effective ongoing operations <li>• Created through effective use of portfolio, program and project management <li>• Strategic planning <ul style="list-style-type: none"> <li>– Portfolios <ul style="list-style-type: none"> <li>• Programs <ul style="list-style-type: none"> <li>– Projects 					
Integration						
Scope						
Time						
Cost						
Quality						
HR						
Communications						
Risk						
Procurement						
Stakeholder	<b>Student Copy – Not for Reproduction or Distribution					<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>

Organizational Influences and Project Life Cycle

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Organizational Structure

Let's Deep Dive PMBOK Table 2-1



Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

2.1.4 Organizational Process Assets

- Any and all process related assets
 - Plans, policies, procedures, guidelines
 - Historical information
 - Lessons learned
- Formal or informal
- Updated throughout the project
- Responsibility primarily rests with project team members
- Categories
 - Processes & procedures
 - Corporate knowledge base



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Knowledge Area

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2.1.5 Enterprise Environmental Factors

- Internal & external factors that influence a project's success
- Not under the project team's control
- Negative or positive
- Inputs to most processes
- Such as
 - Organizational culture, structure, processes
 - Industry standards
 - Existing human resources (capabilities)
 - Personnel administration (staffing, performance reviews)
 - Work authorization systems
 - The PMIS



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Knowledge Area

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2.2 Project Stakeholders

- An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project

- Grouping and naming stakeholders is the primary aid to identifying who views themselves as stakeholders



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Project Stakeholders

- **Project Manager:** The person responsible for managing the project
- **Customer:** The individual or organization who will use the product
- **Sponsor:** The individual or group who creates and approves the project charter and (typically) provides the financial resources for the project
- **Expeditor:** Simply a communications coordinator w/o decision making or enforcing authority

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2.4 Project Lifecycle


- Generally defines...
 - What
 - When
 - Who
 - How
- Common Characteristics
 - Cost & staffing requirements start low and peak during implementation (intermediate phases)
 - Level of uncertainty is highest at the beginning
 - Ability to influence “product” characteristics is highest at the beginning



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Let's Dig Into PMBOK Figure 2-8



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Project “Phases”</h1> <ul style="list-style-type: none"> • Completion of one (or possibly more) deliverables characterizes a phase <ul style="list-style-type: none"> – Logical segmentation for ease of management, planning, and control – Aids governance – Sequential or overlapping phases • Deliverable = measurable, verifiable product or service  • One-size-does-not-fit-all 				
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Life Cycle Types

- Predictive
 - Waterfall
 - Most planning (plan-driven) is completed early in the lifecycle
- Iterative (incremental)
 - Phases “repeat” as product understanding increases
- Adaptive
 - Agile, or change-driven
 - Similar to iterative; however, rapid “sprints” with fixed time and cost
 - Scope and requirements difficult to determine in advance

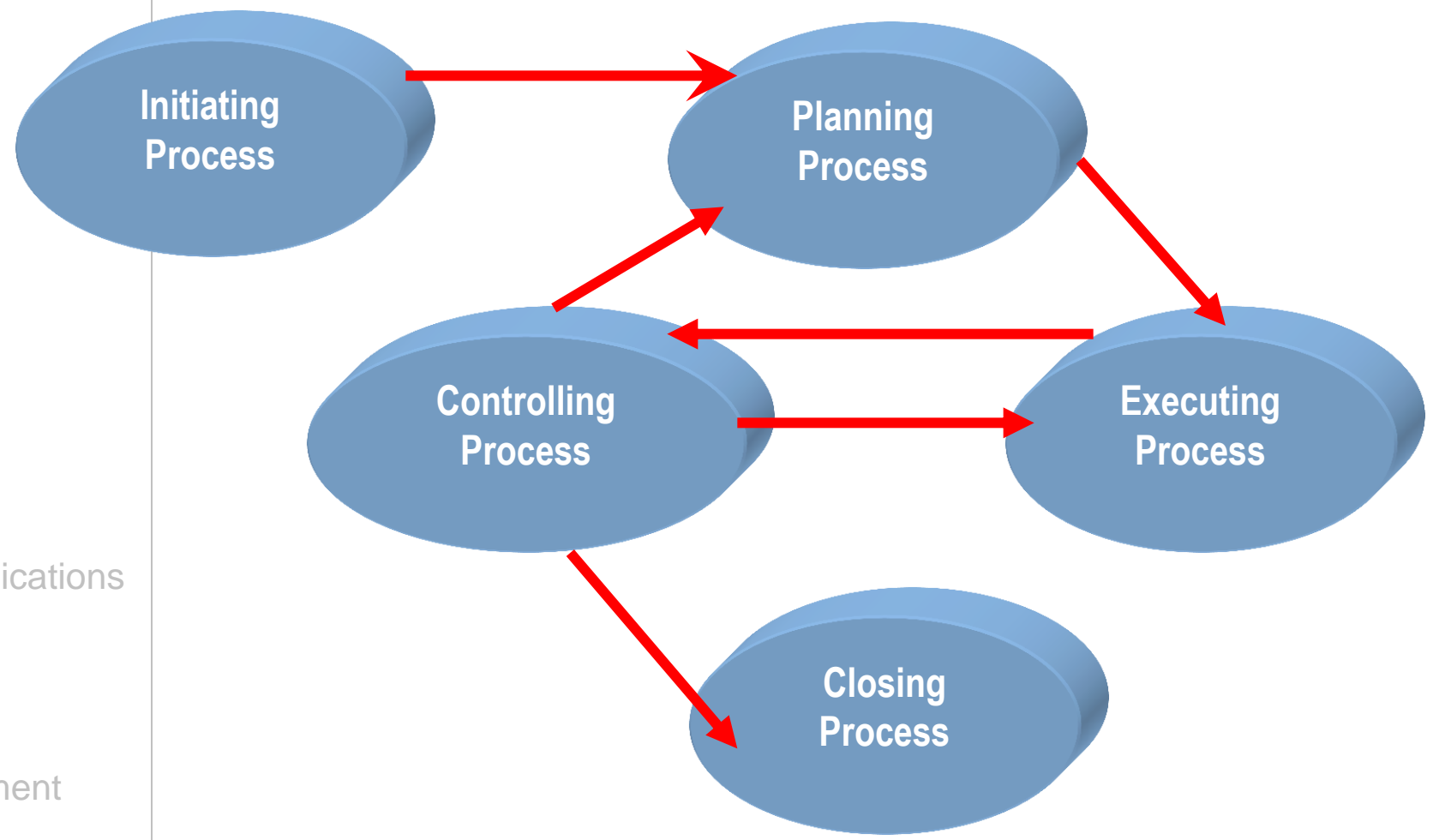
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Project Management Processes

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Knowledge Area
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Stakeholder

Project Management Processes Groups

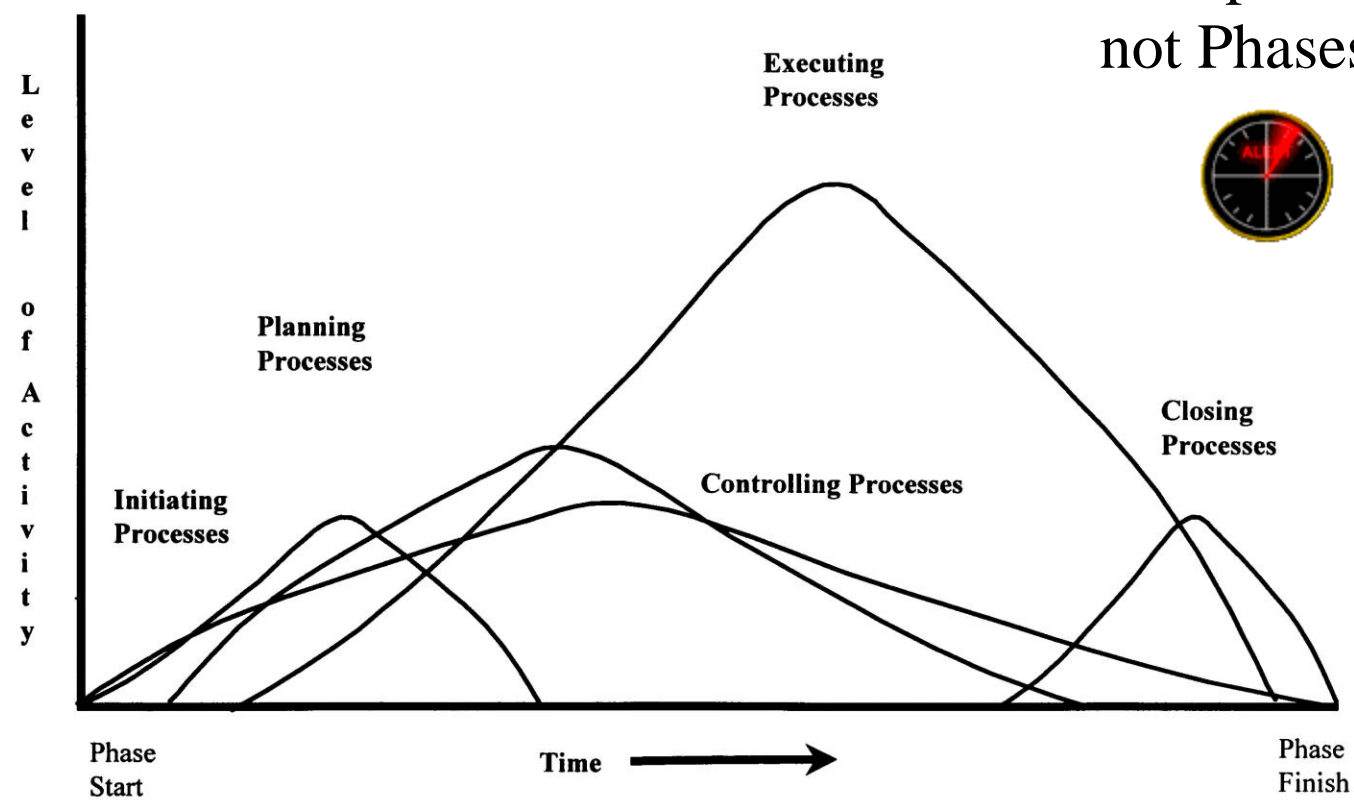


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Knowledge Area
 Integration
 Scope
 Time
 Cost
 Quality
 HR
 Communications
 Risk
 Procurement
 Stakeholder

Process Group Interaction

Process Groups are not Phases



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2>3.8 Project Information</h2> <ul style="list-style-type: none"> <li>• Work performance data – observations and measurements during work (executing measurements input into controlling processes) <li>• Work performance information – data analyzed in context and integrated based on relationships across areas (status, forecasts) <li>• Work performance reports – Representation of work performance information 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>48</p> </div>				

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(Close your PMBOK®)



PMI-ism Break

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Practice Test Time!

Chapters 1 - 3

Project Integration Management

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Knowledge Area
Integration


Project Interfaces

Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement

- Interface Management is critical during execution
- Interfaces:
 - Product
 - Infrastructure
 - Resources
 - People interfaces (cross organization)
 - System interfaces (organization, information)
- **Goal of project integration:** coordinate people, product, infrastructure, system (organization, information) together toward accomplishing the project goals.

Stakeholder

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.1 Develop Project Charter</h1> <p>Document that formally authorizes the project & provides PM authority to allocate resources</p> <p>4.1.1 Inputs</p> <ul style="list-style-type: none"> .1 Project SOW .2 Business case .3 Agreements .4 Enterprise environmental factors .5 Organizational process assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>				


Integration

Constraints & Assumptions

- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

- Constraint – a restriction that will affect the performance of the project
- Assumptions – factors, that for planning purposes, are considered to be true, real, or certain
- Assumptions – affect all aspects of the project planning, and are part of the progressive elaboration of the project



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.1 Develop Project Charter</h1> <h2>4.1.2 Tools & Techniques</h2> <h3>.1 Expert Judgment</h3> <p>Two broad categories of project selection methods:</p> <ol style="list-style-type: none"> 1. Benefit measurement 2. Mathematical models 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>				

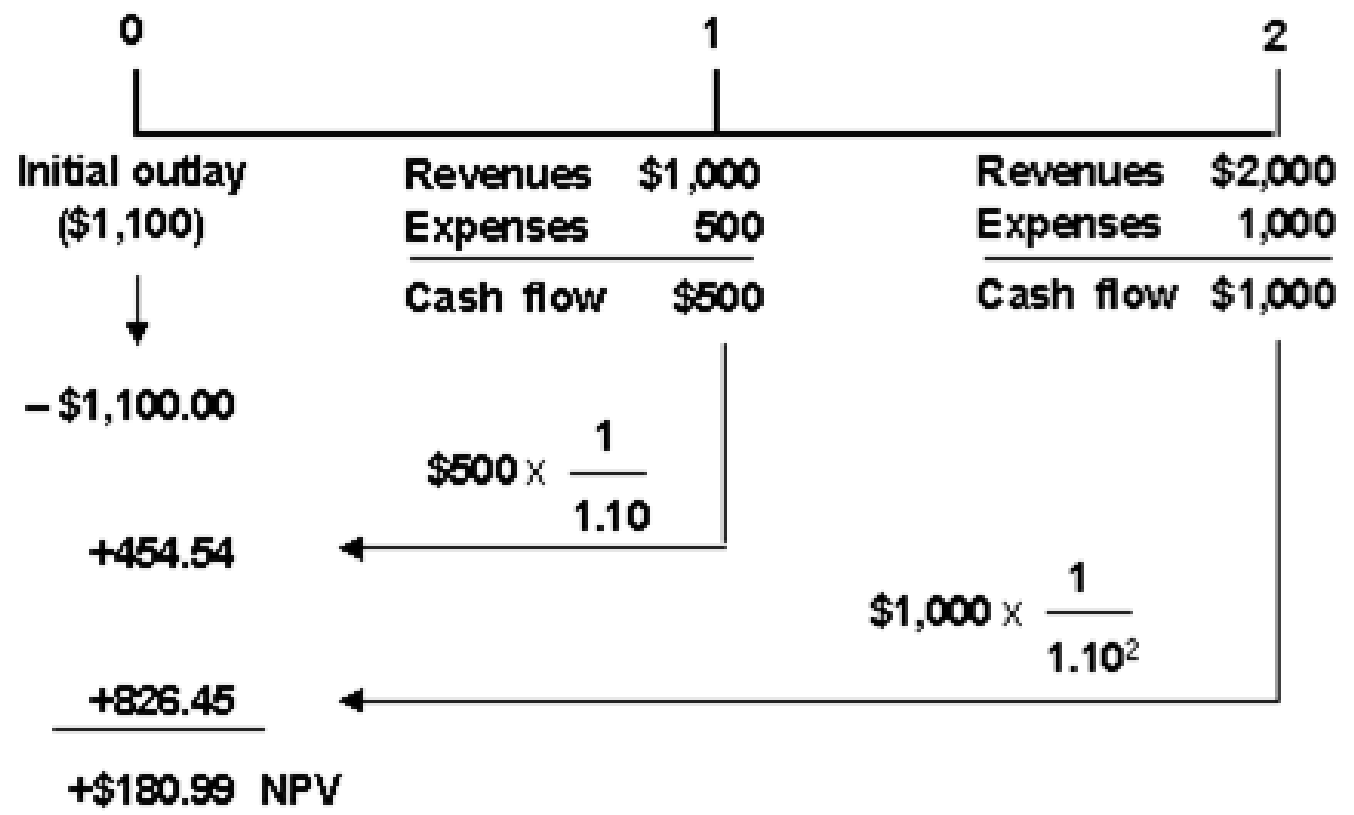
Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Reasons to Authorize a Project</h1> <ul style="list-style-type: none"> <li>• Market Demand <li>• Business Need <li>• Customer Request <li>• Technological Advance <li>• Legal Requirement <li>• Social Need 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	57		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Models</h1>				
Integration					
Scope	<ul style="list-style-type: none"> <li>• Non-numeric <li>• Numeric 				
Time	<ul style="list-style-type: none"> <li>– Sacred Cow <li>– Payback Period 				
Cost	<ul style="list-style-type: none"> <li>– Operating Necessity <li>– Average Rate of Return 				
Quality	<ul style="list-style-type: none"> <li>– Competitive Necessity <li><i>What about TVM?</i> 				
HR	<ul style="list-style-type: none"> <li>– Product Line Extension <li>– DCF or IRR (NPV) 				
Communications	<ul style="list-style-type: none"> <li>– Comparative Benefit 				
Risk	$\text{NPV} = -(\text{Initial Investment}) + \sum \text{ of CF}/(1 + r)^t$				
Procurement					
Stakeholder					
	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>				

Knowledge Area
Integration

Models

Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement



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NPV Exercise



NPV Exercise

- Initial cost = \$12,500
- ERR = 15%
- Annual project cash flow
 - Year 1: Revenue - \$4,500, Expenses - \$750
 - Year 2: Revenue - \$7,300, Expenses - \$1,400
 - Year 3: Revenue - \$11,000, Expenses - \$3,200


$$\text{NPV}_{(\text{project X})} = (-\$12,500) + \frac{4500 - 750}{(1 + 0.15)^1} + \frac{7300 - 1400}{(1 + 0.15)^2} + \frac{11000 - 3200}{(1 + 0.15)^3}$$

$$\text{NPV}_{(\text{project X})} = (-\$12,500) + \frac{3750}{1.15} + \frac{5900}{1.3225} + \frac{7800}{1.5209}$$

$$\text{NPV}_{(\text{project X})} = (-\$12,500) + 3260.87 + 4461.26 + 5128.63$$

$$\text{NPV}_{(\text{project X})} = (-\$12,500) + 12850.75 = 350.75$$

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.1 Develop Project Charter</h1> <h2>4.1.3 Outputs (Figure 4-3)</h2> <h3>.1 Project Charter</h3> <ul style="list-style-type: none"> • Project purpose of justification • Objectives (SMART) • High level <ul style="list-style-type: none"> – Requirements – Project description – Risks • Summary milestone schedule • Summary budget • Approval requirements • Assign PM (responsibility and authority) • Charter approval (sponsor) 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>62</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">4.2 Develop Project Management Plan</h1>				
Integration					
Scope	<p>The PM Plan documents the collection of outputs from each of the processes in the “Planning” process group</p> <h3>4.2.1 Inputs</h3> <ul style="list-style-type: none"> .1 Project Charter .2 Outputs from planning processes .3 Enterprise Environmental Factors .4 Organizational Process Assets 				
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

4.2 Develop Project Management Plan

- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

- 4.2.2 Tools & Techniques
 - .1 Expert Judgment
 - .2 Facilitation Techniques

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">4.2 Develop Project Management Plan</h1> <h2 style="text-align: center;">4.2.3 Outputs (Figure 4-5)</h2> <h3 style="text-align: center;">.1 PM Plan</h3> <ul style="list-style-type: none"> • Integrates and consolidates all of the subsidiary management plans and baselines from planning processes 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p style="text-align: right;">65</p>		

4.3 Direct & Manage Project Execution

4.3.1 Inputs

- .1 PM Plan
- .2 Approved Change Requests
- .3 Enterprise Environmental Factors
- .4 Organizational Process Assets



Types of Approved Changes

- **Corrective**
 - Brings expected future performance in line with the plan
- **Preventative**
 - Reduces the probability of negative consequences associated with risk
- **Defect repair**
 - Documented identification and recommendation to repair or replace

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">4.3 Direct & Manage Project Execution</h1>				
Integration					
Scope	<h2 style="text-align: center;">4.3.2 Tools & Techniques</h2>				
Time	<ul style="list-style-type: none"> .1 Expert Judgment 				
Cost	<ul style="list-style-type: none"> .2 PMIS 				
Quality	<ul style="list-style-type: none"> .3 Meetings 				
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: yellow; padding: 5px;"> <p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p> </div> <div> <p style="text-align: right; font-size: small;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </p> </div> </div>				

Knowledge Area

Integration

Work Authorization System

Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

- Authorizes work to begin
 - Commits resources (people, funds, etc.) to the work
 - Starts the clock on that portion of the plan and schedule
- Large projects
 - Formal written system
 - Frequently, organizational form to prepare
- Small projects
 - Verbal, email, etc.
 - Still a ‘formal system’ and emphasis is needed to retain control of the work

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4.3 Direct & Manage Project Execution

4.3.3 Outputs (Figure 4-7)



- .1 Deliverables
Unique...verifiable product, result, capability...
- .2 Work Performance Data
- .3 Change Requests
- .4 Project Management Plan Updates
- .5 Project Document Updates

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>PM Plan Updates</h1> <ul style="list-style-type: none"> • Requirements Management Plan • Schedule Management Plan • Cost Management Plan • Quality Management Plan • Human Resource Plan • Communications Management Plan • Risk Management Plan • Procurement Management Plan • Project Baselines 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div> <div style="display: inline-block; margin-left: 20px;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div> <div style="display: inline-block; margin-left: 20px;"> 71 </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Product Document Updates</h1> <ul style="list-style-type: none"> <li>• Requirements Documents <li>• Project Logs <ul style="list-style-type: none"> <li>– Issues log <li>– Assumptions <li>• Risk Register (log) <li>• Stakeholder Register 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>72</p>		

4.4 Monitor & Control Project Work

Track, review, regulate...




4.4.1 Inputs

- .1 PM Plan
- .2 Schedule Forecasts
- .3 Cost Forecasts
- .4 Validated Changes (see 4.4.1.4)
- .5 Work Performance Information
- .6 Enterprise Environmental Factors
- .7 Organizational Process Assets

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.4 Monitor & Control Project Work</h1> <h2>4.4.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Analytical Techniques <li>.3 PMIS <li>.4 Meetings 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Track Key Data

- Cost Performance
- Schedule Performance
- Quality
 - Conformance to requirements and specifications (product quality)
 - Quality of project reporting and tracking, too (project quality)
- Plan performance -- maintain the project plan
- Resource utilization -- compare to schedule and costs
- Team performance (group and individual)
- Risk triggers

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">4.4 Monitor & Control Project Work</h1> <h2 style="text-align: center;">4.4.3 Outputs (Figure 4-9)</h2> <ul style="list-style-type: none"> .1 Change Requests .2 Work Performance Reports .3 Project Management Plan Updates .4 Project Document Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p style="text-align: right;">76</p>		

Change Control Outcomes

- Identify and influence factors that create change
 - e.g., add-on requirement during execution phase of project
 - Drives scope change
 - Cost
 - Schedule
- Recognize when a change has occurred
 - Taking action to reflect the change in the plan
 - Identifying changes in performance baselines
- Manage actual changes when they occur




Integrated Change Control

- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

- Key activity in Execution Phase
- Retain control of revisions
 - Scope: Schedule, Cost, Staffing
 - Requirements and specifications: Quality
- Important to keep performance baselines intact
 - (baselines = the plan)
- Not necessary to ‘ban’ changes...just identify, control (and manage) them
 - Identify & Influence, Recognize, Manage

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.5 Perform Integrated Change Control</h1> <h2>4.5.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 PM Plan <li>.2 Work Performance Reports <li>.3 Change Requests <li>.4 Enterprise Environmental Factors <li>.5 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>79</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area	<h1>Configuration Management</h1> <ul style="list-style-type: none"> • Three main objectives: <ul style="list-style-type: none"> – Establish processes to identify, request, and assess value of changes – Continuously validate and improve through considering impact of changes – Processes used to communicate changes to stakeholders 					
Integration						
Scope						
Time						
Cost						
Quality						
HR						
Communications						
Risk						
Procurement						
Stakeholder						
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.5 Perform Integrated Change Control</h1> <h2>4.5.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Meetings <li>.2 Change Control Tools 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

4.5 Perform Integrated Change Control

4.5.3 Outputs (Figure 4-11)

- .1 Approved Change Requests
- .2 Change Log
- .3 Project Management Plan Updates
- .4 Project Document Updates



If a change request is feasible, approved, and outside of scope, the approval requires a baseline change

4.6 Close Project or Phase

4.6.1 Inputs

- .1 PM Plan
- .2 Accepted Deliverables
- .3 Organizational Process Assets

Integration

Impact of Termination

- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

- Project transfer
- Ongoing operations
- Project personnel
- Equipment/material assets
- Future projects
- PM

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Termination by...

- Extinction
 - Successful or not
 - Deliverable is external to or not a fundamental function of the parent organization
- Addition
 - Institutionalized
 - New Division
- Integration
 - Most Common
 - Project assets redistributed
- Starvation
 - Budget decrement

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>4.6 Close Project or Phase</h1> <h2>4.6.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Analytical Techniques <li>.3 Meetings 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>86</p>		

4.6 Close Project or Phase

4.6.3 Outputs (Figure 4-13)

- .1 Final Product, Service, or Result Transition
- .2 Organizational Process Asset Updates



- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

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Practice Test Time!

Chapter 4 Project Integration Management

Project Scope Management

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Scope Management</h1>				
Integration					
Scope	<p>“Scope” Defined:</p> <p>The sum of the products and services to be provided by a project.</p> <div style="text-align: right;">  </div> <p style="text-align: center;"> What the project <u>will</u> deliver andwhat the project <u>will not</u> deliver </p>				
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">5.1 Plan Scope Management</h1>				
Integration					
Scope	<h2>5.1.1 Inputs</h2>				
Time	<ul style="list-style-type: none"> .1 Project Management Plan 				
Cost	<ul style="list-style-type: none"> .2 Project Charter 				
Quality	<ul style="list-style-type: none"> .3 Enterprise Environmental Factors 				
HR	<ul style="list-style-type: none"> .4 Organizational Process Assets 				
Communications	<p>Documents how scope will be defined, validated, and controlled</p>				
Risk	<p>Guidance and direction for managing scope</p>				
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area	<h1>5.1 Plan Scope Management</h1>					
Integration						
Scope	<h2>5.1.2 Tools & Techniques</h2>					
Time						<ul style="list-style-type: none"> .1 Expert Judgment .2 Meetings
Cost						
Quality						
HR						
Communications						
Risk						
Procurement						
Stakeholder						
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">5.1 Plan Scope Management</h1> <h2 style="text-align: center;">5.1.3 Outputs (Figure 5-3)</h2> <ul style="list-style-type: none"> .1 Scope Management Plan .2 Requirements Management Plan 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder



5.2 Collect Requirements

- Active stakeholder involvement during discover and decomposition
- Foundation for the WBS
 - Business: high-level needs (issues/opportunities)
 - Stakeholder: needs of a group
 - Solution: features, functions and characteristics
 - Functional = behavior
 - Nonfunctional = conditions or qualities
 - Transition: temporary (e.g. training)
 - Project: actions, processes, or conditions the project needs to meet
 - Quality: condition or criteria required to validate deliverable

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.2 Collect Requirements</h1> <h2>5.2.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Scope Management Plan <li>.2 Requirements Management Plan <li>.3 Stakeholder Management Plan <li>.4 Project Charter <li>.5 Stakeholder Register 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>96</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.2 Collect Requirements</h1>				
Integration					
Scope	<h2>5.2.2 Tools & Techniques</h2>				
Time	.1 Interviews				
Cost	.2 Focus Groups				
Quality	.3 Facilitated Workshops				
HR	.4 Group Creativity Techniques				
Communications	.5 Group Decision Making Techniques				
Risk	.6 Questionnaires and Surveys				
Procurement	.7 Observations				
Stakeholder	.8 Prototypes				
	.9 Benchmarking				
	.10 Context Diagram: visual representation				
	.11 Document Analysis				
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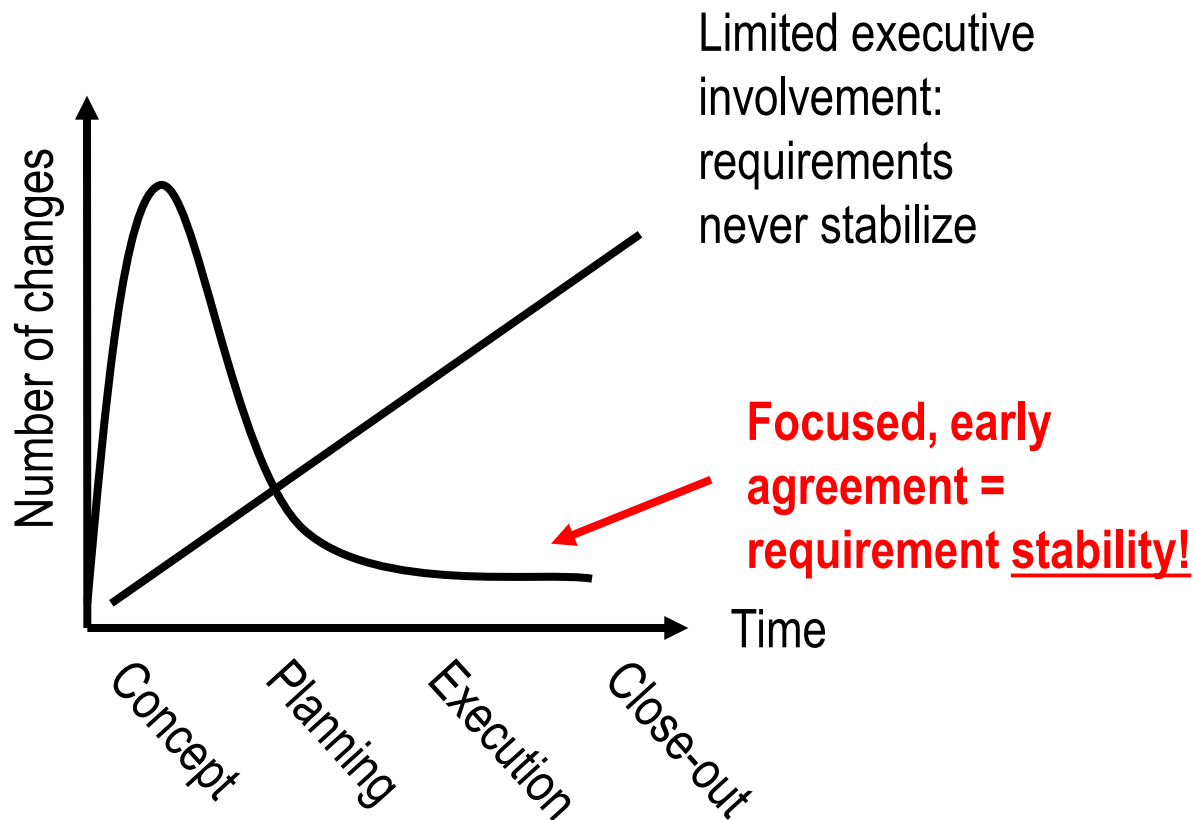
5.2 Collect Requirements

5.2.3 Outputs (Figure 5-4)




- .1 Requirements Documentation
- .2 Requirements Management Plan
- .3 Requirements Traceability Matrix


Requirement Stability





Source: Tuttle, Q.C., *Implementing Concurrent Project Management*, Prentice Hall, 1994

Moral: Agree upon requirements early

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Scope Management</h1>				
Integration					
Scope	<p>The processes required to insure that:</p>				
Time	<ul style="list-style-type: none"> - the project includes all of the work required 				
Cost	<ul style="list-style-type: none"> - only the work required 				
Quality	<ul style="list-style-type: none"> - the project completes successfully 				
HR	<ul style="list-style-type: none"> - controlling what is and is not included in the project 				
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> Student Copy – Not for Reproduction or Distribution <div style="text-align: right;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div> 100 </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Two Types of Scope</h1> <ul style="list-style-type: none"> • <u>Product</u> Scope <ul style="list-style-type: none"> – Features – Functions – Completion measured against product <u>requirements</u> • <u>Project</u> Scope <ul style="list-style-type: none"> – <u>Work</u> that must be done to deliver <u>product</u> – Completion measured against the <u>project plan</u> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution		Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC		101

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Scope Definition</h1> <ul style="list-style-type: none"> <li>• Develops a detailed description of the project and product or service (result) 				
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area	<h1>5.3 Define Scope </h1>					
Integration						
Scope	<h2>5.3.1 Inputs</h2>					
Time	<ul style="list-style-type: none"> .1 Scope Management Plan 					
Cost	<ul style="list-style-type: none"> .2 Project Charter 					
Quality	<ul style="list-style-type: none"> .3 Requirements Documentation 					
HR	<ul style="list-style-type: none"> .4 Organizational Process Assets 					
Communications						
Risk						
Procurement						
Stakeholder						
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5.3 Define Scope

Scope

5.3.2 Tools & Techniques

- .1 Expert Judgment
- .2 Product Analysis: Product breakdown, system analysis, value stream mapping, etc.
- .3 Alternatives Identification
- .4 Facilitated Workshops



5.3 Define Scope

5.3.3 Outputs (Figure 5-8)



.1 Project Scope Statement

Provides common understanding of scope and describes major objectives

Enables detailed planning, guides work, and provides baseline for evaluating change requests


Acceptance criteria

.2 Project Documentation Updates

PMBOK 5th Edition Table 5-1

Table 5-1. Elements of the Project Charter and Project Scope Statement

Project Charter	Project Scope Statement
Project purpose or justification	Project scope description (progressively elaborated)
Measurable project objectives and related success criteria	Acceptance criteria
High-level requirements	Project deliverables
High-level project description	Project exclusions
High-level risks	Project constraints
Summary milestone schedule	Project assumptions
Summary budget	
Stakeholder list	
Project approval requirements (what constitutes success, who decides it, who signs off)	
Assigned project manager, responsibility, and authority level	
Name and authority of the sponsor or other person(s) authorizing the project charter	

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>The WBS!</h1> <ul style="list-style-type: none"> <li>• Deliverable oriented hierarchal decomposition <li>• Organizes and defines “total” scope of the project <li>• WBS subdivides into manageable components  <li>• Represents current work specified in the current approved project scope statement 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p>107</p>			


WBS Type Examples

Scope

- Deliverable-oriented
 - New Bank
 - New Laboratory
 - New Manufacturing Plant
 - New Software
 - Software Upgrade
 - New facility design
- Process-oriented
 - Conducting annual close out at bank
 - Converting chemicals to plastics
 - Monitoring productivity at outlying site
 - Issuing monthly payroll checks

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2 style="text-align: center;">Four Steps to Creating a WBS</h2> <ul style="list-style-type: none"> • Specify the project objectives (scope) • Identify specific products, services or results (deliverables) • Identify 100 percent of the work • Subdivide the elements until a level is achieved that is suitable for planning and control 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>109</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.4 Create WBS</h1> <h2>5.4.1 Inputs</h2> <ul style="list-style-type: none"> .1 Scope Management Plan .2 Project Scope Statement .3 Requirements Documentation .4 Enterprise Environmental Factors .5 Organizational Process Assets <p>Know the PMBOK®'s WBS!</p> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">What is a WBS?</h1> <ul style="list-style-type: none"> • Deliverable-oriented grouping of project elements • Organizes and <i>defines the total work scope</i> of the project • Each descending level represents increasing detail <p style="text-align: center;">Source: Practice Standards for Work Breakdown Structures. (2001). PMI.</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Activity vs. Deliverable</h1> <ul style="list-style-type: none"> • Activity = work to be done <ul style="list-style-type: none"> – Steps or “how” – Defined discrete elements of work on a project – Consumes time & resources • Deliverable = output of work done <ul style="list-style-type: none"> – Tangible item or product 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC	112		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Why use WBS?</h1> <ul style="list-style-type: none"> • Assists in developing schedule and cost • Primary input to: <ul style="list-style-type: none"> – Activity Definition – Resource planning – Cost estimation and budgeting – Risk Management Planning • Communicates to stakeholders • Assists in reporting progress <p style="text-align: center;">Source: Practice Standards for Work Breakdown Structures. (2001). PMI.</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; text-align: center;"> Student Copy – Not for Reproduction or Distribution </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div> <p>113</p> </div> </div>				

5.4 Create WBS

5.4.2 Tools & Techniques



.1 Decomposition

Subdividing the work into smaller, more manageable “work packages.” Work packages are the lowest level of detail.

Often referred to as “rolling wave” or “iterative” planning

.2 Expert Judgment

5.4 Create WBS

Scope

5.4.3 Outputs (Figure 5-10)

.1 Scope Baseline

Project Scope Statement
WBS



WBS Dictionary

.2 Project Documents Updates

5.5 Validate Scope

5.5.1 Inputs

- .1 Project Management Plan
- .2 Requirements Documentation
- .3 Requirements Traceability Matrix
- .4 Verified Deliverables
- .5 Work Performance Data (e.g. degree of compliance with requirements, number & severity of nonconformance, etc.)



Process of obtaining formal acceptance from stakeholders
 If terminated early, establishes and documents level of completion
 Not concerned w/ correctness of work – that's quality

Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Validate Scope vs Control Quality

- **Validate Scope:** Primarily concerned with acceptance of project deliverables
- **Control Quality:** Primarily concerned with correctness of the deliverables (requirements)



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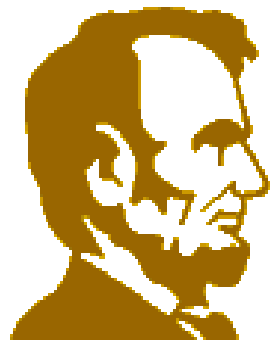
Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.5 Validate Scope</h1>				
Integration					
Scope	<h2>5.5.2 Tools & Techniques</h2>				
Time	<ul style="list-style-type: none"> .1 Inspection 				
Cost	<ul style="list-style-type: none"> .2 Group Decision Making Techniques 				
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
<div style="background-color: yellow; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div>					
<div style="display: flex; justify-content: space-between;"> <div> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div> <p>118</p> </div> </div>					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.5 Validate Scope</h1>				
Integration					
Scope	<h2>5.5.3 Outputs (Figure 5-15)</h2>				
Time	<ul style="list-style-type: none"> .1 Accepted Deliverables 				
Cost	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Document “non-accepted” deliverables with reasons 				
Quality	<ul style="list-style-type: none"> .2 Change Requests 				
HR	<ul style="list-style-type: none"> .3 Work Performance Information 				
Communications	<ul style="list-style-type: none"> .4 Project Documentation Updates 				
Risk	<p>Note this is in the “Monitoring and Control” Process Group</p>				
Procurement					
Stakeholder					



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Scope Creep</h1>				
Integration					
Scope	<ul style="list-style-type: none"> • Small “enhancements” can screw up major functionality! • What causes “Scope Creep?” • How has scope creep impacted your job?.....projects in your organization? 				
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Scope Relationships</h1> <ul style="list-style-type: none"> <li>• Scope translates into requirements <ul style="list-style-type: none"> <li>– Requirements: the stakeholders’ specific needs or wants <li>• Quality is “conformance to requirements” 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Source: Lewis, J. (2001). Project Planning, Scheduling, and Control. 3rd ed.</p>				
<div style="background-color: yellow; border: 2px solid black; padding: 5px; display: inline-block;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>121</p> </div>					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.6 Control Scope</h1>				
Integration					
Scope	<h2>5.6.1 Inputs</h2>				
Time	.1 Project Management Plan				
Cost	.2 Requirements Documentation				
Quality	.3 Requirements Traceability Matrix				
HR	.4 Work Performance Data				
Communications	.5 Organizational Process Assets				
Risk					
Procurement					
Stakeholder					
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<div style="display: flex; justify-content: space-between;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC 122 </div>					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>5.6 Control Scope</h1> <h2>5.6.2 Tools & Techniques</h2> <h3>.1 Variance Analysis</h3>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: inline-block;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>123</p> </div>				

5.6 Control Scope

Scope

5.6.3 Outputs (Figure 5-17)

- .1 Work Performance Information
- .2 Change Requests
- .3 Project Management Plan Updates
- .4 Project Documentation Updates
- .5 Organizational Process Asset Updates



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Scope Change Control



Scope

- Concerned with three things:
 - “...influencing factors that create scope changes to ensure changes are agreed upon,
 - determining that a scope change has occurred
 - managing actual changes when and if they occur.”

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PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition

Practice Test Time!

Chapter 5 Project Scope Management

Project Time Management

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ASQ Certified Manager of Quality / Organizational Excellence
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area	<h1>6.1 Plan Schedule Management</h1>					
Integration						
Scope						
Time						
Cost	<h2>6.1.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Project Management Plan <li>.2 Project Charter <li>.3 Enterprise Environmental Factors <li>.4 Organizational Process Assets 					
Quality						
HR						
Communications						
Risk						
Procurement						
Stakeholder						
		<p>Student Copy – Not for Reproduction or Distribution</p>			<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>129</p>

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.1 Plan Schedule Management</h1> <h2>6.1.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Analytical Techniques <li>.3 Meetings 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.1 Plan Schedule Management</h1> <h2>6.1.3 Outputs (Figure 6-4)</h2> <h3>.1 Schedule Management Plan</h3>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	131		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.2 Define Activities</h1>				
Integration					
Scope					
Time	<h2>6.2.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Schedule Management Plan <li>.2 Scope Baseline <li>.3 Enterprise Environment Factors <li>.4 Organizational Process Assets 				
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder


6.2 Define Activities



6.2.2 Tools & Techniques

- .1 Decomposition – in the context of activity definition, decomposition involves subdividing work packages into smaller, more manageable components (basis for estimating, scheduling, executing, monitoring and controlling work)
- .2 Rolling Wave Planning
Near-term work planned in detail and future work planned at high level
- .3 Expert Judgment

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2 style="text-align: center;">6.2 Define Activities</h2> <h3>6.2.3 Outputs (Figure 6-6)</h3> <ul style="list-style-type: none"> .1 Activity List: <u>Must</u> include all activities that will be performed on the project .2 Activity Attributes: Distinct from milestones in that they have durations and may have resources and cost requirements .3 Milestone List 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				
	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC				134

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.3 Sequence Activities</h1> <h2>6.3.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Schedule Management Plan <li>.2 Activity List <li>.3 Activity Attributes <li>.4 Milestone List <li>.5 Project Scope Statement <li>.6 Enterprise Environmental Factors <li>.7 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

6.3 Sequence Activities

6.3.2 Tools & Techniques

- .1 Precedence Diagramming Method
- .2 Dependency Determinations

Mandatory – Hard logic

Discretionary – Soft logic, preferred, etc...




External – Relationship with non-project activities

Internal – Relationship between project activities

- .3 Leads & Lags

Lead allows acceleration of the successor activity

In PDM, F-S is the most commonly used logical relationship

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">6.3 Sequence Activities</h1> <h2 style="text-align: center;">6.3.3 Outputs (Figure 6-8)</h2> <ul style="list-style-type: none"> .1 Project Schedule Network Diagrams .2 Project Document Updates  				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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					137

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Network Diagram</h1> <h2 style="text-align: center;">“Facts”</h2>				
Integration					
Scope					
Time	<ul style="list-style-type: none"> • All have beginning point and an end point • Represent “predecessor” relationships <ul style="list-style-type: none"> – Complex relationships can be represented in AON <ul style="list-style-type: none"> • F-S, S-S, S-F, F-F – All activities have predecessors – Exception: first task of network has no predecessor • No “hangers” <ul style="list-style-type: none"> – Every task has a “successor” – Exception: last task has no “successor” • No “loops” 				
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

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Knowledge Area
Integration
Scope

Network Flow Diagram

Time

Activity	TE	Predecessor
A	20	
B	20	
C	10	
D	15	A
E	10	B, C
F	14	B, C
G	4	B, C
H	11	C
I	18	G, H
J	8	D, E

Cost
Quality
HR
Communications
Risk
Procurement

Kerzner, H. (2001). Project Management: A Systems Approach to Planning, Scheduling, and Controlling. 7th ed.

Stakeholder

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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Slack (or Float)

- Free slack – task delay w/o delaying successor’s early start
- Total slack – task delay w/o delaying project completion
- Project slack – project delay w/o affecting required due date (desired – actual)





Network Flow Diagram Exercise



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Resource Planning</h1> <ul style="list-style-type: none"> <li>• What <li>• How much <li>• Output: list of resource requirements 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 2px solid black; padding: 5px; display: inline-block;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP</p> <p>© 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>142</p> </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Resource Planning Considerations</h1> <ul style="list-style-type: none"> • Difficulty of the work • Uniqueness of project scope • Organization's history of doing similar tasks • Resource availability • Outsourcing requirements • Organizational policies 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">6.4 Estimate Activity Resources</h1> <p style="text-align: center;">Closely coordinated with Cost Estimating</p> <h2 style="text-align: center;">6.4.1 Inputs</h2> <ul style="list-style-type: none"> .1 Schedule Management Plan .2 Activity Lists .3 Activity Attributes .4 Resource Calendars .5 Risk Register .6 Activity Cost Estimates .7 Enterprise Environmental Factors .8 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">6.4 Estimate Activity Resources</h1> <h2 style="text-align: center;">6.4.2 Tools & Techniques</h2> <ul style="list-style-type: none"> .1 Expert Judgment .2 Alternatives Analysis .3 Published Estimating Data  .4 Bottom-up Estimating .5 PM Software 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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6.4 Estimate Activity Resources

6.4.3 Outputs (Figure 6-13)

.1 Activity Resource Requirements

Types and quantities of resources required

Note: "When" is determined during Schedule Development

.2 Resource Breakdown Structure

.3 Project Document Updates



Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

6.5 Estimate Activity Durations

Note: Overall project duration is determined during Schedule Development

6.5.1 Inputs

- .1 Schedule Management Plan
- .2 Activity List
- .3 Activity Attributes
- .4 Activity Resource Requirements
- .5 Resource Calendar
- .6 Project Scope Statement
- .7 Risk Register
- .8 Resource Breakdown Structure
- .9 Enterprise Environmental Factors
- .10 Organizational Process Assets




6.5 Estimate Activity Durations

6.5.2 Tools & Techniques

- .1 Expert Judgment
- .2 Analogous Estimating
 - Using actual durations from “experience”
 - Accurate if previous activities are similar in fact & team members have needed expertise
- .3 Parametric Estimating
 - Quantitatively determined
- .4 Three-point Estimates
- .5 Group Decision Making Techniques
- .6 Reserve Analysis

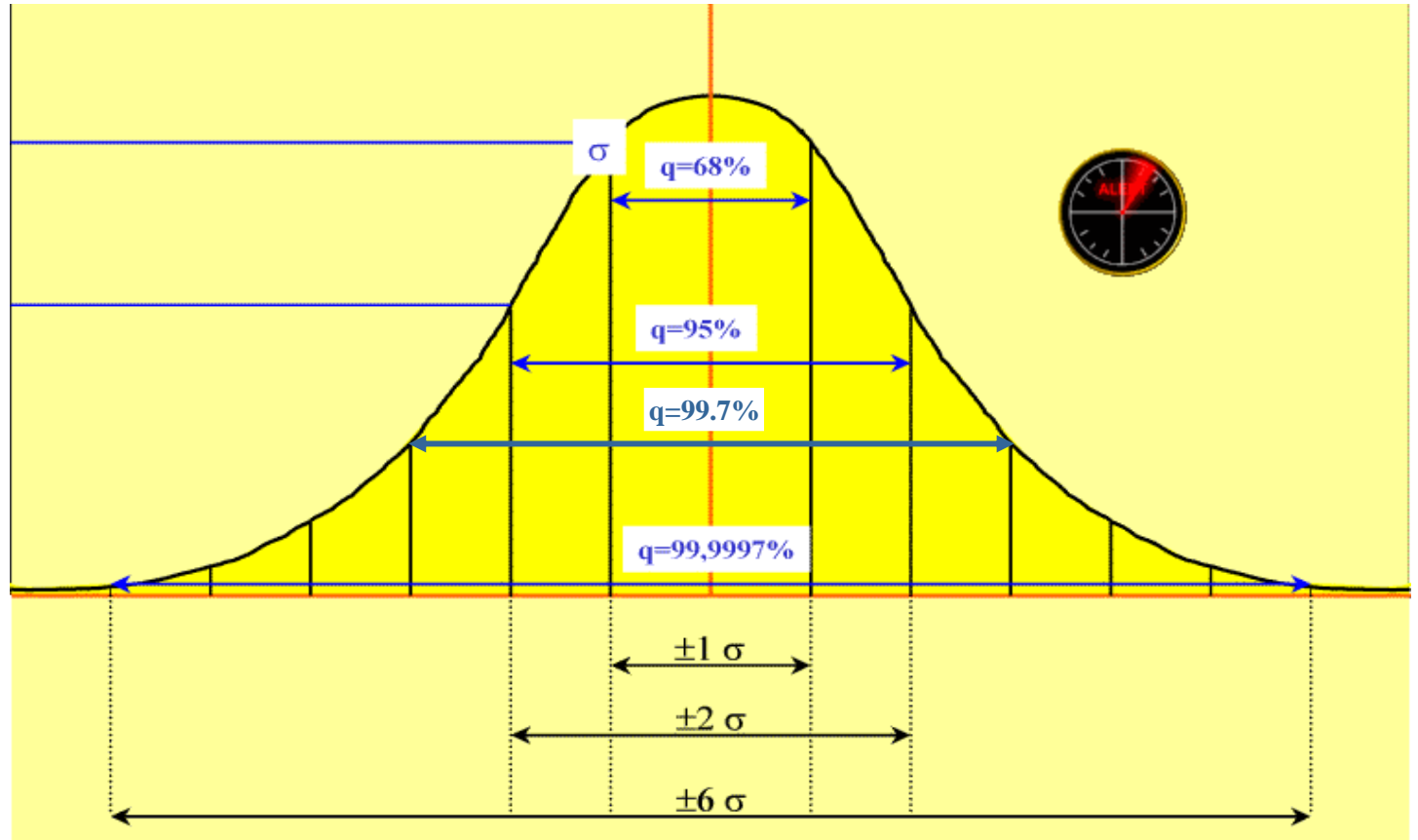


Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">6.5 Estimate Activity Durations</h1> <h2 style="text-align: center;">6.5.3 Outputs (Figure 6-15)</h2> <ul style="list-style-type: none"> .1 Activity Duration Estimates .2 Project Document Updates <p style="text-align: center;">Activity duration estimates should always include some indication of range of possible results (e.g.: +/- time, or % probability)</p> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Concepts for Duration Estimating</h1> <ul style="list-style-type: none"> <li>• Beta Distribution: $tE = \frac{tO + 4tM + tP}{6}$ <li>• $SD = \frac{P - O}{6}$ <li>• Variance = $\left(\frac{P - O}{6}\right)^2$ <li>• Triangular distribution: $tE = \frac{tO + tM + tP}{3}$ 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>150</p> </div>				

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Normal Distribution



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Pert Exercise

- If $P = 24$, $ML = 12$, $O = 6$
- What is the probability that activity will be completed within 10 – 16 days?

$$\frac{6 + 4(12) + 24}{6} = 13$$

- **SD:** $\frac{24 - 6}{6} = 3$



$13 - 3$ (1SD) = 10, $13 + 3$ (1SD) = 16; Roughly 68% chance!

- **Variance:** $3^2 = 9$

Path Standard Deviation and Variances

	Optimistic	Most Likely	Pessimistic	Triangulation	PERT Weighted Average	Standard Deviation (P - O)/6	Variance SD Squared
Activity A	12	15	24	17	16	2	4
Activity B	6	8	12	8.67	8.33	1	1
Activity C	15	22	33	23.33	22.67	3	9
Activity D	8	11	20	13	12	2	4
		<u>56</u>		<u>62</u>	<u>59</u>		<u>18</u>

Duration if estimates are taken at face value

Path SD 4.24

Duration if optimistic, pessimistic & most likely are averaged

Duration, considering optimistic & pessimistic, and weighting the most likely estimates



One Standard Deviation	54.76	63.24
Two Standard Deviations	50.51	67.49
Three Standard Deviations	46.27	71.73

6.6 Develop Schedule


Determine planned start and finish dates

6.6.1 Inputs

- .1 Schedule Management Plan
- .2 Activity List
- .3 Activity Attributes
- .4 Project Schedule Network Diagrams
- .5 Activity Resource Requirements
- .6 Resource Calendars
- .7 Activity Duration Estimates
- .8 Project Scope Statement
- .9 Risk Register
- .10 Project Staff Assignments
- .11 Resource Breakdown Structure
- .12 Enterprise Environmental Factors
- .13 Organizational Process Assets



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.6 Develop Schedule</h1> <h2>6.6.2 Tools & Techniques</h2> <ul style="list-style-type: none"> .1 Schedule Network Analysis .2 CPM .3 Critical Chain Method: Leverages buffers to manage for limited resources and uncertainties .4 Resource Leveling .5 Modeling techniques .6 Leads/Lags .7 Schedule Compression .8 Scheduling Tool 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>				

6.6 Develop Schedule

6.6.2 Tools & Techniques

- .1 Schedule Network Analysis
- .2 CPM
- .3 Critical Chain Method: Leverages buffers to manage for limited resources and uncertainties
- .4 Resource Leveling
- .5 Modeling techniques
- .6 Leads/Lags
- .7 Schedule Compression
- .8 Scheduling Tool



6.6 Develop Schedule

- Tools & Techniques Key Concepts
 - CPM: ES, EF, LS, LF calculated w/o resource limitations
 - Crashing: Compressing (reducing) the duration of activities (CBA)
 - Fast Tracking: Completing tasks concurrently that are normally sequential
 - Critical Chain Method: Modifies schedule to account for limited resources by managing buffer activity durations and resource assignments



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Gantt Chart</h1> <ul style="list-style-type: none"> <li>• Horizontal time scale <li>• Easy to read <li>• Tool for expediting, sequencing and reallocation <li>• Does NOT show technical dependencies 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
	<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: inline-block;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>157</p> </div>				

Gantt Chart Diagram Exercise




Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Project Crashing</h1> <p>12 days</p> <pre> graph LR P[Predecessors] --> A[Activity Foundation Prep] A --> S[Successors] style A fill:#add8e6,stroke:#000,stroke-width:1px style A fill:#add8e6,stroke:#000,stroke-width:1px,stroke-dasharray: 5 5 </pre>				
Integration					
Scope					
Time					
Cost	<ul style="list-style-type: none"> • Cost implications 				
Quality	<ul style="list-style-type: none"> • Resource implications 				
HR	<ul style="list-style-type: none"> • Advantages? 				
Communications	<ul style="list-style-type: none"> • Disadvantages? 				
Risk					
Procurement					
Stakeholder					
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				159	

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Goldratt's Critical Chain</h1> <ul style="list-style-type: none"> <li>• Use Expected Times vs Estimated Times <li>• Replace slack with buffers <ul style="list-style-type: none"> <li>– Feeding buffer <li>– Project buffer <li>• Theory of Constraints <ul style="list-style-type: none"> <li>– Any barrier to successful, on-time, on-budget completion <li>– What resources are in heavy demand? <li>– What resources have scheduling conflicts? <p style="text-align: center; font-size: small;">Source: Goldratt, E.M. (2004). The Goal: A Process of Ongoing Improvement. 3rd revised ed.</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p style="font-size: small;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.6 Develop Schedule</h1>				
Integration					
Scope					
Time	<h2>6.6.3 Outputs (Figure 6-17)</h2> <ul style="list-style-type: none"> <li>.1 Project Schedule <li>.2 Schedule Baseline <ul style="list-style-type: none"> <li>Defines baseline start dates and finish dates <li>.3 Schedule Data <li>.4 Project Calendars <li>.5 Project Management Plan Updates <li>.6 Project Document Updates 				
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: yellow; padding: 5px;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div style="text-align: right;"> <p>161</p> </div> </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Schedule Calculations</h1> <ul style="list-style-type: none"> • Overall window of project time defined by: <ul style="list-style-type: none"> – Estimated Start Time – Required Completion Time 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.7 Control Schedule</h1> <p>Influencing..., determining..., managing...</p>				
Integration					
Scope					
Time					
Cost	<h2>6.7.1 Inputs</h2> 				
Quality	<ul style="list-style-type: none"> <li>.1 Project Management Plan <li>.2 Project Schedule <li>.3 Work Performance Data <li>.4 Project Calendars <li>.5 Schedule Data <li>.6 Organizational Process Assets 				
HR					
Communications					
Risk					
Procurement					
Stakeholder					
<p>Student Copy – Not for Reproduction or Distribution</p>					
<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>					
<p>163</p>					

6.7 Control Schedule

6.7.2 Tools & Techniques

- .1 Performance Reviews
- .2 PM Software
- .3 Resource Optimization Techniques
- .4 Modeling Techniques
- .6 Leads & Lags
- .7 Schedule Compression
- .8 Scheduling Tool



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>6.7 Control Schedule</h1>				
Integration					
Scope					
Time	<h2>6.7.3 Outputs (Figure 6-23)</h2> <ul style="list-style-type: none"> .1 Work Performance Information .2 Schedule Forecasts .3 Change Requests .4 Project Management Plan Updates .5 Project Document Updates .6 Organizational Process Assets Updates 				
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					



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PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition

Practice Test Time!

Chapter 6 Project Time Management

Project Cost Management

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ASQ Certified Manager of Quality / Organizational Excellence
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Innovative Management Solutions, LLC

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Cost Management Processes

- Estimate Costs
 - Approximation of the cost for the resources needed
- Determine Budget
 - Allocating the cost estimate to individual work items
 - Output: cost baseline
- Control Costs
 - Controlling changes to the budget

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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Assumption of Finance 101

- Profits
- Profit margin
- Life-cycle Costing
- Cash Flow Analysis
- Internal Rate of Return (IRR)
- Tangible Costs (Benefits)
- Intangible Costs (Benefits)
- Direct Costs
- Indirect Costs
- Sunk Costs

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.1 Plan Cost Management</h1> <h2>7.2.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Project Management Plan <li>.2 Project Charter <li>.3 Enterprise Environment Factors <li>.4 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.1 Plan Cost Management</h1>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.1 Plan Cost Management</h1> <h2>7.2.3 Outputs (Figure 7-2)</h2> <h3>.1 Cost Management Plan</h3>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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				173	

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.2 Estimate Costs</h1> <p>Developing “approximation” of cost of resources Includes evaluation of different alternatives</p>				
Integration					
Scope					
Time					
Cost	<h2>7.2.1 Inputs</h2> <ul style="list-style-type: none"> .1 Cost Management Plan .2 HR Management Plan .3 Scope Baseline .4 Project Schedule .5 Risk Register .6 Enterprise Environmental Factors .7 Organizational Process Assets 				
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.2 Estimate Costs</h1> <h2>7.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Analogous estimating <li>.3 Parametric Estimating <li>.4 Bottom-up Estimating <li>.5 Three-point Analysis <li>.6 Reserve Analysis <li>.7 Cost of Quality <li>.8 PM Estimating Software <li>.9 Vendor Bid Analysis <li>.10 Group Decision Making Techniques 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Cost Estimation Techniques

- Analogous (Top Down)
 - Actual cost of similar project
 - Less costly, less accurate
- Bottom Up estimating
 - Estimating individual work items and summing
 - More Accurate, time consuming
 - General approach used by software tools
- Parametric
 - Using known rates and quantities
 - Accurate

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Types of Cost Estimates

Type Estimate	When	Why	Accuracy
Rough Order of Magnitude	Very Early	Estimate of costs for project selection	-25% to +75%
Definitive	Later	Provides detail, estimates actual cost	-5% to + 10%



Source: Schwalbe, K. (2001). Information Technology Project Management. 2nd ed.

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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Concepts for Cost Estimating

- Beta Distribution: $cE = \frac{cO + 4cM + cP}{6}$
- $SD = \frac{P - O}{6}$
- Variance = $\left(\frac{P - O}{6}\right)^2$
- Triangular distribution: $cE = \frac{cO + cM + cP}{3}$

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.2 Estimate Costs</h1> <h2>7.2.3 Outputs (Figure 7-5)</h2> <ul style="list-style-type: none"> <li>.1 Activity Cost Estimates <li>.2 Basis of Estimates <li>.3 Project Document Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				

7.3 Determine Budget

Establishes a cost baseline for measuring project performance



Cost

7.3.1 Inputs

- .1 Cost Management Plan
- .2 Scope Baseline
- .3 Activity Cost Estimates
- .4 Basis of Estimates
- .5 Project Schedule
- .6 Resource Calendars
- .7 Risk Register
- .8 Agreements
- .0 Organizational Process Assets

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7.3 Determine Budget

7.3.2 Tools & Techniques



.1 Cost Aggregation

Schedule Activity – Work Package – Higher Components – Entire Project

.2 Reserve Analysis

.3 Expert Judgment


.4 Historical Relationships

.5 Funding Limit Reconciliation

Reserves

- Contingency Reserves
 - Can be partially planned for
 - Known-unknowns
 - e.g., known rate of personnel turnover
- Management Reserves
 - Unpredictable
 - Unknown-unknowns
- Not a part of the baseline, but included in the project budget (which means not a part of EVA)



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.3 Determine Budget</h1> <h2>7.3.3 Outputs (Figure 7-7)</h2> <ul style="list-style-type: none"> <li>.1 Cost Performance Baseline <li>Baseline, or time-phased budget used to measure, monitor, and control cost performance; excluding management reserves (including work package estimates and contingency reserves) <li>.2 Project Funding Requirements <li>.3 Project Document Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; text-align: center;"> Student Copy – Not for Reproduction or Distribution </div> <div style="text-align: right; padding: 5px;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div>				

Budget Components

- Check out figure 7-8 (PMBOK, 2013, p. 213)

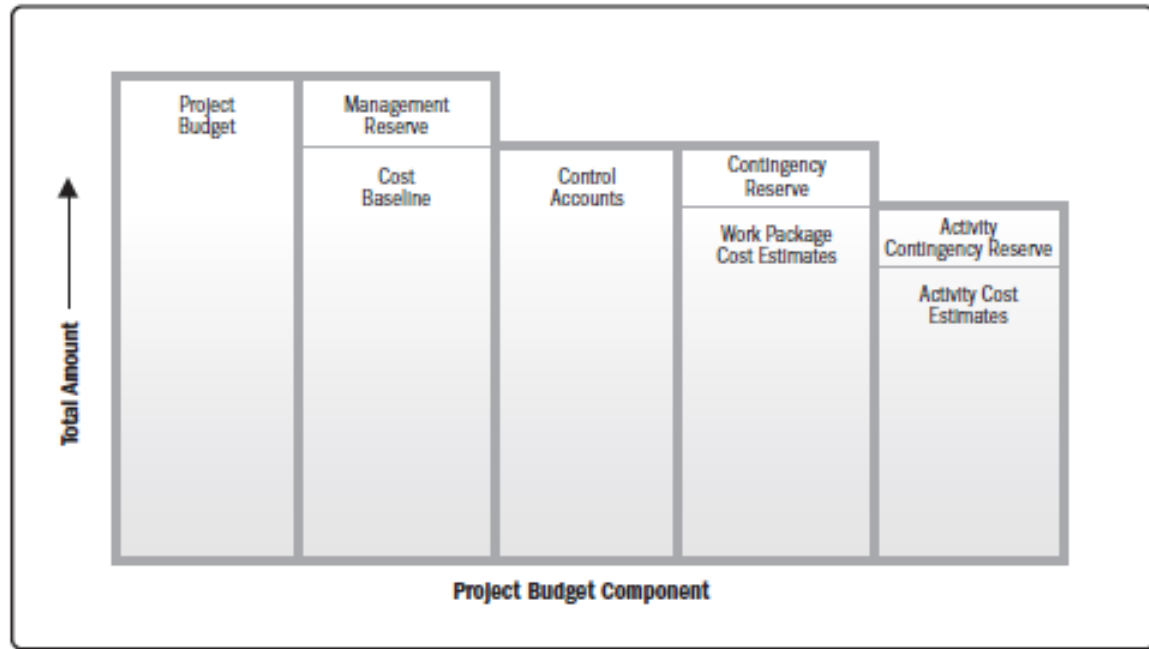


Figure 7-8. Project Budget Components

Budget Estimate Question




- Projected cost = \$2,200,000
- Estimate SD = \$110,000
- Budget (including reserve) = \$2,420,000
- Assuming cost estimates are normally distributed, what is the probability of completing the project over budget?

+/- 1 SD = \$2,310,000 ~ \$2,090,000

+/- 2 SD = \$2,420,000 ~ \$1,980,000

Here's the logic...

- 95% of the results fall within +/- 2 SDs of an “in control” process
- So...5% of the results fall outside of +/- 2 SDs
- We're only concerned about half of those...over budget...so, we have a 2.5% chance of going over budget 😊

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.4 Control Costs</h1> <h2>Influencing, recording, informing</h2> <h3>7.4.1 Inputs</h3> <ul style="list-style-type: none"> .1 PM Plan .2 Project Funding Requirements .3 Work Performance Data .4 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.4 Control Costs</h1> <h2>7.4.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 EVM <li>.2 Forecasting <li>.3 TCPI <li>.4 Performance Reviews <li>.5 PM Software <li>.6 Reserve Analysis 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				

Knowledge Area: Integration, Scope, Time, **Cost**, Quality, HR, Communications, Risk, Procurement, Stakeholder

Earned Value Management (EVM)

- **Budgeted Cost of Work Performed (EV):**
 - Earned Value
 - Amount budgeted for the work “as of” a date
- **Actual Cost of Work Performed (AC):**
 - Actual Costs for the work ‘as of’ a date
- **Budgeted Cost of Work Scheduled (PV):**
 - Planned Value
 - Sometimes called Performance Baseline or Performance Measurement Baseline



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Variance (*Earned Value*)

- **Cost Variance (CV) = EV - AC**
 - Negative indicates over budget
 - CPI: Represent as a % by **EV/AC**
- **Schedule Variance (SV) = EV - PV**
 - Negative indicates behind schedule
 - SPI: Represent as a % by **EV/PV**
- **Budget at Completion (BAC = Baseline or revised budget)**



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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Cost/Schedule Performance Index (CPI/SPI)

- Indicates Cost or Schedule Efficiency for accomplished work.
 - > 1.0 - Ahead of Schedule
 - = 1.0 - On Schedule
 - < 1.0 - Behind Schedule



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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Earned Value

- Estimate at Completion (EAC)
 - For ETC work at budgeted rate (optimistic):

$$EAC = AC + (BAC - EV)$$
 Note: $BAC - EV = \text{Remaining PV}$
 - For ETC work at present CPI (pessimistic):

$$EAC = AC + [(BAC - EV) / CPI]$$

$$EAC = BAC / CPI$$
 - For ETC considering both SPI & CPI

$$EAC = AC + [(BAC - EV) / (CPI \times SPI)]$$
 - Fundamentally flawed estimates:

$$EAC = AC + ETC$$

- Estimate to Complete (ETC)
 - $$ETC = EAC - AC$$

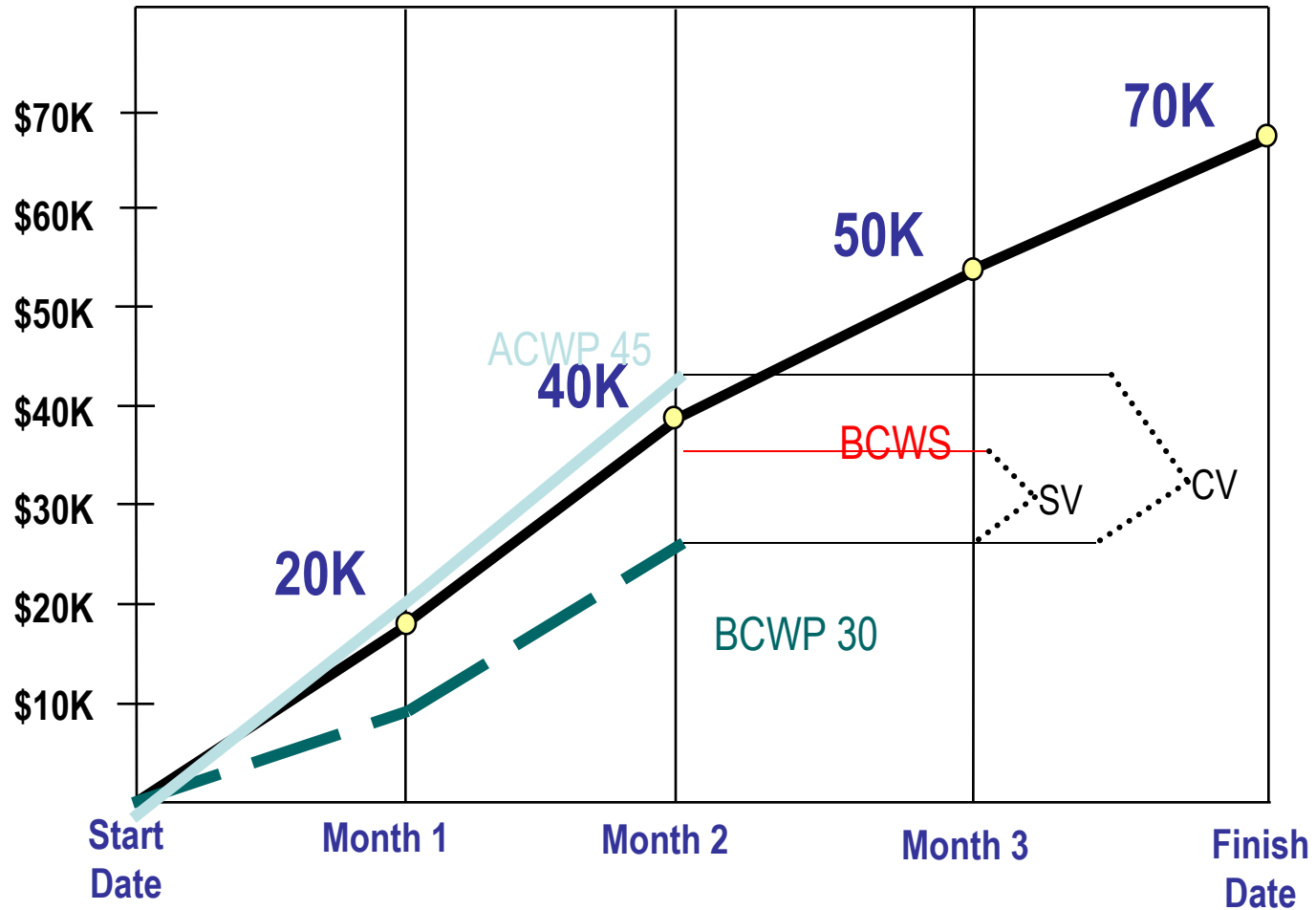


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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time	<h1 style="text-align: center;">To-Complete Performance Index</h1> <ul style="list-style-type: none"> • Performance that must be achieved on remaining work to meet a specified goal (i.e. BAC or EAC) 				
Cost					
Quality HR Communications Risk Procurement	$TCPI = (BAC - EV) / (BAC - AC)$ <p style="text-align: center;">or</p> $TCPI = \text{Work Remaining} / \text{Funds Remaining}$				
Stakeholder	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: yellow; padding: 5px; border: 1px solid black;"> Student Copy – Not for Reproduction or Distribution </div> <div> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div> <div style="text-align: right;"> 192 </div> </div>				

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

EVM in Action



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Earned Value (Exercise)</h1> <p>IF :</p> <div>EV = \$6000</div> <div>PV = \$7000</div> <div>AC = \$8000</div> <p>Find CV, SV, CPI, SPI</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				

Budget Variance



Today

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Activity A (Garage)	\$1000	\$2000	\$500	\$1000	\$6000	\$4500	\$3500	\$2000
B (Storage)	\$2000	\$1000	\$1500	\$2000				

Total Budget:

Activity A is 50% complete & AC are \$12,000; **EV (A) =**

Activity B is 100% complete & AC were \$8,000; **EV (B) =**

PV(A) = PV (B) = PV(P) =

CV (A)? CV (B)? CV = - =

SV (A)? SV (B)? SV = - =

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>7.4 Control Costs</h1> <h2>7.4.3 Outputs (Figure 7-11)</h2> <ul style="list-style-type: none"> <li>.1 Work Performance Measurements <li>.2 Cost Forecasts <li>.3 Change Requests <li>.4 PM Plan Updates <li>.5 Project Documentation Updates <li>.6 Organizational Process Asset Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	196		

EVM Exercise



PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition

Practice Test Time!

Chapter 7 Project Cost Management

Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Remember...

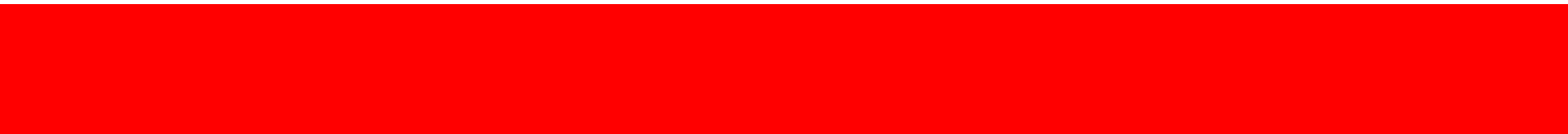
- Cost Management should consider effect of decisions on the following costs as related to the project product/service...
 - Using
 - Maintaining
 - Supporting



Project Quality Management

Chuck Millhollan, MBA, MPM, PMP, PgMP
IIBA Certified Business Analysis Professional (CBAP)
ASQ Certified Six Sigma Black Belt
ASQ Certified Software Quality Engineer
ASQ Certified Manager of Quality / Organizational Excellence
chuck.milhollan@gmail.com
Innovative Management Solutions, LLC

What is Quality?




Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Quality Concepts</h1> <ul style="list-style-type: none"> <li>• Who defines quality? <li>• How have customer expectations evolved? <li>• What are the benefits of a quality program? 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<b>Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Elements of a Quality Focus</h1> <ul style="list-style-type: none"> • Quality first – not short-term profit • Consumer orientation – not producer orientation • The next process is your customer • Use facts and data to make decisions • Respect for knowledge base is a management philosophy • Cross-functional management 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>204</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Bottom Line...</h1> <ul style="list-style-type: none"> <li>• External customers define quality <li>• Internal customers produce quality <li>• Albrecht's Theory of Service Relativity <ul style="list-style-type: none"> <li>– $V = R - E$ <li>– Determines net gain or loss 				
Integration					
Scope					
Time					
Cost					
Quality					
HR	<p>Source: Goetsch, D., and Davis, S. (2000). Quality Management: Introduction to Total Quality Management for Production, Processing, and Services. 3rd ed.</p>				
Communications					
Risk					
Procurement					
Stakeholder					

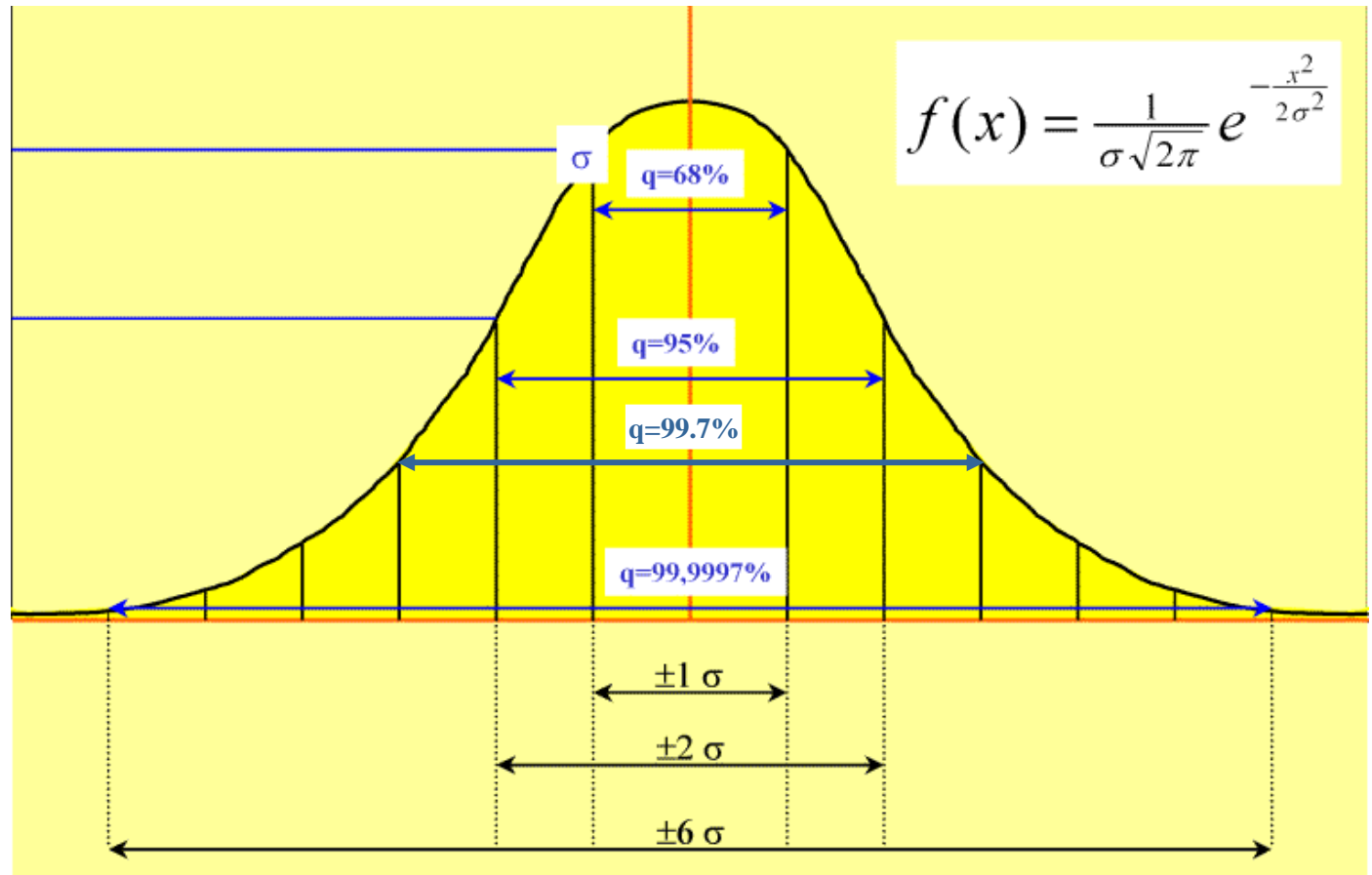
Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Responsibility for Quality</h1> <ul style="list-style-type: none"> <li>• The primary responsibility for quality is with the project manager <li>• Quality is not an assignable task. It must be rooted and institutionalized in every process <li>• It is everyone's responsibility: <ul style="list-style-type: none"> <li>– Self inspection <li>– It's the system that causes the problems - and that is management's responsibility 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>8.1 Plan Quality Management</h1> <p>Project quality management must address management of the project and the product of the project</p> <p>Involves identifying which quality standards are relevant to project and determining how to satisfy them</p> <p>8.1.1 Inputs</p> <ul style="list-style-type: none"> .1 Project Management Plan .2 Stakeholder Register .3 Risk Register .4 Requirements Documentation .5 Enterprise Environmental Factors .6 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Quality Standards</h1> <ul style="list-style-type: none"> <li>• Six Sigma <li>• TQL <li>• ISO (e.g. 14000) <li>• MBNQA <li>• Systems Perspective... 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Normal Distribution



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Six Sigma Phases</h1> <ul style="list-style-type: none"> • DMAIC processes <ul style="list-style-type: none"> – Define <ul style="list-style-type: none"> • Process map, VOC, Stakeholder analysis – Measure <ul style="list-style-type: none"> • Sampling, Data collection, Process Capability – Analyze <ul style="list-style-type: none"> • Cause analysis, Hypothesis testing, DOE – Improve <ul style="list-style-type: none"> • Evaluate, plot, & implement solution • Verify and measure gains – Control <ul style="list-style-type: none"> • Control charts • Lessons learned, standardization, train 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC	210		

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

8.1 Plan Quality Management

8.1.2 Tools & Techniques



- .1 Benefit/Cost Analysis
- .2 Cost of Quality
 - Crosby – Cost of conformance vs non-conformance
- .3 Seven Basic Quality Tools
- .4 Benchmarking
- .5 Design of Experiments
 - A structured, organized method for determining the relationship between factors (Xs) affecting a process and the output of that process (Y)
- .6 Statistical Sampling
- .7 Additional Quality Planning Tools
- .8 Meetings

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PMBOK 5th Edition Figure 8-5

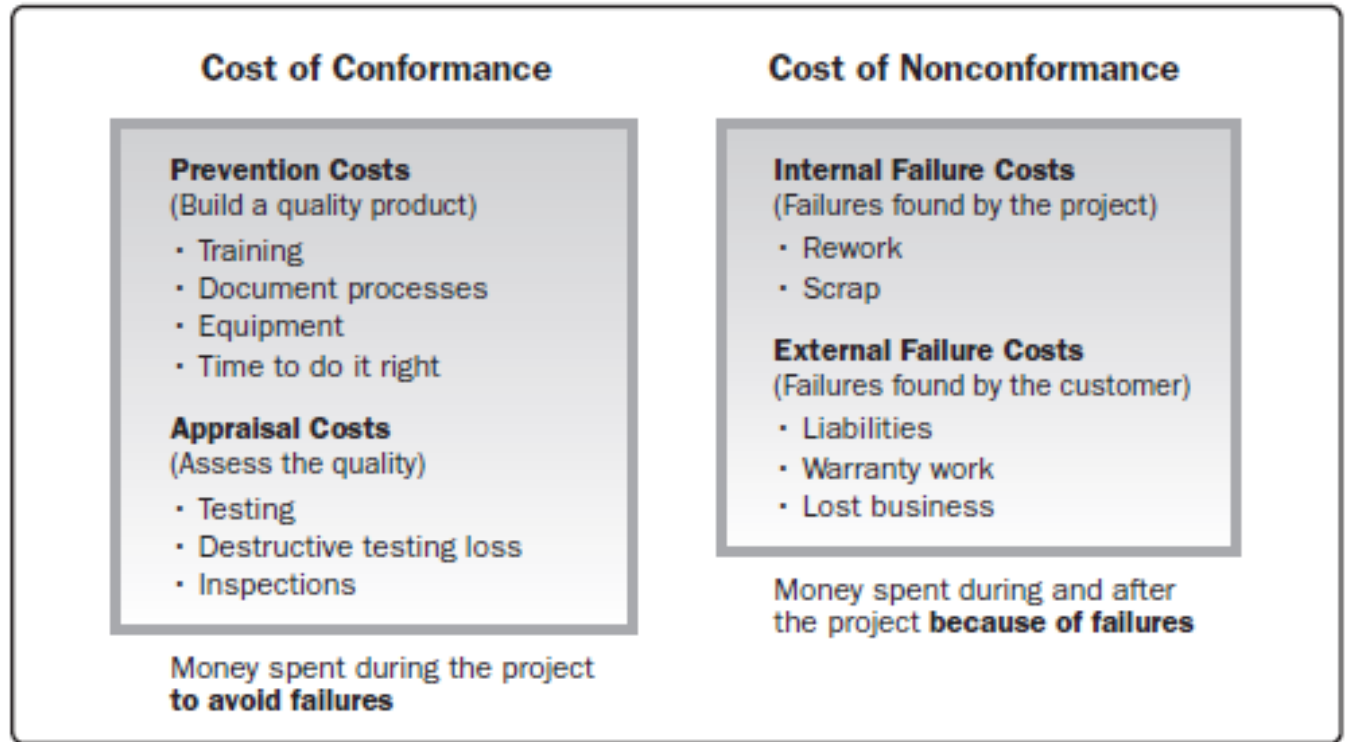


Figure 8-5. Cost of Quality

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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Deming's PDCA Cycle

- Plan what to do.
 - Could be design features or an improvement in the process itself. Use Pareto analysis to identify the most important aspects.
- Do the experimentation.
 - Explore the problem by experimentation, identify and investigate causes.
- Check the solutions.
 - To see if the assumptions and ideas were correct.
- Act on the results.
 - Implement on a scale appropriate to the problem

Source: Goetsch, D., and Davis, S. (2000). Quality Management: Introduction to Total Quality Management for Production, Processing, and Services. 3rd ed.

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The Seven Basic Quality Tools

Know what they're used for...

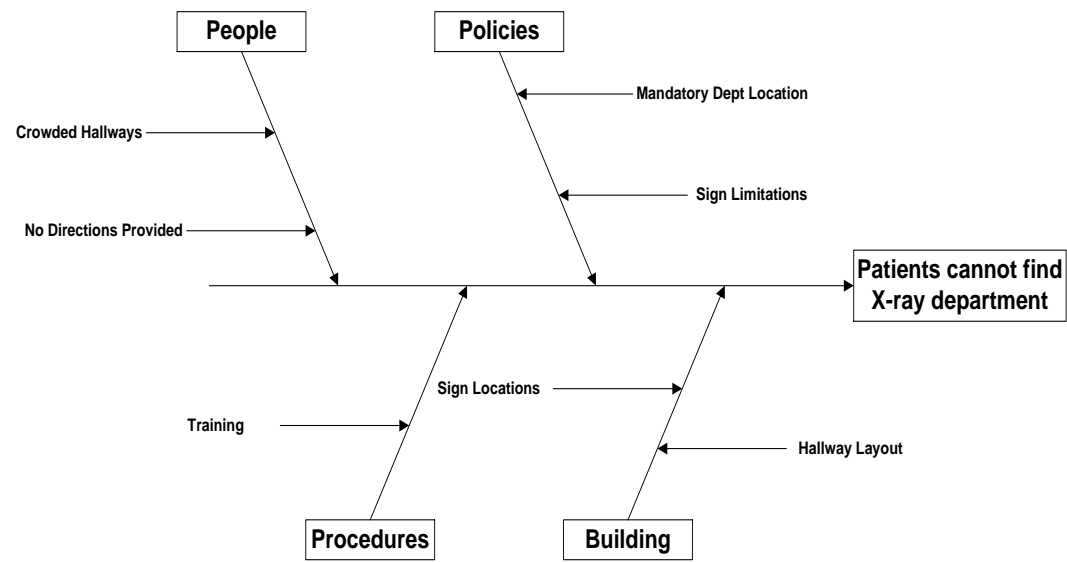
Knowledge Area
 Integration
 Scope
 Time
 Cost

1. Cause-n-Effect Analysis (Fishbone, Ishikawa)

- Visual tool used to logically organize possible causes for a problem by graphically displaying them in increasing detail
- Helps to identify root causes and ensures common understanding of the causes

Quality

HR
 Communications
 Risk
 Procurement

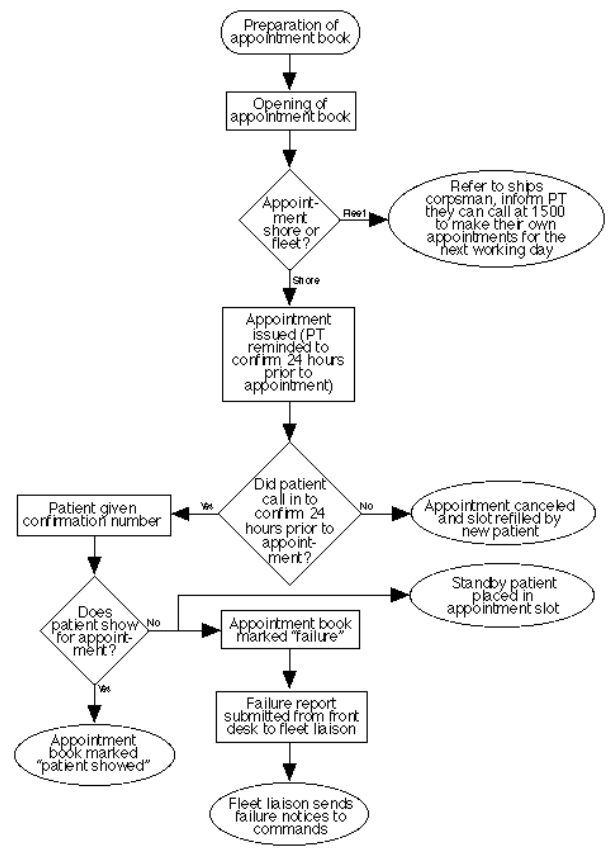


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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

2. Flow Charts

- Show the order or sequence of activities
- Indicates action items & decision points
- Used to map a process



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>3. Checksheets</h1> <ul style="list-style-type: none"> <li>• Tally sheet <li>• Use for... <ul style="list-style-type: none"> <li>– Gathering data <li>– Organizing facts <li>– Collecting attribute data during inspections 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

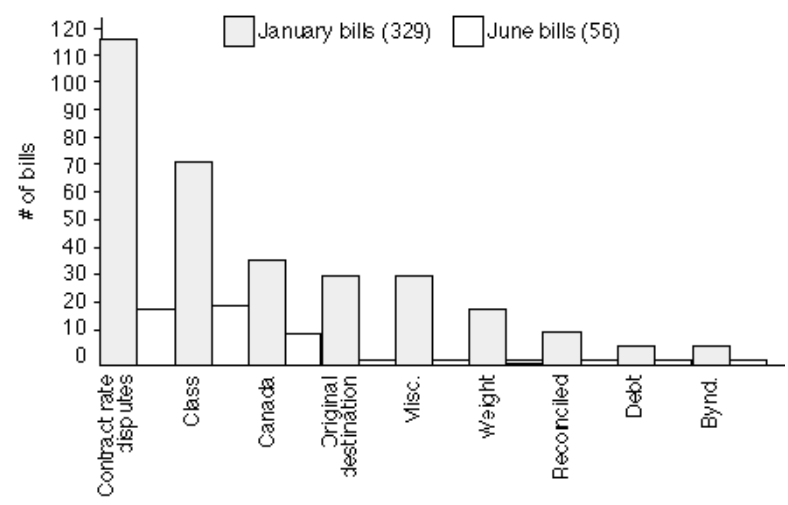
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4. Pareto Chart, 80/20 Rule

- Distribution arranged in frequency
- Graphical picture of the most frequent causes
- Used to determine greatest potential for improvement



Reduced Payment Freight Bills
- After Standardization -



Knowledge Area

Integration

Scope

Time

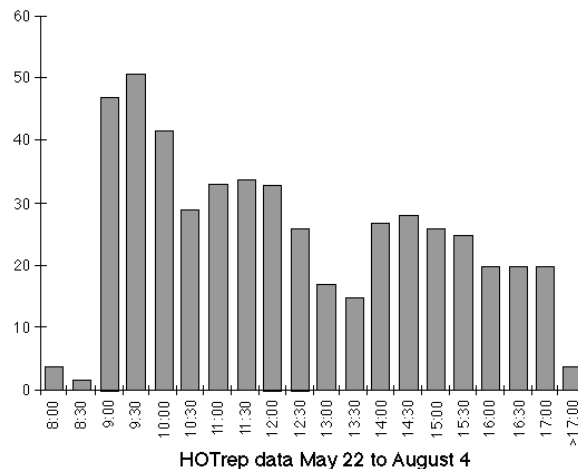
Cost

Quality

5. Histograms

- Distribution of variables
- Summarize data collected over a period of time
- Helps identify the cause from the shape & width of the distribution.

– Exam scores



HR

Communications

Risk

Procurement

Stakeholder

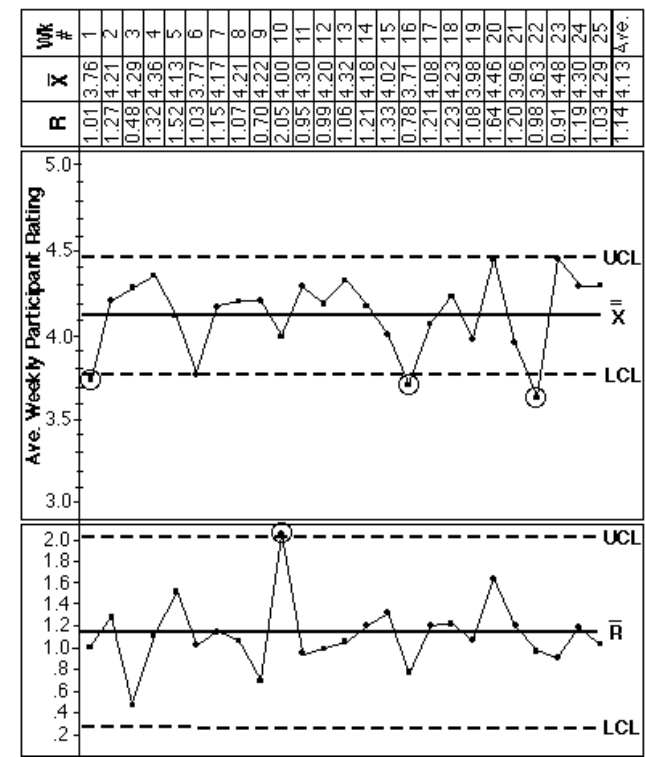
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6. Control Charts



- Run chart with control limits
- Mathematically constructing UCL & LCL at 3 standard deviations above and below the average
- Common causes - random events
- Special causes - unique events
- Goal is to determine variation source, then eliminate special causes & reduce common causes to improve quality
- Rule of “7s”

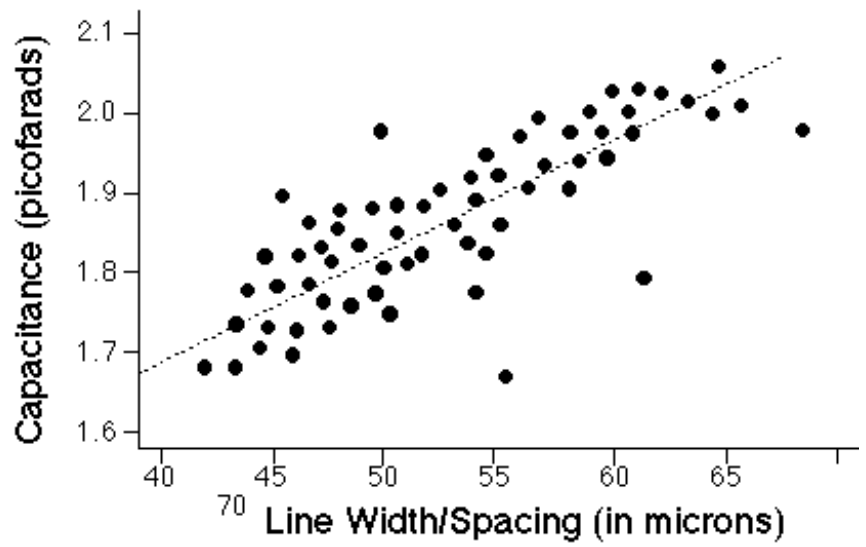
n = 10 evaluations randomly sampled each week
1-Not at all 2-Not very 3-Moderately 4-Very 5-Extremely





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7. Scatter Diagram

- Shows relationship between two variables
 - Joint failures and temperature
- The closer the points...the more closely the variables are related



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">What Should You Benchmark?</h1> <ul style="list-style-type: none"> • Systems, Processes, or Practices which... <ul style="list-style-type: none"> • Incur the highest costs • Major impact on customer satisfaction • Major impact on cycle time • Major impact on quality • High impact on competitive position • Present the most significant area for improvement • Have high probability of support and resources if selected 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p style="text-align: right;">222</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>8.1 Plan Quality Management</h1> <h2>8.1.3 Outputs (Figure 8-4)</h2> <ul style="list-style-type: none"> <li>.1 Quality Management Plan <ul style="list-style-type: none"> <li>Must address QC, QA, and Continuous Improvement <li>.2 Process Improvement Plan <li>.3 Quality Metrics <ul style="list-style-type: none"> <li>What is measured, how it is measured <li>.4 Quality Checklists <li>.5 Project Document Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
Student Copy – Not for Reproduction or Distribution		<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p>223</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Quality Assurance</h1> <ul style="list-style-type: none"> <li>• The process of auditing quality requirements and results from quality control to ensure standards and definitions are used <li>• Primary purpose is to facilitate the improvement of quality processes 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				

8.2 Perform Quality Assurance

Ensure project will employ all processes to meet defined requirements

8.2.1 Inputs to Quality Assurance

- .1 Quality Management Plan
- .2 Process Improvement Plan
- .3 Quality Metrics
- .4 Quality Control Measurements
- .5 Project Documents



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>8.2 Perform Quality Assurance</h1> <h2>8.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Quality Management and Control Tools <li>.2 Quality Audits – the objective of a quality audit is to identify inefficient and ineffective polices, processes, and procedures <li>.3 Process Analysis <p>Audits also confirm implementation of approved change requests, corrective actions, defect repairs, and preventive actions</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div> </div> <div> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> <div> <p>226</p> </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>8.2 Perform Quality Assurance</h1> <h2>8.2.3 Outputs (Figure 8-9)</h2> <ul style="list-style-type: none"> <li>.1 Change Requests <li>.2 PM Plan Updates <li>.3 Project Document Updates <li>.4 Organizational Process Assets Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost	<h1>Quality Control</h1> <p>The process of monitoring and recording results to assess performance and recommend changes</p>				
Quality	<p>Key benefits</p> <ul style="list-style-type: none"> <li>• Identify the causes of poor process or product quality and recommended and/or taking action to eliminate the causes <li>• Validating that deliverables and work meet requirements for final acceptance 				
HR Communications Risk Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; text-align: center;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="text-align: right; padding: 5px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p>228</p> </div>				

8.3 Perform Quality Control

Involves monitoring specific project results to determine if they comply w/ relevant standards & identifying ways to eliminate causes of unsatisfactory results

Quality

8.3.1 Inputs to Quality Control

- .1 PM Plan
- .2 Quality Metrics
- .3 Quality Checklists
- .4 Work Performance Data
- .5 Approved Change Requests
- .6 Deliverables
- .7 Project Documents
- .8 Organization Process Assets



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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

8.3 Perform Quality Control

8.3.2 Tools & Techniques

- .1 Seven Basic Quality Tools
- .2 Statistical Sampling
- .3 Inspection
- .4 Approved Change Request Review



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2>8.3 Perform Quality Control</h2> <p>Gold Plating is adding “scope” that does not add value or quality to the deliverables</p> <p>8.3.3 Outputs (Figure 8-11)</p> <ul style="list-style-type: none"> <li>.1 Quality Control Measurements <li>.2 Validated Changes: Accepted or rejected <li>.3 Verified Deliverables: Correctness of deliverables; Input to Validate Scope <li>.4 Work Performance Information <li>.5 Change Requests <li>.6 PM Plan Updates <li>.7 Project Document Updates <li>.8 Organizational Process Assets Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			

PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition

Practice Test Time!

Chapter 8 Project Quality Management

Project Human Resource Management

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ASQ Certified Six Sigma Black Belt
ASQ Certified Software Quality Engineer
ASQ Certified Manager of Quality / Organizational Excellence
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Innovative Management Solutions, LLC

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>9.1 Plan Human Resource Management</h1>				
Integration					
Scope	9.1.1 Inputs				
Time	.1 Project Management Plan				
Cost	.2 Activity Resource Requirements				
Quality	.2 Enterprise Environmental Factors				
HR	Organizational – Working arrangements, formal/informal relationships				
Communications	Technical – What disciplines and specialties are required				
Risk	Interpersonal – Formal/informal “reporting” relationships, cultural impacts, language, etc...				
Procurement	.3 Organizational Process Assets				
Stakeholder					

9.1 Plan Human Resource Management

9.1.2 Tools & Techniques

- .1 Organizational Charts and Position Descriptions
OBS
Resource Breakdown Structure (RBS) – breaks down the project by “types” of resources
Matrix-based – RAM: e.g. RACI (Responsible, Accountable, Consult, Inform)
- .2 Networking
- .3 Organizational Theory
- .4 Expert Judgment
- .5 Meetings



Knowledge Area: Integration, Scope, Time, Cost, Quality

HR

Communications, Risk, Procurement, Stakeholder

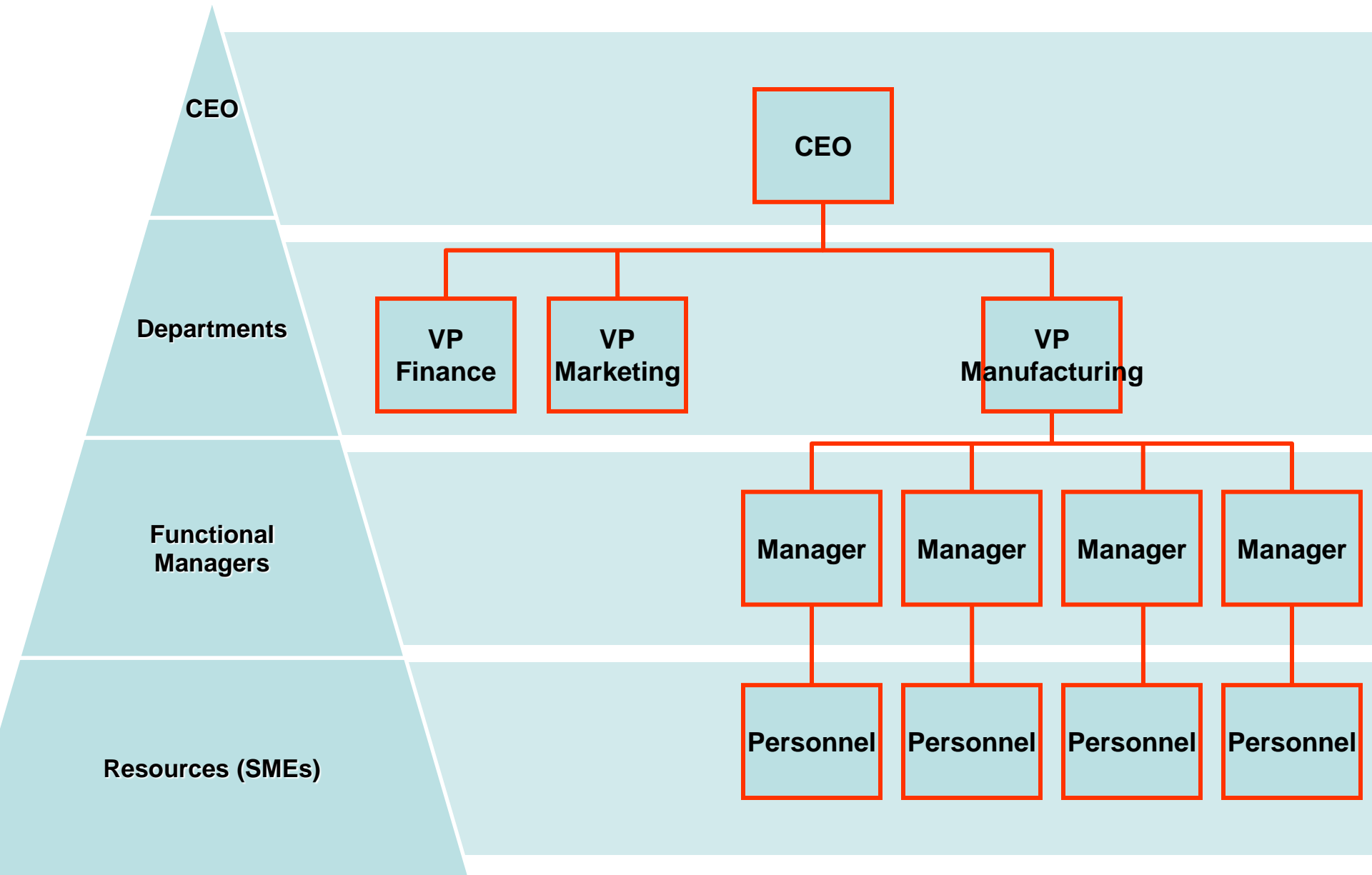
Organizational Influences

- Project-based organizations have management systems that help projects
 - Matrix (PM budget authority varies...highest in “strong”)
 - Projectized (PM has almost total authority)
- Project management is more difficult in non-project-based organizations
 - Functional
- The maturity of an organization with respect to PM systems, culture, style, structure, and PMO can influence project work

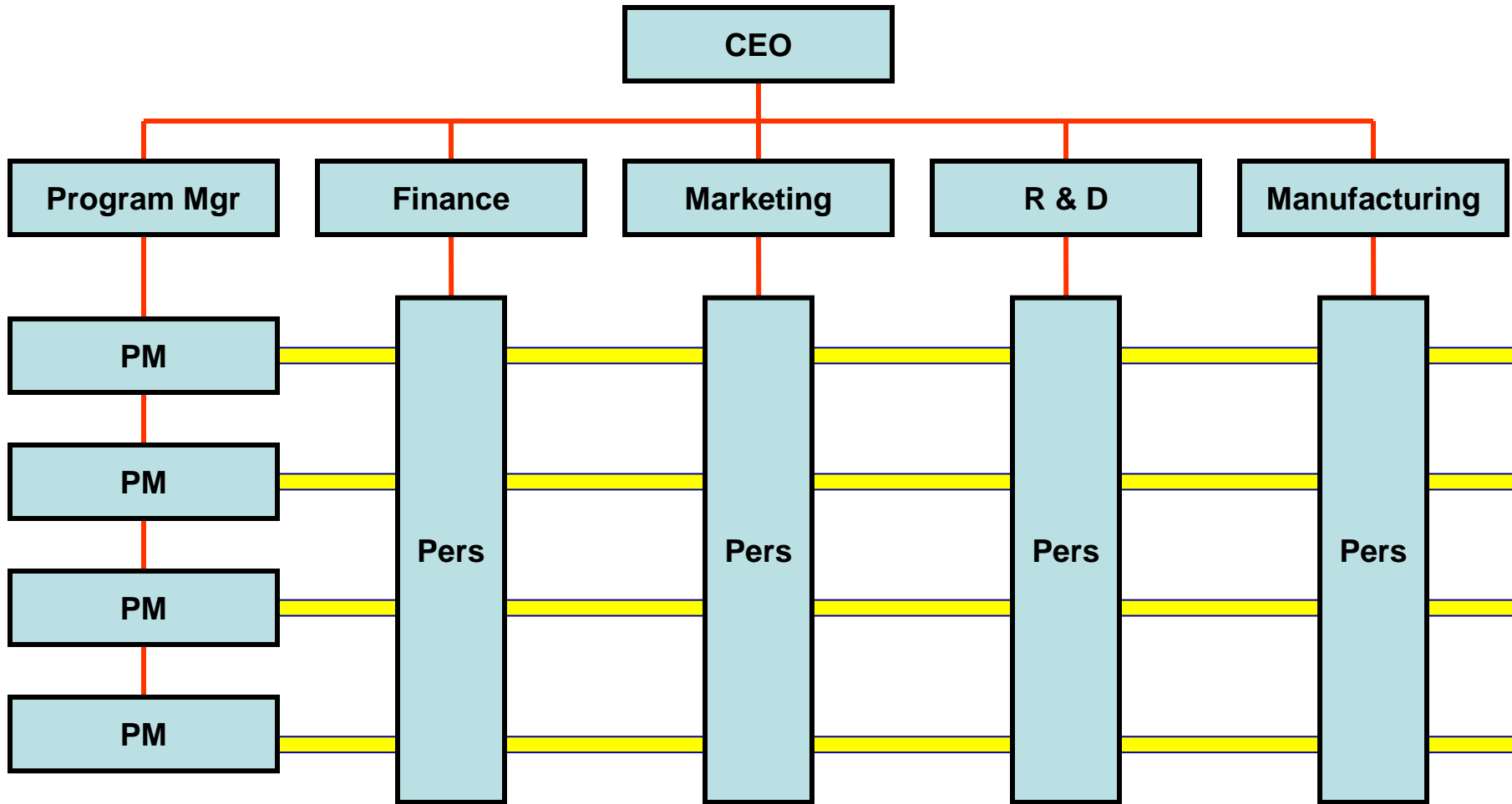


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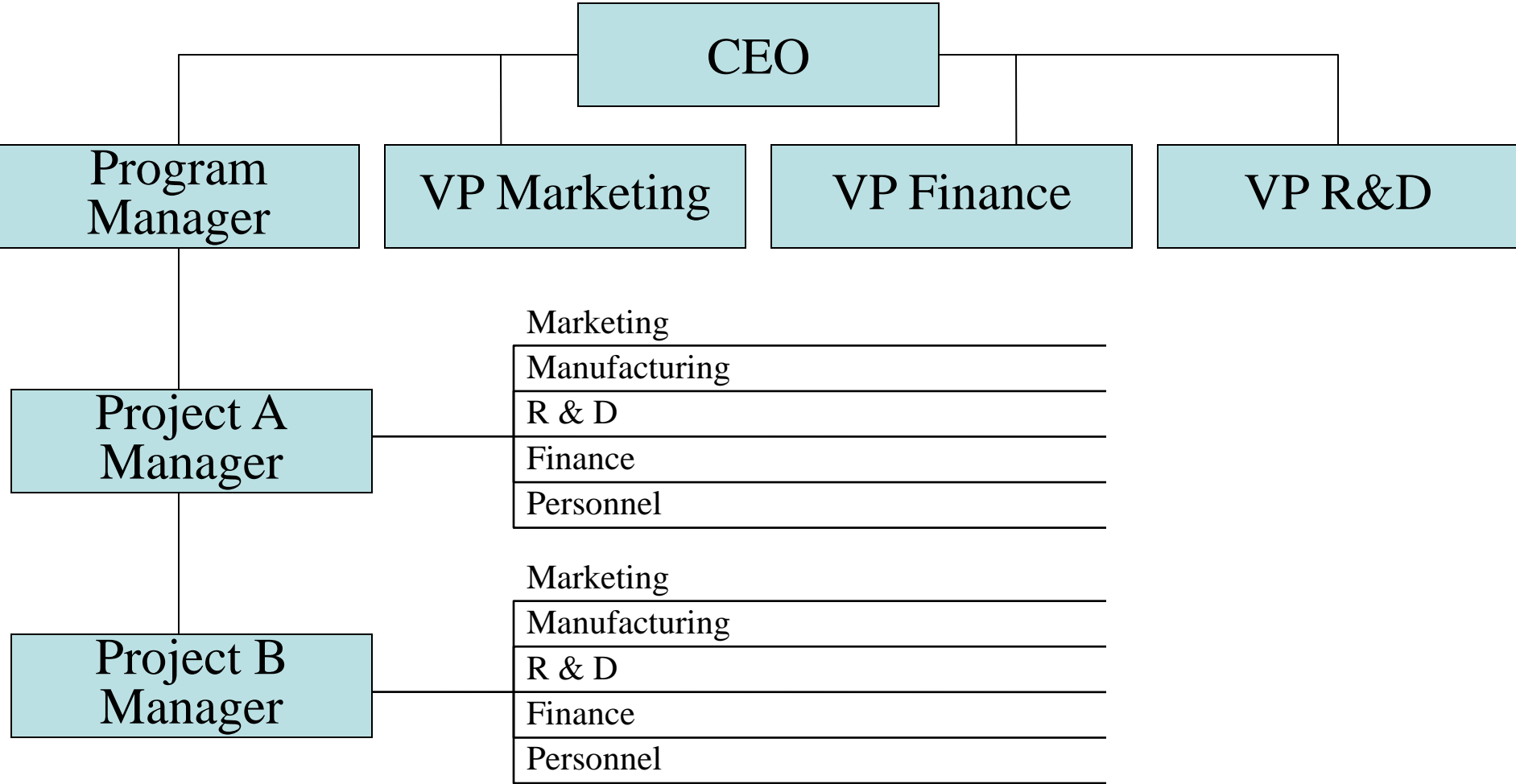
Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Functional, Divisional Organizations</h1> <ul style="list-style-type: none"> <li>• Hierarchies with many levels of management <li>• People become relatively confined to their own area of specialization <li>• Driven by a top-down approach in which managers provide considerable direction and have considerable control over others <li>• Reduces duplication of activities (single division) <li>• Encourages technical expertise (peer groups) <li>• Creates narrow perspectives (can foster rivalry) <li>• Difficult to coordinate across functions 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					




Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>Matrix Structures</h1> <ul style="list-style-type: none"> <li>• Reinforces & broadens technical excellence <li>• Facilitates efficient use of resources <li>• Balances conflicting objectives of the organization <li>• Increases power conflicts <li>• Increases confusion & stress for 2-boss employees <li>• Impedes decision making 				
HR					
Communications Risk Procurement Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Projectized Structures</h1> <ul style="list-style-type: none"> <li>• Project manager is the resource manager <li>• Project manager has the most authority <li>• Can lead to less efficient use of resources <li>• Can limit access to technical expertise 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">9.1 Plan Human Resource Management</h1> <h2 style="text-align: center;">9.1.3 Outputs (Figure 9-3)</h2> <ul style="list-style-type: none"> .1 Human Resource Management Plan <ul style="list-style-type: none"> Roles & responsibilities Project organizational chart Staffing management plan  Staff release plan Training needs Recognition and rewards Compliance (regulation, unions, etc.) Safety 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC	244		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>9.2 Acquire Project Team</h1> <h2>9.2.1 Inputs</h2> <ul style="list-style-type: none"> .1 Human Resource Management Plan .2 Enterprise Environmental Factors .3 Organizational Process Assets 				
HR					
Communications Risk Procurement					
Stakeholder	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: yellow; padding: 5px;"> Student Copy – Not for Reproduction or Distribution </div> <div> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div> <div style="text-align: right;"> 245 </div> </div>				


Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>9.2 Acquire Project Team</h1>				
Integration					
Scope	<h2>9.2.2 Tools & Techniques</h2>				
Time	<ul style="list-style-type: none"> .1 Pre-assignment 				
Cost	<ul style="list-style-type: none"> .2 Negotiations (with both functional managers to ensure competent/available resources and with other PMs to procure scarce/specialized resources) 				
Quality					
HR	<ul style="list-style-type: none"> .3 Acquisition 				
Communications	<ul style="list-style-type: none"> .4 Virtual Teams (Communications planning more important) 				
Risk	<ul style="list-style-type: none"> .5 Multi-Criteria Decision Analysis: 				
Procurement	<ul style="list-style-type: none"> Availability, cost, experience, ability, etc. 				
Stakeholder	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: yellow; padding: 5px;">Student Copy – Not for Reproduction or Distribution</div> <div style="text-align: right;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div> </div>				



9.2.2 Tools & Techniques

- .1 Pre-assignment
- .2 Negotiations (with both functional managers to ensure competent/available resources and with other PMs to procure scarce/specialized resources)
- .3 Acquisition
- .4 Virtual Teams (Communications planning more important)
- .5 Multi-Criteria Decision Analysis:
Availability, cost, experience, ability, etc.

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>Assign the Project Team</h1> <ul style="list-style-type: none"> • “Continuity” is important... <ul style="list-style-type: none"> – Concept Team – Planning Team – Execution Team • Key skills and players • May need contract (third-party) help <ul style="list-style-type: none"> – Procurement Planning 				
HR					
Communications Risk Procurement Stakeholder					
<div style="background-color: yellow; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div> <div style="float: right; text-align: right; font-size: small;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div>					


Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>9.2 Acquire Project Team</h1> <h2>9.2.3 Outputs (Figure 9-8)</h2> <ul style="list-style-type: none"> .1 Project Staff Assignments .2 Resource Calendars: Time periods resources are available for work .3 PM Plan Updates 				
HR					
Communications Risk Procurement					
Stakeholder					

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Responsibility Assignment Matrix

- Shows level of responsibility for groups and/or individuals
- Graphically links the work to be done to those doing it

Task	Sales	Billing & Enrollment	Product Build	Applications Engineering
3.1.1	Primary			
4.2.1	Support	Primary	Support	
4.2.5		Support	Support	Primary
5.4			Primary	Support

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>9.3 Develop Project Team</h1> <p>Individual development is the foundation necessary to facilitate team development</p> <p>Improve team member skills and feelings to trust and cohesiveness among team members</p>				
HR	<h2>9.3.1 Inputs</h2> <ul style="list-style-type: none"> .1 Human Resource Management Plan .2 Project Staff Assignments .3 Resource Calendars 				
Communications Risk Procurement	<div style="text-align: right; margin-right: 50px;">  </div>				
Stakeholder	<div style="background-color: yellow; padding: 5px; text-align: center;"> Student Copy – Not for Reproduction or Distribution </div> <div style="text-align: right; margin-top: 10px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div>				

9.3 Develop Project Team

9.3.2 Tools & Techniques

- .1 Interpersonal Skills
- .2 Training
- .3 Team Building Activities
- .4 Ground Rules
- .5 Co-location
- .6 Recognition & Rewards
- .7 Personnel Assessment Tools: Attitudinal surveys, structured interviews, ability tests, etc.



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Stages of Team Development</h1> <ul style="list-style-type: none"> • Forming: Independent, not open • Storming: Not collaborative • Norming: Adjusting work habits and behaviors, learning to trust • Performing: Functioning as a well-organized unit, working through issues • Adjourning: Released from the project 				
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Knowledge Area
Integration
Scope
Time
Cost
Quality

HR

Communications
Risk
Procurement

Stakeholder


SWOTt Analysis


- **Strengths** Characteristics that allow the business to take advantage of opportunities or reduce the impact of barriers.
- **Weaknesses** Characteristics that could stand in the way of the business taking advantage of opportunities or reducing the impact of barriers.
- **Opportunities** Factors outside the business that allow it to take action to grow the business.
- **Threats** Factors outside the business that stands in the way of its efforts to grow the business.
- **Trends** Current factors that contribute to the business success within its industry.




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Power “Bases”

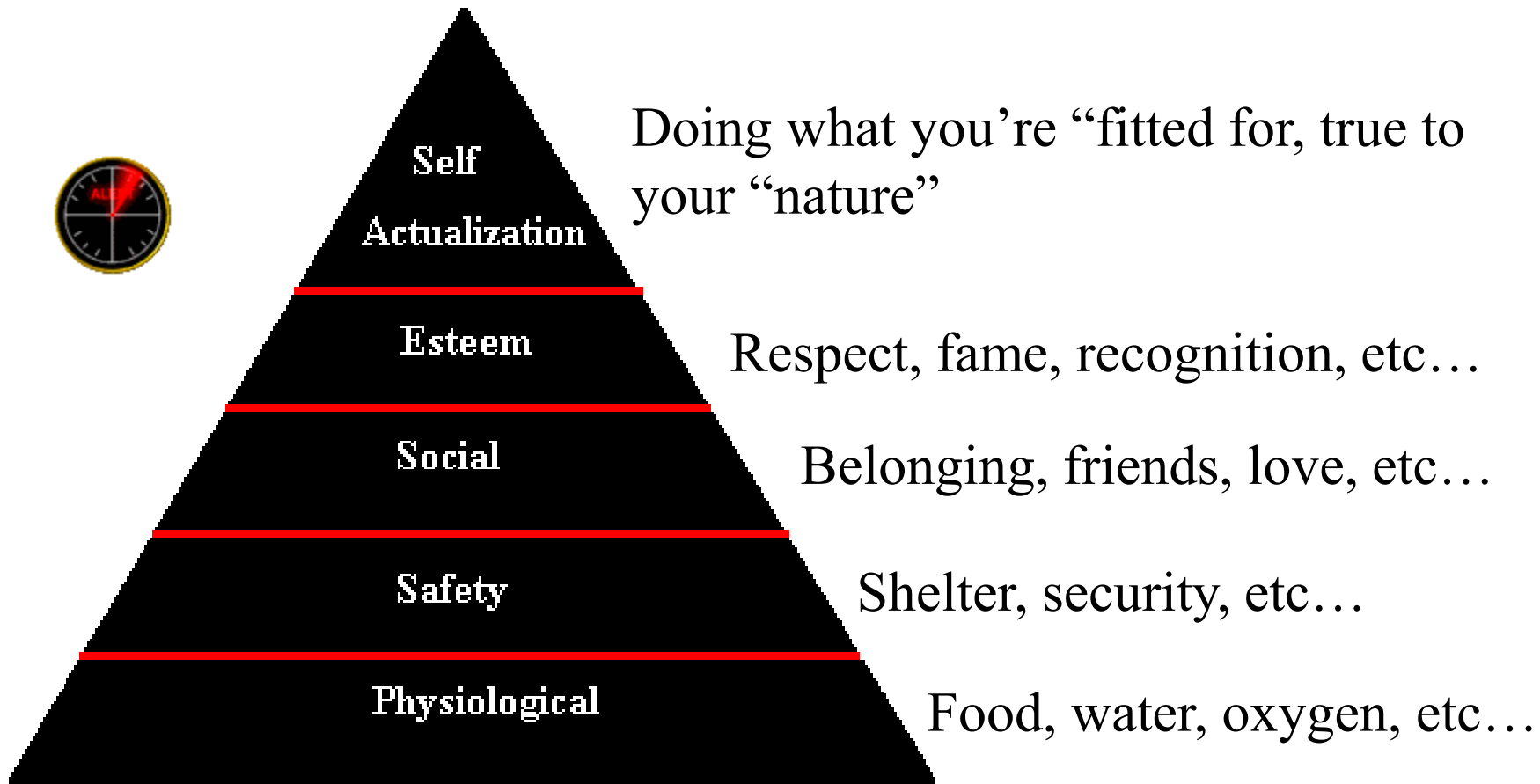
- Formal (legitimate)– Invested by the PM role
- Reward – Duh 😊 
- Penalty (coercive) - consequences
- Expert – PM knowledge
- Referent – team likes the PM, or wants to be liked by the PM

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	 <h1>Theory X</h1> <ul style="list-style-type: none"> • People inherently dislike work • People must be coerced or controlled to do work to achieve objectives • People prefer to be directed 				
HR					
Communications Risk Procurement					
Stakeholder					

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Theory Y</h1> <ul style="list-style-type: none"> <li>• People view work as being as natural as play and rest <li>• People will exercise self-direction and - control towards achieving objectives they are committed to <li>• People learn to accept and seek responsibility 				
Integration					
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Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					
					
<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: inline-block;"> Student Copy – Not for Reproduction or Distribution </div> <div style="display: inline-block; margin-left: 20px;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div> <div style="display: inline-block; margin-left: 20px;"> 256 </div>					

Maslow's Hierarchy of Needs



(Abraham Maslow, *Motivation and Personality*, 1954)

Knowledge Area
Integration
Scope
Time
Cost
Quality

HR

Communications
Risk
Procurement


Stakeholder

Motivator vs Hygiene Factors Theory

- Motivator factors increase job satisfaction
 - Achievement
 - Recognition
 - Work itself
 - Responsibility
 - Advancement
 - Growth
- Hygiene factors are those whose absence can create job dissatisfaction
 - Supervision
 - Company policy
 - Working conditions
 - Salary
 - Peer relationship
 - Security



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Vroom's Expectancy Theory</h1> <ul style="list-style-type: none"> <li>• An individual will act in a certain way based on the expectation that the act will be followed by a given outcome and on the attractiveness of that outcome to the individual <li>• Effort ~ Performance linkage (How hard will I have to work?) <li>• Performance ~ Reward linkage (What is the reward?) <li>• Attractiveness (How attractive is the reward?) 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

Knowledge Area
Integration
Scope
Time
Cost
Quality

HR

Communications
Risk
Procurement
Stakeholder



Ouchi's Theory Z

- Referred to as the “Japanese Management Style”
- Places a large amount of freedom and trust with workers, and assumes that workers have a strong loyalty and interest in team-working and the organization
- Places more reliance on the attitude and responsibilities of the workers vice management perspective (Theories X & Y)

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Knowledge Area

Integration

Scope

Time

Cost

Quality

Blanchard & Hershey's Leadership Behavior

- D4 Competent / Commitment
 - Experienced at the job, and comfortable with their own ability to do it well
- D3 Competent / Variable Commitment
 - Experienced and capable, but may lack the confidence/motivation to go it alone
- D2 Some Competence / Low Commitment
 - May have some relevant skills, but won't be able to do the job without help
- D1 Low Competence / Low Commitment
 - Lacks the specific skills required for the job in hand & and lacks confidence/motivation



HR

Communications

Risk

Procurement

Stakeholder

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Knowledge Area
Integration
Scope
Time
Cost
Quality

HR

Communications
Risk
Procurement
Stakeholder



Situational Leadership


- **Directing** - Leaders define the roles and tasks of the 'follower', and supervise them closely
- **Coaching** - Leaders still define roles and tasks, but seeks ideas and suggestions from the follower
- **Supporting** - Leaders pass day-to-day decisions, such as task allocation and processes, to the follower
- **Delegating** - Leaders are still involved in decisions and problem-solving, but control is with the follower

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>Team Building</h1> <ul style="list-style-type: none"> <li>• Necessary to move toward project goals/deliverables <li>• Symptoms of need for team building: <ul style="list-style-type: none"> <li>– Frustration <li>– Conflict and unhealthy competition <li>– Unproductive meetings <li>– Lack of trust or confidence in PM <p style="text-align: center;"><i>Team building is a key integration activity during project execution</i></p>				
HR					
Communications					
Risk					
Procurement					
Stakeholder					

Source: Verma, V. (1995). Managing the Project Team.

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2 style="text-align: center;">Team Building Ground Rules</h2> <ul style="list-style-type: none"> • Start early - it takes <i>time</i> • Don't stop - it takes <i>effort</i> • Get the right team and manage toward success <ul style="list-style-type: none"> – <u>Best qualified</u> members – People who <u>want</u> to be on the team • Get team agreement on all major points • Don't manipulate members, but do review and evaluate team success/effectiveness • Watch for symptoms of team breakdown • Plan and use a team building process <p style="text-align: center;">Source: Verma, V. (1995). Managing the Project Team.</p>				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: center;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>264</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>9.3 Develop Project Team</h1> <h2>9.3.3 Outputs (Figure 9-10)</h2> <ul style="list-style-type: none"> <li>.1 Team Performance Assessments <li>.2 Enterprise Environmental Factors Updates 				
HR					
Communications Risk Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

9.4 Manage Project Team

Tracking team member performance, providing feedback, resolving issues, & coordinating changes



9.4.1 Inputs


- .1 HR Management Plan
- .2 Project Staff Assignments
- .3 Team Performance Assessments
- .4 Issue Log
- .5 Work Performance Reports
- .6 Organizational Process Assets


9.4 Manage Project Team


9.4.2 Tools & Techniques

- .1 Observation and Conversation
- .2 Project Performance Appraisals
 - 360 degree feedback: feedback provided from many sources, including peers and team members
- .3 Conflict Management
- .4 Interpersonal Skills



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Sources of Conflict</h1> <ul style="list-style-type: none"> <li>• Schedules <li>• Resource allocation <li>• Changing, conflicting priorities <li>• Technical perspectives <li>• Note: personality conflicts are not included in this list 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC	268		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality	<h1>Conflict Resolution</h1> 				
HR	<ul style="list-style-type: none"> • Withdraw or Avoid • Smooth or Accommodate: Emphasize agreements or conceding to build relationships • Compromise or Reconcile: Tends to temporarily or partially resolve the conflict 				
Communications	<ul style="list-style-type: none"> • Force or Direct: Win-lose 				
Risk	<ul style="list-style-type: none"> • Collaborate or Problem Solve: Pick this one! 😊 				
Procurement					
Stakeholder					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>9.4 Manage Project Team</h1> <h2>9.4.3 Outputs (Figure 9-12)</h2> <ul style="list-style-type: none"> <li>.1 Change Requests <p>Remember, staffing issues/changes can disrupt the project plan and impact both schedule and budget...Integrated Change Control processes may be used to document impacts</p> <li>.2 PM Plan Updates <li>.3 Enterprise Environmental Factor Updates <li>.4 Organizational Process Assets Updates  				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>270</p>		

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Practice Test Time!

Chapter 9 Project Human Resources Management

Project Communications Management

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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications Importance

- 78-90% of project manager's job
- Affects every part of a project
- Can make or break a project
- Employed by everyone involved
- There is a direct correlation between the ability to communicate and project performance



Communications

Risk

Procurement

Stakeholder

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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications Realities

- Majority of project communication is done in the early stages of the project.
- Communications Breakdown (23-27% lost in upward communications)
- Meetings - 50% of project managers' time

Communications


Risk

Procurement

Stakeholder



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>10.1 Plan Communications Management</h1> <p>The majority of Communications Planning should be completed in the early phases</p> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<h2>10.1.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Project Management Plan <li>.2 Stakeholder Register <li>.3 Enterprise Environmental Factors <li>.4 Organizational Process Assets 				
<p>Student Copy – Not for Reproduction or Distribution</p>					
				<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR	<h1>10.1 Plan Communications Management</h1> <h2>10.1.2 Tools & Techniques</h2> <ul style="list-style-type: none"> .1 Communications Requirements Analysis .2 Communications Technology .3 Communications Models .4 Communications Methods .5 Meetings 				
Communications					
Risk Procurement Stakeholder					
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Knowledge Area: Integration, Scope, Time, Cost, Quality, HR

Communications Channels

- How many communications channels are there for a team of 9?
- For a team of 6?
- Remember, about 55% of communication is non-verbal & a PM spends about 90% of their time communicating

Communications

$$\# \text{ of Channels} = (N^2 - N)/2$$



Risk, Procurement, Stakeholder

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Knowledge Area: Integration, Scope, Time, Cost, Quality, HR

Communications

Risk, Procurement, Stakeholder

Basic Communications Model

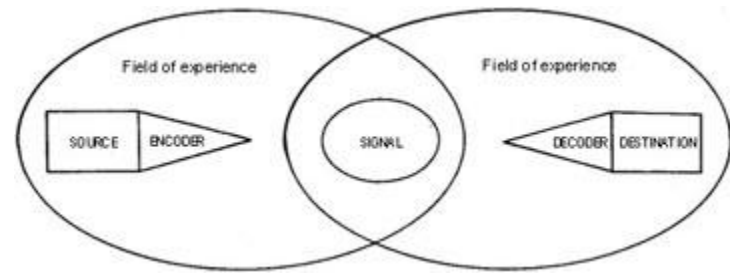
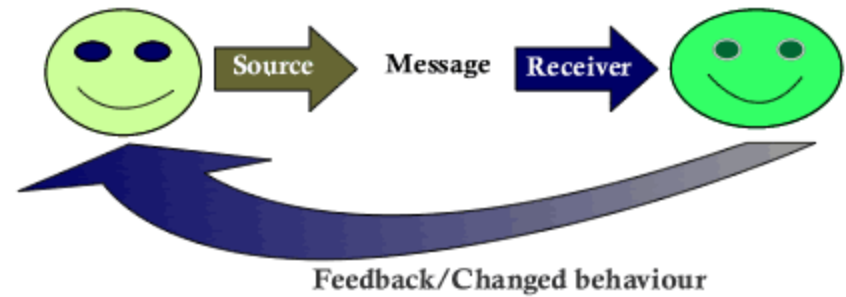
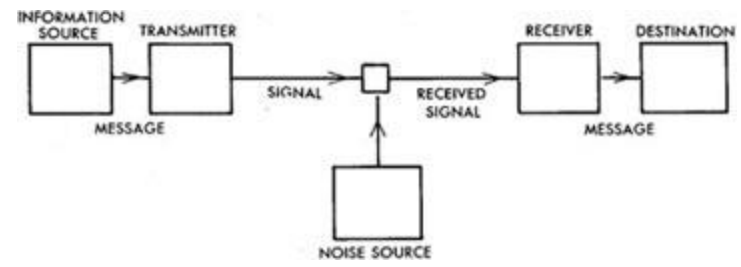
- Key components:
 - Encode: translate thoughts/ideas into language tailored for audience
 - Message: the output of encoding
 - Medium: “how” the encoder chooses to transmit the message
 - Noise: barriers to either transmission or receipt of the message
 - Decode: translation from language in to thoughts/ideas



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Knowledge Area
 Integration
 Scope
 Time
 Cost
 Quality
 HR

Communications Models



Communications

Risk
 Procurement

Stakeholder

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Knowledge Area: Integration, Scope, Time, Cost, Quality, HR

Communications

Risk, Procurement, Stakeholder

Communications Methods

- Formal
 - Presentations
 - Letters
 - Policies & Procedures
- Informal
 - Email
 - Meetings
 - Conference calls



Knowledge Area
Integration
Scope
Time
Cost
Quality
HR

10.1 Plan Communications Management

10.1.3 Outputs (Figure 10-3)

- .1 Communications Management Plan
Describes how project communications will be planned, structured, monitored and controlled
- .2 Project Documentation Updates

Communications

Risk
Procurement
Stakeholder




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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Project Communications Plan</h1> <ul style="list-style-type: none"> • Stakeholders • Informational Needs • Medium • Timing/Frequency • Responsibility • Feedback 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			
			<p style="text-align: right;">283</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR	<h1>10.2 Manage Communications</h1> <h2>10.2.1 Inputs</h2> <ul style="list-style-type: none"> .1 Communications Management Plan .2 Work Performance Reports .3 Enterprise Environmental Factors .4 Organizational Process Assets 				
Communications					
Risk Procurement					
Stakeholder					

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>10.2 Manage Communications</h1> <h2>10.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Communication Technology <li>.2 Communications Models <li>.3 Communications Methods <li>.4 Information Management Systems <li>.5 Performance Reporting: Project performance 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>285</p>		

10.2 Manage Communications

10.2.3 Outputs (Figure 10-6)

- .1 Project Communications
- .2 PM Plan Updates
- .3 Project Document Updates
- .4 Organizational Process Assets (Updates)
Lessons Learned, Project Records, Reports, Presentations, etc...

Communications

Status – where the project stands related to schedule & budget

Progress – what has been accomplished

Forecasting – predict future status and progress



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR	<h1>10.3 Control Communications</h1> <h2>10.3.1 Inputs</h2> <ul style="list-style-type: none"> .1 PM Plan .2 Project Communications .3 Issue Log .4 Work Performance Data .5 Organizational Process Assets 				
Communications					
Risk Procurement Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR	<h1>10.3 Control Communications</h1> <h2>10.3.2 Tools & Techniques</h2> <ul style="list-style-type: none"> .1 Information Management Systems .2 Expert Judgment .3 Meetings 				
Communications					
Risk Procurement Stakeholder					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR	<h1>10.3 Control Communications</h1> <h2>10.3.3 Outputs (Figure 10-8)</h2> <ul style="list-style-type: none"> .1 Work Performance Information .2 Change Requests .3 PM Plan Updates .4 Project Document Updates .5 Organizational Process Asset Updates 				
Communications					
Risk Procurement Stakeholder					
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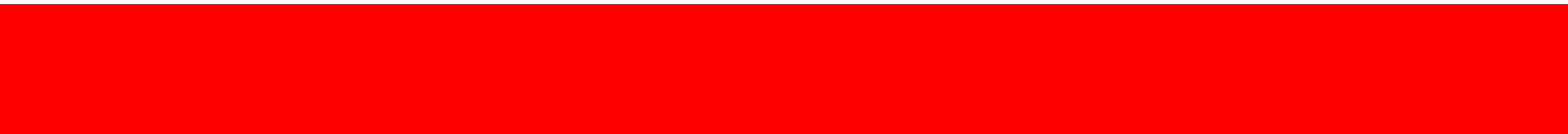
Practice Test Time!


Chapter 10 Project Communications Management

Project Risk Management

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What is “risk?”



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>Risk Management</h1> <ul style="list-style-type: none"> The objective of Risk Management is to increase the probability/impact of positive and decrease the probability/impact of the negative 				
Risk					
Procurement					
Stakeholder					

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Themes that Influence Risk Attitudes</h1> <ul style="list-style-type: none"> <li>• Risk Appetite: Acceptable degree of uncertainty for anticipated benefit <li>• Risk Tolerance: Level of risk an organization, or individual, will withstand <li>• Risk Threshold: Measure of the level of uncertainty or impact; below = accept, above = not tolerate 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; text-align: center;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="text-align: right; font-size: small;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP</p> <p>© 2014, Innovative Management Solutions, LLC</p> </div>				


Themes that Influence Risk Attitudes

- Risk Appetite: Acceptable degree of uncertainty for anticipated benefit
- Risk Tolerance: Level of risk an organization, or individual, will withstand
- Risk Threshold: Measure of the level of uncertainty or impact; below = accept, above = not tolerate

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.1 Plan Risk Management</h1> <h2>11.1.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 PM Plan <li>.2 Project Charter <li>.3 Stakeholder Register <li>.4 Enterprise Environmental Factors <li>.5 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	296		


Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.1 Plan Risk Management</h1> <h2>11.1.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Analytical Techniques <li>.2 Expert Judgment <li>.3 Meetings 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			
			<p>297</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.1 Plan Risk Management</h1> <h2>11.1.3 Outputs (Figure 11-3)</h2> <h3>.1 Risk Management Plan</h3> <p>Includes definitions of risk probability and impact</p> <p>* Tailored for each project for use in Qualitative Risk Analysis</p> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			
			<p>298</p>		

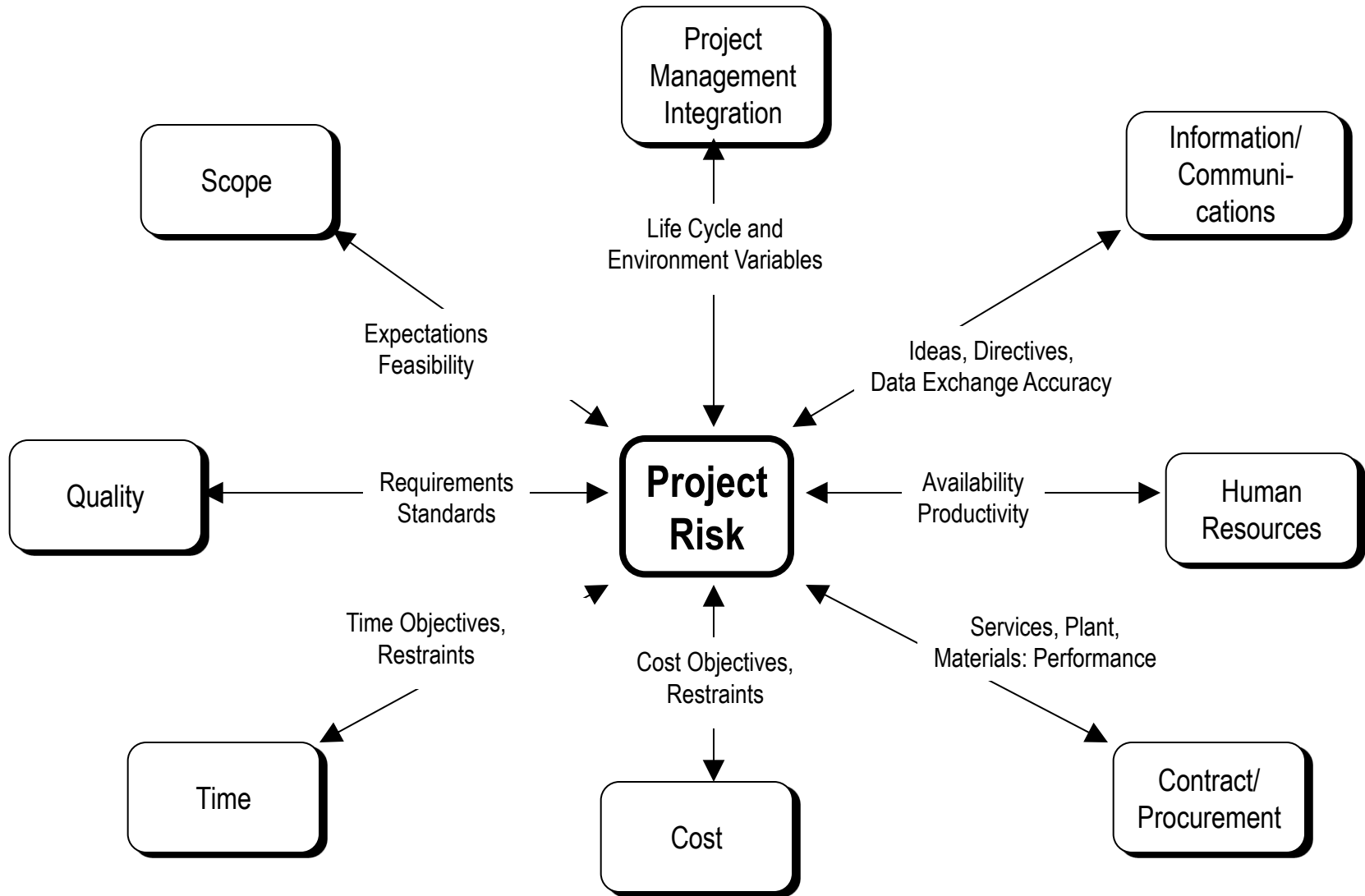
Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>Risk Plan</h1> <ul style="list-style-type: none"> <li>• Risk: the uncertainty associated with an event <li>• Identify risks to the project <ul style="list-style-type: none"> <li>– Both positive and negative <li>– Identify threats <i>and</i> opportunities <li>• Focus on those <i>most likely</i> to occur <li>• Develop pre-planned responses to most likely with big impact 				
<b>Risk					
Procurement					
Stakeholder	<b>Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.2 Identify Risks</h1> <p>11.2.1 Inputs</p> <ul style="list-style-type: none"> <li>.1 Risk Management Plan <li>.2 Cost Management Plan <li>.3 Schedule Management Plan <li>.4 Quality Management Plan <li>.5 HR Management Plan <li>.6 Scope Baseline <li>.7 Activity Cost Estimates <li>.8 Activity Duration Estimates <li>.9 Stakeholder Register <li>.10 Project Documents <li>.11 Procurement Documents <li>.12 Enterprise Environmental Factors <li>.13 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Risk Categories</h1> 				
Integration					
Scope	<ul style="list-style-type: none"> <li>• Technical, Quality or Performance risks: such as reliability, unproven, unrealistic, changes to technology or industry standards <li>• Project Management risks: poor allocation of time and resources, poor project plan, and poor use of project management disciplines <li>• Organizational risks: cost, time and scope objectives that are inconsistent, lack of prioritization of projects, funding problems, and resource conflicts <li>• External risks: shifting legal or regulatory environment, labor issues, changing owner priorities, country risks, weather, Force majeure risks (acts of god) usually require disaster recovery 				
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; text-align: center;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="text-align: right; padding: 5px;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p>301</p> </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.2 Identify Risks</h1> <h2>11.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Documentation Reviews <li>.2 Information Gathering Techniques <li>.3 Checklist Analysis <li>.4 Assumptions Analysis <li>.5 Diagramming Techniques <li>.6 SWOT Analysis <li>.7 Expert Judgment 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p>302</p>			




Source: Wideman, R.M. (1992). Project and Program Risk Management: A Guide to Managing Project Risks and Opportunities.



Information Gathering Techniques

- **Brainstorming** - is probably the most frequently used technique
- **Delphi technique** - using a questionnaire to solicit ideas, circulate the responses to anonymous experts on the subject, until reaching consensus
 - Helps reduce bias in the data
 - Keeps any one person from influencing the outcome
- **Interviewing** - the responsible person identifies appropriate individuals, briefs them on the project, provides information (WBS & assumptions) and gathers information based on their experience
- **Strengths, weakness, opportunities and threats (SWOT) analysis** - ensures examination from each of the SWOT perspectives to increase the breadth of the risk considered

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Information Gathering Techniques</h1> <ul style="list-style-type: none"> • Checklists - Risk identification may be gathered from historical data <ul style="list-style-type: none"> – Quick and simple, but may not be comprehensive enough – Important to update the checklist after each project closeout for possible additions • Diagramming techniques - <ul style="list-style-type: none"> – Cause-and-Effect Diagrams- (Ishikawa or fishbone diagrams) are useful in identifying causes of risks – System or Process Flow Charts- shows how each element interacts and the mechanism of causation – Influence Diagrams- A graphical representation of a problem showing relationships among variables and outcomes 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> <p style="text-align: right;">305</p>			


11.2 Identify Risks

11.2.3 Outputs (Figure 11-6)

.1 Risks Register

Document that contains outputs from Risk Management processes (identified risks, potential responses, root causes, etc...)



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.3 Perform Qualitative Risk Analysis</h1> <p>Methods for prioritizing risks, improving project performance, etc...by focusing on high priority risks</p> <h2>11.3.1 Inputs</h2> <ul style="list-style-type: none"> .1 Risk Management Plan .2 Scope Baseline .3 Risk Register (key item for Qualitative Risk Analysis) .4 Project Scope Statement .5 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>	<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			
			<p>307</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.3 Perform Qualitative Risk Analysis</h1> <h2>11.3.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Risk Probability & Impact Assessment <li>.2 Probability & Impact Matrix <li>.3 Risk Data Quality Assessment <li>.4 Risk Categorization <li>.5 Risk Urgency Assessment <li>.6 Expert Judgment 				
Risk	<ul style="list-style-type: none"> <li>• Probability, Impact, Timing, Frequency 				
Procurement					
Stakeholder	<div style="background-color: yellow; padding: 5px; text-align: center;"> Student Copy – Not for Reproduction or Distribution </div> <div style="text-align: right; padding: 5px;"> Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC </div>				

11.3 Perform Qualitative Risk Analysis

11.3.2 Tools & Techniques

- .1 Risk Probability & Impact Assessment
- .2 Probability & Impact Matrix
- .3 Risk Data Quality Assessment
- .4 Risk Categorization
- .5 Risk Urgency Assessment
- .6 Expert Judgment



- Probability, Impact, Timing, Frequency

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Probability & Impact Matrix (See PMBOK 5th Edition Figure 11-10)

Risk	Impact	Likelihood	Quantification (I X L)	Response
A	High	High	25	X
B	High	Med	15	Y
C	Med	Med	9	Z
D	Low	Low	1	N/A

High = 5

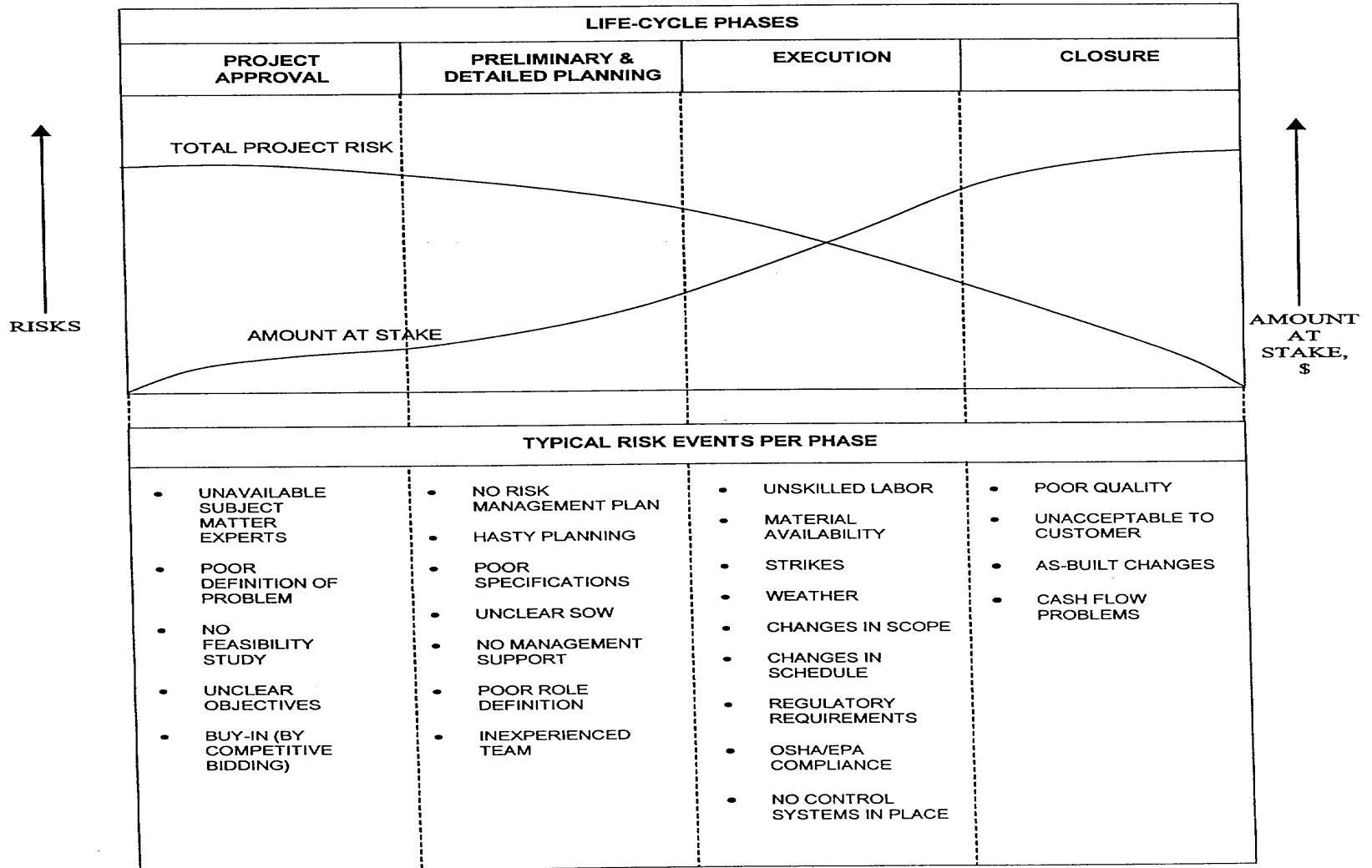
Med = 3

Low = 1

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.3 Perform Qualitative Risk Analysis</h1> <h2>11.3.3 Outputs (Figure 11-9)</h2> <h3>.1 Project Document Updates</h3>				
Risk					
Procurement					
Stakeholder					

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Life-Cycle Risk Analysis




Reference: Kerzner, page 880

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.4 Perform Quantitative Risk Analysis</h1> <p>Performed on risks prioritized in Qualitative Risk Analysis as potentially and substantially impactful</p> <h2>11.4.1 Inputs</h2> <ul style="list-style-type: none"> .1 Risk Management Plan .2 Cost Management Plan .3 Schedule Management Plan .4 Risk Register .5 Enterprise Environmental Factors .6 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					



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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>11.4 Perform Quantitative Risk Analysis</h1> <h2>11.4.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Data Gathering and Representation Techniques <li>.2 Quantitative Risk Analysis and Monitoring Techniques <p>Monte Carlo simulation: numerically analyze the probability of each event and the event's consequences</p> <p>Decision Tree Analysis</p> <p>Expected Monetary Value (EMV) Analysis: statistically calculates average outcomes in uncertainty</p> <li>.3 Expert Judgment 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h2 style="text-align: center;">Expected Monetary Value</h2>  <ul style="list-style-type: none"> • Expected Monetary Value - Is the summation of risk probability and risk consequences • Example: There is 1% probability that I will fail the PMP Exam and consequence of doing so cost me \$275 to retake the test 				
Risk	<p style="text-align: center;">Expect Monetary Value = \$275 * .01 = \$2.75</p>				
Procurement					
Stakeholder	<p style="text-align: center;">Student Copy – Not for Reproduction or Distribution</p>				



Expected Monetary Value


Task	Probability	Impact (Amount at Stake)	Expected Value
A	10%	\$41,000	
B	30%	\$50,000	
C	68%	\$20,000	

Expected Monetary Value

Task	Probability	Impact (Amount at Stake)	Expected Value
A	10%	\$41,000	\$4,100
B	30%	\$50,000	\$15,000
C	68%	\$20,000	<u>\$13,600</u>
			<u>\$32,700</u>

EMV / Decision Tree Exercise



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">11.4 Perform Quantitative Risk Analysis</h1> <h2 style="text-align: center;">11.4.3 Outputs (Figure 11-12)</h2> <h3 style="text-align: center;">.1 Project Documents Updates</h3> <p style="text-align: center;">Probabilistic analysis, probability of meeting cost/time objectives, prioritized list of “quantified” risks, etc...</p> 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution	<p style="text-align: right;">Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>	<p>318</p>		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.5 Plan Risk Responses</h1> <h2>11.5.1 Inputs</h2> <ul style="list-style-type: none"> .1 Risk Management plan .2 Risk Register 				
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Knowledge Area: Integration, Scope, Time, Cost, Quality, HR, Communications, **Risk**, Procurement, Stakeholder

11.5 Plan Risk Responses

11.5.2 Tools & Techniques

- .1 Strategies for Negative Risks or Threats
 - Avoidance
 - Transference
 - Mitigation
- .2 Strategies for Positive Risks or Opportunities
 - Exploit
 - Share
 - Enhance
- .3 Contingent Response Strategies
- .4 Expert Judgment



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Risk Responses

Determining **HOW** to respond to the identified risk

- **Avoidance** - Eliminate the specific threat by eliminating the cause
- **Mitigation** - Reducing the impact by reducing the probability or reducing the occurrence of the risk
- **Transference** – Passing the risk on to another
- **Exploit** – Ensure opportunity is realized
- **Share** – Allocate ownership to 3rd party to capture benefit
- **Enhance** – Modify “size” of opportunity
- **Accept** – Accepting the risk consequence by:
 - Developing a contingency plan
 - Accepting the impact



Risk

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.5 Plan Risk Responses</h1> <h2>11.5.3 Outputs (Figure 11-19)</h2> <ul style="list-style-type: none"> <li>.1 PM Plan Updates <li>.2 Project Documents Updates 				
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.6 Control Risks</h1> <h2>11.6.1 Inputs</h2> <ul style="list-style-type: none"> .1 PM Plan .2 Risk Register .3 Work Performance Data .4 Work Performance Reports 				
Risk					
Procurement					
Stakeholder					

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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

11.6 Control Risks

11.6.2 Tools & Techniques

- .1 Risk Reassessment: Remember...living document)
- .2 Risk Audits: Document effectiveness of responses and the risk management processes
- .3 Variance and Trend Analysis
- .4 Technical Performance Measurement
- .5 Reserve Analysis
 Compare contingency reserves to amount of remaining risks (adequate?)
- .6 Status Meetings



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications	<h1>11.6 Control Risks</h1> <h2>11.6.3 Outputs (Figure 11-21)</h2> <ul style="list-style-type: none"> .1 Work Performance Information .2 Change Requests .3 PM Plan Updates .4 Project Document Updates .5 Organizational Process Assets Updates 				
Risk					
Procurement					
Stakeholder					

PMI-ism Break

Rita Mulcahy, PMP® Exam Prep, 8th
Edition


Practice Test Time!

Chapter 11 Project Risk Management

Project Procurement Management

Chuck Millhollan, MBA, MPM, PMP, PgMP
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ASQ Certified Six Sigma Black Belt
ASQ Certified Software Quality Engineer
ASQ Certified Manager of Quality / Organizational Excellence
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Innovative Management Solutions, LLC

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>Procurement Management</h1> <ul style="list-style-type: none"> <li>• Includes the processes required to acquire goods and services, to attain project scope, from outside the performing organization <li>• <i>Key thought: make or buy</i> <li>• <i>Note: Project procurement management is discussed from the perspective of the buyer in the buyer-seller relationship.</i> 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>Procurement Management</h1> <ul style="list-style-type: none"> <li>• Contract <ul style="list-style-type: none"> <li>– Mutually binding agreement that obligates seller and buyer <li>– Legally binding <li>– Includes terms and conditions 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.1 Plan Procurement Management</h1> <h2>12.1.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 PM Plan <li>.2 Requirements Documentation <li>.3 Risk Register <li>.4 Activity Resource Requirements <li>.5 Project Schedule <li>.6 Activity Cost Estimates <li>.7 Stakeholder Register <li>.8 Enterprise Environmental Factors <li>.9 Organizational Process Assets 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.1 Plan Procurement Management</h1> <h2>12.1.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Make-or-Buy Analysis <li>.2 Expert Judgment <li>.3 Market Research <li>.4 Meetings 				
Procurement					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>Make or Buy Analysis</h1> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="width: 45%;"> <ul style="list-style-type: none"> • Make <ul style="list-style-type: none"> – Cost – Integration of operations – Idle existing capacity – Direct control – Design secrecy – Unreliable suppliers – Stabilize work force </div> <div style="width: 10%; text-align: center;">  </div> <div style="width: 45%;"> <ul style="list-style-type: none"> • Buy <ul style="list-style-type: none"> – Cost – Supplier skills – Small volume requirements – Limited capacity – Augment labor force – Maintain multiple sources – Indirect control </div> </div>				
Procurement					
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Make or Buy Exercise

You are trying to decide whether to buy or lease an item for your project. The daily lease cost is \$120. To purchase the item the investment cost is \$1000 and the daily cost is \$20. How long will it take for the lease cost to be the same as the purchase cost?

Let D = the number of days when the purchase and lease costs are equal.

$$\$120D = \$1,000 + 20D$$

$$\$120D - \$20D = \$1000$$

$$\$100D = \$1000$$

$D = 10$. What does this mean?



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>Buy vs. Lease vs. Rent</h1> <ul style="list-style-type: none"> • Length of use (future projects?) • Cash flow; cost of money; financial statement • Technology life span • Depreciation and taxes • Maintenance; cost & expertise • Insurance 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Contract Type Selection</h1> <ul style="list-style-type: none"> • Goal : To have reasonable distribution of risk between the buyer and seller and the greatest incentive for the seller's efficient and economical performance <ul style="list-style-type: none"> – Degree of cost and schedule risk – Extent of work definition – Need for fast-tracking – Extent of price competition – Marketplace conditions 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
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			336		

Contract Types

- Fixed Price
 - Firm fixed price (FFP)
 - FFP with economic price adjustment (FPEPA)
 - Fixed price incentive fee (FPIF) or FPI
- Cost Reimbursable
 - Cost plus fixed fee (CPFF)
 - Cost plus incentive fee (CPIF)
 - Cost plus award fee (CPAF)
 - Cost plus percentage of cost (illegal in Gov)
- Time and Materials
- Purchase Order (unilateral agreement)



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">Fixed Price Contract Type Comparison</h1> <ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Know cost up front – Risk to seller – Competition – Compare multiple vendors bids – Little experience needed - less work for buyer to manage – Seller has strong incentive to control costs • Disadvantages <ul style="list-style-type: none"> – May not get consistent quality – Not flexible – Can be costly – Seller may under price the work and try to make up profits on change orders – Seller may not complete some of the scope of work if they begin to lose money. 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk

Cost Plus Contract Type Comparison

- | | |
|--|--|
| <ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – More influence & flexibility – Could be less expensive – Share risk – Scope definition can be more flexible | <ul style="list-style-type: none"> • Disadvantages <ul style="list-style-type: none"> – Level of involvement - auditing of seller invoices – No incentive to finish quickly or control costs – Harder to evaluate proposals – Total cost unknown |
|--|--|

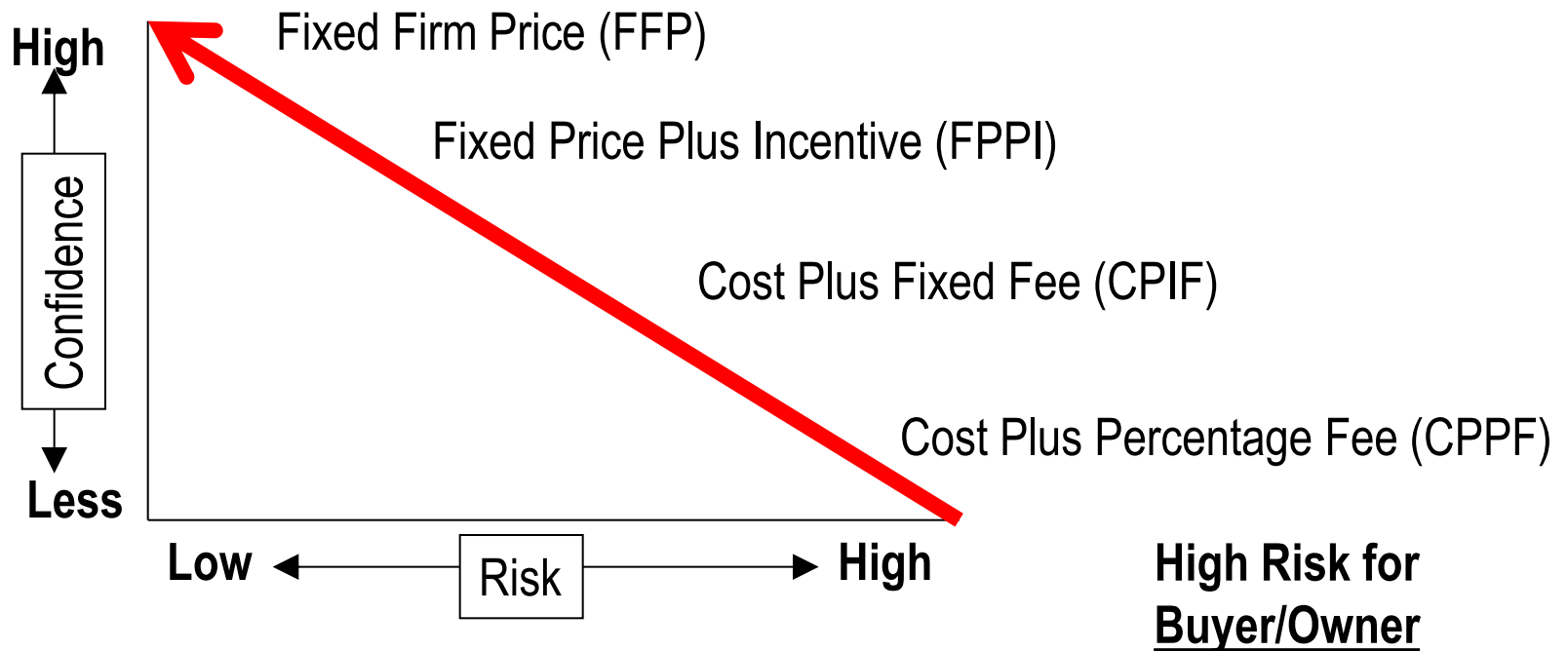
Procurement

Stakeholder

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Contracts and Procurement Risk

High Risk for Seller/Contractor



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>12.1 Plan Procurement Management</h1> <h2>12.1.3 Outputs (Figure 12-3)</h2> <ul style="list-style-type: none"> <li>.1 Procurement Management Plan <li>.2 Procurement Statements of work – describes the procurement item in sufficient detail to allow prospective sellers to determine if they are capable of providing the item <li>.3 Procurement Documents <li>.4 Source Selection Criteria <li>.5 Make or Buy Decision <li>.6 Change Requests <li>.7 Project Documents Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				
<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			341		

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.2 Conduct Procurements</h1> <h2>12.2.1 Inputs</h2> <ul style="list-style-type: none"> .1 PM Plan .2 Procurement Documents .3 Source Selection Criteria .4 Seller Proposals .5 Project Documents .6 Make-or-Buy Analysis .7 Procurement Statement of Work .8 Organizational Process Assets 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>12.2 Conduct Procurements</h1> <h2>12.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Bidder Conferences <p>Used to ensure all prospective sellers have a clear understanding of the requirements...all potential sellers are given equal standing during this process</p> <li>.2 Proposal Evaluation Techniques <li>.3 Independent Estimates <li>.4 Expert Judgment <li>.5 Advertising <p>Used to expand existing list of potential sellers (may be a requirement)</p> <li>.6 Analytical Techniques <li>.7 Procurement Negotiations 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
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				343	

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.2 Conduct Procurements</h1> <h2>12.2.3 Outputs (Figure 12-5)</h2> <ul style="list-style-type: none"> <li>.1 Selected Sellers <li>.2 Agreements <li>.3 Resource Calendars <li>.4 Change Requests <li>.5 PM Plan Updates <li>.6 Project Documents Updates 				
Procurement					
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12.3 Control Procurements

Contracts can be amended any time prior to closure (mutual consent & associated change control terms)

12.3.1 Inputs

- .1 PM Plan
- .2 Procurement Documents
- .3 Agreements
- .4 Approved Change Requests
- .5 Work Performance Reports
- .6 Work Performance Data



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.3 Control Procurements</h1> <h2>12.3.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Contract Change Control System <li>.2 Procurement Performance Reviews <li>.3 Inspections & Audits <li>.4 Performance Reporting <li>.5 Payment Systems <li>.6 Claims Administration <li>.7 Records Management System <p>– Contract Administrator – only person authorized to change contractual agreements (may not be the PM)</p> 				
Procurement					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.3 Control Procurements</h1> <h2>12.3.3 Outputs (Figure 12-7)</h2> <ul style="list-style-type: none"> <li>.1 Work Performance Information <li>.2 Change Requests <li>.3 PM Plan Updates <li>.4 Project Documents Updates <li>.5 Organizational Process Asset Updates 				
Procurement					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.4 Close Procurements</h1> <h2>12.4.1 Inputs</h2> <ul style="list-style-type: none"> .1 PM Plan .2 Procurement Documents 				
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>Contract Close-out</h1> <ul style="list-style-type: none"> <li>• Contract close-out includes <ul style="list-style-type: none"> <li>– Product verification (work completed correctly and satisfactorily) <li>– Administrative activities (update records to reflect final results) <li>– Archiving information for future use <li>• Procurement audits identify lessons-learned <li>• Contract audits <ul style="list-style-type: none"> <li>– Identify best practices and areas for improvement 					
Procurement						
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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk

12.4 Close Procurements

12.4.2 Tools & Techniques

.1 Procurement Audits

Structured review of procurement process from planning through administration

.2 Procurement Negotiations


.3 Records Management System



Procurement

Stakeholder

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk	<h1>12.4 Close Procurements</h1> <h2>12.4.3 Outputs (Figure 12-9)</h2> <ul style="list-style-type: none"> .1 Closed Procurements .2 Organizational Process Assets Updates – requirements for formal acceptance and closure are usually defined in a contract 					
Procurement						
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Knowledge Area: Integration, Scope, Time, Cost, Quality, HR, Communications, Risk, **Procurement**

Termination by...



- Extinction
 - Successful or not
 - Deliverable is external to or not a fundamental function of the parent organization
- Addition
 - Institutionalized
 - New Division
- Integration
 - Most Common
 - Project assets redistributed
- Starvation
 - Budget decrement

Procurement

Stakeholder

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Incentive Contract Example

Target Cost	\$100,000
Target Fee	\$10,000
Target Price	\$110,000
Sharing Ratio	80/20
Actual Cost	\$95,000

$$\text{Fee} = \$100,000 - \$95,000 = \$5,000$$

$$\$5,000 \times 20\% = \$1,000$$

$$\$10,000 + \$1,000 = \$11,000$$

$$\text{Final Price} = \$95,000 + \$11,000 = \$106,000$$

Incentive Contract Exercise

Target Cost	\$100,000
Target Fee	\$10,000
Target Price	\$110,000
Sharing Ratio	80/20
Actual Cost	<u>\$105,000</u>

Fee = \$100,000 - \$105,000 = -\$5,000 (reduction in fee)

\$5,000 X 20% = \$1,000

\$10,000 - \$1,000 = \$9,000

Final Price = \$105,000 + \$9,000 = \$114,000

Ready for a spin? What if CPPC?

Target Cost	\$120,000
Fee	10% of Cost
Actual Cost	<u>\$130,000</u>

$$\text{Fee} = \$130,000 + (10\% \text{ of } \$130,000) = \$143,000$$

Remember...most risky contract type for buyer!

Sharing w/ Ceiling Exercise

Target Cost	\$130,000
Target Fee	\$15,000
Target Price	\$145,000
Ceiling Price	\$160,000
Sharing Ratio	80/20
Actual Cost	<u>\$150,000</u>

Fee = \$130,000 - \$150,000 = -\$20,000 (reduction in fee)

\$20,000 X 20% = \$4,000

\$15,000 - \$4,000 = \$11,000

Final Price = \$150,000 + \$10,000 (not \$11,000) = \$160,000

Point of Total Assumption (For FPIC with a Ceiling)



$$\text{PTA} = \{(\text{Ceiling Price} - \text{Target Price})/\text{Buyer's Ratio}\} + \text{Target Cost}$$

Target Cost	\$130,000
Target Fee	\$15,000
Target Price	\$145,000
Ceiling Price	\$160,000
Sharing Ratio	80/20
Actual Cost	<u>\$150,000</u>

$$\begin{aligned}\text{PTA} &= \{(\$160,000 - \$145,000)/.80\} + \$130,000 \\ & \$15,000/.8 + \$130,000 \\ & \$12,000 + \$130,000 = \$142,000\end{aligned}$$

What is this? A risk trigger.

PMI-ism Break


Rita Mulcahy, PMP® Exam Prep, 8th
Edition

Practice Test Time!


Chapter 12 Project Procurement Management

Project Stakeholder Management

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Project Stakeholder Management</h1> <ul style="list-style-type: none"> <li>• Process used to identify people, groups or organizations that could impact or be impacted <li>• Analyze expectations and their impacts <li>• Develop appropriate management strategies <li>• Focus <ul style="list-style-type: none"> <li>– Continuous communications <li>– Understand needs and expectations <li>– Address issues, conflicts as they occur <li>– Foster appropriate stakeholder engagement 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<div style="background-color: yellow; border: 1px solid black; padding: 5px; text-align: center;"> <p>Student Copy – Not for Reproduction or Distribution</p> </div> <div style="text-align: right; font-size: small;"> <p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p> </div>				

Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.1 Identify Stakeholders</h1> <h2>13.1.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Project Charter <li>.2 Procurement Documents <li>.3 Enterprise Environmental Factors <li>.4 Organizational Process Assets 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.1 Identify Stakeholders</h1> <h2>13.1.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Stakeholder Analysis: process of collecting and evaluating quantitative and qualitative information to determine whose interests should be taken into account during the project <li>.2 Expert Judgment <li>.3 Meetings 					
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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder



Classification Models

- Power / Interest Grid: level of authority and level of concern (Figure 13-4)
- Power / Influence Grid: level of authority and level of active involvement
- Influence / Impact Grid: level of active involvement and ability to effect change
- Salience Model: describes classes of stakeholders based on their power, situational urgency, and legitimacy/appropriateness in their involvement

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.1 Identify Stakeholders</h1> <h2>13.1.3 Outputs (Figure 13-3)</h2> <h3>.1 Stakeholder Register</h3>				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1 style="text-align: center;">13.2 Plan Stakeholder Management</h1> <h2 style="text-align: center;">13.2.1 Inputs</h2> <ul style="list-style-type: none"> .1 PM Plan .2 Stakeholder Register .3 Enterprise Environmental Factors .4 Organizational Process Assets 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>13.2 Plan Stakeholder Management</h1> <h2>13.2.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Expert Judgment <li>.2 Meetings <li>.3 Analytical Techniques 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	<p>Student Copy – Not for Reproduction or Distribution</p>				
<p>Chuck Millhollan, MBA, MPM, PMP, PgMP © 2014, Innovative Management Solutions, LLC</p>			<p>367</p>		

Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement

Engagement Levels

- Unaware – of project and/or potential impacts
 - Resistant – aware and resistant to change
 - Neutral – aware and neither supporting nor resistant
 - Supportive – aware and supportive
 - Leading – aware and actively engaged
- Where are they currently?
 - What is the desired level of engagement?



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>13.2 Plan Stakeholder Management</h1> <h2>13.2.3 Outputs (Figure 13-6)</h2> <ul style="list-style-type: none"> <li>.1 Stakeholder Management Plan <li>.2 Project Document Updates 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder	Student Copy – Not for Reproduction or Distribution				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.3 Manage Stakeholder Engagement</h1> <h2>13.3.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 Stakeholder Management Plan <li>.2 Communications Management Plan <li>.3 Change Log <li>.4 Organizational Process Assets 				
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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement

13.3 Manage Stakeholder Engagement

13.3.2 Tools & Techniques

- .1 Communications Methods
- .2 Interpersonal Skills: building trust, conflict resolution, active listening, etc.
- .3 Management Skills: facilitation, negotiate agreements, etc.


Note the fine line between what the PMI considers interpersonal and management skills



Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.3 Manage Stakeholder Engagement</h1> <h2>13.3.3 Outputs (Figure 13-9)</h2> <ul style="list-style-type: none"> .1 Issue Log .2 Change Requests .3 PM Plan Updates .4 Project Documents Updates .5 Organizational Process Assets Updates 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.4 Control Stakeholder Engagement</h1> <h2>13.4.1 Inputs</h2> <ul style="list-style-type: none"> <li>.1 PM Plan <li>.2 Issue Log <li>.3 Work Performance Data <li>.4 Project Documents 					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.4 Control Stakeholder Engagement</h1> <h2>13.4.2 Tools & Techniques</h2> <ul style="list-style-type: none"> <li>.1 Information Management Systems <li>.2 Expert Judgment <li>.3 Meetings 					
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing	
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement	<h1>13.4 Control Stakeholder Engagement</h1> <h2>13.4.3 Outputs (Figure 13-11)</h2> <ul style="list-style-type: none"> .1 Work Performance Information: Remember, work performance data is transformed into work performance information .2 Change Requests .3 PM Plan Updates .4 Project Documents Updates .5 Organizational Process Assets Updates 					
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PMI-ism Break

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Practice Test Time!

Chapter 13 Project Stakeholder Management

Code of Ethics & Professional Conduct

See the PMP® Handbook

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area	<h1>Vision & Applicability</h1> <ul style="list-style-type: none"> <li>• Committed to doing what is right an honorable <li>• High standards for ourselves <li>• Expect same from fellow practitioners <li>• Applies to volunteer roles 				
Integration					
Scope					
Time					
Cost					
Quality					
HR					
Communications					
Risk					
Procurement					
Stakeholder					

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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h2 style="text-align: center;">Persons to Whom the Code Applies</h2> <ul style="list-style-type: none"> • All PMI members, regardless of certification status • Non-PMI members that meet any of the following criteria: <ul style="list-style-type: none"> – PMI certified – Applicants for PMI certification – Serve PMI in a volunteer capacity 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Individual Integrity</h1> <ul style="list-style-type: none"> • Common sense approach to conflict/issues <ul style="list-style-type: none"> – Be honest – Do what you “should” do – Follow the right processes – Report violations 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Core Values Supporting the Code</h1> <ul style="list-style-type: none"> • Responsibility • Respect • Fairness • Honesty 				
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Process Group	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Area Integration Scope Time Cost Quality HR Communications Risk Procurement Stakeholder	<h1>Aspirational & Mandatory Conduct</h1> <ul style="list-style-type: none"> • Each section includes aspirational standards & mandatory standards • Aspirational <ul style="list-style-type: none"> – Not easily measured, but not optional either • Mandatory <ul style="list-style-type: none"> – Established firm requirements – Can limit or prohibit behavior – Failure can result in disciplinary action 				
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Knowledge Area

- Integration
- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

Responsibility

- Ownership of decisions we make or fail to make
- Aspirational
 - Based on the best interests of society, public safety and environment
 - Accept assignments consistent w/ our background, experience, skills and qualifications
 - Fulfill commitments
 - Ownership of errors (early communication)
 - Protect proprietary or confidential info
 - Hold others accountable to Code
- Mandatory
 - Inform ourselves and uphold policies, rules, regulations and laws that govern our work and volunteer activities
 - Report unethical or illegal conduct
 - Bring violations of the Code to attention
 - Only file complaints when substantiated by facts
 - Pursue disciplinary action for retaliation

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Knowledge Area

- Integration
- Scope
- Time
- Cost
- Quality
- HR
- Communications
- Risk
- Procurement
- Stakeholder

Respect

- High regard for self, others and resources entrusted to us
- Respect fosters trust, confidence, and mutual cooperation
- Aspirational
 - Inform selves of norms and customers of others and avoid disrespectful behavior
 - Listen to others' point of view
 - Approach conflict or disagreement directly
 - Professional, even when not reciprocated
- Mandatory
 - Negotiate in good faith
 - Do not exercise power for personal benefit
 - Do not act abusively
 - Respect others' property rights

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Knowledge Area
Integration
Scope
Time
Cost
Quality
HR
Communications
Risk
Procurement
Stakeholder

Fairness

- Make decisions and act impartially and objectively
- Aspirational
 - Transparency in decision making
 - Constantly reexamine ourselves and make corrective action
 - Provide equal access to information to those authorized
 - Make opportunities equally available to qualified candidates
- Mandatory
 - Proactively disclose conflicts of interests
 - Refrain from decision making process or influencing outcomes if there is a potential conflict of interest
 - Do not hire/fire, reward/punish, award/deny contracts based on personal considerations (favoritism, nepotism, bribery)
 - Do not discriminate (gender, race, age, religion, disability, etc...)
 - Apply the rules of the organization (employer, PMI or other group) without favoritism or prejudice

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Knowledge Area

Integration

Scope

Time

Cost

Quality

HR

Communications

Risk

Procurement

Stakeholder

Honesty

- Duty to understand the truth and act truthfully
- Aspirational
 - Earnestly seek to understand the truth
 - Truthful in communications and conduct
 - Provide accurate info in a timely manner
 - Make commitments or promises in good faith (implied or explicit)
 - Create an environment that others feel safe to tell the truth
- Mandatory
 - Do not engage in behavior that is designed to deceive others (false statements, half-truths, provide info out of context, etc...)
 - Do not engage in dishonest behavior w/ the intent of personal gain or expense of others

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Practice Test Time!

Chapter 13 Professional & Social Responsibility

Course Certificates & Critiques

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