
IT/Software Project Management Core Functions

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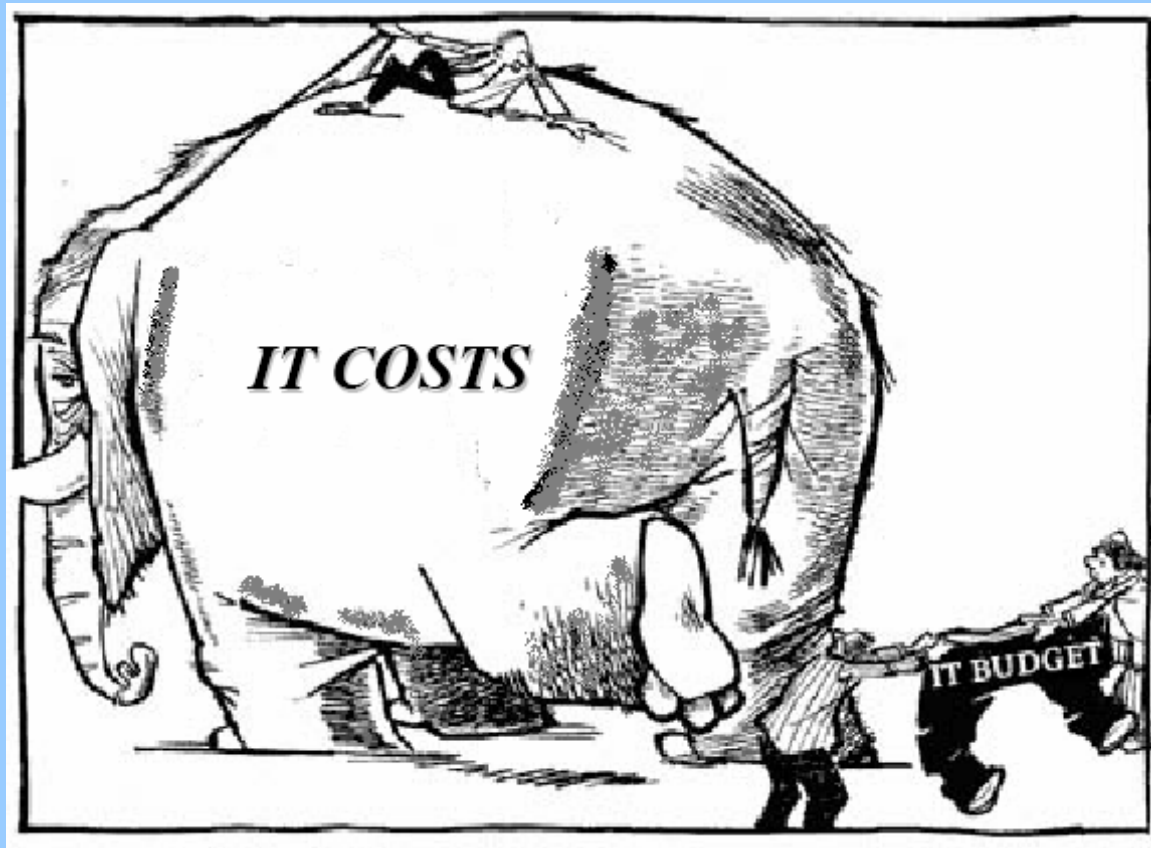
- The following references were mostly used in the preparation of the course; the order reflects the intensity of usage:
 - ✚ IT Project Management, Kathy Schwalbe, Course Technology, 2004.
 - ✚ Ghazy Assassa, Software Engineering Course notes, 2007.
 - ✚ Ian Sommerville: Software Engineering, 7th edition, Addison-Wesley, 2005.
 - ✚ PMBOK Guide, 2004.
 - ✚ Roger Pressman: Software Engineering, McGraw-Hill, 2005.

- ✚ Some information were taken from the following sites:
 - The Institute of Electrical and Electronics Engineers (IEEE)
 - The International Organisation for Standardisation (ISO)
 - The Software Engineering Institute (SEI) at Carnegie Mellon University.

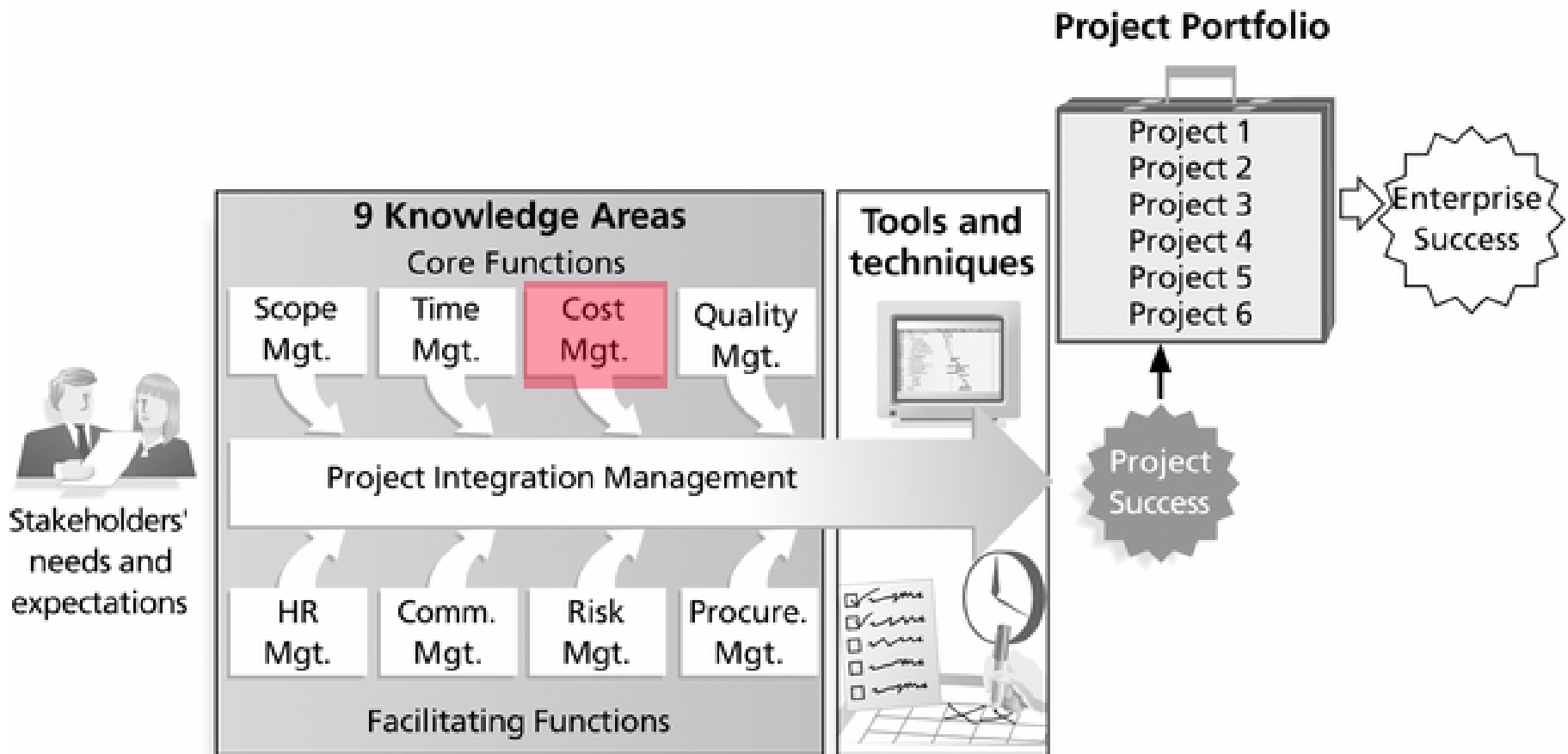
Project Cost Management

Objectives

- To introduce project cost management and its relation to project management framework
- To discuss the importance of project cost management
- To explain cost budgeting and cost baseline

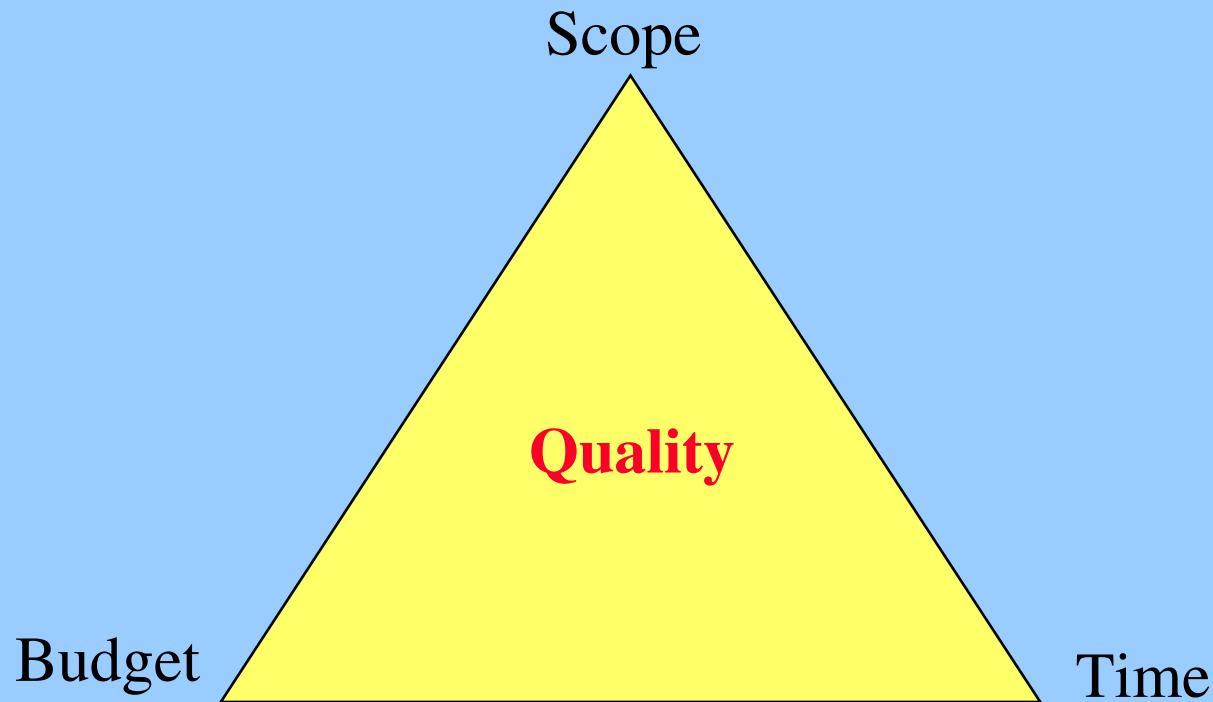


Project Management Framework



IT Project Management, Kathy Schwalbe, Course Technology, 2004.

Quality & The Triple constraint



The Importance of Project Cost Management

- IT projects have a poor track record for meeting budget goals.
- The 2003 CHAOS studies showed the average cost **overrun** was 43 percent.
- U.S. lost \$55 billion in IT projects in 2002 from cancelled projects and overruns compared to \$140 billion in 1994.*

*The Standish Group, "Latest Standish Group CHAOS Report Shows Project Success Rates Have Improved by 50%," A Standish Group Research Note (3/25/03).

What is Project Cost Management?

- **Project cost management** includes the processes required to ensure that the project is completed within an approved budget.

Project Cost Management Processes

- **Cost estimating:** Developing an approximation or estimate of the costs of the resources needed to complete a project.
- **Cost budgeting:** Allocating the overall cost estimate to individual work items to establish a baseline for measuring performance.
- **Cost control:** Controlling changes to the project budget.

Cost Management: Vocabulary

- Managers are more interested in financial terms than IT terms, so IT project managers must speak their language.
 - ✚ **Profits** are revenues minus expenses.
 - ✚ **Life cycle costing** considers the total cost of ownership, or development plus support costs, for a project.
 - ✚ **Cash flow analysis** determines the estimated annual costs and benefits for a project and the resulting annual cash flow.

Cost of Software Defects*

WHEN DEFECT IS DETECTED	TYPICAL COSTS OF CORRECTION
User Requirements	\$100 – \$1,000
Coding/Unit Testing	\$1,000 or more
System Testing	\$7,000 – \$8,000
Acceptance Testing	\$1,000 – \$100,000
After Implementation	Up to millions of dollars

It is important to spend money up-front on IT projects to avoid spending a lot more later.

*Collard, Ross, *Software Testing and Quality Assurance*, working paper (1997).

Cost Management: Vocabulary

- **Tangible costs or benefits** are those costs or benefits that an organization can easily measure in dollars.
- **Intangible costs or benefits** are costs or benefits that are difficult to measure in monetary terms.
- **Direct costs** are costs that can be directly related to producing the products and services of the project.
- **Indirect costs (Overheads)** are costs that are not directly related to the products or services of the project, but are indirectly related to performing the project.

Cost Management Plan

- A document that describes how the organization will manage cost variances on the project.
- A large percentage of total project costs are often labor costs, so project managers must develop and track estimates for labor.

Surveyor Pro Project Cost Estimate

Surveyor Pro Project Cost Estimate Created October 5, 2006

	Units(Hrs)	Cost/Unit(Hr)	Subtotals	WBS Level 1 Totals	% of Total
WBS Items					
1. Project Management				\$306,300	20%
Project manager	960	\$100	\$96,000		
Project team members	1920	\$75	\$144,000		
Contractors (10% of software development and testing)			\$66,300		
2. Hardware				\$76,000	5%
2.1 Handheld devices	100	\$600	\$60,000		
2.2 Servers	4	\$4,000	\$16,000		
3. Software				\$614,000	40%
3.1 Licensed software	100	\$200	\$20,000		
3.2 Software development*			\$594,000		
4. Testing (10% of total hardware and software costs)			\$69,000	\$69,000	5%
5. Training and Support				\$202,400	13%
Trainee cost	100	\$500	\$50,000		
Travel cost	12	\$700	\$8,400		
Project team members	1920	\$75	\$144,000		
6. Reserves (20% of total estimate)			\$253,540	\$253,540	17%
Total project cost estimate				\$1,521,240	

* See software development estimate

Surveyor Pro Software Development Estimate

Surveyor Pro Software Development Estimate Created October 5, 2006

1. Labor Estimate	Units(Hrs)	Cost/Unit(Hr)	Subtotals	Calculations
Contractor labor estimate	3000	\$150	\$450,000	3000*150
Project team member estimate	1920	\$75	\$144,000	1920*75
Total labor estimate			\$594,000	Sum above two values
2. Function point estimate**	Quantity	Conversion Factor	Function Points	Calculations
External inputs	10	4	40	10*4
External interface files	3	7	21	3*7
External outputs	4	5	20	4*5
External queries	6	4	24	6*4
Logical internal tables	7	10	70	7*10
Total function points			175	Sum above function point values
Java 2 language equivalency value			46	Assumed value from reference
Source lines of code (SLOC) estimate			8,050	175*46
Productivity*KSLOC^Penalty (in months)			29.28	3.13*8.05^1.072 (see reference)
Total labor hours (160 hours/month)			4,684.65	29.28*160
Cost/labor hour (\$120/hour)			\$120	Assumed value from budget expert
Total function point estimate			\$562,158	4684.65*120

**Approach based on paper by William Roetzheim, "Estimating Software Costs," Cost Xpert Group, Inc. (2003) using the COCOMO II default linear productivity factor (3.13) and penalty factor (1.072).

Cost Budgeting - **Cost Baseline**

- Cost budgeting involves allocating the project cost estimate to individual work items over time.
- The WBS is a required input for the cost budgeting process because it defines the work items.
- Important goal is to produce a **cost baseline**:
 - ✚ A time-phased budget that project managers use to measure and monitor cost performance.

Surveyor Pro Project Cost Baseline

Surveyor Pro Project Cost Baseline Created October 10, 2006*

WBS Items	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1. Project Management													
Project manager	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	96,000
Project team members	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	144,000
Contractors		6,027	6,027	6,027	6,027	6,027	6,027	6,027	6,027	6,027	6,027	6,027	66,300
2. Hardware													
2.1 Handheld devices				30,000	30,000								60,000
2.2 Servers				8,000	8,000								16,000
3. Software													
3.1 Licensed software				10,000	10,000								20,000
3.2 Software development		60,000	60,000	80,000	127,000	127,000	90,000	50,000		594,000			594,000
4. Testing			6,000	8,000	12,000	15,000	15,000	13,000		69,000			69,000
5. Training and Support													
Trainee cost									50,000				50,000
Travel cost									8,400				8,400
Project team members							24,000	24,000	24,000	24,000	24,000	24,000	144,000
6. Reserves				10,000	10,000	30,000	30,000	60,000	40,000	40,000	30,000	3,540	253,540
Totals	20,000	86,027	92,027	172,027	223,027	198,027	185,027	173,027	148,427	753,027	80,027	53,567	1,521,240

*See the lecture slides for this chapter on the companion Web site for a larger view of this and other figures in this chapter.

Cost Control

- Project cost control includes:
 - ✚ Monitoring cost performance.
 - ✚ Ensuring that only appropriate project changes are included in a revised cost baseline.
 - ✚ Informing project stakeholders of authorized changes to the project that will affect costs.

Using Software to Assist in Cost Management

- Spreadsheets are a common tool for resource planning, cost estimating, cost budgeting, and cost control.
- Many companies use more sophisticated and centralized financial applications software for cost information.
- Project management software has many cost-related features, especially enterprise PM software.