
Project Management

Projects

***A project* is a one-time effort to achieve a particular, current goal of an organization, subject to specific time or cost constraints.**

Management

***Management* is the activity of bringing an organization's resources to bear to achieve its goals as efficiently as possible.**

Management Activities

- ❑ *Staffing*: acquiring, training and educating, and assigning human resources
 - ❑ *Organizing*: structuring problems, resources, and work assignments
 - ❑ *Controlling*: directing resources, tracking progress, adjusting plans and organizations
 - ❑ *Leading*: setting goals and objectives, motivating, facilitating resolution of conflicts and problems, removing obstacles, and supporting people
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Project Management

***Project management* is the application of management principles to plan, staff, organize, control, and lead a project.**

Software Project Management

Software project management is management of projects to create and maintain software systems.

Software projects are difficult to manage because:

- it is hard to estimate time and costs accurately
- they are large and require many resources
- much coordination of sub-tasks is required
- it is hard to track progress

Software Project Failures

- ❑ Lack of project planning and control is a major cause of schedule slippage, cost overruns, poor quality, high maintenance costs, and outright project failures
 - ❑ Early planning is difficult because so much is unknown—but the point of early planning is to discover project unknowns, because they are the source of problems
 - ❑ Early planning is also essential as the basis for refined planning later on
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Basic Definitions

***A milestone* is any significant event in a project.**

***A deliverable* is any document, program, data, service, hardware, or object produced for an internal or external customer.**

Data-Driven Management

- ❑ A fundamental principle of good management is that decisions be based on facts rather than impressions or guesses
 - ❑ The facts that drive software management decisions usually have to do with issues of productivity and quality
 - ❑ Thus measurements of productivity and quality are basic needs for effective software project management
 - ❑ Using measurements is called being *data-driven*
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Measures and Metrics

***A measure* is a quantitative indication of the amount, size, or extent of some attribute of a product or process.**

***A metric* is a formula, algorithm, or technique for obtaining a measure or combining measures.**

Some Common Metrics

Several metrics are commonly used in software project management for:

size—lines-of-code (LOC), thousands-of-lines of code (KLOC) or function-points

cost or effort—time (person-months) or dollars

quality—defects-per-KLOC

productivity—size per unit of effort (LOC-per-month-per-programmer, or KLOC-per-dollar)

Other Metrics

- Depending on need, managers may define and collect metrics of their own devising, for example:

A manager attempting to improve size estimates may collect an estimation-accuracy metric defined as the actual divided by the estimated size; a value of 1 is a perfect estimate

Example

Grant Proposals and Project Tracking

Project Name	Project Contacts	Funding Status	2001								Budget Amount	Costs to Date	Remaining Funds	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug				
Project 1	Foundation A	● ▼	1/22 ▶		3/8 ◆		5/7 ◆	6/13 ◆	7/20 ■		\$2,000.00	\$1,400.00	\$600.00	
	ABC	▼		3/3	5/2						\$800.00	\$800.00	\$0.00	
Construction	Falkner Constr	▼				5/3	7/2			\$1,200.00	\$600.00	\$600.00		
Project 2	Foundation B	● ▼		2/13 ▶	3/20 ◆		5/13 ◆	6/7 ■			\$1,800.00	\$1,000.00	\$800.00	
	ABC	▼		2/22	3/12						\$600.00	\$600.00	\$0.00	
Construction	Falkner Constr	▼			3/24	5/23				\$1,200.00	\$400.00	\$800.00		
Project 3	Foundation C	● ▼		2/26 ▶		4/28 ◆		6/15 ■			\$4,000.00	\$1,200.00	\$2,800.00	
	ABC	▼			3/31	4/13					\$1,000.00	\$600.00	\$400.00	
Construction	Evans Constr	▼				5/7	6/15			\$3,000.00	\$600.00	\$2,400.00		
Project 4	Foundation D	● ▼			3/25 ▶	4/28 ◆		6/22 ◆	7/30 ■		\$3,200.00	\$1,500.00	\$1,700.00	
	ABC	▼			4/5	5/3					\$1,500.00	\$600.00	\$900.00	
Construction	White Constr	▼				5/29	7/28			\$1,700.00	\$900.00	\$800.00		
Budget				\$221.05	\$1,209.13	\$4,466.14	\$7,629.10	\$10,180.33	\$11,000.00			Value SmartColumns	Calculation SmartColumn	
Actual				\$221.05	\$1,075.64	\$2,760.88	\$3,704.51	\$4,667.21	\$5,100.00					
Remaining Funds				\$133.49	\$1,705.26	\$3,924.59	\$5,513.11	\$5,900.00						
Budget Actual Remaining Funds				Cumulative values graphed by month										
\$10,998.00 \$7,332.00 \$3,666.00 \$0.00														
● Approved ● Pending ● Terminated ▶ Proposal Due ◆ Update Due ■ Final Report Due														

Example

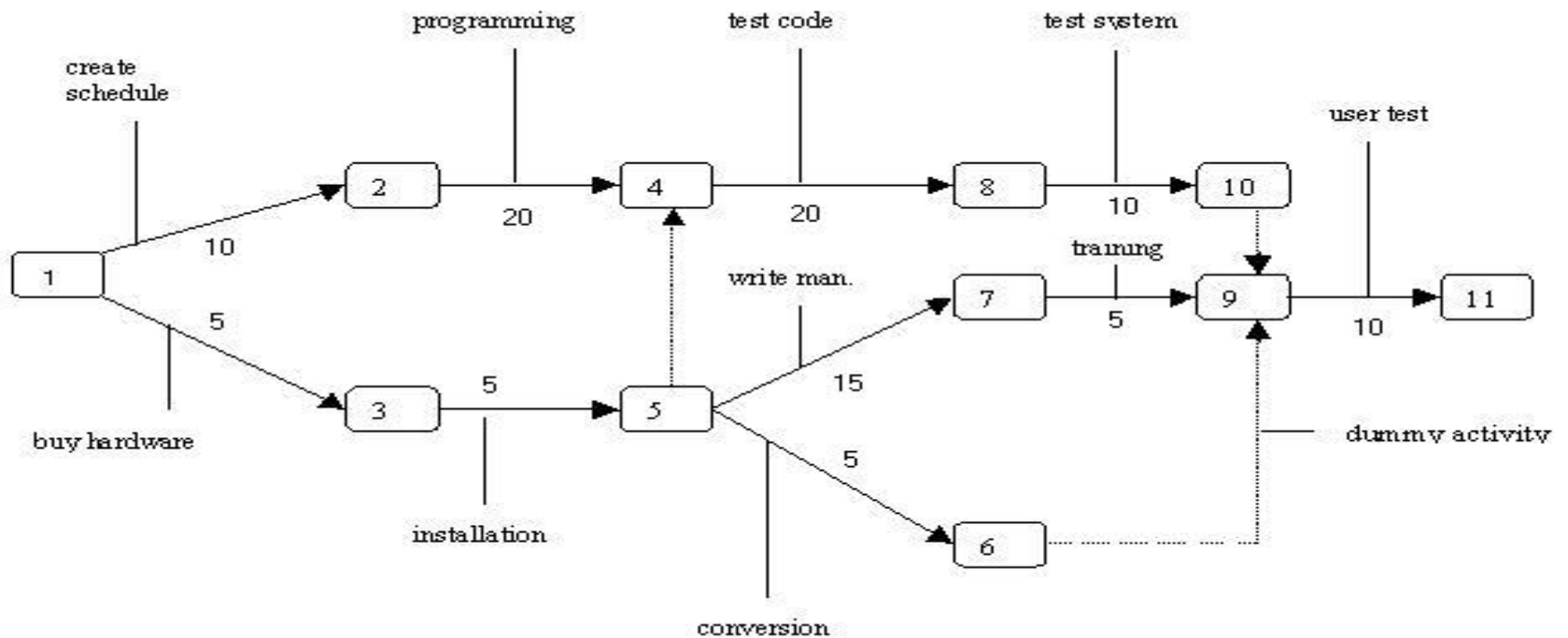


Fig. 1:
PERT Chart

- * Numbered rectangles are nodes and represent events or milestones.
- * Directional arrows represent dependent tasks that must be completed sequentially.
- * Diverging arrow directions (e.g. 1-2 & 1-3) indicate possibly concurrent tasks
- * Dotted lines indicate dependent tasks that do not require resources.

Contain of Proposal

Introduction Documents:

Inquiry Letter, Cover Letter, Title Page, Table of Contents, Non-Disclosure (long form and short form)

Client-centered Documents:

(Summary Section)

Executive Summary, Cost Summary

(Needs Assessment Section)

Competitive Analysis, Industry Trends, Client Background, Client Operations, Market and Audience, Opportunities

Project-centered Documents:

(Goals and Objectives Section)

Statement of Work, Expected Results, Benefits, Features, Samples, Project Deliverables, Services Provided

Contain of Proposal

□ (Methodology Section)

Technical Approach, Production Schedule, Project Management, Marketing Plan, Testing Plan, System Integration, Installation Schedule, Training Plan, Maintenance Plan, Assumptions, Storyboard Diagrams, Legal Considerations, Risk Analysis, Contingency Planning, Project Constraints

Contain of Proposal

□ **(Evaluation Section)**

Requirements, Documentation
Requirements,
Interface Requirements, Acceptance
Criteria

□ **(Budget Section)**

**Cost/Benefit Analysis, Supplied
Material, Equipment,
Hardware and Software, Work Order
#1, Work Order #2,
Payment Schedule, Contract and Terms**

Contain of Proposal

□ **(Project Summary Section)**

Recommendations, Project Summary

□ **Your Company-centered Documents: (Qualifications Section)**

Mission Statement, Qualifications, Quality Control, Case Study, Company History, Products, Future Developments, Testimonials, References, Portfolio, Team Resume
