

PROJECT MANAGEMENT PROCESSES & COST MANAGEMENT ESSENTIALS STUDY GUIDE

Key Terms

Project is temporary with a beginning & end. It creates unique product, service, or result. It gets progressively elaborated.

Program is a group of related projects.

Project Management Office (PMO) provides support and guidance to project managers, e.g., policies, tools, methodologies & templates.

Project Manager should be a great communicator, is ultimately responsible for project success or failure, and therefore should be empowered formally or informally by the organization. A good way to acquire informal power is to be an expert and earn the respect of peers and senior management. This includes having very good skills in negotiating, and influencing stakeholders. Project managers should be good at escalating risks to senior management and stakeholders. Formal Project manager's authority in organizational structures ranges from weak to strong.

- **Functional structure:** Project manager's authority is weak
- **Matrix structure:** Project manager's authority is medium in a balanced matrix structure. Can range from weak to strong, depending on matrix structure being weak matrix or strong structure.
- **Projectized structure:** Project manager's authority is strong

Five Project Management Process Groups

- Initiating
- Planning
- Executing
- Monitoring & Controlling
- Closing

Project Management Knowledge Areas

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

Knowledge areas have processes. The following table describes the processes associated with each knowledge area. Each process represents a project management activity that you can insert in your Work Breakdown Structure (WBS).

Project Management Process Groups with Knowledge Mapping					
Knowledge Area	Initiating Process	Planning Process	Executing	Monitor and Control	Closing
Integration Management	Develop Project Charter	Develop Project Management Plan	Direct & Manage Project Execution	Monitor & Control Work Perform Change Control	Close Project or Phase
Scope Management		Collect Requirements Define Scope Create WBS		Verify Scope Control Scope	
Time Management		Define Activities Sequence Activities Estimate Activity Resources Estimate Activity Durations Develop Schedule		Control Schedule	
Cost Management		Estimate Costs Determine Budget		Control Costs	
Quality Management		Plan Quality	Perform Quality Assurance	Perform Quality Control	
Human Resource Management		Develop HR Plan	Acquire Team Develop Team Manage Team		
Communications Management	Identify Stakeholders	Plan Communications	Distribute Information Manage Stakeholder Expectations	Report Performance	
Risk Management		Plan Risk Management Identify Risks Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Response		Monitor and Control Risks	
Procurement Management		Plan Procurements	Conduct Procurements	Administer Procurements	Close Procurements

COST MANAGEMENT FACTS & FORMULAS FOR PROJECT MANAGERS

There are three project cost management processes — Estimate Costs, Determine Budget, and Control Costs.

Three Point Method, also known as PERT: Use the formula $\text{Mean} = P + 4L + O / 6$ where O is an optimistic estimate, L is likely estimate, and P is a pessimistic estimate. To calculate one standard deviation, use $S = (P - O) / 6$. To calculate two standard deviations, $S = 2 * (P - O) / 6$. To calculate three standard deviations, use $S = 3 * (P - O) / 6$. Normal distribution for S is +/- 68%, 95%, and 99.7%, respectively, for the above.

Parametric model is a statistical model based on historic data to estimate project costs, e.g., \$100 per square foot to build a garage.

Analogous model is an estimate based on historic experience with a similar project from the past. You may use your expert judgment or other experts who have managed a similar project.

Bottom-up cost estimating involves rollup of all decomposed WBS cost packages.

Top-down cost estimating is faster than bottom-up cost estimating. This approach uses tools like three point method, parametric, or analogous to estimate.

Earned Value Management formulas are helpful to monitor and control project cost and schedule.

- Budget at Completion [BAC] is the total budget for the project
- Planned Value [PV] Budgeted cost for the package or period. $\text{Planned \%} * \text{BAC}$
- Earned Value [EV] Actual work completed. $\text{Actual \%} * \text{BAC}$
- Actual Cost [AC] Actual cost associated with the work completed.
- Cost Variance [CV] $\text{CV} = \text{EV} - \text{AC}$
- Cost Performance Index [CPI] $\text{CPI} = \text{EV} / \text{AC}$
- Schedule Performance Index [SPI] $\text{SPI} = \text{EV} / \text{PV}$
- Estimate At Completion [EAC] $\text{EAC} = \text{BAC} / \text{CPI}$
- Estimate To Complete [ETC] $\text{ETC} = \text{EAC} - \text{AC}$
- To-Complete Performance Index [TCPI] (BAC formula) $\text{TCPI} = (\text{BAC} - \text{EV}) / (\text{BAC} - \text{AC})$
- To-Complete Performance Index [TCPI] (EAC formula) $\text{TCPI} = (\text{BAC} - \text{EV}) / (\text{EAC} - \text{AC})$
- Variance at Completion [VAC] $\text{VAC} = \text{BAC} - \text{EAC}$

0/50/100 is a method to compute earned value for completed work packages—no EV credit is given for the work until it is 50% complete, and then no additional EV credit is given until it is 100% complete. Other conservative schemes are 0-100 where no credit is given until it is 100% done, or 20-100 where 20% EV credit is given when you start the project and 80% when it is all done.

Direct cost—cost attributed to a project, e.g., training cost associated with a resource

Indirect Cost—cost can be attributed to multiple projects, e.g., rent cost for building.

Variable cost—attributed to per widget manufactured, e.g., cost per printed book

Fixed cost—cost remains constant example, e.g., cost for equipment to print books such as a printing press

Contract types

- Fixed-Price (FP) buyer and seller agree to a fixed cost to complete a project. Buyer risk is low.
- Cost plus Percent of Cost (CPPC) buyer pays the seller all actual costs incurred plus a percentage profit of the incurred project expenses. Buyer risk is high.
- Cost plus Award Fee (CPAF) actual costs are paid to the seller and an award based profit for satisfactory completion of identified project objectives. Buyer carries more risk.
- Fixed plus Incentive Fee (FPIF) is similar in nature but it is a fixed price contract with a reward to the seller for meeting project objectives. Buyer carries less risk than seller.
- Time and Materials (T & M) Both time (hourly salary rate is fixed) and materials are provided to seller. Buyer risk can be less if “not to exceed \$ amount” clause exists in contract.

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