

The Steps of a High-Quality Cost Estimating Process

Step	Description	Associated Task(s)
1	Define estimate's purpose and schedule	Determine: <ul style="list-style-type: none"> • The estimate's purpose; • The level of detail required; • Who will receive the estimate; • The overall scope of the estimate.
2	Develop estimating plan	Determine: <ul style="list-style-type: none"> • The Cost Estimating team • Outline the cost estimating approach. • The estimate timeline. • Who will do the Independent Estimate • The Team's master schedule.
3	Obtain data and information	Identify in a technical baseline description document: <ul style="list-style-type: none"> • The relationship to DOE priority programs and purpose; • System and performance characteristics; • Technology implications; • Acquisition schedule and strategy; • Risk items; • System quantities for development, test, and production; • Operation and maintenance plans; • Predecessor or similar legacy systems for analogous estimate comparison. • Create a data collection plan with emphasis on collecting current and relevant technical, programmatic, cost, and risk data. • Investigate possible data sources. • Collect data and normalize them for cost accounting, inflation, learning and quantity adjustments. • Analyze information for cost drivers, trends and outliers; compare results against know rules of thumb and standard factors derived from historical data; • Investigate/Interview data sources and assess pedigree (reliability, accuracy, completeness, etc.);document all pertinent information,
4	Identify ground rules and assumptions	Determine; <ul style="list-style-type: none"> • Clearly define what is included and excluded from the estimate. • Identify program specific assumptions such as the estimate's base year, including time-phasing and life cycle cost assumptions. • Schedule information by phase including any schedule or budget constraints; • Escalation/ inflation assumptions; • Equipment and/or materials that the government is to furnish. • Use of existing facilities or new modified facilities.

		<ul style="list-style-type: none"> • Technology assumptions and new technology to be developed. • Commonality with legacy systems. • Effects of new ways of doing business.
5	Determine Estimating approach	Determine: <ul style="list-style-type: none"> • Work Breakdown Structure (WBS); • Best estimating method for each WBS element; • Potential cross checks for likely cost and schedule drivers; • Develop a cost estimating checklist
6	Develop Estimate	<ul style="list-style-type: none"> • Develop the cost model by estimating each WBS element, using the best methodology from the data collected. • Include all estimating assumptions in the cost model. • Express costs in constant year dollars. • Time-phase the results by spreading costs in the years they are expected to occur, based on the master schedule. • Sum the WBS elements to develop the overall point estimate. • Validate the estimate by checking for errors such as double counting, omitting costs or factors. • Compare estimate against the baseline identify variances. • Perform cross-checks on cost drivers to see if results are similar. • Update the model as more data become available or as changes occur; compare results against other and/or previous estimates.
7	Conduct Sensitivity/ Risk Analysis	<ul style="list-style-type: none"> • Determine the level of cost, schedule, and technical risk associated with each WBS element and discuss with technical experts. • Analyze each risk for its severity and probability of occurrence. • Develop minimum, most likely, and maximum ranges for each element of risk. • Use an acceptable statistical analysis model (Monte Carlo simulation) to develop a confidence interval around the point estimate. • Determine type of risk distributions and reason for their use. • Identify the confidence level of the point estimate. • Identify the amount of contingency funding and/or management reserve to determine the risk-adjusted estimate. • Recommend that the project or program office develop a risk management plan to track and mitigate risks.
8	Draft Basis of Estimate (BOE) Document	<ul style="list-style-type: none"> • Document the estimate rules and assumptions. • Document all steps used to develop the estimate so that it can be recreated quickly by a cost analyst unfamiliar with the project and produce the same result.

		<ul style="list-style-type: none"> • Document the purpose of the estimate, the team that prepared it, who approved the estimate and on what date. • Describe the project, including the schedule and technical baseline used to create the estimate. • Present the time-phased life-cycle cost of the project. • Include auditable and traceable data sources for each cost element. • Describe estimating methodology and rationale. • Document all data sources how the data were normalized.
9	Perform QA/QC and Peer reviews	<ul style="list-style-type: none"> • Thoroughly review BOE to avoid errors and omissions. • Validate that standard policies and procedures have been followed, that and requirements have been met to ensure a high quality estimate. • Ensure that DOE cost estimating goals have been achieved.
10	Present Estimate for Approval	<p>As required:</p> <ul style="list-style-type: none"> • Ensure BOE has an executive summary. • Develop a briefing that presents the documented life cycle cost for management approval including: <ul style="list-style-type: none"> ○ An explanation of the technical and programmatic baseline and any uncertainties; ○ Comparison to prior and analogous projects, prior estimates and baselines; ○ Enough detail to present and defend the estimate by showing its completeness, accuracy, and high quality. ○ Act on and document management feedback. • The cost estimating team should request acceptance/ approval of the estimate.
11	Check/Validate and update estimate to reflect actual cost data and conduct variance analysis	<ul style="list-style-type: none"> • Update the estimate to: <ul style="list-style-type: none"> ○ Reflect changes in project scope and/or assumptions. ○ Keep current as the program passes through key milestones and critical points. • Replace estimates with EVM and actual costs at completion. • Assess variances from actual and estimated costs and document lessons learned.
12	Store Estimate data in database	Document estimate, costs, parameters, drivers and changes that occurred that affected the estimate.

