QRST method: A four-step approach for project cost management

In any project by a company, the actual costs generally exceed the estimated costs and time, as a result of which budget takes a backseat. Cost management is the bottom line for any company's projects. Here is an outline of the QRST method for bringing the deviations in expected cost over-runs within acceptable limits.

Today, any individual handling a project can be found talking about cost over-runs, budget over-runs, time over-runs, and will be frustrated. Why do most people face such problems? Is there no solution for these problems? With regard to project management, the first question that comes up is how to complete the project on time, but one fails to understand the cost impact of this over-run on the overall profit of the firm. Here, Project Cost Management (PCM) comes into picture.

Purpose of PCM

Ensuring that the plan is in place and tracking & minimising the deviations from the plan is critical for preventing or minimising cost over-runs. Thus, Project Cost Control must ensure the following:

- Identifying early trends of cost variances on QRST basis for timely corrective actions
- Projection of estimated cost to completion according to study of trends & technical analysis
- Suggest corrective actions to minimise cost over-runs, to manage the review and final decision
- Analyse costs incurred on each construction contract package

Levels of PCM

PCM calls for three ingredients for being effective, namely, cost budgeting, actual cost tracking and cost control.

Cost budgeting: It means estimating costs of resources needed to complete project activities and allocating overall cost estimate to individual work activities.

Actual cost tracking: It involves capturing actual costs incurred at the WBS level when it incurs (not approximation of the cost incurred across WBS elements).

Cost control: It includes tracking changes to the project budget, identifying trends and ensuring on-time at-cost completion.

Understanding cost drivers

There are four reasons for deviations in the actual project cost from the budget. These include Quantity, Rate, Specification and Time (QRST).

Q: Implication on cost due to change in quantity

- Change in quantity requirements may occur due to change in design and scope, extra work not specified in the contract or not envisaged in the estimate
- On account of rework due to modification at post-installation, incorrect installation, failure of installation and failure of design

R: Implication on cost due to change in rate as a result of Statutory variations, Tax structure, Inflation, Demand and supply, etc.

S: Implication on cost due to change in specification with respect to Materials, Physical design, Quality characteristics, ie, changes due to tolerances, finishing, codes, standards, inspection and testing, Safety standards, etc.

T: Implication on cost due to time factors Delay resulting in idle time of resources or Crashing of activities leading to exponential rise in cost

Earned Value Management (EVM)

EVM measures, monitors and manages project cost on an on-going basis. It continuously measures project performance relating to three variables:

- Budgeted Cost of Work Scheduled (BCWS) – also called Planned Value (PV):
  - Physical work to be performed, including the estimated value of this work
  - BCWS to be completed on an activity or WBS component up to a given point in time
- Budgeted Cost of Work Performed (BCWP) – also called Earned Value (EV):
  - Physical work actually accomplished, including estimated value of this work
  - Budgeted cost for the work actually completed on the schedule activity or WBS component during a given time
- Actual Cost of Work Performed (ACWP) – also called Actual Cost (AC):
  - Actual costs incurred to accomplish the earned value.
  - Total cost incurred in accomplishing work on schedule or WBS component during a given period. This must correspond in definition and coverage to that budgeted for BCWS and BCWP

Performance metrics for EVM

EVM uses a few key performance metrics to manage project costs, viz, cost variance, schedule variance, cost performance index and schedule performance index.

Cost Variance (CV): Indicates if the work accomplished using labour and materials costs more or less than was planned in the project (measured as BCWP minus ACWP)

Schedule Variance (SV): An overall assessment in monetary terms of the progress of work packages in the project scheduled to date (measured as BCWP minus BCWS).
Cost Performance Index (CPI): It is calculated as BCWP/ACWP. This measures the cost efficiency of work accomplished to date. CPI<1 indicates cost over-run and CPI>1 indicates that the costs are within budget.
Schedule Performance Index (SPI): It is calculated as BCWP/BCWS. This measures scheduling efficiency and is used to predict the completion date. It is used in conjunction with CPI for projecting project completion status. SPI <1 indicates that the project is behind schedule and SCI>1 indicates that the project is ahead of schedule.

Prediction metrics of EVM
For a project manager, it is critical to have a mechanism that pre-empts the cost and schedule over-run, a mechanism to plan the road ahead to get it done within schedule. EVM uses two metrics to assist in this, viz. Estimate At Completion (EAC) and Estimate To Complete (ETC). EAC is a forecast of most likely total project costs based on project performance and risk quantification. EAC is measured as ACWP plus ETC. ETC is a forecast of the additional costs that will be incurred in future. This is calculated by considering the future cost trends and corrective actions to be taken to manage the EAC.

Triggers for Cost Over runs:

Cost over-runs triggered at various phases of a project:

- Proposal phase (Failure to understand customer requirements, Unrealistic appraisal of in-house capabilities, Underestimating time requirements)
- Planning phase (Omissions, Inaccuracy of work breakdown structure, Misinterpretation of information, Use of wrong estimating techniques, Failure to identify and concentrate on major cost elements, Failure to assess and provide for risks)
- Negotiation phase (Forcing a speedy compromise, Procurement ceiling costs, Negotiation team that must “win this one”)
- Contractual phase (Contractual discrepancies, Statement of Work different from Request for Proposal requirements, Proposal team different from project team)
- Design phase (Accepting customer requests without management approval, Problems in customer communication channels and data items, Problems in design review meetings)
- Production phase (Excessive material costs, Unacceptable specifications, Manufacturing and engineering disagreement)

Recovery actions to PCM
On the basis of EVM, PCM has to manage the Estimate To Complete to ensure that the EAC is within acceptable limits. Some recovery actions that can be taken are as follows:

- Push for compliance

    - Try and maintain original plan
    - Do not assume that potential changes should be accepted
    - Sometimes a firm reminder of the commitment and offer of support can stimulate better performance
- Recover in later tasks
    - Future plans must reflect in the project schedule
- Add resources
    - Get additional help
    - Consider the potential increase in project expenditure and the possibility of diminishing returns when resources are added
- Accept substitutions

When something is unavailable or expected to be delivered late, substitute a comparable item

    - Consider any potential effects on performance
- Use alternative work methods
    - Find a more expedient way to accomplish the work
    - Check its impact on cost and/or schedule
- Accept partial deliverables
    - Delivery of only some of the items you need may allow you to keep the project moving forward
- Offer incentives
    - Offer a bonus or other inducement to improve performance
    - Penalty clauses may have the same effect, but are negative
- Renegotiate cost and schedule targets
    - Explore extending deadline or increasing budget
- Reduce scope
    - Reduce quality and/or performance requirements of deliverables to reduce the work required
    - All stakeholders must agree on taking this course of action

In a nutshell

PCM includes influencing the factors that cause changes to cost baseline, ensuring that requested changes are agreed upon, managing the actual changes as they occur, assuring that potential cost over-runs do not exceed the authorised funding periodically and in total for the project, monitoring cost performance to detect and understand variances from cost baseline, recording all changes accurately against cost baseline, preventing incorrect, inappropriate or unapproved changes from being included in the reported cost or resource usage, informing stakeholders of approved changes and working to bring expected cost over-runs within acceptable limits.

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