



30 Project Cost Control Metrics

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PROJECT MANAGEMENT COLLECTION

30 Project Cost Control Metrics



PLAN



TRACK



CONTROL



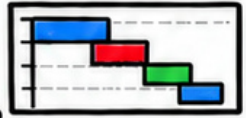
DELIVER



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1

PLANNED VALUE



The authorized budget for work scheduled by the status date.

1 WHAT IT MEASURES

Planned value (PV) is the time-phased budgeted value of the work that should be completed by the status date, using the approved scope baseline.



AUTHORIZED BUDGET:

Uses the approved budget for the scheduled work.



SCHEDULED WORK:

Includes the budgeted portion scheduled by the status date, even in unfinished activities.



TIME-PHASED:

Cumulative value of work planned up to the cutoff date.



SCOPE BASELINE:

Derived from the approved scope, schedule and budget.



PURPOSE:

Sets the baseline for comparing with earned value and actual cost.

2 FORMULA & METHOD

$PV = \text{Budgeted value of work scheduled by the status date}$



1 Use a common status date for the schedule and cost system.



2 Take the approved time-phased baseline (scope, schedule and budget).



3 Sum the time-phased budget scheduled through the status date, including planned portions of ongoing work.



4 PV is a cumulative value from project start up to the cutoff date.



CONTROL:

Use the same approved baseline and status date for all comparisons.

3 DATA & EVIDENCE



SCHEDULE BASELINE:

Approved schedule showing planned activities, dates and milestones.



BUDGET BASELINE:

Budgeted value for each work package aligned to the schedule.



SCOPE BASELINE:

Approved scope and work breakdown structure (WBS).



TIME-PHASED PLAN:

Cumulative budget by date from the project schedule.



OWNER:

Scheduler or project controls prepares PV. Project manager approves and ensures the baseline is current.



EVIDENCE:

Baseline schedule file, budget report and configuration control records.

4 WORKED EXAMPLE

Illustrative project at the status date:

The approved baseline shows that \$100,000 of work should be complete by today.

Planned value (PV): \$100,000

RESULT: PV = \$100,000



INTERPRETATION:

The budgeted value of scheduled work up to the status date is \$100,000, based on the approved time-phased baseline.



NOTE:

This is an illustrative example using the given value. Actual project amounts will vary.

5 INTERPRET & CAUTIONS



WHAT PV SHOWS:

The authorized budget for work that should be complete by the status date.



KEY POINT:

PV is derived from the approved scope, schedule and budget using a common cutoff date.



WHAT PV IS NOT:

Not actual spending, not cash flow and not evidence of physical completion.



CAUTIONS:

PV depends on a realistic and approved schedule. Changes to the baseline affect PV and downstream analysis. Ensure the status date and baselines are consistent.

6 ACTIONS & OUTPUTS



RECONCILE FIRST:

Check that the schedule, budget and scope baseline are aligned and use the same status date.



VALIDATE BASELINE:

Confirm approved time-phased budget values for all scheduled work up to the cutoff date.



CALCULATE PV:

Sum all baseline budget scheduled through the cutoff.



COMPARE NEXT:

After PV is confirmed, compare with earned value (EV) and actual cost to assess performance.



OUTPUTS:

PV value, baseline schedule report and a record of the data sources and status date used.



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EARNED VALUE



Measure the budgeted value of work actually accomplished under objective earning rules.



1 WHAT IT MEASURES

Earned Value (EV) is the budgeted value of work actually accomplished, using the same approved scope and earning rules as the plan.



EARNED VALUE (EV):

Budgeted value credited to verified completed work.



BUDGETED VALUE (PV):

Budgeted value of work scheduled to be completed by today.



FOCUS:

Measures progress in terms of value, not money spent or time elapsed.



PURPOSE:

Provides an objective basis to compare planned and earned performance.

2 FORMULA & METHOD

$$EV = \sum \text{Budgeted Value earned under approved rules}$$

1



Use approved scope, work packages and earning rules.

2



Apply consistent method at work-package level (e.g. 0/100, 50/50).

3



Credit progress only when approved earning criteria are met.

4



Sum credited EV across all work packages, including work in progress.

5



Ensure the same scope baseline and rules are used throughout the project.

3 DATA & EVIDENCE



COMPLETION EVIDENCE:

Approved deliverables, test results, inspection records or acceptance certificates.



OWNERS:

Project manager, work-package owner and quality team provide and verify evidence.



PLANNED INFORMATION:

Work breakdown structure, baseline budget and approved earning rules for each package.



PROGRESS RECORDS:

Status reports, completion dates and change approvals.



CONTROLS:

Ensure only authorized scope is included and evidence is retained for audit and review.

4 WORKED EXAMPLE

Illustrative work package using an approved 50/50 earning rule:



Work package budget (BAC): \$20,000.



At valid start:
First 50% earns \$10,000 EV.



At completion:
Remaining 50% earns \$10,000 EV.

RESULT: EV at start = \$10,000
EV at completion = \$20,000



NOTE:

The budgeted value is earned when the defined work is completed according to the approved rule.

5 INTERPRET & CAUTIONS



MEASURES PROGRESS:

EV shows the value of completed work, not the actual cost or cash spent.



NOT COST:

Spending money does not earn value unless the defined work is completed.



NOT TIME:

Elapsed time alone does not earn value.



UNAUTHORIZED SCOPE:

Do not credit EV for work outside the approved scope, as this can inflate results.



SUBJECTIVE CLAIMS:

Reported progress must be supported by objective evidence and agreed earning rules.

6 ACTIONS & OUTPUTS



AGREE EARNING RULES:

Define and document rules for each work package (e.g. 0/100, 50/50) and apply them consistently.



VERIFY COMPLETION:

Collect and keep evidence such as test results, inspection records or acceptance certificates.



REVIEW CLAIMS:

Challenge subjective progress updates and confirm they meet the approved rules.



RECORD EV:

Sum credited EV across work packages and update reports.



OUTPUTS:

Earned value for the reporting period, a variance narrative and a log of completion evidence.



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30 Project Cost Control Metrics



ACTUAL COST



Measure the recorded cost of work performed through a defined status date.

1 WHAT IT MEASURES

Actual cost (AC) is the total recorded cost of work performed through the status date, following the agreed accounting policy.



RECORDED COST:

Includes recognized incurred costs and valid accruals, not just paid invoices.



WORK PERFORMED:

Covers only work actually done up to the status date.



ACCOUNTING POLICY:

Uses the organization's approved rules for recognizing and recording costs.



PURPOSE:

Provides the cost input for performance analysis with schedule and scope.

2 FORMULA & METHOD

$$AC = \text{RECORDED INCURRED COSTS} + \text{VALID UNRECORDED ACCRUALS}$$

Avoid overlap; apply the agreed accounting policy.

1



Identify all costs for work performed up to the status date.

2



Include incurred costs whether invoices are paid or unpaid.

3



Add valid accruals for costs incurred but not yet invoiced.

4



Apply the agreed accounting policy and cut-off date.

5



Ensure costs are correctly coded to the project and work packages.

3 DATA & EVIDENCE



SOURCE RECORDS:

Supplier invoices, expense claims, timesheets and accrual journals.



REQUIRED EVIDENCE:

Cost ledger, invoice records and accrual calculations at the status date.



OWNERS:

Finance team for actual costs and accruals, and project controls for work-package coding.



VERIFICATION:

Check that costs relate to work performed and are not duplicated with other projects.



DEPENDENCIES:

Consistent accounting policy, cut-off date and cost coding structure.

4 WORKED EXAMPLE

Illustrative project at the status date:

Recorded incurred costs for work performed: \$45,000

Valid accruals for work performed: \$5,000

$$AC = \$45,000 + \$5,000$$

RESULT: \$50,000



INTERPRETATION:

Actual cost is \$50,000 including recognized incurred costs and additional valid accruals.



NOTE:

No overlap exists between recorded costs and additional accruals.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The cost incurred for work performed, compared with its earned value for cost analysis.



USEFUL FOR:

Identifying cost performance and supporting variance analysis.



POTENTIAL PITFALLS:

Late invoices can underestimate AC at the status date.



INCONSISTENT CUT-OFFS:

Different cutoff dates or accounting policies can distort performance comparisons.



LIMITATION:

AC reflects recorded costs only and does not predict future costs. Accuracy depends on timely and consistent cost recording.

6 ACTIONS & OUTPUTS



RECONCILE RECORDS:

Match finance records, accruals and work-package costs before analysis.



CHECK ACCRUALS:

Confirm that accruals are valid, reasonable and relate to work performed.



VERIFY CODING:

Ensure costs are correctly coded to the project and appropriate work packages.



COORDINATE OWNERS:

Work with finance and project controls to resolve discrepancies and missing items.



OUTPUTS:

A reliable actual cost (AC) figure for the status date, ready for variance analysis and reporting.



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COST VARIANCE



Compare the budgeted value of accomplished work with its actual cost.



1 WHAT IT MEASURES

Cost variance shows the difference between the budgeted value of accomplished work (earned value) and the actual cost of that work, using the same scope and cutoff.



EARNED VALUE (EV):

Budgeted value of work actually completed and accepted.



ACTUAL COST (AC):

Total cost actually incurred for the completed work.



POSITIVE CV:

Cost performance is favorable (under budget).



NEGATIVE CV:

Cost performance is unfavorable (over budget).



USER:

Use with other metrics such as schedule variance for a full view.

2 FORMULA & METHOD

$$CV = EV - AC$$



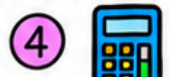
1 Use a common status date for scope, schedule and cost data.



2 Confirm the earned value is for work actually completed and accepted.



3 Obtain the total actual costs for the same work and time period.



4 Subtract actual cost (AC) from earned value (EV).



5 A positive result is favorable, a negative result is unfavorable.



CONTROL:

Use consistent scope, accounting rules and data cutoff across EV and AC.

3 DATA & EVIDENCE



EARNED VALUE DATA:

Agreed scope, work breakdown structure, accepted work and budgeted values (PV and EV).



COST RECORDS:

Actual cost (AC) from accounting system, including labor, materials and other direct costs.



PROGRESS EVIDENCE:

Accepted deliverables, timesheets, measurements or inspection records to support EV.



OWNERS:

Project control team provides EV, finance provides actual costs, and project manager validates the reconciliation.



DEPENDENCIES:

Approved baselines, change log and consistent time period for all data.

4 WORKED EXAMPLE

Illustrative example at the same status date and scope:

Earned value (EV): \$80,000

Actual cost (AC): \$100,000

$$CV = \$80,000 - \$100,000$$

RESULT: -\$20,000



INTERPRETATION:

The project has spent \$20,000 more than the budgeted value of the work completed. This is an unfavorable cost variance.



NOTE:

This example shows cost performance only. It does not indicate schedule status or total project success.

5 INTERPRET & CAUTIONS



POSITIVE CV:

Actual costs are less than the earned value. Cost performance is favorable under the same scope and cutoff.



NEGATIVE CV:

Actual costs are greater than the earned value. Cost performance is unfavorable.



DO NOT OVER-INTERPRET:

A favorable CV does not prove the project is on schedule or achieving its benefits.



CHECK CAUSES:

Variances can result from rate changes, productivity issues, scope changes or accounting timing differences.



LIMITATION:

CV does not measure cash flow or future costs. Use with other metrics for complete analysis.

6 ACTIONS & OUTPUTS



INVESTIGATE CAUSES:

Review cost rate changes, productivity, scope changes and accounting classifications to explain the variance.



AGREE ACTIONS:

Assign owners and deadlines for corrective or preventive actions as needed.



FORECAST REMAINING WORK:

Use current information to re-estimate the cost of remaining work and the expected final cost at completion.



OUTPUTS:

Variance narrative, causes, agreed actions, updated forecast and entries in the issue or risk log.



TRACK OVER TIME:

Monitor the variance trend in future reviews to confirm whether actions are effective.



COST PERFORMANCE INDEX



Measure the earned value obtained per unit of actual cost.

1 WHAT IT MEASURES

Cost Performance Index (CPI) shows how efficiently actual cost is being used to earn value, using earned value management.



EARNED VALUE (EV):

Budgeted value of work actually completed and objectively verified.



ACTUAL COST (AC):

Total direct and indirect costs incurred for the work performed.



CPI ABOVE 1:

Favorable cost efficiency. More value earned per unit of actual cost.



CPI BELOW 1:

Unfavorable cost efficiency. Less value earned per unit of actual cost.



UNIT:

Unitless ratio comparing earned value to actual cost.

2 FORMULA & METHOD

$$CPI = EV / AC$$

EV = Earned Value

AC = Actual Cost



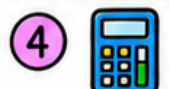
1 Confirm the measurement period and scope of the earned value data.



2 Obtain the earned value (EV) for completed work and the total actual cost (AC) incurred.



3 Calculate CPI by dividing EV by AC.



4 If CPI is greater than 1, cost efficiency is favorable. If less than 1, it is unfavorable.



CONTROL:

AC must be greater than zero. Use N/A when AC is zero.

3 DATA & EVIDENCE



EARNED VALUE DATA:

Verified progress measurements, accepted work and the approved budget for the work performed.



COST DATA:

Actual cost records for the same scope and time period as the earned value.



BASELINE REFERENCE:

Approved scope baseline and work breakdown structure (WBS) for consistent measurement.



EVIDENCE SOURCES:

Timesheets, purchase records, subcontractor invoices, cost reports, and progress documentation.



OWNERS:

Project control team provides EV and cost data; project manager reviews and validates.

4 WORKED EXAMPLE

Illustrative project at the same status date:

Earned value (EV): \$80,000

Actual cost (AC): \$100,000

$$CPI = EV / AC \\ = \$80,000 / \$100,000$$

RESULT: 0.80



INTERPRETATION:

The project earned \$0.80 of value for each \$1.00 of actual cost, indicating unfavorable cost efficiency at this point in time.

5 INTERPRET & CAUTIONS



CPI > 1:

Favorable. More value earned per unit of actual cost.



CPI < 1:

Unfavorable. Less value earned per unit of actual cost.



CONSIDER CONTEXT:

Review trends over time and with other metrics before drawing conclusions.



LIMITATIONS:

One aggregate CPI can hide work-package level problems or immature data.



SPECIAL CASE:

If actual cost is zero, CPI is not defined. Use N/A.

6 ACTIONS & OUTPUTS



ANALYZE DRIVERS:

Investigate causes of low or high CPI such as scope changes, productivity, rework or estimate accuracy.



TAKE ACTION:

Address identified issues at the work-package level with owners and agreed corrective actions.



REVIEW TRENDS:

Look at CPI over time and with other metrics before using it in forecasts.



UPDATE FORECASTS:

Use CPI carefully as an input along with other relevant information.



OUTPUTS:

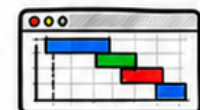
Variance narrative, action log and updated estimates or forecasts as appropriate.



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COST VARIANCE PERCENTAGE



Express the cost variance relative to a clearly stated denominator.



1 WHAT IT MEASURES

Cost variance percentage (CV%) shows the cost variance relative to the earned value, indicating whether actual costs are higher or lower than the value of work performed.



EARNED VALUE (EV):

Budgeted value of work actually completed and objectively verified.



ACTUAL COST (AC):

Total costs actually incurred for the completed work.



POSITIVE CV%:

Actual costs are lower than earned value (favorable).



NEGATIVE CV%:

Actual costs are higher than earned value (unfavorable).



EXPRESSES RELATIVE SIZE:

Shows the cost variance as a percentage of the earned value.

2 FORMULA & METHOD

$$CV \% = 100 \times (EV - AC) / EV$$

EV > 0 (required)



1 Confirm EV and AC are for the same period and scope of work.



2 Ensure EV is greater than zero (required for this definition).



3 Calculate the currency variance: EV - AC.



4 Divide by EV and multiply by 100 to get the percentage.



5 Keep the sign: positive favorable, negative unfavorable.



CONTROL:

EV must be greater than zero. Use this definition consistently.

3 DATA & EVIDENCE



EARNED VALUE RECORDS:

Verified progress measurements, budgeted values and work completion evidence.



COST RECORDS:

Actual cost data for the same completed work (AC), including labor, materials and other costs.



SCOPE ALIGNMENT:

Confirm EV and AC cover the same scope, work packages and time period.



OWNERS:

Project controls team provides earned value data; finance team provides actual cost data.



EVIDENCE QUALITY:

Use approved, time-phased data from the project's cost and schedule systems.



DEPENDENCIES:

Consistent coding, cut-off dates and reconciliation between schedule and cost records.

4 WORKED EXAMPLE

Illustrative project at the monthly cutoff:

Earned value (EV): \$80,000

Actual cost (AC): \$100,000

Currency variance:

$$EV - AC = \$80,000 - \$100,000 \\ = -\$20,000$$

RESULT: -25%

$$CV \% = 100 \times (-\$20,000 / \$80,000) \\ = -25\%$$



INTERPRETATION:

Actual costs are 25% higher than the earned value for the completed work (unfavorable).

5 INTERPRET & CAUTIONS



MEANING:

Shows the size and direction of the cost variance relative to earned value.



POSITIVE VALUE:

Actual costs are lower than earned value (favorable).



NEGATIVE VALUE:

Actual costs are higher than earned value (unfavorable).



CAUTION ON DEFINITIONS:

Other organizations may use different denominators (for example, AC or PV). Do not compare unlabeled percentages.



LIMITATION:

Thresholds for concern are project-specific. Consider CV% with the currency variance and other cost metrics.

6 ACTIONS & OUTPUTS



APPLY CONSISTENT DEFINITION:

Use $CV \% = 100 \times (EV - AC) / EV$ and document it in your project controls procedures.



REPORT BOTH VALUES:

Always report the underlying currency variance (EV - AC) alongside the percentage.



ANALYZE DRIVERS:

Investigate the causes of unfavorable variances and identify responsible work packages.



AGREE ACTIONS:

Define corrective actions with an owner and deadline to address the causes.



UPDATE AND MONITOR:

Recalculate at each reporting period using the same definition and check the trend over time.



OUTPUTS: Cost variance percentage, currency variance, variance narrative, action log and updated forecasts.



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BUDGET AT COMPLETION



The total authorized budget for the performance measurement baseline scope.

1 WHAT IT MEASURES

Budget at Completion (BAC) is the total budgeted cost for all work in the performance measurement baseline (PMB). It represents the authorized budget for the agreed scope of work.



TOTAL BASELINE BUDGET:

Sum of all time-phased baseline budgets.



PERFORMANCE MEASUREMENT BASELINE (PMB):

Approved scope, schedule and budget used for tracking.



AUTHORIZED SCOPE:

Only work included in the PMB is counted.



EXCLUDES RESERVES:

In a conventional EVM setup, management reserve is not included in BAC.

2 FORMULA & METHOD

$$BAC = \sum \text{Baseline Budgets (time-phased)}$$



1 Identify all approved work packages in the performance measurement baseline.



2 Use the time-phased baseline budget for each work package.



3 Sum all work-package baseline budgets to obtain the BAC.



4 Confirm that management reserve is excluded in a conventional EVM setup.

3 DATA & EVIDENCE



BASELINE DOCUMENTS:

Approved scope statement, WBS, schedule and time-phased budget.



WORK-PACKAGE DETAILS:

List of control accounts and work packages with baseline budgets.



CHANGE HISTORY:

Approved changes that affect the baseline budget.



OWNERS:

Project control team, planning team and control account managers provide and maintain the data.



RECONCILIATION EVIDENCE:

Records showing BAC agrees to the sum of control account budgets.

4 WORKED EXAMPLE

Illustrative project with three work packages in the baseline:

	Work package 1:	\$120,000
	Work package 2:	\$180,000
	Work package 3:	\$200,000

$$BAC = \$120,000 + \$180,000 + \$200,000$$

RESULT: \$500,000



INTERPRETATION:

The total authorized budget for the performance measurement baseline scope is \$500,000.

5 INTERPRET & CAUTIONS



WHAT IT TELLS YOU:

The total budgeted cost for the agreed PMB scope, used as the denominator for earned value measures.



NOT A FORECAST:

BAC is not the current forecast cost to complete. Forecasts such as EAC may be higher or lower than BAC.



NOT NECESSARILY TOTAL FUNDING:

BAC is not necessarily the entire funding ceiling. It excludes management reserve in a conventional EVM setup.



CHANGES AFFECT BAC:

Approved scope changes will update BAC through formal change control.

6 ACTIONS & OUTPUTS



MAINTAIN CHANGE HISTORY:

Process and record approved changes that affect the baseline budget.



RECONCILE TO CONTROL ACCOUNTS:

Verify that the sum of control account budgets equals the BAC.



KEEP DATA CURRENT:

Update BAC promptly when approved changes are incorporated.



OUTPUTS:

Authoritative BAC value, updated baseline documentation, and a clear change history log.



USE FOR FURTHER ANALYSIS:

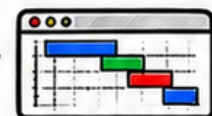
Use BAC as the denominator for earned value metrics and for project performance reporting.



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ESTIMATE AT COMPLETION



Forecast the total expected cost when the project is complete.

1 WHAT IT MEASURES

Estimate at Completion (EAC) is the forecast of the total cost expected when the project is finished, based on current performance and remaining work.



PURPOSE:

Helps assess whether the project will finish within budget and informs corrective action.



CONSIDERS:

Actual costs to date, the remaining scope, current rates, resource plans and known risks.



USES:

Supports forecasting, budget reviews and management decisions throughout the project.

2 FORMULA & METHOD

$$EAC = AC + ETC$$

AC = Actual Cost to date

ETC = Estimate to Complete (remaining work)

1



Confirm the current scope and remaining work packages.

2



Estimate the cost to complete (ETC) using current rates, resource plans and risks.

3



Add the actual cost to date (AC) to the ETC to calculate EAC.

4



Review and update regularly as new information becomes available.

3 DATA & EVIDENCE



SCOPE BASELINE:

Approved scope, work breakdown structure and remaining work packages.



COST INFORMATION:

Actual costs to date (AC) and current cost rates for remaining work.



RESOURCE PLANS:

Resource assignments, productivity assumptions and availability.



RISK INFORMATION:

Identified risks, contingencies and potential impacts on remaining costs.



OWNERS:

Project manager, cost estimator, function leads and project sponsor provide and validate the information.

4 WORKED EXAMPLE

Illustrative project forecast using the bottom-up method:

Actual cost to date (AC): \$180,000

Estimate to complete (ETC): \$370,000

$$EAC = AC + ETC \\ = \$180,000 + \$370,000$$

RESULT: \$550,000



INTERPRETATION:

Based on current information, the total expected cost to complete the project is \$550,000.

5 INTERPRET & CAUTIONS



WHAT IT TELLS YOU:

The forecast total project cost if all remaining work is completed as planned.



UPDATE FREQUENTLY:

Revise EAC as progress, scope, rates or risks change.



KEY CAUTION:

A formula is only as credible as the assumptions used for ETC.



DO NOT:

Mechanically extend past trends or assume current performance will continue without change.



ALSO CONSIDER:

Changes in scope, resource constraints and new risks can significantly affect the forecast.

6 ACTIONS & OUTPUTS



REVIEW DRIVERS:

Check the assumptions for ETC including scope, rates, resources and risks.



COMPARE SCENARIOS:

Prepare alternative forecasts (e.g. different resource levels or risk outcomes) and assess their implications.



TAKE ACTION:

Agree and implement corrective actions if the forecast is higher than the approved budget.



OUTPUTS:

Updated EAC, forecast rationale, list of key assumptions and agreed actions.



USE FOR:

Management reporting, budget reviews and decision making.



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CPI-BASED COST FORECAST



Estimate the final cost when past cost efficiency is expected to continue.

1 WHAT IT MEASURES

CPI-based forecasting estimates the project's final cost (EAC) using the cumulative cost efficiency to date, assuming the same performance continues for the remaining work.



COST PERFORMANCE INDEX (CPI):

Ratio of earned value to actual cost. Shows cost efficiency so far.



EARNED VALUE (EV):

Budgeted value of work actually completed and objectively verified.



ACTUAL COST (AC):

Total incurred cost of work performed to date, including valid accruals. AC is not just cash paid.



EAC:

Estimate at Completion, forecast of total project cost.

2 FORMULA & METHOD

$$EAC = BAC / CPI$$

$$CPI = EV / AC$$

1



Confirm the approved Budget at Completion (BAC) for the project.

2



Calculate the Cost Performance Index (CPI) using EV and AC.

3



Apply the formula:
 $EAC = BAC / CPI$.

4



Use this forecast only if past cost efficiency is expected to continue.

5



Ensure CPI is greater than zero.



CONTROL:

CPI must be > 0 .
The method assumes the same efficiency continues.

3 DATA & EVIDENCE



BUDGET BASELINE:

Approved BAC and work breakdown structure (WBS).
Owner: Project controls.



EARNED VALUE DATA:

Cumulative EV for completed work, based on the approved scope.
Owner: Project controls / PM.



COST DATA:

Cumulative actual cost (AC), including all relevant direct and indirect costs.

Owner: Finance / project accountant.



STATUS DATE:

Common reporting date for EV, AC and CPI to ensure consistency.
Owner: Project controls.



ASSUMPTION EVIDENCE:

Reasons to expect past efficiency to continue (e.g., stable scope and execution environment).

Owner: Project manager.

4 WORKED EXAMPLE

Illustrative project using CPI-based forecast:

Budget at Completion (BAC): \$500,000
Cost Performance Index (CPI): 0.80

$$EAC = BAC / CPI$$

$$= \$500,000 / 0.80$$

RESULT: \$625,000



INTERPRETATION:

If past cost efficiency continues, the estimated final project cost is \$625,000, which is higher than the approved budget.



NOTE:

This is an illustrative example only. Actual results depend on your project's facts and future performance.

5 INTERPRET & CAUTIONS



MEANING OF CPI:

CPI below 1.0 means the project is spending more than the budgeted value of work performed. The EAC will be higher than the BAC.



KEY ASSUMPTION:

Assumes past cost efficiency continues for the remaining baseline work.



POTENTIAL LIMITATIONS:

May be unreliable after major changes, such as scope revisions, new technology, or significant execution issues.



CHECK RELEVANCE:

Consider whether current conditions are representative of the future work to be completed.



DO NOT USE IF:

CPI is zero or historical performance is not expected to continue.

6 ACTIONS & OUTPUTS



COMPARE FORECASTS:

Compare the CPI-based EAC with a bottom-up estimate for the remaining work and explain any material differences.



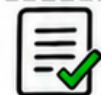
INVESTIGATE DRIVERS:

Understand the causes of low or high CPI (e.g., cost variances, productivity, rework) and address them with the team.



AGREE ACTIONS:

Define and assign actions to improve cost performance where appropriate, with owners and deadlines.



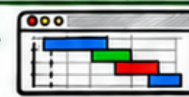
OUTPUTS:

Updated cost forecast (EAC), explanation of variances with other forecasts, and a list of actions and assumptions.



REVIEW REGULARLY:

Recalculate as new data becomes available and update the forecast and assumptions.



COMBINED PERFORMANCE FORECAST



Forecast the total project cost by considering both cost and schedule performance.



1 WHAT IT MEASURES

Estimates the final total project cost when both cost and schedule efficiency are expected to influence future performance. It uses earned value indices to model the remaining cost of work.



FORECAST COST (EAC):

Expected total cost at completion using cost and schedule trends.



ACTUAL COST (AC):

Incurred cost of work performed to date, including valid accruals; not just cash paid.



BUDGET AT COMPLETION (BAC):

Total approved budget for the project work.



COST PERFORMANCE INDEX (CPI):

$EV \div AC$, shows cost efficiency.



SCHEDULE PERFORMANCE INDEX (SPI):

$EV \div PV$, shows schedule efficiency.

2 FORMULA & METHOD

$$EAC = AC + \frac{(BAC - EV)}{(CPI \times SPI)}$$

This model assumes both cost and schedule performance will continue to affect the remaining work.

1



Obtain AC, BAC and EV from the approved scope and cost system.

2



Calculate $CPI = EV \div AC$ and $SPI = EV \div PV$.

3



Use the formula above to estimate EAC.

4



Use only positive CPI and SPI values (greater than zero).



CONTROL:

CPI and SPI must be positive. This model is not universally appropriate for all projects.

3 DATA & EVIDENCE



EARNED VALUE DATA:

Approved scope baseline with PV, EV and AC from the project control system.



CURRENT SCHEDULE STATUS:

Verified progress, milestones and forecast activity durations.



COST RECORDS:

Actual costs from accounting or project cost system.



OWNERS:

Project manager, cost controller and scheduler to provide and validate the data.



DEPENDENCIES:

Consistent scope, approved changes and current estimates for remaining work.



EVIDENCE QUALITY:

Use recent, reliable and reconciled data. Ensure EV, PV and AC are calculated using the same rules.

4 WORKED EXAMPLE

Illustrative project using both cost and schedule performance:

AC: \$100,000
BAC: \$500,000
EV: \$80,000
CPI: 0.80
SPI: 0.90

$$EAC = \$100,000 + \frac{(\$500,000 - \$80,000)}{0.80 \times 0.90}$$

$$= \$100,000 + \frac{\$420,000}{0.72}$$

$$= \$100,000 + \$583,333$$

EAC ≈ \$683,333



INTERPRETATION:

Based on current cost and schedule efficiency, the total project cost is expected to be about \$683,333 (illustrative example only).

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

Estimated total cost if both current cost and schedule efficiency continue.



HIGHER EAC:

Indicates potential cost overrun due to poor CPI and/or SPI.



LOWER EAC:

Suggests potential underrun, but still requires validation.



KEY CAUTIONS:

SPI is value-based and loses usefulness at or near project completion.



LIMITATION:

The model is not universally appropriate. It may not suit projects where schedule is not expected to drive future cost, or where trends are likely to change.

6 ACTIONS & OUTPUTS



PERFORM SENSITIVITY CHECKS:

Explore how changes in CPI and SPI affect the EAC result.



TEST ASSUMPTIONS:

Confirm that both cost and schedule performance are relevant for the remaining work.



USE CURRENT EVIDENCE:

If recent data or expected changes make the model unreliable, prefer an estimate based on current forecasts and detailed reviews.



OUTPUTS:

EAC estimate, key assumptions, sensitivity analysis and a short explanation of the chosen method and its suitability.



UPDATE REGULARLY:

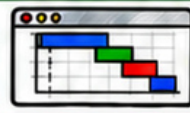
Recalculate as new data becomes available or when significant changes occur in scope, schedule or cost.



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30 Project Cost Control Metrics



ESTIMATE TO COMPLETE



Forecast the cost of the remaining work from the status date onward.

1 WHAT IT MEASURES

Estimate to Complete (ETC) is the forecast cost of the work that remains to be done from the status date to project finish.



REMAINING WORK:

Covers all approved scope not yet completed.



FORECAST COST:

Includes direct costs, indirect costs and risk allowances for the remaining work.



FORWARD LOOKING:

Based on the latest information about scope, resources, risks and market conditions.



NOT ACTUAL COST:

ETC is an estimate, not money already spent.

2 FORMULA & METHOD

$$ETC = EAC - AC$$

ETC = Estimate to Complete

EAC = Estimate at Completion

AC = Actual Cost to date

1



Establish or confirm the Estimate at Completion (EAC) for the project.

2



Obtain the Actual Cost (AC) to date from the cost system.

3



Calculate ETC using:
 $ETC = EAC - AC$

4



ETC may be estimated bottom-up from remaining work packages when an EAC is not yet established.

3 DATA & EVIDENCE



SCOPE INFORMATION:

Approved scope, work package details and remaining quantities.



COST INPUTS:

Latest rates, unit costs, resource plans and indirect cost assumptions.



RISK ALLOWANCES:

Current risk register and contingency for remaining work.



COST RECORDS:

Actual cost to date (AC) from the accounting or project cost system.



OWNERS:

Project manager, cost estimator, work package owners and finance team to provide and validate the data.

4 WORKED EXAMPLE

Illustrative project using an approved EAC and actual cost to date:

Estimate at Completion (EAC): \$550,000

Actual Cost to date (AC): \$180,000

$$ETC = EAC - AC$$

RESULT: \$370,000



INTERPRETATION:

The estimated cost of the remaining work is \$370,000 based on the current EAC and actual cost to date.



NOTE:

This is an illustrative example only. Actual results will vary based on project-specific information.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The forecast cost needed to complete the remaining work from the status date.



USE WITH EAC:

ETC depends on a realistic and up to date Estimate at Completion (EAC).



DO NOT CONFUSE:

ETC is not the same as unspent budget. Unspent budget may include management reserves or other amounts and does not equal remaining forecast cost.



AVOID DOUBLE COUNTING:

Do not double-count commitments, accruals or other forecasted costs already included in the EAC.

6 ACTIONS & OUTPUTS



UPDATE ESTIMATES:

Work with owners to update remaining quantities, rates, productivity, risks and scope.



VALIDATE ASSUMPTIONS:

Confirm key assumptions with technical and delivery teams, including indirect costs and risk allowances.



CALCULATE AND RECORD:

Calculate ETC, document the basis of estimate and record in the cost system.



INTEGRATE WITH FORECAST:

Use ETC to update the EAC and overall cost forecast.



OUTPUTS:

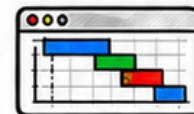
Updated ETC, revised EAC, assumption log and supporting documentation for the next review cycle.



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30 Project Cost Control Metrics



VARIANCE AT COMPLETION



Compare the authorized baseline budget with the current final cost forecast.



1 WHAT IT MEASURES

Variance at Completion (VAC) compares the authorized baseline budget with the current final cost forecast to show the expected difference at project finish.



BAC (Budget at Completion):
Total authorized budget for the entire project.



EAC (Estimate at Completion):
Current forecast of total project cost at finish.



POSITIVE VAC:
Forecast to finish under the authorized budget.



NEGATIVE VAC:
Forecast to finish over the authorized budget.



PURPOSE:
Helps decision makers understand the projected cost position at completion.

2 FORMULA & METHOD

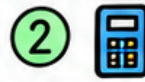
$$VAC = BAC - EAC$$

If VAC is negative, the forecast is an overrun.

If VAC is positive, the forecast is an underrun.



1 Confirm the authorized baseline budget (BAC) for the full project scope.



2 Obtain the current estimate at completion (EAC).



3 Apply the formula:
 $VAC = BAC - EAC$.



4 Check that the EAC is realistic and includes all known costs to complete.



CONTROL:
Use a credible, documented EAC based on current project information.

3 DATA & EVIDENCE



AUTHORIZED BASELINE:

Approved project budget (BAC), including any approved changes in scope.



COST FORECAST:

Current estimate at completion (EAC) from the latest approved forecast.



SUPPORTING EVIDENCE:

Detailed cost estimates, open commitments, risk allowances and change requests.



PROGRESS RECORDS:

Actual costs to date, remaining work estimates and forecast updates.



OWNERS:

Project manager (prepares EAC), project controls (validates), finance (confirms budget), and sponsor (decision making).

4 WORKED EXAMPLE

Illustrative project:
Authorized baseline budget (BAC):
\$500,000
Estimate at completion (EAC):
\$550,000

$$VAC = BAC - EAC$$

$$VAC = \$500,000 - \$550,000$$

RESULT: -\$50,000



INTERPRETATION:

The forecast total cost is \$50,000 more than the authorized budget, indicating a projected overrun at completion.

5 INTERPRET & CAUTIONS



WHAT IT TELLS YOU:

Shows the expected difference between the authorized budget and the forecast final cost.



NEGATIVE VAC:

Indicates a forecast overrun (if EAC is higher than BAC).



POSITIVE VAC:

Indicates a forecast underrun (if EAC is lower than BAC).



KEY CAUTION:

An optimistic forecast can make VAC look healthy without credible recovery actions.



LIMITATION:

VAC depends on the accuracy of the EAC. It does not show when costs occur or the cash position.

6 ACTIONS & OUTPUTS



IDENTIFY DRIVERS:

Explain the main reasons for the difference, such as scope changes, productivity, risks or market costs.



ASSESS UNCERTAINTY:

Review key assumptions, open risks and pending changes that could affect the final cost.



DEVELOP OPTIONS:

Prepare and evaluate authorized cost-reduction or scope-adjustment options.



COMMUNICATE TO DECISION MAKERS:

Present the drivers, uncertainty and recommended options.

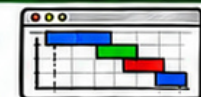


OUTPUTS:

Variance analysis narrative, updated forecast, list of actions, and decision requests for any required changes to scope, budget or resources.



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TCPI TO BUDGET



Calculate the remaining cost efficiency required to finish at the original budget (BAC).

1 WHAT IT MEASURES

TCPI to Budget (BAC) shows the cost efficiency required on the remaining work to finish the project at the original budget.



BAC (Budget at Completion):

Total approved budget for the project.



EV (Earned Value):

Budgeted value of work actually completed and verified.



AC (Actual Cost):

Actual cost of the work performed to date.



TCPI (BAC):

Required cost efficiency (ratio) for the remaining work to meet the original BAC.



FOCUS:

Indicates how efficiently the remaining work must be performed, not overall past performance.

2 FORMULA & METHOD

$$TCPI(BAC) = (BAC - EV) / (BAC - AC)$$



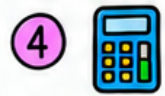
1 Confirm the original BAC for the project.



2 Use the latest verified EV and AC.



3 Calculate the remaining budget: $(BAC - EV)$.



4 Calculate the remaining cost to be incurred at BAC: $(BAC - AC)$.



5 Divide to find the required cost efficiency: TCPI(BAC).



CONTROL:

The denominator $(BAC - AC)$ must be positive and the target must still be meaningful.

3 DATA & EVIDENCE



BUDGET BASELINE:

Approved project scope, schedule and cost baseline with the BAC.



EARNED VALUE RECORDS:

Verified EV for completed work from the approved measurement method.



COST RECORDS:

Actual costs (AC) from the accounting system, mapped to the project scope.



STATUS ASSESSMENT:

Current scope, known changes and forecasted remaining work.



OWNERS:

Project manager, cost controller and project sponsor to provide and validate the data.



EVIDENCE QUALITY:

Use the latest, complete and verified records. Costs must be for project work only.

4 WORKED EXAMPLE

Illustrative project at the time of assessment:

BAC (original budget): \$500,000

EV (earned value): \$200,000

AC (actual cost): \$250,000

$$\begin{aligned} TCPI(BAC) &= (BAC - EV) / (BAC - AC) \\ &= (\$500,000 - \$200,000) / (\$500,000 - \$250,000) \\ &= \$300,000 / \$250,000 \end{aligned}$$

RESULT: 1.20



MEANING:

A TCPI of 1.20 means the remaining work must be performed at a cost efficiency of 1.20 to finish at the original BAC.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The cost efficiency required on the remaining work to finish at the original BAC.



HIGHER VALUES:

A value above 1.00 means better cost efficiency is needed than has been achieved so far.



COMPARE WITH CPI:

Compare the required efficiency with the project's demonstrated CPI to assess realism.



NOT A GUARANTEE:

A required efficiency of 1.20 is a target, not proof it is feasible.



LIMITATIONS:

The denominator $(BAC - AC)$ must be positive and the target must still be meaningful. Changes to scope or BAC will affect the result.

6 ACTIONS & OUTPUTS



ASSESS RECOVERY:

Review whether improved cost efficiency on the remaining work is achievable using approved recovery actions.



DEVELOP PLAN:

If feasible, agree specific actions, owners and timelines to improve cost efficiency.



SEEK REVISED TARGET:

If the required efficiency is not achievable, seek an authorized revised target (for example, revised BAC) following change control.



OUTPUTS:

Recovery action plan or a request for an approved baseline change, with supporting analysis and evidence.



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30 Project Cost Control Metrics





TCPI TO FORECAST



Calculate the remaining efficiency required to achieve an approved EAC target.

1 WHAT IT MEASURES

TCPI (To-Complete Performance Index) shows the cost efficiency needed on the remaining work to meet an approved EAC target.



EAC TARGET:

Total forecast cost approved for the project.



REMAINING WORK:

Work not yet completed within the authorized scope.



REQUIRED EFFICIENCY:

The cost performance needed on future work to meet EAC.



USE:

Helps assess whether the target is realistic and what level of control is required.

2 FORMULA & METHOD

$$TCPI(EAC) = (BAC - EV) / (EAC - AC)$$



BAC: Budget at completion (approved total budget for all authorized work).



EV: Earned value (budgeted value of completed work).



EAC: Estimate at completion (approved forecast total cost).



AC: Actual cost (cost incurred for work performed).



1 Confirm BAC, EV, EAC and AC for the same scope and date.



2 Calculate the remaining budget and remaining cost allowance.



3 Apply the formula to get TCPI(EAC).



CONTROL:
EAC - AC must be positive.
A positive remaining cost allowance is required for a valid result.

3 DATA & EVIDENCE



APPROVED BASELINES:

BAC from the current approved project baseline and scope.



EARNED VALUE DATA:

EV and AC from the project's earned value system at the same cut-off date.



EAC FORECAST:

Approved EAC target with supporting assumptions and rationale.



SCOPE EVIDENCE:

Remaining authorized scope, work packages and schedule.



OWNERS:

Project control analyst provides the calculations; project manager and finance owner approve the inputs and EAC assumptions.

4 WORKED EXAMPLE

Illustrative project using an approved EAC target:

BAC: \$500,000

EV: \$200,000

EAC: \$600,000

AC: \$250,000

$$\begin{aligned} TCPI(EAC) &= (BAC - EV) / (EAC - AC) \\ &= (\$500,000 - \$200,000) / (\$600,000 - \$250,000) \\ &= \$300,000 / \$350,000 \end{aligned}$$

RESULT: 0.857



INTERPRETATION:

A TCPI(EAC) of 0.857 means the remaining work must be delivered at a cost efficiency of 0.857 to achieve the approved EAC target.

5 INTERPRET & CAUTIONS



MEANING:

A value below 1.0 allows remaining cost efficiency below the original budgeted rate while still meeting the EAC target. Compare the required efficiency with demonstrated CPI.



USE THE CORRECT TARGET:

Use the approved EAC for the same scope and time period. Different targets give misleading results.



CHECK THE DENOMINATOR:

EAC - AC is the remaining cost allowance. If zero or negative, TCPI is not suitable and the target cannot be achieved within the current EAC.



LIMITATIONS:

TCPI does not predict outcome, account for risks or changes, and is only valid for the remaining authorized scope.

6 ACTIONS & OUTPUTS



CHECK FEASIBILITY:

Assess whether the required efficiency is realistic based on team capability, remaining work and known risks.



VALIDATE ASSUMPTIONS:

Review EAC assumptions such as productivity improvements, cost saving actions and schedule changes.



AGREE ACTIONS:

If the required efficiency is difficult to achieve, identify and agree corrective actions with the project manager and owners.



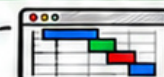
UPDATE FORECAST:

Revisit the forecast and EAC if scope, risks or assumptions change.



OUTPUTS:

TCPI(EAC) result, assessment of achievability, agreed actions and an updated cost forecast narrative for decision making.





PERIOD COST BURN RATE



Track the speed of actual cost consumption over a defined interval.

1 WHAT IT MEASURES

Cost burn rate shows how quickly actual project costs are being consumed over a defined period, usually per week or per working day.



ACTUAL COST:

Total costs incurred and recorded in the period.



TIME BASIS:

Number of comparable working days or weeks in the same period.



HIGHER BURN RATE:

Spending faster than planned and may increase cash needs.



LOWER BURN RATE:

Spending slower than planned and may indicate delays.



UNIT:

Currency per day or per week, depending on the period used.

2 FORMULA & METHOD

$$\text{Burn Rate} = \text{AC} \div \text{N}$$

AC = actual cost in the period

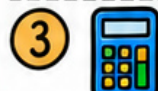
N = number of working days or weeks (in the same time basis)



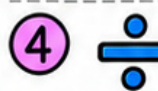
1 Choose a consistent time basis (days or weeks).



2 Total the actual costs incurred in that period (AC).



3 Count the number of comparable working days or weeks (N).



4 Divide AC by N to find the average burn rate per day or per week.



CONTROL:

Use the same time basis for actual and planned comparisons.

3 DATA & EVIDENCE



COST RECORDS:

Actual costs from the accounting system or cost reports for the selected period.



TIME EVIDENCE:

Calendar or working day/week records showing the number of days or weeks in the period.



PLANNED INFORMATION:

Planned activity and planned spending profile for the same time basis.



OWNERS:

Project manager, cost controller and finance/accounting team provide and verify the data.



DEPENDENCIES:

Consistent cost categorization and approved period close.

4 WORKED EXAMPLE

Illustrative project over four weeks:



Actual cost (AC): \$60,000

Time basis (N): 4 weeks

$$\text{Burn Rate} = \text{AC} \div \text{N}$$

$$= \$60,000 \div 4 \text{ weeks}$$

RESULT: \$15,000 per week



INTERPRETATION:

The project averaged \$15,000 of actual cost per week during this period.



NOTE:

This is an illustrative example only. The correct time basis and amounts depend on the project.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The average speed of actual cost consumption in the period.



NOT PRODUCTIVITY:

Spending rate is not the same as productivity or the amount of work completed.



HIDDEN TIMING EFFECTS:

A single average can hide spikes, lumpy spending or accruals at period end.



COMPARE IN CONTEXT:

Compare with planned activity, upcoming commitments and the overall project phase.



LIMITATION:

The metric depends on accurate and consistent cost data and the chosen time basis.

6 ACTIONS & OUTPUTS



COMPARE WITH PLAN:

Check the burn rate against planned activity and spending for the same time basis.



CHECK UPCOMING COMMITMENTS:

Include approved work packages, procurement and other near-term obligations before projecting cash needs.



INVESTIGATE VARIANCES:

If the burn rate is higher or lower than expected, review the causes with the relevant owners.



UPDATE FORECAST:

Use the latest burn rate, together with upcoming commitments, to update the cash flow forecast.

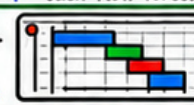


OUTPUTS:

Burn rate analysis, variance narrative, actions and updated cash flow forecast.



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ACTUAL COST TO BAC



Measure how much of the baseline budget has been consumed by actual cost.

1 WHAT IT MEASURES

Shows the proportion of the total baseline budget (BAC) that has been spent as actual cost (AC). It answers how much of the approved budget has been consumed.



ACTUAL COST (AC):

Total cost of work performed to date, from actual expenditures.



BUDGET AT COMPLETION (BAC):

Total approved budget for the entire project scope.



BUDGET CONSUMED:

Percentage of BAC spent as actual cost.



PURPOSE:

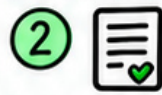
Helps monitor cost consumption and identify potential cost risk early.

2 FORMULA & METHOD

$$\text{Budget consumed \%} = \frac{\text{AC}}{\text{BAC}} \times 100$$



1 Obtain actual cost (AC) to date from approved cost records.



2 Confirm the authorized budget at completion (BAC) for the project.



3 Calculate: $\text{AC} / \text{BAC} \times 100$ to find the percentage of budget consumed.



4 Ensure BAC is greater than zero. Do not use this metric if BAC is zero.



CONTROL:

BAC must be greater than zero. Use N/A if no approved BAC exists.

3 DATA & EVIDENCE



COST RECORDS:

Actual expenditures, cost reports and accounting data to determine AC.



APPROVED BASELINE:

Cost baseline and total BAC from the approved project plan.



VERIFICATION:

Reconciled, time-phased actual costs that match the project's accounting system.



OWNERS:

Project controller or finance team provides cost data; project manager confirms project scope and BAC.



QUALITY CHECK:

Use current, complete and reconciled data. Ensure costs are allocated to the correct project.

4 WORKED EXAMPLE

Illustrative project at the reporting date:

Actual cost (AC): \$180,000

Budget at completion (BAC): \$500,000

$$\text{Budget consumed \%} = \frac{\text{AC}}{\text{BAC}} \times 100$$

RESULT: 36%

$$\text{Budget consumed \%} = \frac{\$180,000}{\$500,000} \times 100 = 36\%$$



INTERPRETATION:

36% of the approved project budget has been spent as actual cost to date.



NOTE:

This is an illustrative example only. Actual values and percentage will vary by project.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

Higher percentage means more of the baseline budget has been consumed by actual cost.



NOT PHYSICAL PROGRESS:

This is not the percentage of work complete. It measures cost spent, not delivered scope.



COMPARE WITH PROGRESS:

Review alongside earned value (EV / BAC) and remaining scope to understand overall performance.



POTENTIAL ISSUES:

A high percentage with low verified progress may indicate cost overrun risk.



LIMITATIONS:

It does not show future costs, cost efficiency or quality of spend. Interpret in project context.

6 ACTIONS & OUTPUTS



INVESTIGATE VARIANCE:

If budget consumption outpaces verified progress, investigate the causes.



CHECK DRIVERS:

Review scope changes, rework, productivity issues and unplanned costs.



TAKE ACTION:

Agree corrective actions with the project team and relevant stakeholders.



UPDATE FORECAST:

Reassess the estimate at completion and remaining budget, considering the latest information.



OUTPUTS:

Variance analysis, narrative explanation, agreed actions and updated forecast for management review.





EARNED PROGRESS PERCENTAGE



Express earned value as a proportion of the authorized baseline budget.

1 WHAT IT MEASURES

Earned progress percentage shows how much of the authorized project budget has been earned as completed work, using the earned value (EV).



EARNED VALUE (EV):

Budgeted value of work actually completed and objectively verified.



BUDGET AT COMPLETION (BAC):
Total authorized baseline budget for the project.



EARNED PROGRESS %:

Proportion of the baseline budget earned to date, shown as a percentage.



USE:

Shows budget-weighted progress that can be compared with planned progress.



DISTINCT FROM COST:

EV is not actual cost or cash spent; it values completed work using the agreed budget.

2 FORMULA & METHOD

$$\text{Earned Progress \%} = \text{EV} / \text{BAC} \times 100$$



1

Use the approved performance measurement baseline for EV and BAC.



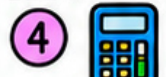
2

Confirm that EV is calculated using valid earning rules for completed work.



3

Ensure BAC is the total authorized baseline budget for the project and is greater than zero.



4

Divide EV by BAC and multiply by 100 to get the percentage.



5

Use the same scope and baseline for EV and BAC.



CONTROL:

BAC must be positive and earning rules must be applied consistently.

3 DATA & EVIDENCE



PERFORMANCE BASELINE:

Approved scope, schedule and budget (BAC), with a documented work breakdown structure.



EARNED VALUE RECORDS:

Verified completed work packages, measured using the agreed earning rules.



SCHEDULE EVIDENCE:

Status reports and milestone records showing completed items and dates.



COST INFORMATION:

Actual cost records to support the context and cross-checks (EV is not cost).



OWNERSHIP:

Project controls or PMO provides EV and BAC; work package owners supply completion evidence.



QUALITY CHECK:

Ensure data is current, consistent with the approved baseline, and subject to appropriate review.

4 WORKED EXAMPLE

Illustrative project at a status date:

Earned value (EV): \$200,000

Budget at completion (BAC): \$500,000

$$\text{Earned Progress \%} = \text{EV} / \text{BAC} \times 100$$

RESULT: 40%

Earned Progress %

$$= \$200,000 / \$500,000 \times 100$$

$$= 40\%$$



INTERPRETATION:

Forty percent of the authorized baseline budget has been earned as completed work.



NOTE:

This does not mean 40% of the physical work is finished. Progress is budget-weighted.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The share of the baseline budget earned through completed work. Useful for tracking overall progress.



BUDGET-WEIGHTED:

Progress reflects the budget value of work, not necessarily the fraction of physical quantities completed.



POTENTIAL DISTORTION:

Activities with higher budget weight can make progress appear greater or smaller than physical progress.



REQUIRES VALID DATA:

Depends on correct EV, consistent earning rules and an accurate BAC.



USE WITH OTHER METRICS:

Pair with schedule status, milestone completion and cost consumption for a balanced view.

6 ACTIONS & OUTPUTS



CHECK THE BASIS:

Confirm EV and BAC use the same approved scope and baseline and valid earning rules.



COMPARE WITH MILESTONES:

Review completed deliverables and milestone evidence to explain the percentage.



ANALYSE VARIANCES:

Look at reasons for higher or lower earned progress and consider schedule and cost impacts.



TAKE ACTION:

Address issues such as delayed work, scope changes or resource constraints.



REPORT & COMMUNICATE:

Include the percentage in status reports with clear commentary and supporting evidence.



USEFUL OUTPUTS:

Variance narrative, actions agreed, and updates to forecasts if needed. Set tolerances to project context; no universal threshold applies.



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30 Project Cost Control Metrics



COMMITTED COST COVERAGE



Track the baseline or forecast cost represented by valid outstanding commitments.

1 WHAT IT MEASURES

Committed cost coverage shows the share of remaining forecast cost already covered by valid outstanding commitments.



OUTSTANDING COMMITMENT:

The unfulfilled portion of an approved commitment, net of costs already invoiced or accrued.



FORECAST COST (ETC):

Estimated cost to complete the remaining work.



PURPOSE:

Shows how much of the future spend is already committed, supporting funding, risk and cash planning.



UNIT:

Percentage (%); a dimensionless ratio multiplied by 100.



PAIR IT WITH:

Estimate at completion (EAC) and a committed cost log.

2 FORMULA & METHOD

$$\text{Committed Cost Coverage \%} = \frac{\text{Outstanding Commitments}}{\text{Remaining Forecast Cost (ETC)}} \times 100$$

1



Identify the remaining unfulfilled commitments and exclude portions already recognized in AC.

2



Determine the remaining forecast cost (ETC) for the same scope.

3



Divide commitments by ETC and multiply by 100 to get the percentage.

4



Use the same scope and currency for both numerator and denominator.

5



Review and update regularly as commitments and ETC change.



CONTROL:

Use only valid, current commitments for the defined project scope.

3 DATA & EVIDENCE



SOURCE DOCUMENTS:

Approved purchase orders, contracts, work orders and commitment records.



FORECAST DATA:

Current ETC from the cost estimate or forecasting system.



STATUS EVIDENCE:

Invoices, receipts and accruals to identify the un-invoiced portion of each commitment.



OWNERS:

Project controls for cost data, procurement for order status, and finance for accrual alignment.



RECORDS TO MAINTAIN:

Commitment register, change orders, cancellations and supporting correspondence.



EVIDENCE QUALITY:

Use approved, up-to-date records that reflect the same scope and reporting date as the forecast.

4 WORKED EXAMPLE

Illustrative project at the current date:

Outstanding commitments: \$120,000

Remaining forecast cost (ETC): \$300,000

$$\text{Committed Cost Coverage \%} = \$120,000 / \$300,000 \times 100$$

RESULT: 40%



INTERPRETATION:

40% of the remaining forecast cost is already covered by valid outstanding commitments.



NOTE:

This is an illustrative example using the same method. Results will vary by project.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The portion of remaining forecast cost already tied to commitments, helping assess funding needs and exposure to cost changes.



HIGH COVERAGE:

Less remaining cost is uncommitted, but still check for change risk and scope alignment.



COMMON PITFALLS:

Do not add full purchase orders to actual cost if part is already invoiced or accrued.



LIMITATIONS:

Commitments are not always final liabilities. They may be changed, cancelled or re-scoped.



USE WITH CARE:

Ensure commitments and ETC use the same scope and reporting date. Thresholds are project-specific.

6 ACTIONS & OUTPUTS



RECONCILE RECORDS:

Match purchase orders to invoices, receipts and accruals. Update for changes and cancellations.



CHECK FORECAST IMPACT:

Review whether new, changed or cancelled commitments affect ETC and overall cost forecasts.



MANAGE EXPOSURE:

Identify uncommitted remaining costs and actions needed to secure funding or place orders.



UPDATE REGULARLY:

Refresh commitments and ETC at each reporting cycle.



OUTPUTS:

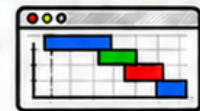
Committed cost coverage percentage, reconciled commitment log, variance narrative and recommended actions.



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30 Project Cost Control Metrics





COST ACCRUAL COMPLETENESS



Check whether known incurred but uninvoiced costs are reflected in the reporting cutoff.

1 WHAT IT MEASURES

Cost accrual completeness shows how many known incurred but uninvoiced costs are recorded in the reporting cutoff, using the same approved scope and period.



ACCRUAL:

A liability for work received or costs incurred but not yet invoiced.



KNOWN ACCRUAL:

Identified from receipts, work records or supplier information.



COMPLETENESS:

All validated known accrual items are recorded.



PURPOSE:

Improve accuracy of period costs and project liabilities.

2 FORMULA & METHOD

Cost Accrual Completeness %

$$= \frac{\text{Validated accrual items recorded}}{\text{Validated accrual items requiring recording}} \times 100$$

1



Identify all known accrual items requiring recording for the period.

2



Check which of these items are recorded in the accounts at the cutoff.

3



Use only validated items supported by evidence.

4



Divide the recorded count by the required count and multiply by 100.



CONTROL:

Both counts must use the same scope, period and validation criteria.

3 DATA & EVIDENCE



REQUIRED EVIDENCE:

List of known incurred but uninvoiced costs from receipts, work records and supplier statements.



SOURCE DOCUMENTS:

Goods receipts, service confirmations, works completion records and supplier statements.



DATA IN SYSTEM:

Recorded accrual journal entries and supporting details at the reporting cutoff.



OWNERS:

Project finance team, cost accountant and procurement/supply chain team to provide and validate data.



QUALITY CHECK:

Ensure items are relevant to the project, within the period and properly supported.

4 WORKED EXAMPLE

Illustrative project at the reporting cutoff:

Validated accrual items requiring recording: 20 items

Validated accrual items recorded: 18 items

Cost Accrual Completeness %

$$= \frac{18}{20} \times 100$$

RESULT: 90%



INTERPRETATION:

Eighteen of twenty known required accrual items are recorded, so completeness is 90%.

5 INTERPRET & CAUTIONS



HIGHER IS BETTER:

A higher percentage indicates more complete recording of known accrual items.



WHAT IT SHOWS:

Focuses on the count of validated items, not their monetary value.



LIMITATIONS:

Count coverage does not reveal monetary materiality and cannot prove unknown costs are absent.



OTHER FACTORS:

A high result may still miss significant unrecorded amounts if they are not yet identified.



USE WITH OTHER METRICS:

Review alongside total project costs and variance analysis for a fuller picture.

6 ACTIONS & OUTPUTS



REVIEW OMISSIONS:

Investigate large or unusual omissions and determine the reason for non-recording.



RECONCILE RECORDS:

Compare accrual list with receipt, work and supplier records to identify missing items.



ASSIGN ACTIONS:

Give each omission an owner and deadline to investigate and record if valid.



UPDATE AND MONITOR:

Record valid accruals and update the register regularly before each reporting cutoff.



OUTPUTS:

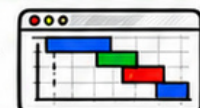
Reconciled accrual register, action log and updated accounting records reflecting validated accrual items.



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30 Project Cost Control Metrics



INVOICE PROCESSING TIME



Measure the elapsed time from a valid invoice entering the workflow to approval or payment.



1 WHAT IT MEASURES

Invoice processing time shows how long it takes to move a valid invoice from the point it enters the workflow to a chosen endpoint, either approval or payment.



VALID INVOICE:

Complete, correct and all required documents received.



START DATE:

Date the invoice enters the workflow (e.g., received or logged in the system).



ENDPOINT:

Either approval date or payment date, use one consistently.



EXCLUDED:

Track disputed and incomplete invoices separately so they do not distort the main result.

2 FORMULA & METHOD

$$\text{Processing time (days)} = \text{End date} - \text{Start date}$$

Report two key measures:



Median processing time for completed invoices (less affected by outliers).



Open invoice age
Current age of invoices still in the workflow.



Show disputed invoices separately with their current age.



Show incomplete invoices separately with their current age and reason.



CONTROL:

Use the same start and end points each period for a consistent trend.

3 DATA & EVIDENCE



INVOICE RECORDS:

Invoice ID, receipt date, approval date, payment date, status and reason codes.



SUPPORTING DOCUMENTS:

Purchase order, contract, goods or service confirmation and required approvals.



SYSTEM REPORTS:

Accounts payable or procurement system showing workflow dates and current status.



OWNERS:

Accounts payable team provides data; project finance and project team confirm validity and resolve exceptions.



EVIDENCE QUALITY:

Use accurate, complete and dated records with an audit trail of changes.

4 WORKED EXAMPLE

Illustrative set of approved invoices with processing times (days):



2 days 3 days 4 days 7 days 9 days

Ordered times: 2, 3, 4, 7, 9

RESULT: Median = 4 days

The middle value (3rd of 5) is 4 days, so the median approval time is 4 days.



Interpretation:

Three of the five invoices took 4 days or less; two took longer. The median is the middle ordered value, 4 days.

5 INTERPRET & CAUTIONS



USE THE MEDIAN:

Processing times often vary widely. The median gives a more representative result than the average.



SEPARATE EXCEPTIONS:

Report disputed and incomplete invoices separately to show their current age and avoid distorting the main metric.



APPROVAL vs PAYMENT:

Approval time is not the same as payment time. Choose one endpoint and keep it consistent.



CONSISTENCY MATTERS:

Changing the start or end point, or including different invoice types, makes trends misleading. Results are project-specific.

6 ACTIONS & OUTPUTS



FIND BOTTLENECKS:

Review each workflow step (e.g., coding, approvals, finance review) to identify where delays occur most often.



COORDINATE WITH FINANCE:

Agree clear validation rules, required documents and approval steps under the project's terms.



RESOLVE EXCEPTIONS:

Work with suppliers and internal owners to fix incomplete or disputed invoices and reduce their open age.



OUTPUTS:

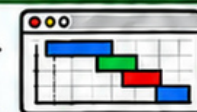
Median processing time, open invoice age and a list of key delay causes with agreed actions and owners.



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CARD 20 OF 30

30 Project Cost Control Metrics



INVOICE EXCEPTION RATE



Percentage of invoices that require correction or investigation before approval.

1 WHAT IT MEASURES

Invoice exception rate shows the proportion of supplier invoices that need correction or investigation before they can be approved for payment.



INVOICE EXCEPTION:

An error, missing information or issue that must be resolved.



PURPOSE:

Highlights issues in invoice accuracy and the effectiveness of procurement and receiving controls.



INDICATES:

Higher values suggest more invoice problems, potential delays and higher administrative effort.



UNIT:

Percentage (%) of invoices reviewed.

2 FORMULA & METHOD

$$\text{Invoice Exception Rate \%} = \left(\frac{\text{Invoices with Exceptions}}{\text{Invoices Reviewed}} \right) \times 100$$

1



Define what counts as an invoice exception for the project (e.g. coding, quantity, pricing, missing documents).

2



Count the number of invoices with exceptions in the period.

3



Count all reviewed invoices, with and without exceptions. Exclude unreviewed submissions.

4



Divide and multiply by 100 to obtain the percentage.



CONTROL:

Use consistent exception definitions and counting rules.

3 DATA & EVIDENCE



INVOICE RECORDS:

Supplier invoices and their approval status, including exceptions and resolution notes.



SUPPORTING EVIDENCE:

Exception details (e.g. coding errors, quantity mismatches, pricing issues, missing receipts) and correspondence with suppliers.



SOURCE SYSTEMS:

Accounts payable system, procurement system and receiving records.



OWNERS:

Accounts payable team, project finance manager and procurement lead (to investigate and resolve exceptions).



RECORDS TO KEEP:

Exception log, corrected invoices and approval dates for audit trail.

4 WORKED EXAMPLE

Illustrative project in a review period:

Invoices with exceptions: 12
Invoices reviewed: 80

$$\text{Invoice Exception Rate \%} = 12 / 80 \times 100$$

RESULT: 15%



INTERPRETATION:

15% of invoices required correction or investigation before approval in this period.



NOTE:

This is an illustrative example using a single period. Actual values will vary by project.

5 INTERPRET & CAUTIONS



WHAT A HIGH RATE MEANS:

More invoice issues, potential payment delays, higher administrative effort and possible control weaknesses.



WHAT A LOW RATE MEANS:

Fewer issues and smoother invoice processing, but always check the nature and severity of exceptions.



CAUTIONS:

Different invoice complexity across suppliers and projects can affect comparability.



ALSO CONSIDER:

Repeat submissions and multiple revisions may inflate the rate. Report both the value and severity of exceptions to give full context.

6 ACTIONS & OUTPUTS



ADDRESS ROOT CAUSES:

Investigate recurring issues such as coding errors, quantity discrepancies, pricing mismatches and missing receipts or approvals.



IMPROVE PROCESSES:

Clarify invoice requirements, strengthen purchase order and receiving controls, and provide supplier guidance.



WORK WITH SUPPLIERS:

Discuss frequent errors and agree actions to reduce rework and repeat submissions.



OUTPUTS:

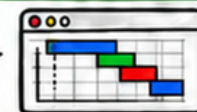
Action log of identified issues, corrective actions and status. Reduced invoice exception rate over time, with supporting evidence of improvements.



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30 Project Cost Control Metrics





FORECAST ACCURACY



Compare an earlier forecast with the later actual cost for the same scope and period.

1 WHAT IT MEASURES

Forecast accuracy shows how close a cost forecast made at an earlier date is to the actual cost for the same scope and period.



FORECAST:

Estimated cost fixed at a specific date before the work is completed.



ACTUAL COST:

Final cost for the same scope and time period.



PURPOSE:

Highlights estimating accuracy and bias in cost forecasts.



USE:

Compare across periods, projects or estimate updates to understand trends.

2 FORMULA & METHOD

Absolute percentage error (APE):

$$APE = \frac{|\text{Forecast} - \text{Actual}|}{\text{Actual}} \times 100$$

Signed error:

$$\text{Error} = \text{Forecast} - \text{Actual}$$

1



Use the forecast that was fixed at an earlier date for the same scope and period.

2



Calculate the signed error and the absolute percentage error.

3



Record results and compare across periods or forecast updates to identify bias.



CONTROL:

Use this method only when the actual cost is greater than zero.

3 DATA & EVIDENCE



FORECAST RECORDS:

Cost forecast with a clear date, scope description and assumptions.



ACTUAL COST RECORDS:

Final cost for the same scope and period, from the cost system or financial reports.



SCOPE EVIDENCE:

Confirmation that the forecast and actual cover the same scope and time period.



OWNERS:

Project controller or cost manager to provide data, and project manager to confirm scope.



ADDITIONAL INFORMATION:

Estimate assumptions and the date the forecast was approved or communicated.

4 WORKED EXAMPLE

Illustrative example for the same scope and period:

Forecast (earlier date): \$110,000

Actual cost (later): \$100,000

Signed error:

$$\$110,000 - \$100,000 = \$10,000$$

Result: \$10,000 overforecast

Absolute percentage error:

$$APE = \frac{|\$110,000 - \$100,000|}{\$100,000} \times 100$$

$$= \frac{\$10,000}{\$100,000} \times 100 = 10\%$$



INTERPRETATION:

The forecast was 10% higher than the actual cost (overforecast) for the same scope and period.

5 INTERPRET & CAUTIONS



WHAT A LOW ERROR MEANS:

The forecast was close to the actual cost for the same scope and period.



WHAT A HIGH ERROR MEANS:

The forecast was inaccurate. Check for consistent over or underforecasting (bias).



CHECK THE SIGN:

A positive error means an overforecast. A negative error means an underforecast.



DO NOT REPLACE:

Do not update or replace the original forecast after the outcome is known.



LIMITATION:

If the actual cost is zero, the percentage error cannot be calculated. Use another measure in that case.

6 ACTIONS & OUTPUTS



ANALYZE BIAS:

Review signed errors over time to see if forecasts are consistently high or low.



FIND THE CAUSE:

Check estimate assumptions, scope changes, and the timeliness and quality of data.



IMPROVE ESTIMATES:

Update estimating assumptions, use more reliable data, and incorporate lessons learned.



UPDATE PROCESS:

Strengthen estimate review, validation and approval steps.



USEFUL OUTPUTS:

Signed error, absolute percentage error, variance narrative and actions to improve future forecast accuracy for the project.



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30 Project Cost Control Metrics





ESTIMATE RANGE WIDTH



Show the uncertainty around a stated cost estimate rather than hiding it behind one number.

1 WHAT IT MEASURES

Estimate range width shows the span between a lower and upper cost estimate, highlighting the level of uncertainty.



UNCERTAINTY:

The range shows the possible variation in total cost.



BOUNDS:

Lower estimate (minimum plausible cost) and upper estimate (maximum plausible cost).



PURPOSE:

Makes uncertainty visible for decision-makers and avoids a false sense of precision.



USE:

Applicable to total project cost or specific work packages. The bounds must reflect the same scope and assumptions.

2 FORMULA & METHOD

$$\text{Range width} = \text{Upper estimate} - \text{Lower estimate}$$

1



Define the scope and estimate the lower and upper costs for the same work.

2



Range width = Upper estimate minus Lower estimate.

3



Record what the bounds represent and the key assumptions behind them.

4



Keep the range with the estimate baseline and update as new evidence becomes available.



CONTROL:

A range width shows uncertainty. It is not a confidence interval unless it is modeled as one.

3 DATA & EVIDENCE



COST BASIS:

Detailed cost estimates for the same scope, including quantity take-offs, rates and assumptions.



EVIDENCE SOURCES:

Quotes, vendor proposals, historical data, technical studies and expert judgement.



OWNERS:

Cost estimator or quantity surveyor, with input from technical, procurement and project management.



DOCUMENTATION:

State what the lower and upper bounds mean and the reasons for them, including any exclusions.



DEPENDENCIES:

Consistent scope, design maturity, market conditions and schedule assumptions.

4 WORKED EXAMPLE

Illustrative estimate at a defined scope:

Lower estimate: \$450,000

Upper estimate: \$600,000

Range width = \$600,000 - \$450,000

RESULT: \$150,000

This \$150,000 shows the possible variation in total cost for the stated scope and assumptions.



IMPORTANT:

This range is not a confidence interval unless it is modeled as one using a defined statistical method.



EXAMPLE USE:

Use the range in reports and decision discussions to reflect the uncertainty, not just a single point estimate.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

A wider range indicates greater uncertainty. It highlights areas that need more evidence.



NOT A GUARANTEE:

A narrow range can give a false sense of certainty if the bounds are not well justified.



CONSISTENT SCOPE:

Lower and upper estimates must use the same scope, assumptions and currency. Do not mix different scopes or methodologies.



LIMITATIONS:

Range width does not show the likelihood of costs within the range. It does not replace detailed risk analysis or schedule risk.

6 ACTIONS & OUTPUTS



REDUCE UNCERTAINTY:

Obtain targeted evidence for major cost drivers, such as design details, supplier quotes or site information.



REFINE ESTIMATES:

Update the lower and upper estimates as new information is confirmed and risks are resolved.



ENGAGE STAKEHOLDERS:

Discuss the range, key assumptions and remaining uncertainties with sponsors, clients and the project team.



OUTPUTS:

Updated estimate range, summary of main changes, and a record of the evidence and assumptions used to set the bounds.



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CONTINGENCY DRAWDOWN



Track the authorized use of a defined contingency allowance.

1 WHAT IT MEASURES

Contingency drawdown shows how much of the approved contingency allowance has been authorized for use, helping to track risk funding consumption over time.



CONTINGENCY:

Approved allowance for identified project risks.



AUTHORIZED USE:

Approved changes that use contingency, via agreed control.



DRAWDOWN:

Portion of the original allowance that has been consumed.



PURPOSE:

Indicates how much risk funding remains to manage known risks.

2 FORMULA & METHOD

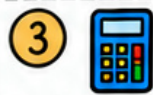
$$\text{Drawdown \%} = \frac{\text{Authorized contingency consumed}}{\text{Original authorized contingency}} \times 100$$



1 Confirm the original authorized contingency amount.



2 Total the authorized contingency consumed via approved changes.



3 Apply the formula and calculate the drawdown percentage.



4 Show approved adjustments to the contingency amount separately.



CONTROL:

Use only authorized changes. Keep adjustments to the allowance separate from consumption.

3 DATA & EVIDENCE



CONTINGENCY BASELINE:

Original authorized contingency amount, documented in the cost baseline and risk management plan.



APPROVED CHANGE RECORDS:

Change requests, approvals and cost breakdowns showing use of contingency.



RISK REGISTER:

Current risk status, potential impacts and risk response plans.



ADJUSTMENT RECORDS:

Approved changes to the contingency allowance, shown separately from consumption.



OWNER CHECK:

Project controller or cost manager verifies amounts and reconciliation with change control records.



QUALITY RULE:

Use a consistent definition of contingency and include only authorized items.

4 WORKED EXAMPLE

Illustrative project use of contingency:

Original authorized contingency: \$80,000

Authorized contingency consumed: \$20,000

$$\text{Drawdown \%} = \$20,000 / \$80,000 \times 100$$

RESULT: 25%



INTERPRETATION:

Twenty-five percent of the contingency allowance has been authorized and is now consumed. The remaining allowance is still available for future approved risks.



NOTE:

This is an illustrative example only. Actual amounts and thresholds are project-specific.

5 INTERPRET & CAUTIONS



CONTEXT MATTERS:

A low drawdown is not automatically good if the overall risk exposure is rising.



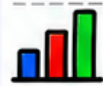
CHECK RISK EXPOSURE:

Compare remaining allowance with current and forecast risk needs.



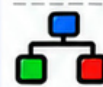
DEFINITION RISK:

Avoid mixing management reserve and contingency definitions.



TREND ANALYSIS:

Review drawdown trend over time to understand the pace of contingency use.



APPROVAL DISCIPLINE:

Include only authorized changes. Do not include unapproved costs or actuals not yet approved.



LIMITATION:

Does not measure overall project health on its own. Use with other cost and risk metrics.

6 ACTIONS & OUTPUTS



COMPARE WITH RISK NEEDS:

Compare the remaining allowance with current risk exposure and forecast needs.



UPDATE FORECAST:

Revise risk cost forecasts based on latest information and expected risk responses.



TAKE ACTION:

Initiate risk responses, seek additional funding if needed, or adjust scope and schedule.



TRACK GOING FORWARD:

Monitor drawdown regularly and investigate significant changes.



OUTPUTS:

Updated drawdown percentage, remaining allowance, explanation of major drivers, and actions agreed with stakeholders.



INFORM DECISIONS:

Supports cost control, risk management and governance reporting.



MANAGEMENT RESERVE BALANCE



Monitor the remaining authorized management reserve under the organization's governance rules.

1 WHAT IT MEASURES

Management reserve balance shows how much of the authorized reserve remains available to address unforeseen work, using the organization's governance rules.



MANAGEMENT RESERVE:

Authorized funds held for unknown risks, outside the performance measurement baseline.



REMAINING BALANCE:

Reserve not yet allocated to approved work.



PURPOSE:

Monitor availability for future approved allocations.



NOT FOR ROUTINE WORK:

Used only for approved, unanticipated changes.



GOVERNANCE RULES:

Use follows the organization's authorization and approval process.

2 FORMULA & METHOD

$$\text{Remaining Reserve} = \text{Opening Balance} + \text{Approved Additions} - \text{Authorized Allocations}$$



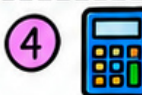
1 Identify the opening management reserve balance for the period.



2 Add any approved additions to the reserve (organizational approvals).



3 Subtract the total of authorized allocations to approved work.



4 Calculate the remaining balance using the formula above.



CONTROL:

Only include approved additions and authorized allocations.

3 DATA & EVIDENCE



AUTHORIZATION RECORDS:

Approved reserve amount, additions and allocation decisions.



CHANGE CONTROL LOG:

Approved change requests using management reserve, with dates and references.



FINANCIAL RECORDS:

Funding records showing reserve amounts and transactions.



PROJECT BASELINE:

To confirm that management reserve is outside the performance measurement baseline.



OWNERS:

Project manager, PMO, finance team and governance body that authorizes reserve use.



RECONCILIATION EVIDENCE:

Records linking reserve balance to funding changes and baseline updates.

4 WORKED EXAMPLE

Illustrative project management reserve calculation:

Opening balance:	\$50,000
Approved additions:	\$0
Authorized allocations:	\$12,000

$$\text{Remaining Reserve} = \$50,000 + \$0 - \$12,000$$

RESULT: \$38,000



INTERPRETATION:

After allocating \$12,000, the remaining management reserve is \$38,000, available for future authorized allocations.

5 INTERPRET & CAUTIONS



WHAT IT SHOWS:

The amount of authorized management reserve still available.



EVM CONSIDERATION:

In conventional EVM, management reserve is outside the performance measurement baseline and not part of PV, EV or AC.



AUTHORIZATION REQUIRED:

Transfers from management reserve to the baseline require formal approval.



LIMITATIONS:

Not for routine work or known risks. Use only for approved, unanticipated changes, following organizational rules.

6 ACTIONS & OUTPUTS



MAINTAIN ALLOCATION LOG:

Record each approved allocation with date, amount, purpose and reference.



RECONCILE REGULARLY:

Match the reserve balance with funding records and baseline changes.



SEEK APPROVAL:

Obtain the required governance approvals for additions or allocations.



UPDATE REPORTS:

Reflect changes in project status reports and communicate the remaining balance.



OUTPUTS:

Updated reserve balance, audited allocation log, and evidence to support funding and baseline reconciliations.



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CHANGE COST EXPOSURE



Show the estimated cost effect of pending scope changes without treating them as approved.

1 WHAT IT MEASURES

Change cost exposure shows the total estimated cost of identified pending scope changes that are not yet approved, using consistent rules and current estimates.



PENDING CHANGE:

A proposed addition, removal or modification to project scope under evaluation.



COST EXPOSURE:

Estimated cost effect if the pending changes are approved.



NOT BASELINE:

These are potential costs and must not be treated as authorized spending or added to the baseline.



PURPOSE:

Make the financial impact of pending changes visible for decision making and planning.

2 FORMULA & METHOD

$$\text{Change Cost Exposure (CCE)} = \sum \text{Estimated Cost of Pending Changes}$$

1



Identify all pending changes using consistent inclusion rules (e.g., in review or awaiting decision).

2



Use current, best-available estimates for each change on a consistent basis.

3



Include an uncertainty range for each estimate (e.g., low to high).

4



Sum the estimated costs to calculate the total exposure.

5



Keep the total separate from the approved baseline and show in forecasts.

3 DATA & EVIDENCE



CHANGE REQUESTS:

Documented change proposals with clear scope description, rationale and current cost estimate.



SUPPORTING ESTIMATES:

Estimate breakdowns, assumptions, quantity takeoffs and vendor quotes.



STATUS RECORDS:

Current approval status (in review, awaiting decision or rejected) and dates.



OWNERS:

Change control board, project manager, cost estimator and functional owners provide and validate the information.



EVIDENCE LOCATION:

Change log, estimate files, meeting notes and decision records in the project repository.

4 WORKED EXAMPLE

Illustrative pending changes:



Change 1:

Estimated cost: \$8,000



Change 2:

Estimated cost: \$12,000



Change 3:

Estimated cost: \$5,000

Change Cost Exposure (CCE):

$$= \$8,000 + \$12,000 + \$5,000$$

RESULT: \$25,000



INTERPRETATION:

The three pending changes represent \$25,000 of gross potential cost exposure if approved. This is an illustrative example.

5 INTERPRET & CAUTIONS



NOT AUTHORIZED:

Pending estimates are not approved spending and must not be added to the baseline.



UNCERTAINTY:

Each estimate has uncertainty. Use a low-high range and review as more information becomes available.



NO DOUBLE COUNTING:

Do not blindly sum overlapping or alternative changes. Check interdependencies and exclusivity.



MAY CHANGE:

Estimates can increase, decrease or be rejected. Keep them updated and do not treat as commitments.



CONTEXT:

Thresholds and inclusion rules are project-specific. Use consistent rules throughout the analysis.

6 ACTIONS & OUTPUTS



SEPARATE STATUS:

Keep approved, pending and rejected changes in separate categories in the change log.



UPDATE FORECASTS:

Include the pending cost exposure in forecast scenarios (e.g., downside and upside) without changing the approved baseline.



COMMUNICATE:

Share the total exposure and key pending changes with stakeholders for informed decision making.



DRIVE DECISIONS:

Use the information to prioritize reviews, request more detail and decide which changes to advance, defer or reject.



MAINTAIN RECORDS:

Update the change log, estimates and assumptions regularly and track decisions to keep the exposure



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30 Project Cost Control Metrics



UNIT COST



Compare actual cost with a consistent quantity of accepted output.



1 WHAT IT MEASURES

Unit cost shows the actual cost per unit of accepted output, allowing fair comparison over time or between options.



UNIT COST:

Total relevant actual cost divided by accepted units.



ACCEPTED OUTPUT:

Units that meet defined quality and scope criteria.



RELEVANT COST:

Direct and agreed indirect costs needed to produce the units.



PURPOSE:

Compare efficiency and identify cost changes using a consistent unit of measure.

2 FORMULA & METHOD

$$\text{Unit cost} = \frac{\text{Relevant actual cost}}{\text{Accepted comparable units}}$$

1



Define the output and quality criteria for an accepted unit.

2



Sum the relevant actual costs for the same scope and time period.

3



Count the number of accepted units using a consistent definition.

4



Divide total relevant actual cost by the accepted units.



CONTROL:

Use the same unit definition, scope and cost inclusions for comparison.

3 DATA & EVIDENCE



COST RECORDS:

Actual direct costs and agreed indirect costs for the output. Owner: Finance.



ACCEPTANCE RECORDS:

Count of units that meet quality and scope criteria. Owner: Project team.



QUALITY EVIDENCE:

Inspection or test results confirming accepted units. Owner: Quality assurance.



SCOPE DOCUMENTS:

Definition of the unit, inclusions and exclusions for costs and quality. Owner: Project manager.



DEPENDENCIES:

Use the same time period, unit definition and data sources for valid comparison.

4 WORKED EXAMPLE

Illustrative project:

Relevant actual cost for accepted units: \$48,000

Number of accepted units: 120

Unit cost = \$48,000 / 120

RESULT: \$400 per unit



INTERPRETATION:

It cost \$400 to produce each accepted unit based on the relevant actual costs in this period.

5 INTERPRET & CAUTIONS



MEANING:

A lower unit cost can indicate better efficiency, but only when the unit definition, scope and quality are consistent.



VALID COMPARISON:

Compare like-for-like units with the same complexity, quality and cost inclusions.



KEY CAUTIONS:

Differences in complexity, quality or fixed-cost allocation can make comparisons invalid.



LIMITATIONS:

May not reflect overall value, benefits or outcomes. Always consider scope, quality and project-specific context.

6 ACTIONS & OUTPUTS



INVESTIGATE DRIVERS:

Analyse cost components, process efficiency, waste, rework and changes in complexity or quality.



IMPROVE EFFICIENCY:

Remove waste, fix issues and apply lessons learned to reduce future unit costs.



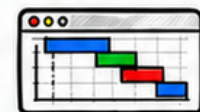
USE SUPPORTING METRICS:

Pair unit cost with acceptance rates, productivity and quality evidence to understand changes.



OUTPUTS:

Unit cost report, analysis of drivers, actions to reduce costs and updated estimates using the same unit definition.





Shows the share of cost spent correcting work that failed agreed requirements.

1 WHAT IT MEASURES

Rework cost rate shows the proportion of total project cost spent on correcting work that did not meet agreed requirements.



REWORK COST:

Cost to fix, redo or replace non-conforming work.



PURPOSE:

Indicates quality issues and efficiency losses.



HIGHER RATE:

More cost is spent correcting work, reducing value.



LOWER RATE:

Indicates better first-time right performance.



USE WITH:

Quality metrics, change control and root-cause analysis.

2 FORMULA & METHOD

$$\text{Rework cost rate} = \frac{\text{Identified rework cost}}{\text{Total relevant actual cost} \times 100}$$

1



Define and code rework costs consistently (e.g., rework labour, materials, subcontractor costs).

2



Identify the total relevant actual cost for the same scope and period.

3



Divide rework cost by total relevant actual cost and multiply by 100.

4



Ensure consistent coding and time period for both numerator and denominator.



CONTROL:

Include only genuine rework costs. Use consistent coding across the project.

3 DATA & EVIDENCE



COST RECORDS:

Detailed cost reports showing rework labour, materials and subcontractor costs.



WORK PACKAGES:

Records of non-conforming work and corrective actions taken.



CHANGE LOG:

Approved changes to separate planned work from rework.



QUALITY RECORDS:

Inspection reports, test results and defect lists.



OWNERS:

Project control team for cost data, quality team for non-conformance records, and package owners for validation.



EVIDENCE STANDARD:

Use agreed definitions and consistent coding across all sources.

4 WORKED EXAMPLE

Illustrative example for a project period:

Identified rework cost: \$9,000
Total relevant actual cost: \$150,000

$$\text{Rework cost rate} = \$9,000 / \$150,000 \times 100$$

RESULT: 6%



INTERPRETATION:

Six percent of the relevant actual cost was spent on correcting work that did not meet agreed requirements.



NOTE:

This is an illustrative example only. Actual results will vary by project, scope and time period.

5 INTERPRET & CAUTIONS



WHAT IT INDICATES:

A higher rate suggests quality problems, inefficient processes or inadequate requirements.



CONSIDER CONTEXT:

Compare over time and across work packages to identify trends and recurring issues.



KEY CAUTIONS:

Not every design iteration or planned change is avoidable rework. Define planned learning and change separately from rework costs.



LIMITATION:

Excludes benefits of changes and does not measure overall project value or quality.

6 ACTIONS & OUTPUTS



FIND CAUSES:

Analyse recurring causes of rework using quality records and change logs.



TARGET IMPROVEMENT:

Prioritise high-impact causes and agree preventive actions with responsible owners.



IMPLEMENT ACTIONS:

Update processes, requirements or training to reduce future rework.



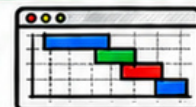
VERIFY EFFECTIVENESS:

Monitor future periods to confirm that rework cost rate decreases after actions are implemented.



OUTPUTS:

Root-cause analysis, action log, updated procedures and follow-up reports showing the impact on rework costs.



COST CODING ACCURACY



Check whether reviewed cost transactions are assigned to the correct work package and account.

1 WHAT IT MEASURES

Cost coding accuracy checks the proportion of reviewed cost transactions that are assigned to the correct work package and account.



COST TRANSACTION:

An actual cost record, such as an invoice, expense claim or journal entry.



WORK PACKAGE:

The planned part of work to which the cost should be charged.



ACCOUNT:

The cost account or category within the cost structure.



ACCURATE CODING:

The transaction is charged to the correct work package and account in line with project coding rules.

2 FORMULA & METHOD

$$\text{Cost Coding Accuracy \%} = \frac{\text{Correctly Coded Transactions}}{\text{All Reviewed Transactions}} \times 100$$



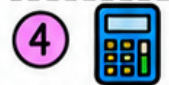
Select a representative sample of cost transactions to review.



Check each transaction is coded to the correct work package and account.



Count the number of correct transactions and the total reviewed transactions.



Apply the formula and calculate the percentage.



Report the sampling method and the monetary value impact of any misallocations.



CONTROL:

Use consistent coding rules and a documented review approach.

3 DATA & EVIDENCE



TRANSACTION RECORDS:

Invoices, expense claims, journal entries and procurement records with cost codes.



CODING STRUCTURE:

Work breakdown structure, work packages and cost accounts in the project's chart of accounts.



EVIDENCE OF REVIEW:

Sample list, review notes and results showing which transactions were correct or incorrect.



REPORTING:

Sampling method used and the value impact of any misallocated transactions.



OWNER CHECK:

Project controls or finance team performs the review, with project manager agreement on any corrections.

4 WORKED EXAMPLE

Illustrative sample of reviewed transactions:

Correctly coded transactions: 94

All reviewed transactions: 100

$$\text{Cost Coding Accuracy \%} = \frac{94}{100} \times 100$$

RESULT: 94%



INTERPRETATION:

In this sample, 94% of the reviewed transactions were coded to the correct work package and account.



NOTE:

This is an illustrative example using a sample of transactions, not a full population.

5 INTERPRET & CAUTIONS



WHAT A HIGH RESULT MEANS:

Most reviewed transactions are coded correctly, supporting reliable cost reporting.



WHAT A LOW RESULT MEANS:

More transactions are misallocated, which can distort work package costs and project decisions.



SAMPLE LIMITATION:

The result is based on a sample, not a complete population of transactions.



VALUE IMPACT:

A small number of errors by count can still have a high monetary impact if the transactions are large or significant.



CONTEXT:

Thresholds for acceptable accuracy are project-specific and depend on risk, size and governance needs.

6 ACTIONS & OUTPUTS



CORRECT MISALLOCATIONS:

Update the coding on incorrect transactions and repost where required, with proper approvals.



INVESTIGATE CAUSES:

Identify why errors occurred, for example unclear guidance, wrong account selection or system issues.



IMPROVE GUIDANCE:

Clarify coding rules, provide examples and update user guidance and training.



STRENGTHEN CONTROLS:

Add or improve validation checks in the systems and review processes to prevent future errors.



OUTPUTS:

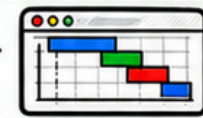
Corrected transactions, a summary of review results including value impact, and an action plan to improve coding accuracy.



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30 Project Cost Control Metrics



COST REPORT TIMELINESS



Track whether complete, reconciled cost reports reach decision makers by the agreed deadline.



1 WHAT IT MEASURES

Cost report timeliness tracks whether complete and reconciled cost reports are issued to decision makers by the agreed deadline.



COMPLETE REPORT:

Includes all required cost data, reconciliations and explanations.



ON TIME:

Issued by the agreed deadline in the reporting calendar.



DECISION MAKERS:

Project management team, sponsors or other defined recipients.



PURPOSE:

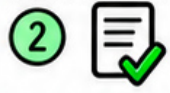
Supports timely decisions and effective cost control through accurate information.

2 FORMULA & METHOD

$$\text{Cost Report Timeliness \%} = \left(\frac{\text{Reports on time and complete}}{\text{Reports due}} \right) \times 100$$



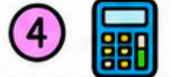
1 Define the reporting period and agreed deadlines in the reporting calendar.



2 Check each report for completeness and timely issue date.



3 Count reports that are both on time and complete.



4 Divide by the total number of reports due in the period.



5 Multiply by 100 to get the percentage.



CONTROL:

Reports must be both on time and complete to be counted.

3 DATA & EVIDENCE



REQUIRED EVIDENCE:

Issued cost reports, submission dates and a checklist showing completeness and reconciliations.



DATA SOURCES:

Finance system, project cost reports, reporting calendar and distribution records.



KEY DETAILS:

Report period, agreed deadline, issue date, completeness check results and recipient list.



OWNER:

Project controller or finance lead prepares and validates the reports.



REVIEW BY:

Project manager and sponsor confirm receipt and use for decision making.

4 WORKED EXAMPLE

Illustrative example for monthly reports:

Reports on time and complete: 11
Reports due: 12

$$\text{Cost Report Timeliness \%} = 11 / 12 \times 100$$

RESULT: 91.7%



INTERPRETATION:

Eleven of twelve monthly reports meet the deadline and completeness criteria, giving 91.7%.



ILLUSTRATIVE ONLY:

This example is for illustration purposes. Actual results, reporting frequency and deadlines are project-specific.

5 INTERPRET & CAUTIONS



HIGHER IS BETTER:

A higher percentage means cost reports are reaching decision makers on time and complete.



CHECK DATA QUALITY:

Timeliness and data quality must be reviewed together. Early but unreconciled reports can mislead.



POTENTIAL CAUSES:

Late inputs, incomplete data, reconciliation issues or unclear deadlines.



USE WITH OTHER METRICS:

Consider alongside cost accuracy and issue resolution metrics for a full view of reporting performance.

6 ACTIONS & OUTPUTS



RESOLVE LATE INPUTS:

Identify and remove blockers that delay cost data and reconciliations.



ASSIGN DATA OWNERS:

Define clear ownership for each data input and reconciliation task.



PUBLISH CUTOFF:

Communicate the reporting cutoff date, required content and distribution list.



PRODUCE OUTPUTS:

Timely, complete and reconciled cost reports issued to the agreed recipients.



CONTINUOUS IMPROVEMENT:

Review recurring delays and implement process improvements to increase timeliness and quality.



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CARD 30 OF 30

30 Project Cost Control Metrics





HOW TO USE THIS GUIDE & SOURCES

Get the most from the 30 Project Cost Control Metrics learning cards.



① START WITH A NEED

Select a card that matches a real project decision. This helps you apply the right metric in context and avoid misuse.



CONFIRM SCOPE:

Understand what is in and out of scope for the decision.



CHECK CONTEXT:

Identify the project lifecycle stage, key stakeholders and constraints.



USE DEFINITIONS:

Apply the terms and formulas consistently across your team.



READ THE EXAMPLE:

Use the worked example as an illustration, not a promise.



SELECT EVIDENCE:

Identify the data and documents needed before acting.

② APPLY & REVIEW

Follow a clear process to apply each card and review the result. Tailor the details to your project environment.



ASSIGN AN OWNER:

Nominate who will gather data, apply the metric and review the outcome.



AGREE INPUTS AND OUTPUT:

Confirm the data sources, metric inputs and the expected output from the card.



RECORD ASSUMPTIONS:

Note any assumptions, exclusions or data limitations used in the calculation.



APPLY AND REVIEW:

Use the card, check the result and discuss what it means for the decision.



ADAPT TO YOUR PROJECT:

Set an appropriate review frequency and thresholds.



IMPORTANT:

If a denominator is zero, use N/A, not zero percent. Protect sensitive information and maintain a version history.

③ ABOUT THIS EDITION

This guide is part of the WikiFree Project Management Collection.



BOOK 6 IN THE COLLECTION:

Thirty original practical learning cards on project cost control metrics.



PRACTICAL SYNTHESIS:

Terminology and techniques present a practical synthesis, not an exhaustive standard or formal certification.



LOCAL ADAPTATION:

Custom working metrics must be defined locally to suit your project and organization.



EXAMPLES ARE ILLUSTRATIVE:

Worked examples show how the metric can be applied. They are illustrations, not guarantees or benchmarks.



FURTHER READING:

Panels 4-6 provide sources for deeper study.

④ SOURCE 1

DOE - Project Management Lexicon

The U.S. Department of Energy (DOE) Project Management Lexicon provides definitions of common project management terms used across the project lifecycle.



It is a useful foundation for understanding terminology used in this guide and for further reading. It is not an endorsement of this publication.



Click this panel to open the source.

⑤ SOURCE 2

U.S. DoD - EVM Definitions

The U.S. Department of Defense (DoD) Earned Value Management (EVM) guidance provides definitions, terms and concepts for cost, schedule and performance measurement.



It is a useful foundation for understanding EVM terminology used in this guide and for further reading. It is not an endorsement of this publication.



Click this panel to open the source.

⑥ SOURCE 3

PMI - Benefits Realization Framework

The Project Management Institute (PMI) Benefits Realization Framework provides guidance on linking project outputs to outcomes and longer-term value.



It is a useful foundation for understanding benefits realization concepts used in this guide and for further reading. It is not an endorsement of this publication.



Click this panel to open the source.



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REFERENCE & APPLICATION

30 Project Cost Control Metrics

