EARNED VALUE MANAGEMENT
(EVM)

What is Earned Value Management (EVM)

Earned value management (EVM) is a project management methodology that integrates schedule, costs, and scope to measure project performance and progress.

It is a systematic project management process used to find variances in projects based on the comparison of worked performed and work planned.

It helps to make critical project decisions utilizing the "Early Warning Signs" based on data, variances & trends.

By seeing this graph, we have found that the actual cost is less than the planned cost, which seems good.

But how to find out what we have done against the cost spent.

Cost

Planned Cost

Actual Cost

Time
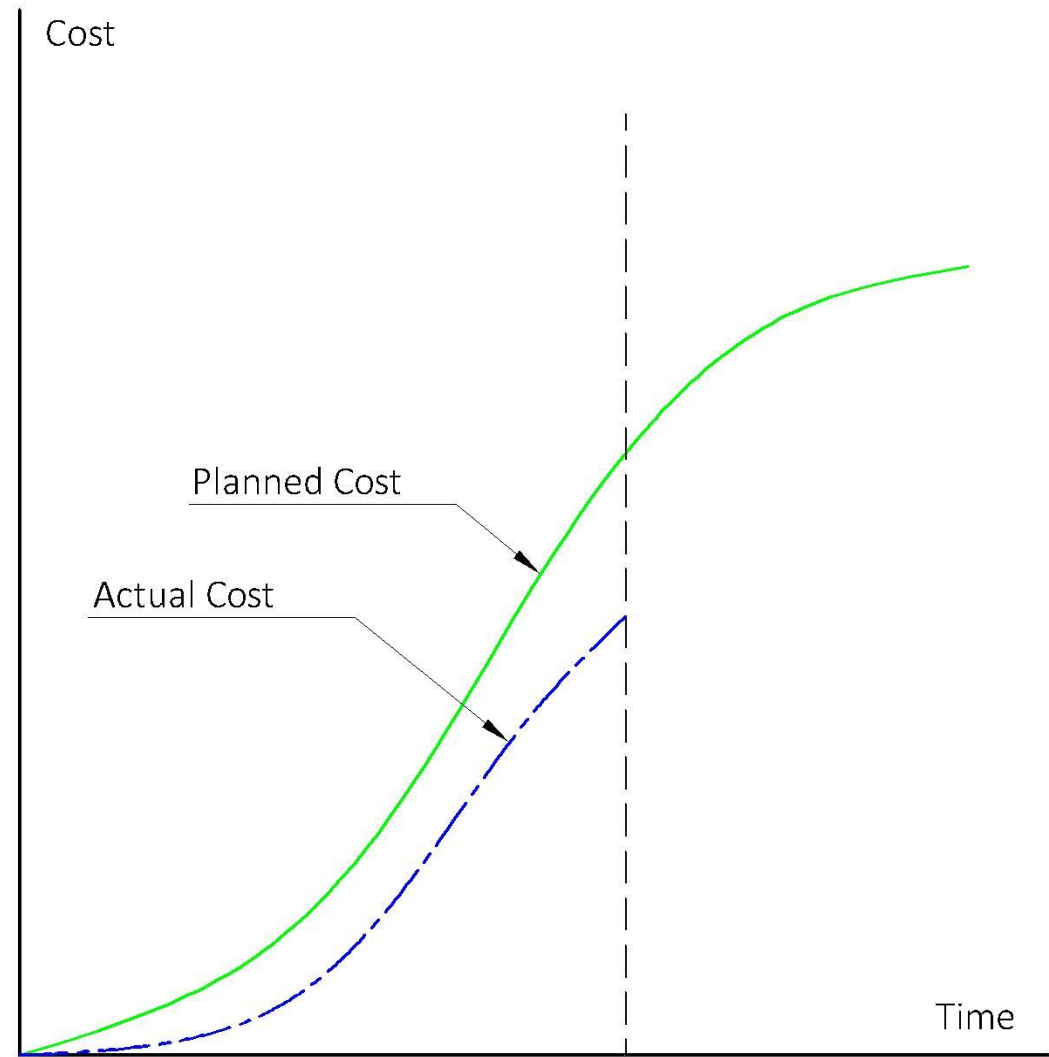
Now look at this graph, it clearly shows that the work done (or Earned Value) is less than the planned progress and the cost spent is higher than the work has been done (or Earned Value)

It indicates the Project Managers to find out the causes of project delay and cost overrun.

This simple example illustrates that what is "**Earned Value Management**"

Cost

Planned Cost

Actual Cost

Earned Value

Time
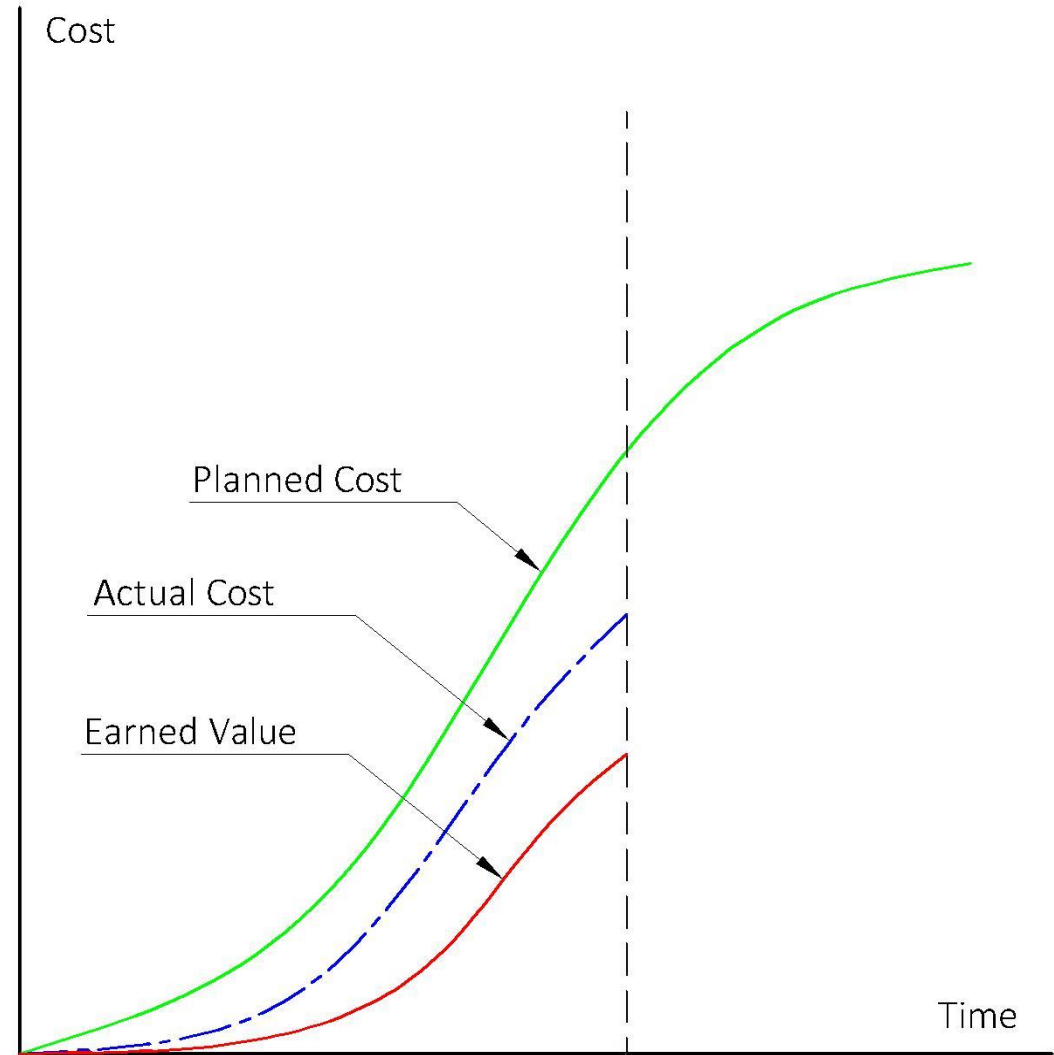
PV – Planned Value

Planned Value (PV) is the budgeted cost for the work scheduled to be done

EV – Earned Value

Planned Value (PV) is the amount of budget that should have been spent for work completed at specific date
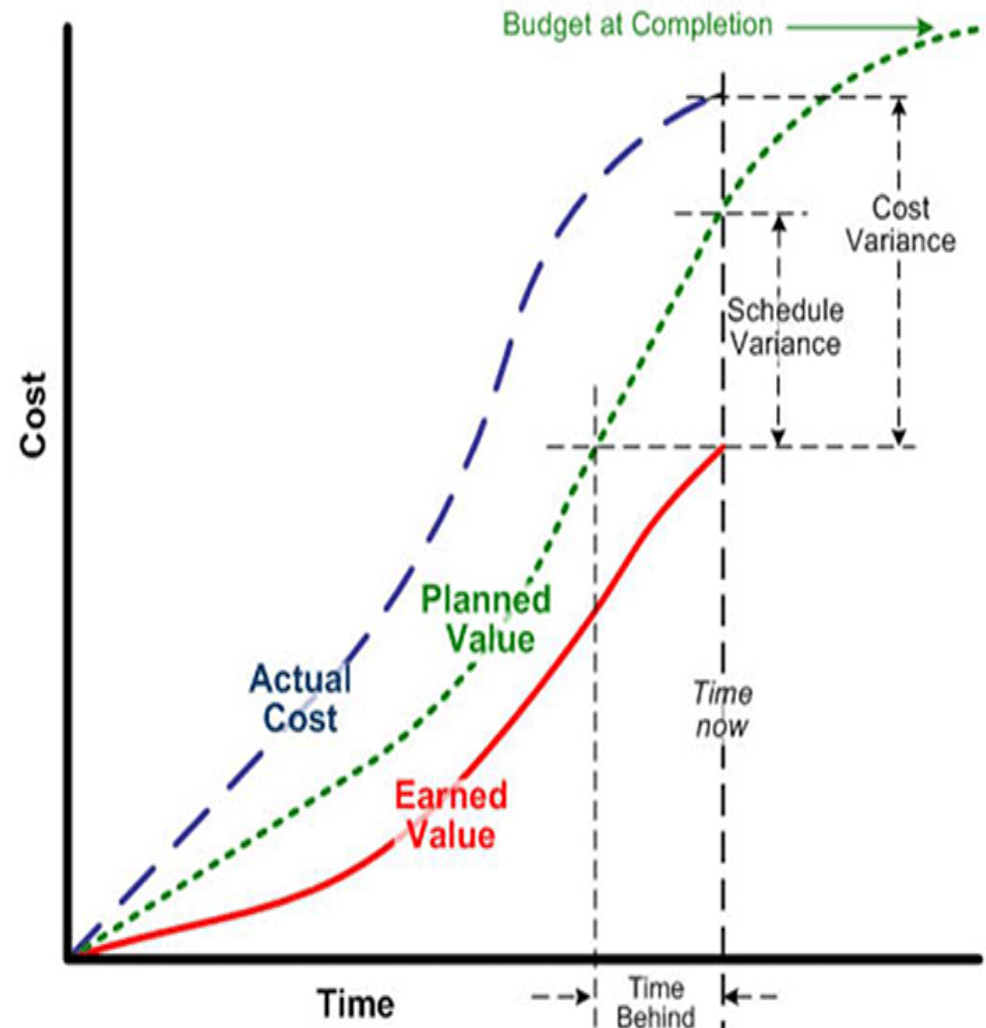
AC – Actual Cost

Actual Cost (AC) is the actual project expense of the work that has been done at specific date

CV – Cost Variance = EV-AC

Cost Variance (CV) is the difference of amount between earned and actual expense at specific work done

SV – Schedule Variance = EV-PV

Schedule Variance (SV) is the difference of amount between earned and planned expense at specific work

BAC – Budget at Completion
It is the cumulative amount of budget required to complete the project as per planned

EAC – Estimate at Completion
It is the cumulative estimated amount of budget at completion of project
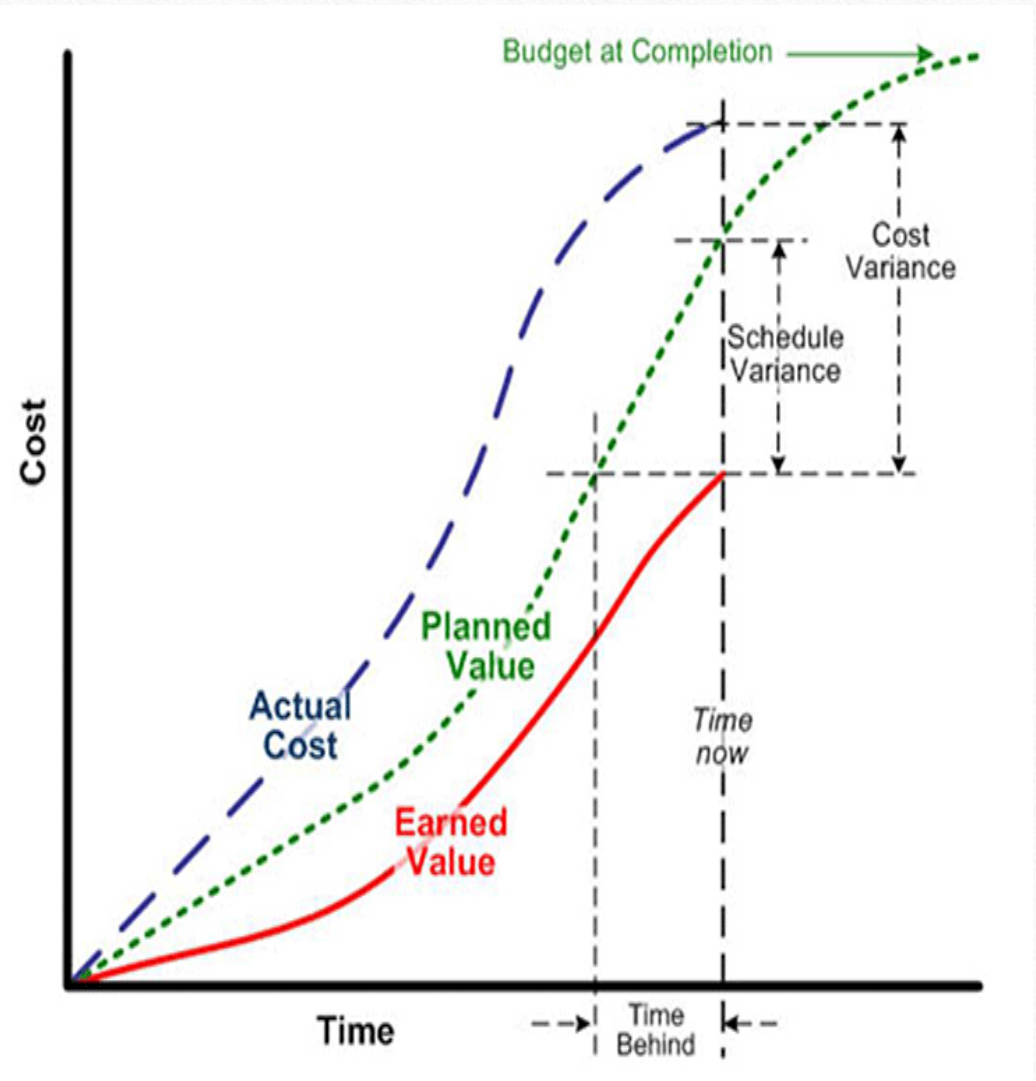
ETC – Estimate to Completion
It is the forecasted cost to complete all the work remaining to be completed

CPI – Cost Performance Index = EV/AC
It is the ratio of Earned Value (EV) and Actual Cost (AC)

SPI – Schedule Performance Index = EV/PV
It is the ratio of Earned Value (EV) and Planned Value (PV)

VAC – Variance at Completion = BAC - EAC
How much expected amount will be spent over or under planned budget
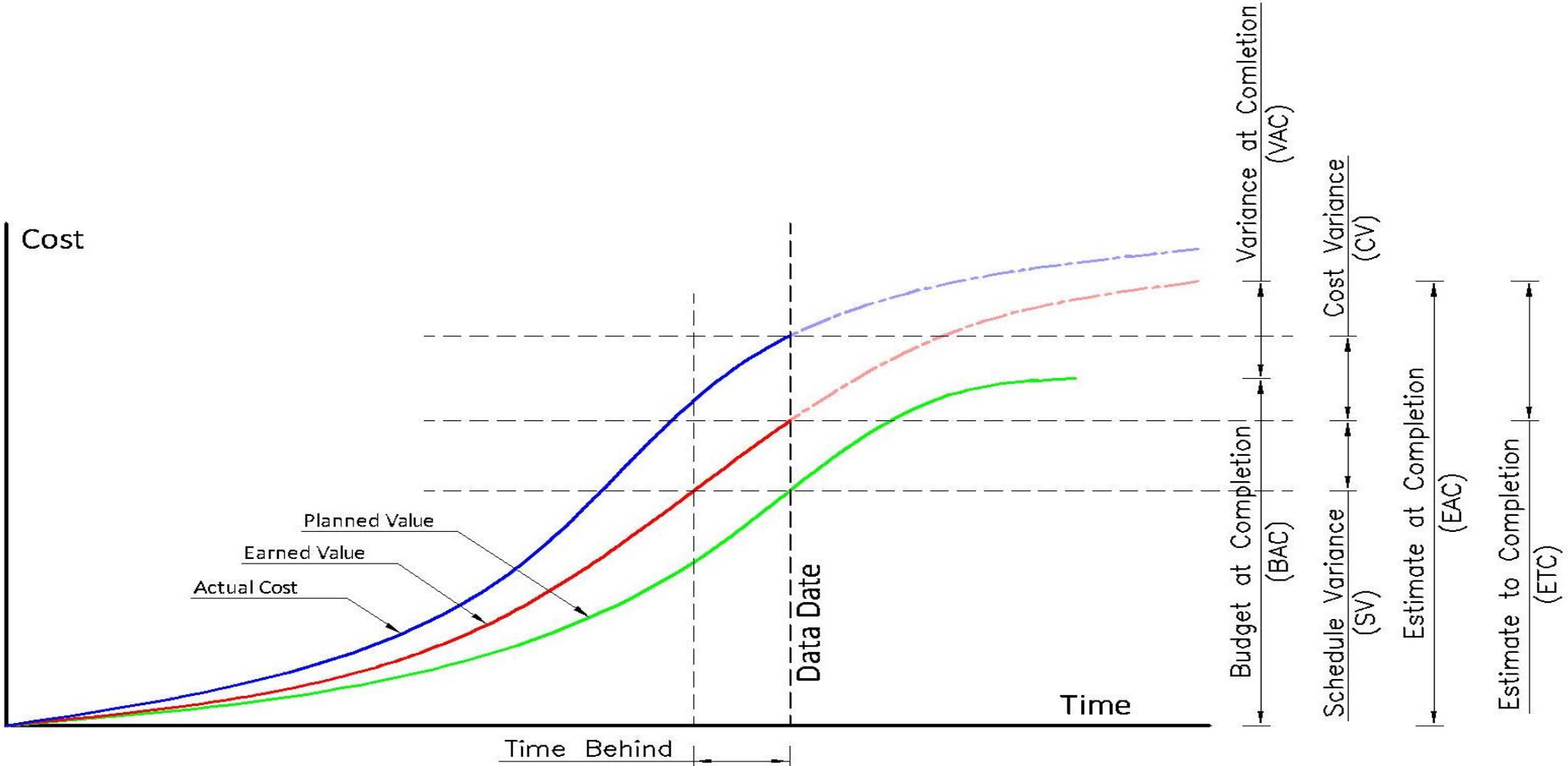
TCPI – Total Completed Performance Index
It is the future performance required to achieve project objectives

In simple words, how much worth of work must be done for every unit of amount (eg. Pound) forecasted to be spend, to meet the current BAC.
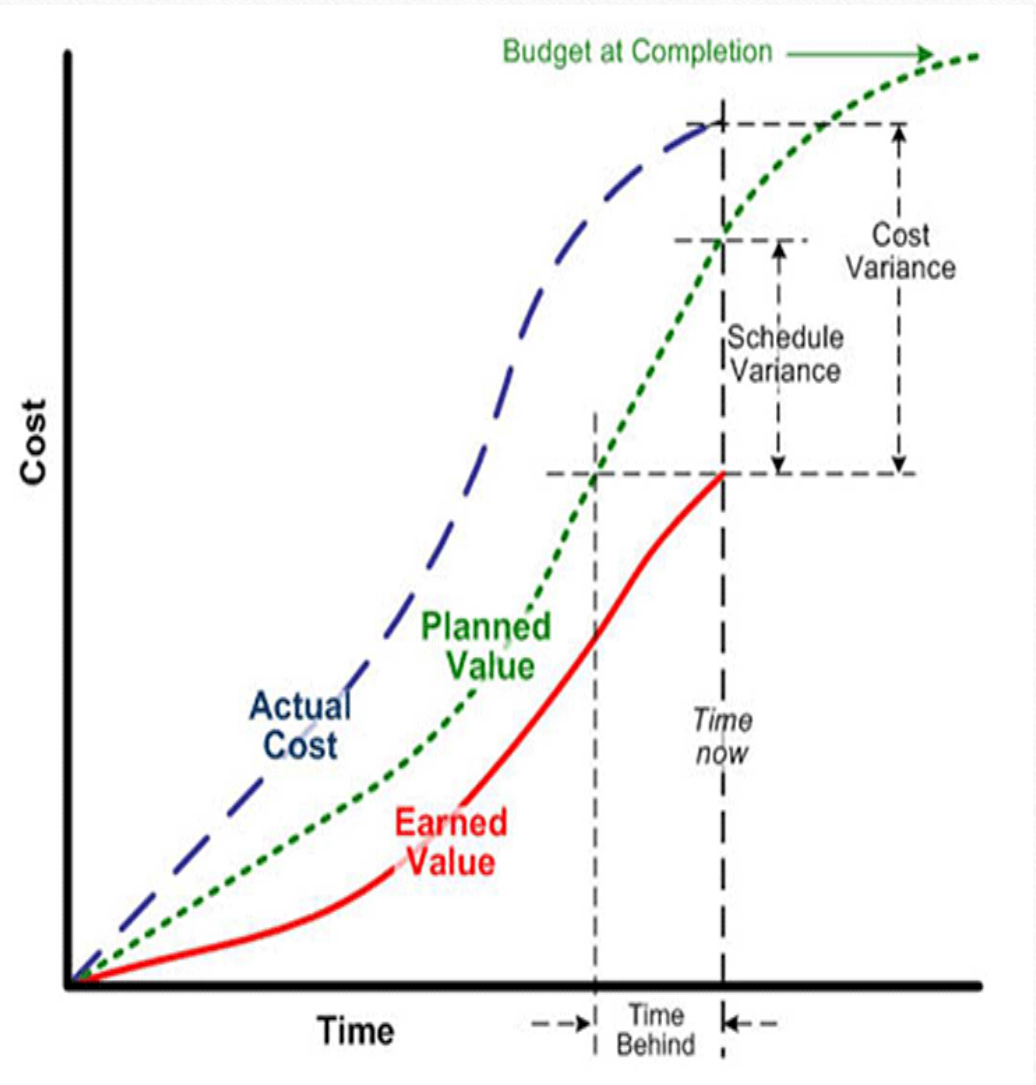
Graphical Representation

CPI   Cost Performance Index

CPI = EV / AC
(<1.0 mean Project Cost Overrun)
(=1.0 mean Project on Track)
(>1.0 mean Project Under Budget

SPI   Schedule Performance Index

SPI = EV / PV
(<1.0 mean Project Behind of Planned Progress)
(=1.0 mean Project on Track)
(>1.0 mean Project Ahead of Planned Progress)

CV   Cost Variance

CV = EV – AC
(Negative mean Project Cost Overrun)
(Positive mean Project Under Budget)

SV   Schedule Variance

SV = EV-PV
(Negative mean Project Behind of Planned Progress)
(positive mean Project Ahead of Planned Progress)

TCPI   Total Completed Performance Index

TCPI =   (BAC – EV) / (BAC – AC)
(<1.0 mean more effort was done to complete the tasks)
(>1.0 mean more effort will be required to complete the tasks)

VAC   Variance at Completion

VAC = BAC – EAC
(Positive mean project will be under budgeted)
(Negative mean project will be over budgeted)

Key Indications

If	Indication	Remarks
SV > 0.0	Completed more work than planned	V Good
SV = 0.0	Project on Track	Good
SV < 0.0	Completed less work than planned	Bad
CV > 0.0	Spent less money than the value of the work done	V Good
CV = 0.0	Project on Track	Good
CV < 0.0	Spent more money than the value of the work done	Bad
SPI > 1.0	Project is ahead of schedule	V Good
SPI = 1.0	Project is on schedule	Good
SPI < 1.0	Project is behind schedule	Bad
CPI > 1.0	Project is under budge	V Good
CPI = 1.0	Project is on budget	Good
CPI < 1.0	Project is over budget	Bad
EAC < BAC	Less money on project will be expected to spent than planned	V Good
EAC = BAC	Project will be completed in allocated budget	Good
EAC > BAC	More money on project will be expected to spent than planned	Bad

How to Calculate Earned Value (EV)

Earned Value (EV) is a project Key Performance Indicator (KPI) that represents a quantified value of the work accomplished to date. EV is calculated as the sum of the budget for all completed work on a project or portion of a project (i.e., a WBS element, Control Account, or Work Package). This includes the budget of all work that is 100% complete, plus partial budgets for work that is in-progress.

The amount of EV calculated for work-in-progress is based on a pre-assigned calculation rule called an EV Method (or EV Technique). EV Methods are used to provide objective measures of progress and avoid subjective estimates of completion that can introduce bias into the calculations.
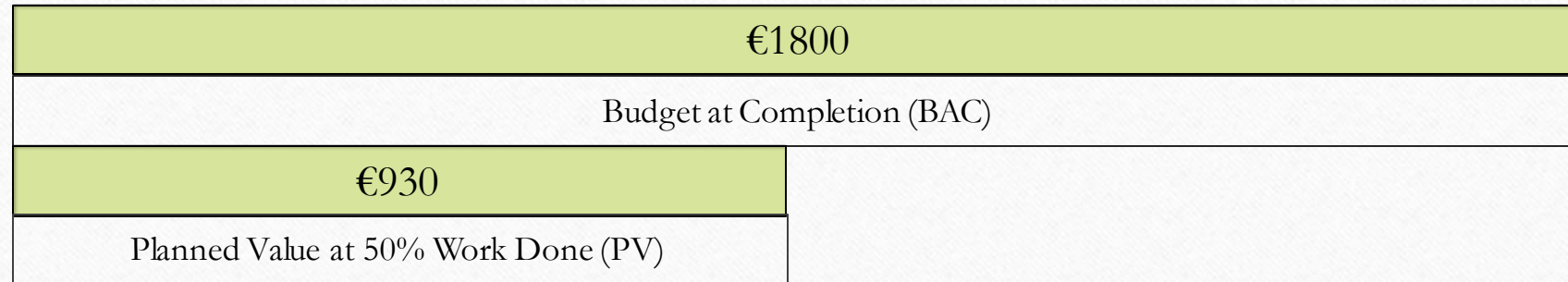
Benefits of EVM

- Provides information about the project in terms of Cost and Time

- Helps to make critical decisions based on actual vs planned cost/time, variances, trends and to predict future performance

- Improves project performance and progress by time to time forecasting

- Identifies the problems by analyzing the data captured

- Allow the project team to evaluate the magnitude of the deviation from the approved base schedule

Example

CV Cost Variance

CV = EV – AC (€855-€1170) -€315
(Negative mean Project Cost Overrun)
(Positive mean Project Under Budget)

SV   Schedule Variance

SV = EV-PV (€855-€930) -€75
(Negative mean Project Behind of Planned Progress)
(positive mean Project Ahead of Planned Progress)

CPI   Cost Performance Index

CPI = EV / AC   (€855/€1170)   0.73 (73%)
(<1.0 mean Project Cost Overrun)   **(27% Cost Overrun)**
(=1.0 mean Project on Track)   **(Or €0.73 of work was done for**
(>1.0 mean Project Under Budget   **every euro spent on the project)**

SPI   Schedule Performance Index

SPI = EV / PV   (€855/€930)   0.92 (92%)
(<1.0 mean Project Behind of Planned Progress)   **(8% Behind Schedule)**
(=1.0 mean Project on Track)   **(Or €0.92 of work was done for**
(>1.0 mean Project Ahead of Planned Progress)   **every planned euro for the project)**

TCPI   **Total Completed Performance Index**

TCPI = (BAC – EV) / (BAC – AC)   (€1800-€855)/(€1800-€1170)   1.5

(Or €1.5 of work will be required for every euro spent on the project to meet the planned budget or BAC)

VAC   **Variance at Completion**

VAC = BAC – EAC   (€1800-€2000)   -€200

(Positive mean project will be completed under planned budget)
(Negative mean project will be over budgeted)

(It means more €200 than planned budget will be required to complete the project)