

The Earned Value Calculation

Let's say we're working on a project to design an app for a smartwatch. Overall we are trying to answer the following two questions:

- Are we over, on, or below budget?
- Are we ahead, on, or behind schedule?

The formula:

$$EV = \% \text{ complete} * BAC$$

What you get: A monetary value.

(BAC = Budget at Completion)

Calculate Schedule Variance

Schedule variance tells us whether our smartwatch app project is ahead, on, or behind schedule.

Schedule Variance (SV)¹. A measure of schedule performance on the project, expressed as the difference between project's earned value and planned value.

The formula:

$$SV = EV - PV$$

What you get: A monetary amount. A negative number means you are behind schedule (bad). A positive number means you are ahead of schedule (good).

Cost Variance (CV)

Schedule variance is one way to get a view on how your project is performing. Another way to look at it is to use the cost variance formula.

The CV formula is also used to work out if the project is over, on, or under budget.

The formula:

$$CV = EV - AC$$

What you get: A monetary amount. A negative number means you are over budget (bad). A positive number means you are under budget (good!). (AC = Actual Cost)

Cost Performance Index (CPI)

CPI in project management measures the cost efficiency of a project.

The formula:

$$CPI = EV / AC$$

What you get: A number. You're aiming for 1. That means that you are getting \$1 of value for every \$1 spent.

Estimate at Completion (EAC)

Estimate at Completion and it works out the expected final and total cost of the project, based on project performance.

The formula:

$$EAC = BAC / CPI$$

What you get: A monetary value.

(BAC = budget at completion. CPI = cost performance index)

Schedule Performance Index (SPI)

The SPI formula is used to work out if the project is:

- Ahead, on, or behind schedule.
- Going to finish when predicted.

The formula:

$$SPI = EV / PV$$

What you get: A number. Again, you are aiming for 1 as that means you are working through the project at the rate you had expected.

Variance at Completion (VAC) Formula

Variance at completion (VAC) is the total cost we originally planned minus the total cost that we now expect.

The formula:

$$VAC = BAC - EAC$$

What you get: A monetary value. A value of \$0 means you'll hit budget. Less than zero means you'll be over budget so ideally you're looking for a number near \$0.

Estimate to Complete Formula (ETC)

The Estimate to Complete (ETC) formula is the simplest and easiest to use in straightforward situations.

The formula:

$$ETC = EAC - AC$$

What you get: A monetary value that tells you how much more the project will cost.

To Complete Performance Index (TCPI)

TCPI is used to calculate the cost performance that must be achieved to hit your cost target (either BAC or EAC).

The formula:

$$\text{TCPI} = (\text{BAC} - \text{EV}) / (\text{EAC} - \text{AC})$$

What you get: A figure.

The first part, BAC – EV, indicates how much project work is remaining, i.e., how much value remains that need to be achieved. The second part, EAC – AC, indicates the money available to finish the project. The TCPI gives you the ratio of work that needs to be completed and the money available to complete the project.