Project Cost Management involves monitoring project performance based on indices. In this article, we’ll explore the Cost Performance Index (CPI) and the Schedule Performance Index (SPI) by conducting Earned Value Analysis. Examples are also provided for Earned Value Analysis.

Earned Value (EV) Analysis leverages the Earned Value Fundamental Formula to determine the project performance indices pertaining to project cost and schedule. Earned Value is part of the Control Costs process group in Project Cost Management. Earned Value Performance formula consist of:

**• Cost Performance Index (CPI):** Represents the amount of work being completed on a project for every unit of cost spent. CPI is computed by Earned Value / Actual Cost . A value of above 1 means that the project is doing well against the budget.

**• Schedule Performance Index (SPI):** Represents how close actual work is being completed compared to the schedule. SPI is computed by Earned Value / Planned Value. A value of above one means that the project is doing well against the schedule.

**Abbreviations**
You'll start to see many different abbreviations in the next few sections - I've listed them out here to help as you continue reading.
EV = Earned Value
PV = Planned Value
BAC = Budget at Completion
AC = Actual Cost

**Formulas**
The following formulas will be used for the following examples.
PV = Planned Completion (%) \* BAC
EV = Actual Completion (%) \* BAC
CPI = EV/AC
SPI = EV/PV

Earned Value Analysis Example 1
Suppose you have a budgeted cost of a project at $900,000. The project is to be completed in 9 months. After a month, you have completed 10 percent of the project at a total expense of $100,000. The planned completion should have been 15 percent.
Now, let’s see how healthy the project is by computing the CPI and SPI.
From the scenario, you can extract the following:
• BAC = $900,000
• AC = $100,000
The Planned Value (PV) and Earned Value (EV) can then be computed as follows:
• Planned Value = Planned Completion (%) \* BAC = 15% \* $ 900,000 = $ 135,000
• Earned Value = Actual Completion (%) \* BAC = 10% \* $ 900,000 = $ 90,000

Compute the earned value variances:
• Cost Performance Index (CPI) = EV / AC = $90,000 / $100,000 = 0.90. This means for every $1 spent, the project is producing only 90 cents in work.
• Schedule Performance Index (SPI) = EV / PV = $90,000 / $135,000 = 0.67. This means for every estimated hour of work, the project team is completing only 0.67 hours (approximately 40 minutes).

Interpretation: Since both Cost Performance Index (CPI index) & Schedule Performance Index (SPI index) are less than 1, it means that the project is over budget and behind schedule. This example project is in major trouble and corrective action needs to be taken. Risk management needs to kick-in.