IT PROJECT MANAGEMENT

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Using Earned Value Management in Software Projects

Defining Earned Value Management

- Earned value management (EVM) is a way of measuring your performance (and the performance of your project team) at any given date or point in the schedule.

- You use the EVM measurements to compare your projected progress with your actual progress on a certain date.

Understanding what earned value is (and isn't)

- Earned value is a means of measuring your performance on a project by evaluating the status of your project costs and schedule. You can also perform EV analysis on other areas of your project.

Discovering the other pieces of the EV formula

- To complete this analysis, you need to calculate a few formulas.
- Here are the primary terms and formulas you need to understand:
  - Planned value (PV)
  - Actual cost (AC)
  - Earned value (EV)

Table 14-1	Earned Value Terms, Then and Now
This Is the Current Formula	**This Is the Old-School Formula**
Planned value (PV)	Budgeted Cost of Work Scheduled (BCWS)
Actual cost (AC)	Actual Cost of Work Performed (ACWP)
Earned value (EV)	Budgeted Cost of Work Performed (BCWP)

Determining a project's worth

- How much the team and other future teams learn from the mistakes made or opportunities that arose.

- How much you can use the code in future projects.

- How much you can make by selling the salvageable parts of your project.

Discovering the Earned Value Management Formulas

For our example, say your imaginary company has been contracted to create a software program that can be used in vehicles to alert drivers to oncoming radar.

In fact, the software can automatically bring the car down to the correct speed limit. The program can be positioned to preconfigured settings to recognize whether the driver should be driving the city speed limit or the highway speed limit.

You have budgeted $120,000 for the cost of the project and you are in the third month of the 12-month project. You've done a great job on all your project planning, communication planning, scope management, and schedules, and you've won awards for your risk management plan; now, it's time to report the status of the costs and schedule for the project to your sponsor and stakeholders

- **Planned value (PV):** Planned value refers to how much you planned for activities to cost during a certain stretch of time. You created these estimates when you started your project planning. Planned value is the cost for activities that you expected you and your team would have completed as of a particular time, and it answers the question: "What did we say would be the value of the work that the team completed as of this particular date?"

- **Actual cost (AC):** Actual cost refers to how much the project work costs as of a certain date. It answers the question: "How much have we spent on this debacle — I mean project — anyway?" Actual cost includes the indirect costs of the project as well as the direct costs of the project if you considered these in your project planning process. The direct costs include all monies spent directly for your software project. For example, wages for resources assigned to work only on your software project are direct costs. Indirect costs refer to monies spent on resources or other items that may be shared among several projects, such as overhead. Subtract the AC from the PV (or the PV from the AC). The difference between these numbers tells you how much over or under budget you are.

- **Earned value (EV):** EV provides you with a measure of your project's progress as of a certain date. EV answers the question: "What is the value of this project work as of this particular date or particular point in the schedule?" To determine your project's EV, combine all the costs budgeted for work that your team has accomplished at this point. The formula for figuring the EV is total budget multiplied by the percent age of work complete. For example, if you have completed 50 percent of a $300 project, your EV is $150.

Table 14-2	Earned Value Formulas
Term	**Meaning**
Planned value (PV)	Planned percentage complete × the amount Budgeted at Completion (BAC)
Actual cost (AC)	Indirect costs + Direct costs + All other costs from your original project plan
Earned value (EV)	Actual percentage complete × the amount Budgeted at Completion (BAC)

- **Budgeted at Completion (BAC):** This refers to the amount that you planned for the cost of the project. In our example, we budgeted $120,000 for the cost of the entire software project. When you add all the planned values for all the project activities, you get a total BAC. In our example, your BAC is $120,000. BAC is the total cumulative PV at completion.

- **Estimate at Completion (EAC):** Looking at where you are now, how much work do you estimate it will take to complete the scheduled activities? The answer to that question is your EAC. To gather your EAC data, use what you know about where things stand right now to estimate what your costs will be when the project is completed. You evaluate your project's performance as of a particular point in time

Calculating your PV

If your BAC is $120,000 and you planned on having 25 percent of the project completed, here's what the math yields:

PV = Planned % complete × BAC

Planned % complete = 25%

Budget at Completion (BAC) = $120,000

PV = .25 × $120,000 = $30,000

You had planned on your project having a value of $30,000 at this point in time.

Calculating earned value

In our example we have completed 20 percent of the project, so here are the details:

EV = Actual % complete × BAC

Actual % complete = 20%

Budget at Completion (BAC) = $120,000

EV = .20 × $120,000 = $24,000

At this point in time, your project has an earned value of $24,000.

Calculating your AC

- You add your direct costs to your indirect costs to determine your actual cost (AC). Say for the sake of argument that the AC is $25,000.

Finding your cost and schedule performance indexes

Table 14-4	Index Formulas
Index	*Formula*
Cost Performance Index (CPI)	$CPI = EV \div AC$
Schedule Performance Index (SPI)	$SPI = EV \div PV$

Creating a new EAC

To calculate your EAC, you divide your BAC by your CPI.

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EAC = BAC ÷ CPI
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In your example, this would be EAC = $120,000 ÷ 0.96 = $125,000. Seems logical, doesn't it? You budgeted $120,000, but you know your project isn't going as efficiently as planned because your CPI is less than one. If it's not as efficient as you planned, then you know you're spending more money than you expected. If you continue going at this rate, then instead of spending $120,000 as you originally budgeted, you should expect to spend $125,000 at completion.

Variance

Table 14-3	Variance Formulas
Concept	*Formula*
Cost Variance (CV)	CV = EV - AC
Schedule Variance (SV)	SV = EV - PV
Variance at Completion (VAC)	VAC = BAC - EAC