PM TRENDS

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Measuring project performance using Earned Value

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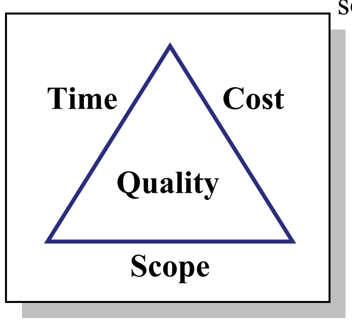
Probably the clearest statement of what "Earned Value" is comes from Quentin W. Fleming and Joel M. Hoppelman's well-known book, *Earned Value Project Management*. These authors state that:

> "Earned Value is a technique used to accurately measure the project's planned value of the defined work against earned value actually accomplished. This relationship indicates to the project manager precisely how much of the planned (scheduled) work has been accomplished as of a point of time. It tells whether the project is ahead of, right on, or behind the work it set out to do. It provides the project manager with a schedule performance efficiency factor for the planned work.

In This Issue

Earned Value analysis can be used to improve project success by enabling the project manager to determine "problem spots" early in the project and take the appropriate corrective action.

The three main areas that the project manager is expected to control – scope, time, and cost - can be managed using earned value.



Cost and time objectives can be monitored by keeping an eye on the Cost Variance and the Schedule Variance. The Cost Variance compares budget deviations while the Schedule Variance compares *planned* work versus the work *actually* completed. *Schedule variance is expressed in terms of the dollars' worth of work ahead or behind the Project Plan* and must be analyzed in conjunction with other schedule information, such as Network Diagrams and Gantt charts. The resulting variances can be translated into dollar values, permitting quantification in monetary terms.

Earned Value Management is a project performance management tool that measures the progress of complex and changeable projects against a baseline. The four main steps involved in performing Earned Value Analysis are:

1. Define the work
2. Schedule the work and assigning resources
3. Monitor and determining the status of the work
4. Re-plan the work

DEFINING THE WORK consists of looking at what has to be done on the project and developing a detailed Work Breakdown Structure (WBS). The WBS should define all deliverables and the activities necessary to produce those deliverables.

SCHEDULING AND RESOURCING THE WORK consists of plotting the discrete work-packages defined by the WBS across a timeline, and assigning resources to underlying activities that comprise the work-packages.

MONITORING AND STATUSING THE WORK involves tracking the actual work accomplished on the activities in the WBS, and comparing actual work accomplished to the planned work up to a specific point in time.

RE-PLANING involves modifying the WBS (and associated costs and schedules) in response to major scope, schedule, or budget changes or unknown risks. A key success factor of any planning or re-planning is use of a comprehensive change management system. Management's use of a sound change management system should

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sustain the project focus, avoid scope creep, and ensure that only authorized modifications are made to the WBS. Whether one is responding to a sudden budget cut or realignment of critical resources, the results of a good change management system are controlled costs and schedules throughout the project life cycle.

PROJECT PERFORMANCE AND TRENDS

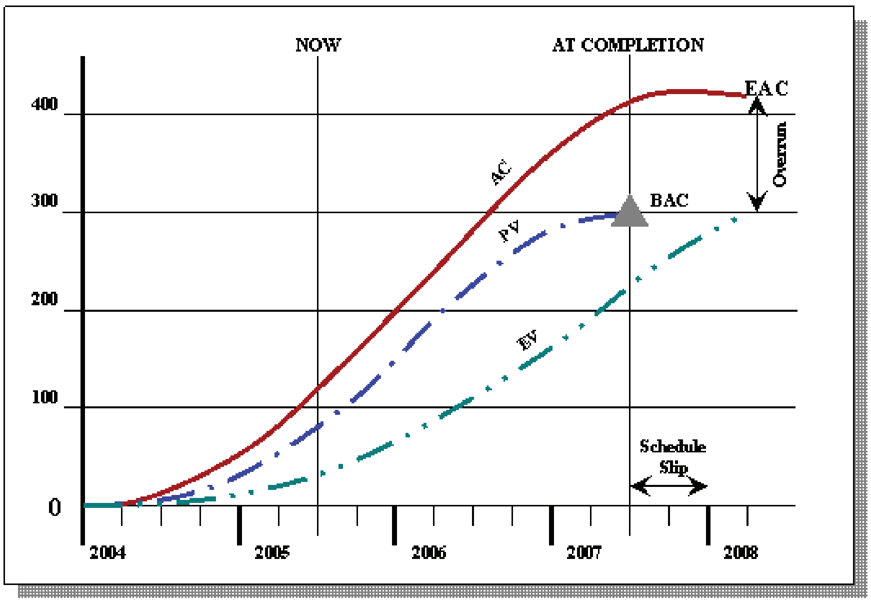
Planned or scheduled value of work, *earned value*, and *actual cost of work performed* provide objective performance measures, enabling a *performance trend analysis* to be calculated and cost estimates at project completion to be developed.

With the increased reliance on contracted services, a project manager needs to a look at the relationship of all contracted work and corresponding schedules. The Earned Value Performance Measurement Baseline represents the contractor's internal work plan — a time-phased schedule for the performance of the contract (expressed in dollars). This internal plan generally provides for some cushion or slack calendar time to address the typical types of problems encountered during contract execution. Typical problems may include late vendor deliveries and /or time required for rework of materials.

Earned Value Management helps Project Manager look at the **exceptions** on the project. When using Earned Value, the Project Manager is utilizing a type of "Management By Exception", focusing on activities that have variances outside acceptable ranges of performance.

The Project Manager should not ask, "*Do* we have a variance this month?" The answer to that question will almost always be "Y*es.*"

The question should be**,** *"Does the variance we have this month lie within an acceptable range?"*



The Project Manager needs to be careful about demanding *zero* variance, because in most cases zero-variance is unachievable, and such an unreasonable demand may encourage corner cutting and distort the Project Plan.

BENEFITS OF USING EARNED VALUE METHODOLOGY

The goal of the Earned Value Management System is to provide Project Managers and decision makers with valid, timely, and auditable performance information on which to base management decisions. Earned Value Management provides many benefits to successfully deliver a project at acceptable quality levels on time and within budget, including:

- Allowing for continuous, detailed planning
- Providing an objective measure of cost, schedule, and technical scope
- Enabling the design, monitoring, and modification of risk mitigation plans for a project
- Increasing the effectiveness of status reporting
- Managing project performance.

The Earned Value measurement is useful for progress and status reporting. It is great for calculating the latest Revised Estimate vs. the Progress Payment Submission for a contract. It allows the Project Manager to calculate the Estimate at Completion (EAC) on a project to confirm the project will be completed within budget.

The keys to a successful Earned Value Management System are:

- A properly structured WBS
- Quantification of the work (i.e., effort) required to produce the deliverables
- Realistic estimates of activity duration and resource requirements
- Accurate, truthful, and timely reporting of resource-hours utilized
- Having a system in place that facilitates taking corrective actions necessary to get back on baseline when variances occur.