



10 Steps to Understanding Earned Value Management

When I was early in my Cost Management career, I ran into a colleague who worked exclusively on a large government project in our particular silo at SAIC who smugly asked if we were doing Earned Value on the other, smaller projects my PP&C group monitored. I had to grudgingly admit that I did not know about "Earned Value". So, burning with a childhood competitive fire (stoked from years of "I know more than you" arguments with my younger brother), I set out to promptly learn all about this Earned Value.

The first thing I discovered is that Earned Value (EV) equates to a math formula. A very simple math formula at that, one even my math-phobic daughter could understand. But thinking of EV only in terms as the answer to an equation is a costly mistake made by many companies. In order for the answer to be meaningful and provide guidance in decision making, a proper supportive management framework is required. This framework takes EV from being just an equation to being a project management philosophy used to navigate projects through to and on-time and on-budget completion.

In this article, I have reduced the process of Earned Value Management (EVM) to a basic 10 step approach to help guide the understanding of those new to the game. In reality, EVM is decomposed into 32 summary criteria detailing the establishment of an Earned Value Management System (EVMS) and these 32 criteria contain approximately 200 attributes.

Ten Steps to Earned Value

1. The Foundation - Deconstructing the project Statement of Work (SOW) into discrete, measurable components to develop the Work Breakdown Structure (WBS) and the activities/tasks that are required to execute the work (Vertical Integration)
2. Determine the effort and resources required to perform the work (Estimate)
3. Develop a resource loaded schedule of the time it takes to execute the work (Horizontal Integration)
4. Define a methodology to measure activity/task completion (EV Methods)
5. Price the effort and resources to create a project budget (Budgeted Cost of Work Scheduled)



6. Collect actual cost by period against the WBS below the level required for reporting (Actual Cost of Work Performed)
7. Calculate the activity/task completion percentage (using methodology established in step 4)
8. Multiply the activity/task completion percentage against the budget at completion to determine the amount accomplished in terms of budget dollars (Earned Value or Budgeted Cost of Work Performed)
9. Subtract the Budgeted Cost from the Earned Value to obtain the Schedule Variance. Subtract the Actual Cost from the Earned Value to obtain the Cost Variance (Variance Analysis)
10. Using the actual cost, variance information, and the work remaining to complete the activity/task, calculate a new estimate at complete (EAC)

These 10 basic steps are intended only to illuminate the path forward to establishing an Earned Value Management System (EVMS). Each step could be an article all its own and the interested reader is encouraged to research best practice methodology involved with each step. For this article, I would like to focus attention on the first step because, as with any foundation, it is key to a strongly constructed EVMS.

At a glance, the first step of developing a WBS would seem like a no-brainer since it is a take-away from the Statement of Work (SOW) from the contract. Typically, however, the SOW is written at a summary level and it is the contractor's responsibility to provide the detail determining how each component of work is executed. This detail should establish the components of the WBS breaking the near-term work into discrete measurable activities or tasks that roll-up into summary components or Work Packages. Future work should be held in higher level elements, known as Planning Packages, since more knowledge about the execution of the work may be available closer to the time the work would be accomplished.

The WBS should be product-based (even if your product is a service), with the components on the structure representing elements of work that decomposes the product. It is *not* an Organization Breakdown Structure and should not include elements that are functionally-based for example, "Engineering" or "Manufacturing". The only way to measure such an activity or task would be based on the hours of worked accomplished and this would not provide very useful Earned Value metrics. The primary goal here is to be able to understand and measure the completion percentage of discrete components of the product which in turn provides useful information to the completion of the entire product. If the product is a house, I will want to know "how much done" is the foundation, the outer framework, the flooring, the roof, the drywall, etc. If I do not have a WBS that breaks down the work in this fashion I will not understand where the house stands in terms of completion. Knowing the roofers



spent 10 hours so far on a roof estimated to take 100 hours of effort does not really convert to the roof being 10% completed if the roofers spent time dealing with issues obtaining roofing materials for example. In order to measure the completeness of the roofing effort, the WBS would breakdown the work into components such as framing the roof, laying the tar paper for the roof, laying the shingles, etc. so that understanding completeness of each component helps provide useful information on the completion of the roof as a whole.

Accurately understanding the completeness of a product and its budget provides valuable information for trending the remaining work, calculating a new Estimate At Completion and dealing with potential issues in the near term prior to the issues growing catastrophically. It is this "crystal ball" information that is sought, thereby making the WBS the corner stone to a properly executed EVMS.

About the author of this article

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Founded in 1997, STATUS has extensive experience implementing and managing project cost systems for large aerospace/defense companies (both in the US and the UK), many of the national laboratories, construction companies, and technical and environmental service companies. Specializing in integrated cost and schedule system design and software implementations, STATUS consultants focus on building the business financial infrastructure to successfully support management and reporting requirements for companies operating in the complex environment of government regulatory compliance.

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