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Measuring the Value of Work Accomplishment

Part Four: Managing the Baseline for Phased Projects (i.e. IT/AD Applications)

Author's Note: This is the fourth in a series of articles on practical applications of the Earned Value Analysis concept. We will address common issues and misunderstandings about EVA and provide examples of very simple and practical uses of this extremely valuable tool.

Earned Value Analysis: Purposes and Problems

In this series of papers on practical applications of Earned Value Analysis concepts we have discussed the benefits of establishing a project baseline for the purpose of measuring and analyzing variances from the project plan. We have provided examples of simple applications; even allowing for valuable results in cases where cost management is not included in the EVA model.

Paramount to effective utilization of EVA, in any degree of implementation, is the need to establish a valid baseline and to manage the baseline for the inevitable changes without invalidating the baseline. In Part Three of this series, we discussed practical approaches to avoiding scope creep and how to incorporate authorized changes into the EVA baseline. In the examples provided, we used a contract-based project model wherein the project was primarily defined at the time of authorization and only minor changes were expected ... mostly very early in the project execution.

Obviously, this contract-based model does not apply to a large portion of managed projects, especially those in the Information Technology/Applications Development (IT/AD) arena and other applications where the project scope is defined (or refined) as the project progresses.

Phased Baselineing

Human nature dictates that we cannot expect people to participate in a flawed process. In the case of EVA, if the participants realize that the baseline is suspect or invalid, then how can we demand that they diligently manage the project to achieve baseline values? If the project team is experiencing rampant changes in the measurement base, perhaps 20% to 50% of original values, how can we ask them to then manage the project to stay within, say 10% of the baseline? The process becomes a farce and support for that process goes down the drain.

With the recognition that such is that nature of most IT/AD projects, does this mean that the EVA process cannot be effectively applied in this environment? The answer is an emphatic NO!

The solution lies in integrating the EVA process with the normal phased approach toward IT/AD projects. What happens in these projects is that as each phase develops, a finer definition of the phases to follow is included as part of its deliverables.

If we develop a work breakdown structure (WBS) based on the project phases, we can create an EVA model that will permit us to have the following:

1. an original EV baseline, based on the estimated scope of the project when it is authorized,
2. a modified EV baseline, based on the updated estimate at the completion of each phase,
3. a phase-specific baseline based on the latest valid estimates for each phase.

For example, let's use a phased project model that appeared in Lois Zell's book "Managing Software Projects"¹. The phases are as follows:

1. The Kickoff Phase
2. The Sizing Phase
3. The Data Gathering Phase
4. The Implementation Modeling Phase
5. The Design Phase
6. The Coding Phase
7. Testing

Refining the Baseline

In such a phased project, it would be reasonable to assume that the project estimate and workscope would be refined as we completed each phase. Here is a way that we could deal with this phenomenon to maintain a valid EVA baseline.

1. Develop an "Original" baseline based on the project workscope as conceived at the time of authorization. This might be developed using one of the traditional estimating methodologies, such as COCOMO or Function Point Analysis. Or it may be derived from a repository of project models, perhaps applying a multiplier. In some cases, it might be a top-down authorization, just to establish a preliminary budget. For instance, the sponsor authorizes a preliminary budget of \$150,000, which, based on prior experience and models, is broken down into percentages for each phase, totaling 100% for the entire project. At this time, the WBS is only two levels: Project and Phase.
2. Along with this high-level phase-based cost estimate, there should be a phase-based project milestone schedule. This will define the top-level schedule objectives and constraints at the time of project conception.
3. During the Kickoff Phase, the project review team puts the request or authorization through a vigorous review process. If the project passes review

- (some projects may not survive this initial screening), it gets placed in the project portfolio. Surviving projects will probably have modifications to scope and budget
4. Each phase may have some modifications and the next phase (Sizing) should have a detailed plan, schedule, and EV (earned value) estimate. This plan (for the Sizing Phase) should expand the WBS at least two more levels, to include the various work packages that comprise the phase and the measurable components of these work packages (often called Activities and Tasks in traditional IT/AD WBS lingo). Each item in the plan should have a budget or an effort estimate (or at least a weight factor). Any one of these three quantification values will allow you to express the relative percentage of the work item against the work package, phase, and project. All key milestones and other deliverables should be identified.
 5. If you do not want to push your EVA process down to the task level, you can apply values at the work package level, or you can apply values only to the deliverables. Using the latter method can reduce the number of measurement points, but also provides a coarser analysis of progress and variances. Also, you will have to estimate the percent complete of the deliverable, or wait until the deliverable has been accomplished before recording it as 100% complete. (See part one of this series for a discussion on progressing methods.)
 6. The original EV basis should be retained (Original Baseline). This will allow a comparison of progress against the original plan, for historical purposes.
 7. The modifications determined during the Kickoff Phase should be documented. What are the modifications? What caused the modifications? What work changes result from the plan modifications? What is the effect of these changes on the original schedule and budget?
 8. A new baseline is established for the Sizing Phase. Progress (% Complete and Actual Costs/Hours, if these are tracked) is compared to the new baseline for a valid variance analysis.
 9. This stepped process (items 4 through 8, above) is repeated as each phase is accomplished. Each phase is expanded and the modified scope and budgets are incorporated into the plan for that phase. The original baseline is maintained and a new baseline is created at each phase, for practical variance analysis.
 10. Essentially, what you will be doing is setting up a series of subprojects ... one for each phase ... that will have a reasonably valid baseline. This validity is because the baseline is established when information from prior phases allow for the definition of a sound workscope and plan.
 11. At the end of each phase, or whenever the modified plan for a future phase is proposed, the new workscope and baseline should be reviewed with the key stakeholders and approved by the sponsor.

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