Using Earned Value Analysis to Manage Projects

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This paper looks into the usage of Earned Value Analysis by project managers. While Earned Value is the most important tool for monitoring and controlling project performance, and it is also included in any set of best practices in project management, we discover a very low usage rate of this valuable tool. We then identify barriers to the use of Earned Value, reasons why it is not used. Finally, we prescribe a set of practices that will overcome these barriers and facilitate the use of this tool. If followed, these steps will help this best practice tool to really be put into practice.

Earned Value Analysis is a tool for managing the work during the execution phase of a project. It is a Control tool, used to help the project manager keep the project on track and headed in the right direction toward project success. We would think that every project needs a good Control tool and therefore that every project manager would use it.

Any curriculum on the subject of Project Management explains that there are three major tools that are needed to manage projects, three tools that are not used in other types of operations. These three tools are the Work Breakdown Structure (WBS), Critical Path Method (CPM) Scheduling, and Earned Value Analysis.

The WBS provides the scope of the project, detailing each task required to be performed. Since it is very difficult to conduct a project without a list of tasks that need to be completed, virtually everyone in project management uses the WBS.

The CPM schedules the tasks from the WBS, putting them on a calendar to provide a plan for carrying out the project. This plan or schedule is usually illustrated with a Gantt chart. Again, no organization would allow a project manager to spend their money or use their resources without having such a plan, so again virtually everyone in project management uses this CPM tool.

Earned Value Analysis is not a planning tool. It is a tool for managing the work during the Execution phase of a project. It is the tool used to allow the project manager to control the work that takes place during that Execution phase. But most project managers, and most organizations, do not use Earned Value Analysis.

Earned Value Analysis is included in any description of "best practices" in the field of project management. As such, every project manager should be using it.

This paper looks into the usage of Earned Value Analysis by project managers, and by companies that conduct projects. It looks at reasons why Earned Value is used and reasons why it is not used. The main purpose of the paper is then to prescribe ways to increase the use of this valuable tool.

WHAT DOES EARNED VALUE ANALYSIS PROVIDE?

Every person interested in tracking how a project is doing, and this may include higher management in the company conducting the project as well as outside clients, will want to have status and progress updates provided to them by the project manager. An ideal tool would be able to summarize project status in one number. Earned Value comes close, providing a summary status report with just two numbers. These two numbers are the two major components of project performance, one for schedule (on time delivery) status and one for cost (over or under budget) status.

That should be enough to make every project manager want to use Earned Value. But Earned Value also provides another, possibly more valuable, measure. Earned Value provides forecasts, updated in real time, to predict the eventual total cost of the project and the delivery date.

These two results of Earned Value Analysis, which tell us where we are and where we are headed, are valuable by themselves. But the best use of Earned Value Analysis is not the reporting of information to management or customers. The best use is for the project manager, used within the project itself. Armed with this information, the project manager can use it to help steer the project in the right direction. It provides indications concerning when to take actions to correct issues and when to let things proceed as is. It is the Control tool that we need to increase the chance of successful project completion, on time, and on budget.

In summary, Earned Value provides an objective measure where most now use subjective measures. It provides earlier identification of problems, allowing for their prevention or correction. Finally, it provides fast feedback on any corrective actions taken.

IS EARNED VALUE USED IN PRACTICE?

We have been asking participants in our classes for years questions concerning what project management tools are used in their projects and in their companies. In public courses, we find that everyone is using the WBS. This is virtually 100%. When we find a project manager who is not using the WBS, it turns out, after more discussion that they have just never heard of this term. But they do make a list of tasks very much like a WBS to define the scope of the project before planning the rest of the project. Most companies require a WBS to be approved before any work can begin. Where a PMO exists, we have never seen a company that is not using the WBS. Our in-house courses find the same results.

We see similar findings for the Critical Path Method. Virtually everyone uses it. Surprisingly though, many project managers tell us they have not heard of the Critical Path Method. They use commercial software to provide their schedules, or they have schedules provided for them by their PMO. Further investigation of both cases shows that the software is CPM software and the PMO uses CPM. This is somewhat disturbing since, even when CPM software is used, it is still essential that the project manager be aware of the critical path and the concepts surrounding it when conducting a project.

We see one notable exception to the use of critical path for scheduling. That is the construction industry. While the more sophisticated project managers in that industry use it, most project managers schedule their projects manually, or don't even schedule the full project, just scheduling ahead for the next few weeks or months. While this industry was a leader in adopting project management, the scheduling in most small firms has not kept up.

Regarding Earned Value Analysis, our results are at the other extreme. In a typical public class of 20 project managers, we are likely to hear that 20 of the 20 do not use Earned Value. Almost all of them have never heard of it.

When we find project managers who do use Earned Value, the reason is always to use it for an external client to report performance progress instead of using it for their own needs to improve performance. If it is only used to satisfy outside mandates, then even these people are not really committed to using this tool.

Project managers need to monitor and control progress throughout the project. What tools do they use if not Earned Value? We find that many use the tracking Gantt chart. This tool provides reasonable status

reporting on schedule issues, but no forecasting. It provides little or no use to monitor costs. In fact, we find that many, close to a majority, of project managers do not monitor costs and have no cost responsibility. We have even been told (repeatedly) that projects have no costs since the resources are already on staff anyway!!!

WHY DOES NO ONE SEEM TO USE EARNED VALUE? WHAT ARE THE BARRIERS?

The primary inputs into an Earned Value system are all costs. We have just seen that many or most project managers do not monitor costs. This is the major barrier to using Earned Value. Whether or not the project manager is responsible for costs, tracking costs is necessary to gain the benefit of Earned Value analysis.

Using costs as the key input requires some reliance on the cost monitoring system. Even when a good cost tracking system is in place, that system always compares two numbers, a planned cost and an actual cost, for control purposes. But in Earned Value a third number, called the earned value, is also needed. Since most systems have no mechanism built in to allow the third number, the company's software systems provide a powerful barrier to using Earned Value. The cost of changing the system and the change management issues as well, hinder adoption of Earned Value.

Another obstacle is the long list of equations used in Earned Value. Its quantitative nature puts off the typical user. But this is a false barrier, as most courses teach all possible Earned Value statistics, when only the one pair is needed.

A fourth barrier has been the focus of project management on project planning. The assumption is that with a good plan, a good project manager can carry out that plan. Very little focus is provided on project execution.

A fifth barrier is the accuracy of the costing system. The timeliness of the system is also part of this barrier. A good Earned Value system requires up to date reporting on project costs, detailed by project task. Many companies cannot provide this information. Many others do not want to, as it increases transparency of problems.

A more basic barrier is just the existence of a costing system. Too many project managers are responsible for the schedule progress, but have no input or access to cost figures. Cost control needs to be a part of every project manager's job description.

Some of these barriers may have some basis in reality. But there is a myth that Earned value requires more information. It does not require more information, it only requires good information. If that is not available, then it should be for other purposes than just Earned Value.

It also requires a good project plan, a detailed one. But is this a barrier? It should not be. No one should start a project without a good detailed plan.

SO WHAT NEEDS TO BE DONE?

The most important barrier to overcome is convincing project managers of the value and necessity of using Earned Value in helping them achieve project success. If this goal is not achieved, then the other barriers will not ever be addressed.

Another high level barrier to be overcome is to convince management of the need to require project managers to be responsible for costs on a project. Accurate costing on projects can help to avoid cost overruns. More importantly, at a higher level, it allows for better portfolio management and use of resources to meet key company goals and objectives. The absence of good cost management stops us from achieving these important goals.

The first step is good project management training. The market today is flooded with trainers who do not fully understand this tool, and who view training as an end result rather than a means to improvement. The emphasis of training has moved to a focus on passing certification exams instead of a focus on improving project management performance. This needs to be reversed.

Training has to include guiding the actual implementation of an Earned Value System, project governance policies and procedures and, more specifically, the details of the Earned Value system. Current training focuses too much on the equations needed for Earned Value without putting them in their proper context as to when to use them, why to use them and how to use them. This emphasis on the equations has limited the ability of the project manager to implement the system. It has also excluded a large percentage of project managers who look to avoid needing equations in the first place.

Training also needs to include more emphasis on Project Execution. The current over-emphasis on Project Planning needs to be corrected. Project managers spend most of their time on Execution, not on Planning. And Execution is what they are paid to do.

The second step is the development of good project management systems within companies. This can be part of the training, but probably follows the training. A big part of this second step, or maybe a pre-requisite for it, is the development of a Project Management Office. Many PMO's have created extra work for project managers and extra reporting responsibilities with little help to them in doing their job. But a good PMO will focus on facilitating the use of good project management practices, and Earned Value would be at the top of any such list.

The third step is to actually guide all project managers in an organization through the use of Earned Value on all projects over a trial period of time, probably about six months. Again, the PMO would have to take a lead in this process. By the end of this time, most if not all of the project managers would want to keep using this tool as a standard for all projects.

These steps are high level steps. More detailed steps need to be taken to make this work. Without the detailed steps laying a foundation or infrastructure for the use of Earned Value, that trial period suggested above will lead to a failure, suggesting that the use of Earned Value is a mistake.

The key barriers that need to be over come from an infrastructure standpoint are those involving the availability of a good project plan, good estimates of project costs, and even more fundamentally, a good cost management system to track and report costs.

As a result, the fourth step that we suggest is to invest in the infrastructure to make the right data available to the right people at the right time. This is good management planning, and is required both in and out of project management.

A detailed plan must be required for all projects. That detailed plan will include the WBS listing all tasks. For every task, someone must be listed as the responsible individual. Additionally for every task, a time and a cost estimate must be provided. And finally, every task must have a start and finish date. In other words, a detailed project schedule must be provided.

From the schedule and the cost estimates, a time-phased baseline schedule also needs to be developed. For any date within the project, it is necessary to know how much money should have been spent by that time.

In addition to the detailed project plan, the cost management and tracking system needs to be in place. Up to date information on costs will allow the project manager to know how much money has been spent at any given time.

The final step is to make sure that all of this is actually put into every day practice. Training should be provided continually to assist the project managers while their projects are in progress to assure this result. Monitoring plans should be in place to track it. Periodic audits should be included to be sure the systems are being used, used appropriately, and that they are yielding the intended results and benefits.

CONCLUSIONS

Earned Value Analysis is not used by most project managers. It is the most important tool for controlling project performance, and is part of any description of best practices in this field. This paper has identified reasons why it not used, barriers to its use. A set of steps is provided to overcome these barriers. If followed, Earned Value Analysis can and should be put into everyday use.