Sarbanes-Oxley:

Does Compliance Require Earned Value Management on Projects?

The latest legislation demands an accurate assessment of the true current status of costs, which is possible to calculate.

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About the Authors

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There are numerous ways corporate executives can put a "positive spin" on their financial reports. Some methods are legal, others are blatantly illegal. The illegal ways are now being addressed by a number of groups, including the U.S. Congress, Securities and Exchange Commission (SEC), Department of Justice, state attorney generals, and others. With the president's signature on the Sarbanes-Oxley Act of 2002, the spotlight is now on every CFO and CEO to give an accurate portrayal of their true financial condition.

...The Commission shall, by rule, require, for each company filing periodic reports under section 13(a) or 15(d) of the Securities Exchange Act of 1934...that the principal executive officer or officers and the principal financial officer or officers, or persons performing similar functions, certify in each annual or quarterly report filed or submitted under either section of such act that

(1) The signing officer has reviewed the report;

(2) Based on the officer's knowledge, the report does not contain any untrue statements of a material fact or omit to state a material fact necessary in order to make the statements made, in light of the circumstances under which such statements were made, not misleading;

(3) Based on such officer's knowledge, the financial statements, and other financial information included in the report, fairly present in all material respects the financial condition and results of operations of the issuer as of, and for, the periods presented in the report;

(4) The signing officers

(A) are responsible for establishing and maintaining internal controls;

(B) have designed such internal controls to ensure that material information relating to the issuer and its consolidated subsidiaries is known to such officers by others within those entities, particularly during the period in which the periodic reports are being prepared....[1]

There is a legal way, however, for corporate executives to effectively "cook their books" and put a positive spin on performance. Perhaps it should not be legal, for at best, this practice is highly questionable. This approach ignores the early performance indicators on major new projects (capital, software, etc.), which often span several fiscal years. One should not wait until the actual funds have been expended to predict an overrun of costs—by then, it could be too late.

Some obvious examples of major capital investment projects that would

impact the firm's bottom line would be: the construction of a new corporate headquarters, an IT transition project, a commitment for a new corporate enterprise resource planning (ERP) system, construction of a new factory, or the decommissioning of a nuclear reactor. These are just a few examples of multi-year projects that, if performed poorly, could have a major material effect on the profitability of any organization—and of course, the resulting bonuses of their managing executives.

The prevailing attitude of many firms would seem to be that whenever they make a commitment to fund a major new project that spans multiple fiscal years, there is no obligation to ascertain and report both the current status and final expected costs. A recent best-selling book on the Enron affair typifies this type of corporate attitude:

...the truth is that there is no entirely satisfactory way to account for complex deals that extend over several years.[2]

Respectfully, the authors disagree with this assertion. There is a method—proven and accurate—to measure the current status and exactify final required costs on major capital projects that span multiple fiscal years. That technique is called earned value management (EVM). It is a concept that originated more than 100 years ago by industrial engineers, as they measured cost results in U.S. factories. The U.S. Department of Defense (DOD) has successfully employed this technique for the past 40 years on its major systems acquisitions.

Private industry has been slow to adopt this technique in major project management for various reasons, some valid and some self-serving. Perhaps it is better not to know the true conditions and final costs of major projects—particularly if such public knowledge would have an adverse impact on year-end revenues and resulting executive bonuses.

Adding Work Value

Today, most corporate financial executives measure the cost performance on projects using only two dimensions: the planned costs versus the actual costs. If all the allotted money is spent, they are right on target. If less was spent, then there is an underrun of costs; if more, then an overrun. To the authors, this is *not* cost performance, but rather funding performance. What is missing is the "value of the work" performed for the money spent. This is called the earned value management (EVM).

For example, if your project budget was $100 million, you spent $90 million, but had only accomplished $80 million of work, respectfully, we feel it should be called what it is: a $10 million overrun of costs. The missing third dimension on most corporate projects today is a measure of the value of the physical work accomplished for the money spent.

The Sarbanes-Oxley Act raises this issue: In this scenario, would a $10-million-dollar overrun of project costs be a "material" financial issue? Perhaps.

A century ago, industrial engineers, led by the father of scientific management Frederick W. Taylor, were correct in their understanding of what represented "true" cost performance in the factories. Cost performance represented the difference between the accomplished work (represented in earned standards) versus spent actual work costs—it was not the difference between the planned costs and actual costs. Today, many corporate executives still do not grasp this simple concept and are content to focus on planned versus actual expenditures. They then call this planned figure their "cost performance."

The early industrial engineers created what they called their "planned standards" representing two components: the authorized work and the authorized budget for the work. Planned standards represented only their baseline plan, however, not the accomplished work. It was only when such work was completed that they could determine their true cost performance.

Thus, Taylor and other engineers a century ago, focused on the "earned standards" that represented physically accomplished work, plus its original authorized budget. They then compared the earned standards against the actual hours expended to determine their true "cost performance." It worked.

Earned Value Management

The DOD was the first group in modern times to adopt this early industrial engineering factory concept for use in the management of projects.

In 1962, the DOD had a major capital project called the "Minuteman Missile." This project employed hundreds of people, cost millions of taxpayer dollars, and spanned several fiscal years. The U.S. Air Force project staff recognized their duty to the taxpayers to perform well and report accurate status. They adopted this simple industrial engineering concept to a one-time-only major project. To their amazement, earned value worked for them.

They broke the project into discrete pieces and separate tasks. They added an authorized budget to each task. When each task was completed, they credited its completion, plus they "earned" its corresponding authorized budget. They compared this completed work, which they called the "earned value," against the costs spent to accomplish this work. The result was an accurate reflection of their true cost performance.

Since 1977, the Pentagon has kept track of the performance of hundreds of projects, reflecting actual performance, the good, the bad, and the downright ugly. In total, they have now analyzed more than 800 separate projects. The results have been spectacular—they have been able to verify the predictability of final project cost performance based on actual earned value data. These studies have also supported the notion that early cost overruns are rarely (if ever) offset by later performance.

The single most important tracking metric in EVM is what is called the "CPI," or the cost performance index. The CPI represents the relationship between the earned value accomplished divided by the actual costs spent to accomplish this value. The cumulative CPI has been demonstrated to be a stable predictor of performance at completion, even as early as the 15- to 20-percent point of the project.

The CPI can thus be used to accurately predict the final cost position of any project, even those spanning multiple years in performance. If the cumulative CPI registers a $.80 performance value, it means that for every dollar that was spent, only $.80 of value was earned. This can also be called an overrun. Early overruns are very serious indicators, as subsequent performance rarely ever recovers early overruns.

Most importantly, the cumulative CPI can be used (starting at the 20-percent completion point) to accurately forecast the final project cost results with amazing precision. For example, if a five-year $100 million-dollar project has experienced a cumulative CPI of $.80 at the 20-percent point, you can forecast the final cost results within a finite range.

Simply take the $100 million project budget and divide it by the CPI of $.80. Immediately, the final project costs forecast about $125 million, or a cost overrun of approximately $25 million. How good is this forecast? Empirical studies support the position that it will be accurate within plus or minus 10 percent from the $125 million final costs.

Important point: The $100 million budget will not be adequate to finish this project. Sarbanes-Oxley issue: Would a $25 million projected overrun of final costs constitute a "material" financial issue? Perhaps.

Scientific analytical research by the DOD supports this doctrine:

DOD experience in more than 400 programs since 1977 indicates that without exception the cumulative CPI does not significantly improve during the period between 15 percent and 85 percent of contract performance; in fact, it tends to decline.... the cumulative CPI did not change by more than 10 percent from the value at the 20 percent contract completion point.[3]

Financial Reporting Today

There is no valid reason today why all companies cannot accurately measure and report the true cost position of all capital projects by employing a simple form of EVM. This technique should also be applied to perhaps the most challenging tasks we face today—software projects.

Using EVM to manage long-term capital projects is essential to meet corporate executives' fiduciary duty to the shareholders. As the authors stated in 2000, one full year before the Enron headlines and two years before Sarbanes-Oxley:

> It has been the contention of the authors that there is often a duty created on the part of selected corporate officers and government officials, based on the offices they hold. That duty would require them to employ all proven management tools in the performance of their jobs, including, and in particular, EVM….This duty would extend to project managers, the chief financial officers, chief information officers, and certainly chief executive officers of most corporations….These individuals can in part meet this fiduciary duty by employing a simple but effective form of earned value in the management of their projects.[4]

The Sarbanes-Oxley Act was signed into law July 30, 2002. It would seem to reinforce the contention that there is a fiduciary duty placed on corporate executives to tell the whole truth when reporting the financial condition of their companies. This duty would include an accurate assessment of the true current status and the final required costs to finish all multi-year projects.

Employing a simple form of earned value management can help corporate executives meet this obligation.

CM ■ **CMBOK 1.1.2 and 1.1.6**

Endnotes

1. Sarbanes-Oxley Act of 2002, Sec. 302 Corporate Responsibility for Financial Reports.
2. Peter C. Fusaro and Ross M. Miller, *What Went Wrong at Enron* (Hoboken, NJ: 2002).
3. Major David S. Christensen and Captain Scott R. Heise, USAF, "Cost Performance Index Stability," *NCM Journal* 25:1 (1993) 7.
4. Quentin W. Fleming and Joel M. Koppelman, *Earned Value Project Management*, (Newton Square, PA: Project Management Institute, 2000).