

FORETHOUGHT TOOL

Would the capital-project forecasts you endorse withstand public scrutiny? Here's how to be sure.

What's Your Project's Real Price Tag?

by Quentin W. Fleming and Joel M. Koppelman

Reprint [F0309C](#)

What's Your Project's *Real* Price Tag?

Would the capital-project forecasts you endorse withstand public scrutiny? Here's how to be sure.

by Quentin W. Fleming and Joel M. Koppelman

Earned-value management can accurately predict a major project's final cost—years before completion.

There are many ways executives can cook the books, some legal, some not. The illegal ways are becoming less attractive, thanks to recent attention from Congress, the SEC, and other regulatory bodies. But there is a way some executives put a spin on company performance that is no less dangerous for being legal: They endorse, even encourage, optimistic forecasts on major long-term capital projects. We're talking about big projects like building new factories, implementing IT outsourcing, or decommissioning nuclear reactors—projects that can depress the bottom line for years if they run late or seriously over budget.

The problem is that most corporate financial executives track the cost of a project using only two dimensions: planned costs and actual costs. According to this accounting method, if managers spend all the money allotted to a project, they are right on target. If they spend less than allotted, they have a cost underrun. If they spend more, it's an overrun. But this method ignores a key third dimension—the value of the work performed.

Consider an example: On a five-year aircraft-development project costing \$1 billion, the budget you've projected for the first two and a half years is \$500 million, a number that reflects the expected value, in labor and materials, of the project at the halfway mark. Let's say that when you reach this point, you have spent only \$450 million. Some project managers would call this "coming in under budget." But what if you're behind schedule, so that the value of the work completed is only \$400 million? This isn't coming in under budget at all. We think you should call it what it is: a \$50 million overrun.

So how can you measure the true cost performance of long-term capital projects? We advise companies on the use of a project-tracking method called earned-value management (EVM). Industrial engineers in American factories first applied EVM principles more than a century ago. Today, while EVM has found a few champions in the private sector, government contractors are still the major practition-

ers. Since 1977, the Department of Defense (DOD) has used the technique to track the performance of more than 800 projects. A recent study by David Christensen and David Rees at Southern Utah University of 52 DOD contracts validates EVM's precision in tracking cost performance as projects proceed. Perhaps more important, the work also confirms that EVM can be used to accurately predict the final cost of projects—years before completion.

Nuts, Bolts, and Dollars

The most important tracking metric in EVM is the cost performance index, or CPI. The CPI shows the relationship between the value of work accomplished (the "earned value"), as established by a meticulously prepared budget, and the actual costs incurred to accomplish that work. So, for example, if a project is budgeted to have a final value of \$1 billion, but the CPI is running at 0.8 when the project is, say, one-fifth complete, the actual cost at completion can be expected to be around \$1.25 billion (\$1 billion/0.8). You're earning only 80 cents of value for every dollar you're spending. Management can take advantage of this early warning by reducing costs while there's still time.

The CPI is remarkably stable over the course of most projects. That's what makes it such a good predictive tool. The DOD study shows that the CPI at the 20% completion point rarely varies by more than 10% from the CPI at the end of the project. To continue with the aircraft-development example, the potential variance in the CPI means your final cost will likely fall between roughly \$1.1 billion and \$1.4 billion. In any case, by the end of the first year, you've identified a likely cost overrun for the completed project. In fact, the DOD experience shows that the CPI typically gets worse over a project's course. Final costs calculated early in a project are usually underestimates.

A Matter of Scale


If EVM is so powerful, why doesn't every com-

pany use it? The fact is, when it's used in its full-fledged form for major acquisitions, it can be a demanding exercise, particularly as practiced by government agencies. The DOD requires the companies it contracts with to meet dozens of complex EVM criteria covering everything from detailed planning to progress measurement to the valuation of incomplete work. For monitoring multibillion-dollar reimbursable projects, like the development of a new fighter aircraft, the complex accounting is worth the considerable investment.

But we believe there's an untapped value for EVM in private industry. There, a simplified version of EVM can help control the growth of project costs. And with the increasing scrutiny of companies' financial statements, EVM can help ensure that the balance sheets signed by company executives are accurate.

Private-sector companies such as Edison International and Computer Sciences Corporation have applied a simplified EVM approach to IT projects with great success. At Boeing, Michael Sears, now CFO, embraced EVM practices as a program manager on the development of the company's F/A-18E/F fighter aircraft in the 1990s. Sears championed the

adoption of weekly EVM measurement throughout the company, even migrating it to the commercial side of the business, where it was tailored for use in developing the 717 passenger jet. Sears later summarized the practical case for EVM: "We flew the F/A-18E/F on cost, a month early, and under weight...No adjustments. No asterisks. No footnotes. No kidding."

Using EVM to cut the "kidding" from project cost accounting isn't just good management; with companies' financial statements scrutinized as never before, it's a smart move for those who must ultimately stand behind the numbers. 

Quentin W. Fleming is an independent consultant in earned-value management (www.quentinf.com). *Joel M. Koppelman* is the cofounder and CEO of Primavera Systems (www.primavera.com), a project-management software firm.

Reprint [F0309C](#)

To order, see the next page
or call 800-988-0886 or 617-783-7500
or go to www.hbr.org

To Order

For reprints, *Harvard Business Review* OnPoint orders, and subscriptions to *Harvard Business Review*:

Call 800-988-0886 or 617-783-7500.

Go to www.hbr.org

For customized and quantity orders of reprints and *Harvard Business Review* OnPoint products:

Call Frank Tamoshunas at

617-783-7626,

or e-mail him at

ftamoshunas@hbsp.harvard.edu

Harvard Business Review

www.hbr.org

U.S. and Canada

800-988-0886

617-783-7500

617-783-7555 fax