Advancing EVM and Government Contracting Efficiencies

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Earned value management processes and software tools are only as good as the system and the data for which they are implemented. Consideration of underlying contractor motives will lead to a better understanding today as to why EVM is not embraced by the majority even if there is belief that EVM tools are the answer to maximizing efficiency gains and promoting cost-saving benefits.

Focusing on the Department of Defense weapons system acquisition process, let's begin with a few age-old questions: Why do DoD contracts overrun on a consistent basis? Why are contractors motivated to add scope of work to existing contracts? Why isn't EVM embraced as the best project management tool for advancing government contracting management efficiencies?

With more than 20 years of training and consulting experience in project management using cost and schedule controls, ***Zosh*** *provides worldwide industry-leading EVM expertise on a regular basis.*

EVM system guidelines and procedures have been a part of the weapons system acquisition process for more than 45 years. Over the years, it had different labels—Cost\Schedule Control Systems Criteria, or CSCSC, is one—but its base philosophy has not changed. What *has* changed is the introduction of incredibly efficient software tools used to implement EVM practices. At no other time in the history of government defense systems acquisition have there been such advanced capabilities to manage risk, reduce cost, and maximize contracting efficiencies. So what's wrong? Why aren't we beginning to see government contracts underrun instead of overrun?

A Simple Concept

Following government-required guidelines for EVM implementation can be a rather elaborate endeavor for contractors; however, the concepts of EVM are really quite simple. EVM is most effective when applied in its purest state: in a commercially profit-motivated environment where project management efficiency needs to be maximized to reduce costs and increase profits. Depending on whether it's for government, oil and gas companies, big pharmaceutical companies, construction, high-tech/new-tech industries, or the automotive industry, the project management tracking structure may be called something different and may not use the same terms as we use in EVM, but the concepts are the same.

Management systems are structured to track progress against a formulated baseline, with deviations from that baseline calculated to express variances; and those variances are assessed and prioritized for management action to mitigate risk. The question is whether the contractor is motivated to produce a superior product ahead of schedule and under cost. That will dictate whether EVM is used to manage the effort or is simply exercised to satisfy government requirements for data delivery and adherence to EVM guidelines.

The Right Way

Successful execution of an EVM system, validated or not, depends heavily on whether the system is used to report data or to manage the project. The system should always be used to manage the project, with data being used to verify integrity of the project to mitigate technical, cost, and/or schedule risk through identification of problem areas and to adopt management decision-making processes to:

- Realign resources (if required)
- Correct systemic issues
- Check schedule logic
- Re-evaluate trade space
- Recommend technical tradeoffs using cost as an independent variable, or CAIV, principles
- Reprogram work, budget, or resource mix
- Implement other management actions.

The Problem

In a typical DoD weapons system procurement, much of the cost of the system is expended during research and development and, therefore, there's a large amount of profit consideration given to the contractors' developing systems that exist only on paper as technical specifications. The government customer typically takes on the predominant amount of risk at that stage of a weapons system life cycle because it is paying the contractor to develop the system with a profit margin included based on the size of the contract. On a $1 billion contract with an 8 percent negotiated fee, the contractor profits $80 million. If the contract grows (via amendments) to $1.5 billion, the contractor profits $120 million. Therefore, the contractor has an underlying motivation to grow the value of the contract with additional scope of work.

Without cost and schedule performance incentives, the contractor profits the most by adding more requirements and scope of work to the contract and delivering the product on time and on budget. That doesn't necessarily equate to developing a product with maximum efficiency in an attempt to deliver ahead of schedule and under budget. It also gives us a perspective as to why government contractors are not particularly interested in underrunning contracts unless there is a specific incentive agreement that generously rewards doing so.

Extending this thought, let's review some examples that highlight the underlying problem:

Scenario 1

Original contract base value is $100 million, 8 percent fee, and a share ratio over/under of 80/20. The contractor underruns 10 percent. Fee is $8 million plus $8 million underrun (80 percent share of $10 million underrun) equals $16 million profit for performance of 1.1 cost performance index (CPI). (This is phenomenal performance by today's standards, and it rarely, if ever, happens.)

Scenario 2

Original contract base value is $100 million, 8 percent fee, and a share ratio over/under of 80/20. The contractor overruns 5 percent. Fee is $3 million ($8 million minus $5 million overrun) plus $1 million (20 percent share of the government in the overrun) equals $4 million profit. The contractor adds 100 percent modifications and performs at CPI 1.0, which means an additional $8 million fee, equaling $12 million total profit. That is $4 million less than the very-aggressive scenario 1. However, let's say the overhead rate for this contractor is 200 percent ($2 for every $1 direct), and if the contractor could reduce overhead by 20 cents, or 10 percent for this contract, by adding more work, that would save $6.6 million, making real profit plus savings equal $18.6 million if the contractor could extend the contract and add $100 million in contract modifications. How I calculated that number: $100

million contract modification equals $33.3 million (direct), $66.6 million (indirect). Reduce indirect cost by 10 percent by adding contract modifications, 0.10 times 66.6 equals $6.6 million savings. The profit is increased by $2.6 million by overrunning and adding scope of work to the contract.

This scenario is normal government contracting practice today. Government contractors are motivated to add scope of work, extend schedules, and overrun the base contract to gain higher profits via increased contract value and decreased overhead costs.

Scenario 3

Original contract base value is $100 million, 8 percent fee, and the government contracts for a $15 million incentive fee for on-target performance or better (CPI – 1.0 or better; on schedule or better) and eliminates profit/loss share ratios. The contractor performs at CPI 1.1, and the schedule is on target. The profits are calculated as follows: $8 million (fee) plus $10 million (underrun) plus $15 million (incentive fee award), equaling $33 million total profit.

The benefits of scenario 3 are:

- The contractor is strongly incentivized to become highly efficient, thereby placing a great deal of reliance on EVM to mitigate risk and find and resolve problems quickly.
- The government takes delivery of the product faster.
- The government has tangible savings of approximately $94 million (in scenario 2, the costs equal $217 million, while in scenario 3, the costs equal $123 million).
- The contractor's profit is higher ($33 million in scenario 3 versus $18.6 million in scenario 2).
- There is reduced government oversight cost as the contract period of performance is reduced (intangible savings).

That brings us back to the true purpose of EVM principles and tools: to control cost, schedule, and technical risk. In essence, EVM allows the government to identify risk and maximize efficiency to reduce that risk so a technically superior system can be produced for as little cost and in as little time as possible.

Those scenarios highlight the reason why EVM has difficulty being embraced: the defense industry does not properly incentivize its contractors to underrun costs and deliver ahead of schedule. Even with firm fixed-priced contracts, there is strong motivation to grow the contract value with added scope of work requirements. As noted previously, an additional consideration is the positive effect on the corporate indirect overhead rate reduction when contractors' direct value is increased and the schedule is lengthened. As a government team representative, I once asked a control account manager why he wasn't trying to close out his work packages ahead of schedule, and he explained there was no reward for doing so. That is true in most contractual arrangements, in which the motivation is to stay on target rather than ahead of target. If EVM is being used only to provide customer reports verifying that the contractor is within acceptable index thresholds (CPI, schedule performance index, to complete performance index, baseline execution index, and critical path length index), then the full use of EVM principles and tools are drastically undermined. The optimal point of profit maximization for contractors is 1.0 CPI or better. There is, however, little motivation to achieve that index as it does not promote a reasonable argument for modifying the contract to add value and extend the schedule; that is, if everything is going well, then there is no reason to add contract changes and modifications to the contract budget base.

How Should EVM Work?

Let's consider EVM in a free market profit-motivated scenario and use the Apple® iPhone as an example. Apple is strongly motivated to build the best product for the least amount of cash and in the least amount of time because they receive higher profits by reducing the time to market, allowing revenues to grow as quickly as possible and outpacing the competition. In addition, Apple takes advantage of the iPhone's hype at its pinnacle, leading to greater profit potential. When Apple maximizes operational, developmental, and production execution, investors rush to buy stock, significantly increasing Apple's market capitalization.

On the government side, because of policies legislating arms sales, there is a great amount of uncertainty in how much a defense contractor can profit by selling production copies to other countries. Therefore, "rush to market" in the government business is not nearly as effective as it would be in a free market commercial enterprise system. EVM implementation in such a scenario can be used to maximize the management efficiency during the product development cycle to prevent and fix problems, thereby reducing risk.

This assessment doesn't spell doom for EVM system effectiveness within the confines of government contract structures. Not a whole lot has changed in the way government contracts have been managed in the last 20 years;

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however, an EVM system that meets DoD guidelines will continue to identify areas of risk and will assist in making accurate performance predictions on future work. The downside is that much of the responsibility for analysis and assessment will fall on the doorstep of the government program office and the Defense Contract Management Agency, who must share the burden of EVM project management and surveillance with the contractor. That can be a bit of a struggle, as contractor motives do not always align with government motives. When motives differ, it will be up to the government side to make sure the prime and sub-contractors adhere to EVM principles. Although DoD has a working arrangement to allow EVM to function, EVM is not used as efficiently and effectively as it would if the contractor and government were to team together to attain the same goals, to deliver a superior product ahead of schedule (if possible), and underrun the cost (if possible).

Why should we be so concerned about the government building products faster, better, and cheaper? Because the funding comes directly from taxpayer dollars, and when those dollars are not spent efficiently and do not provide a good return on what is spent, the entire U.S. economy is affected negatively. So what can be done, and how can current ways of doing business change so EVM can be used for its intended purpose—to manage project performance—and not simply to deliver data?

Recommendations

I hope that, what you read in this article will provoke some thoughts as to what can be done to make EVM more effective in managing government contracts. Here are a few of my own thoughts:

- Change the way contracts are structured. Provide heavy incentives for underruns against the original program baseline (contract modifications will not receive incentives), for meeting key technical milestones, and for deliveries ahead of schedule (also against the original baseline). Why is this difficult? It runs contrary to the way the government does business and allocates funds. The government traditionally does not spend or allocate funding in attempt to save on the overall project cost, and it usually ends up spending much more than it could have saved if it had motivated the contractor with monetary incentives. The closest contract type to this recommendation is fixed-price incentive fee. The incentive fee, however, is typically so miniscule when compared with the incentive to add scope to the contract that it doesn't really have much impact on a contractor's performance, and the contractor somehow manages to get most of the incentive fee even if performance isn't very good (less than 1.0). Awarding incentives for performance would require tracking the baseline data separately from new contract modifications.

- Do away with underrun share ratios. If the contractor organization underruns, it should be entitled to the entire amount and even be rewarded with additional incentitives. Contractors need large incentives to underrun, and if incentivized, they will use EVM to manage their projects to maximize efficiencies and reduce risk.

- Penalize contractors for not meeting contract deliverable milestones and requirements. Always track the contractor to the original baseline without intermingling contract changes that skew performance on the original set of requirements. Penalize the contractor for poor performance on the original baseline by decreasing the contractor's negotiated fee percentages on the contract change portions of the effort.

- Do away with overrun share ratios—up to a point. The contractor needs to take on the entire burden for an overrun up to the price at completion (negotiated contract cost plus fee). Once the price at completion is realized, a share ratio will kick in.

A great deal of government oversight cost could be reduced if contractors were incentivized properly to adhere to EVM guidance and to streamline their EVM processes, giving them stronger chances to meet government award fees for underrunning. Award fees or bonuses need to be high-percentage values on the contract and will promote adherence to EVM and ease the need for constant oversight and push mechanisms for EVM that are so prominent in today's industry.

Pull, Don't Push

In light of the worldwide economic dilemmas being faced today, something needs to be done to increase the efficiencies of government acquisition contracting practices and project management oversight processes. EVM is an efficient and effective tool for measuring progress and identifying areas of risk, and it can be applied to any industry. EVM implementation and execution on government contracts sometimes encounters difficulties because contractors do not fully embrace the concept with the full intent the government wants to see imposed, or contractors will perform and report to EVM standards because they are required to do so. Contractor motives do not always align with those of the government, and this is especially true when it comes to EVM principles on government contracts.

Instead of pushing contractors to adhere to EVM guidance, there has to be more pulling them into the process, and that will happen when contractors are incentivized properly to achieve underruns. If the correct steps are taken, EVM teamwork between the contractors and government agencies will benefit both sides greatly, resulting in billions of dollars in savings for the government and greater profits for the contractor.

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