Modernizing Earned Value Management [1, 2]

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Abstract

Earned Value Management (EVM) has been part of Department of Defense (DoD) acquisition policy for 50 years, remains an essential part of that policy, and is growing internationally. EVM's longevity is discussed from the unique perspective of one who led that evolution as a public servant in the Office of the Secretary of Defense (OSD) for many years and is helping to define its newest form — Integrated Program Performance Management (IPPM).

Background

After a half century, anyone familiar with DoD acquisition policy for major programs should understand EVM principles. If not, the literature is extensive. For an excellent explanation and history, see Fleming and Koppelman, EARNED VALUE Project Management. [1] The authors traced EVM's origins back to industrial management processes from more than a century ago and noted that, as a matter of Defense policy, nothing substantive had changed in its first four decades. That remains true today.

EVM's longevity is attributable to its nonprescriptive nature and its holistic, integrative approach to industrial management. The EVM pioneers did not tell the industry "how to manage" but rather defined a set of mandatory, scalable criteria for industrial management. Those criteria, now referred to as "guidelines," have proved remarkably resilient because they relate to underlying essential management concepts such as defining, organizing, scheduling and measuring work performance.

The other key EVM attribute, integration, refers to relationships between industrial management processes and project (or contract) work. Simply put, as a contractor extends the customer's Work Breakdown Structure (WBS), EVM requires that all work is identified, budgeted and scheduled to the extent practicable. This disciplined planning makes possible the reliable measurement of project performance against a baseline and the ability to forecast the outcome.

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[1] Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally published in *CrossTalk*, March/April 2017. It is republished here with the author's permission.

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The DoD Comptroller was the original policy owner for EVM. This proved to be a two-edged sword. While independence from engineering and acquisition disciplines allowed EVM to establish itself, the Comptroller's ownership identified it with financial management and reporting. Indeed, the first DoD EVM policy was called "Cost/Schedule Control Systems Criteria" (C/SCSC or CS[2]) and was issued in 1967 as a DoD instruction in the Comptroller's 7000 series. There was an accompanying instruction for reporting.

It was many years before responsibility for EVM was transferred to the Office of the Under Secretary for Acquisition & Technology in 1989, and it was two more years before EVM was incorporated into the 5000 series in 1991.[1] With EVM having proved itself over more than two decades, the transfer placed EVM in its proper context as the essential integrating management discipline for major acquisition programs. New management processes, notably the Integrated Baseline Review (IBR), were developed to improve contract planning and execution. The DoD Acquisition Reform era of the late 1990s further served to strengthen EVM.

As with any "control" policy, EVM was not without its detractors. Through five decades it's been challenged, examined and reexamined by various auditors and reformers, always emerging stronger while other management fads came and went. OSD staff confidence in the merits of integrated project management using EVM grew as governments in other nations studied and adapted U.S. EVM techniques for their acquisition organizations.

In the mid-1990s, the Office of Management and Budget (OMB) mandated EVM for all government agencies. At the same time, OSD reached out to industry experts to develop a standard that could reduce the need for the government to define industrial management requirements. In 1998, that led to the American National Standards Institute standard EIA-748-98, "Earned Value Management Systems," issued by the Electronic Industries Alliance.[2] The criteria were virtually unchanged.

EVM gained further traction in the global project management community in 2005 when the Project Management Institute (PMI®) published the Practice Standard for Earned Value Management.[3] Thus in its first four decades, EVM evolved from a set of industrial management criteria defined by the government to a set of guidelines defined by the industry, codified in a national standard and embraced by PMI® and other professional associations.

EVM and Information Technology

The relationship between EVM and information technology (IT) has been fractious. That was not the case in the early years, when IT development was much different than it is now and typical lines-of-code measurement worked well with EVM. That changed as

new techniques were developed. Shortly before the author retired from OSD in 1999, the executive in charge of IT policy met with him to discuss issues being raised by her staff.

She said some people asserted that because EVM depends on a definite scope of work, and because software engineers don't know what they will do in spiral development, the two were incompatible. This argument doesn't hold water, however, because defense contracts are not (or should not be) open-ended. Further, EVM is fully able to accommodate changes to the sequence of work and changes that revise the contractual scope of work. The executive was persuaded and EVM remained a part of the DoD's IT acquisition policy.

As years passed, the issue resurfaced occasionally. Spiral, waterfall - each new IT development technique renewed the assertion that "software is different." And that was increasingly true, at least in the commercial marketplace where requirements for products such as cell phones are not as defined as, for example, those for a developmental avionics system that must be compatible with other defense systems.

With the evolution of Agile development, the issue intensified. Several organizations began investigating the respective roles of Agile and EVM, including the Government Accountability Office (GAO), National Defense Industrial Association (NDIA), OSD and the College of Performance Management (CPM), a not-for-profit professional association that represents and advocates for EVM.

The GAO has researched Agile development as part of its ongoing project to issue a series of "best practice" guidelines. As of this writing, the research is continuing, with GAO teams having "shadowed" Agile teams at several companies and government organizations. The results will be incorporated as appropriate in the cost and schedule guides that have been published. [4] Through semiannual meetings with an expert advisory panel [5] the GAO ensures that it is up to date on Agile and EVM developments. An example of such developments is "Agile and Earned Value Management: A Program Manager's Desk Guide," issued by OSD.[2] Another useful document, "Techniques for Integrating Agile Development Processes into Department of Defense Earned Value Management Systems," was published by the NDIA Planning & Scheduling Working Group.[3]

Through these coordinated efforts, both government and industry are continuing to modernize EVM by adapting it to the latest management developments. CPM plays an important role by providing independent, non-attribution venues for training and workshops and symposia that clarify concepts and advance the state of the art. [6]

The Future of EVM

EVM was ahead of its time 50 years ago as management philosophy, but supporting software tools were not adequate to deal with the increasing complexity and volume of management data. This placed practical limits on systems integration. Monthly reconciliation with accounting data was the norm and reporting lagged weeks behind the accounting cutoff. Times have changed. Today's EVM systems are capable of operating in near-real time by using labor hours to manage and measure progress. This allows contractors to synchronize their EVM systems with their business rhythm, for example, by aligning EVM with weekly or biweekly schedule status reporting rather than monthly accounting cycles.

Given this progress, CPM is leading an initiative that draws on knowledge gained over the past 50 years to move EVM to the next level —Integrated Program Performance Management. IPPM further enhances process integration by including Technical/Benefits Management (TBM) practices. TBM prioritizes measuring and managing for results that meet business or mission needs. IPPM also emphasizes the Schedule/Resource Management (SRM) practices that are necessary to accommodate more dynamic approaches, such as Agile, to schedule planning and control methods that have emerged throughout the EVM experience.

Little exists in the way of formal education or professional credentials addressing IPPM as an integrated set of disciplines. The IPPM professional certification is emerging to fill this void in the integrated program management field. The IPPM model includes three levels of expertise — foundational, practitioner and enterprise professional. The pyramid illustration (Figure 1) gives a broad overview of the program and illustrates how practical experience and career accomplishment builds upon a knowledge base comprising the EVM, SRM, and TBM disciplines.

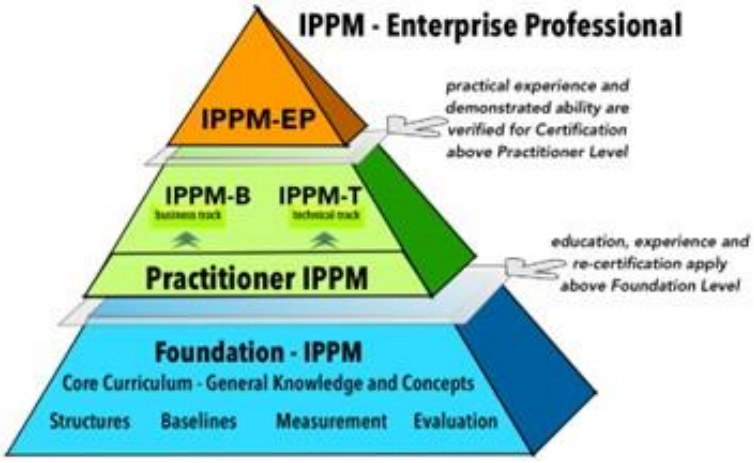

Figure 1

The IPPM foundation certification is designed to demonstrate that people have learned the general knowledge and basic concepts behind the core principles of IPPM. The intermediate (practitioner) level builds on this foundation by requiring mastery of analytical principles and ability to apply basic principles to practical settings. Applicants for the practitioner certification may choose either a "business management" or "technical management" certification to match their situation. Achieving the ultimate expert practitioner level will require both mastery of the integrated set of disciplines and evidence of practical experience and accomplishment.

Conclusion

As the senior program analyst for contractor performance measurement in OSD for nearly two decades, the author was responsible not for defending EVM, but for implementing the most effective management and measurement methods on behalf of the taxpayer. His organization's confidence that EVM was that method was confirmed as one nation after another — Australia, Canada, Japan, Sweden and the United Kingdom – adapted the U.S. model for their acquisition organizations.

The Japan experience is especially noteworthy. The nation that gave us so many management innovations — Kaizen, Deming's quality management and others — has embraced the U.S. model for integrated program management as a core function of the new Acquisition, Technology and Logistics Agency (ATLA) in the Ministry of Defense. ATLA representatives are frequent visitors to OSD, GAO, OMB and other government, industry and professional organizations as they study and adapt U.S. policies and processes.

One message they hear repeatedly is that management systems and reporting alone are not sufficient. Effective management depends on people, both in government and in industry. The systems and reports are not the end; they are a means to an end. A half-century of EVM experience has shown repeatedly that it works. It works best when both sides take full advantage of EVM and the accompanying tools that have been developed, such as the IBR and the Agile and EVM desk guide.

EVM works, whether by identifying failing contracts early and permitting timely cancellation or by facilitating timely decisions to help ensure success. Of course, the latter is preferable. History shows that the greatest successes are achieved not by having EVM specialists independently record and report on technical teams' progress, but rather by having both government and industry managers understand and use EVM effectively within a multidisciplinary team. IPPM will prepare the next generation of managers by building on the knowledge gained over 50 years on hundreds of defense programs.

NOTES

1. Currently DoD Instruction 5000.02. (January 7, 2015.)

2. Currently EIA-748 Revision C. (March 1, 2013.) Published by SAE International.

3. Currently 2nd Edition. (2011.)

4. "GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs." (March 2, 2009.) http://www.gao.gov/products/GAO-09-3sp

5. "GAO Schedule Assessment Guide: Best Practices for Project Schedules," (Dec. 22, 2015.) http://www.gao.gov/products/GAO-16-89G .

6. The author is a member of the GAO expert advisory panel and a contributor to the cost and schedule guides.

7. www.mycpm.org

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3. "Techniques for Integrating Agile Development Processes into Department of Defense Earned Value Management Systems." (October 2016.) Arlington, Virginia. NDIA Planning & Scheduling Working Group.

4. CrossTalk March/April 2017

About the Author

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Wayne Abba is an independent consultant in program and project management. For 17 years before retiring in 1999, he was the senior program analyst for contract performance management in the Office of the Under Secretary of Defense (Acquisition & Technology). He was a volunteer expert advisor to the US Government Accountability Office team that published the "Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs," and "Schedule Assessment Guide: Best Practices for Project Schedules." He is (twice) Past President, College of Performance Management.

Semi-retired but still active, Wayne is currently a member of a Program Management Improvement Team advising the U.S. National Nuclear Security Administration's Office of Safety, Infrastructure and Operations. He also serves on the board of the Graduate School Japan, a nonprofit organization that provides training and consulting services to Japan government ministries, including planning for management of the Fukushima nuclear plant decommissioning. His voluntary work with the National Science Foundation includes membership on several project review panels ranging from conceptual through final design reviews.

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