The technique known generically as Earned Value Management (EVM) is 50 years old this year. Let that sink in for a moment. How many other management techniques remain not only relevant but essentially unchanged after a half-century? EVM originated in Department of Defense (DoD) policy as Cost/Schedule Control Systems Criteria (C/SCSC or CS²) in 1967 and is at the core of the emerging concept known as Integrated Program Performance Management (IPPM).

EVM History
The EVM concept grew from a need to better manage increasingly complex defense programs, such as ballistic missiles, that were conceived in the 1960s. It overcame deficiencies in the Program Evaluation and Review Technique (PERT–PERT COST with the addition of a cost component). The genius of EVM, and a primary reason for its

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longevity, is its absence of prescriptive requirements. The EVM pioneers, including contractor and later Air Force executive A. Ernest “Ernie” Fitzgerald and Air Force Lt. Col. Hans “Whitey” Driessnack (who would retire as a lieutenant general) captured industry’s best management practices and issued them in defense policy not as “how to” requirements but as 35 criteria for industrial management systems. To this day, industry has not identified significant changes in those criteria.

The criteria specified, for example, that schedules must be integrated horizontally and vertically and that schedule accomplishment must be related to technical achievement—but the choice of scheduling systems was, of course, a contractor’s decision. This is an important point. Government contracts with industry because industry has superior knowledge of how to define, schedule and manage the work on any given contract. When government intrudes on those prerogatives, conflict ensues—often not to the government’s advantage.

The criteria were codified as DoD policy in 1967 and have stood the test of time. They remain virtually unchanged today as 32 guidelines that have been adopted by governments and industries around the world. But nothing lasts forever—like other significant policies, EVM has a bit of a “checkered history.” The time has come to revisit how we got here and to examine where we’re going.

The core principle of EVM was “integration”—of contractor cost, schedule and technical performance measurement. In the 1960s, each was governed by its own defense instruction or military standard. That has changed over the years. Especially noteworthy is the DoD’s changing philosophy of systems engineering, which in the 1960s was governed by Military Standard (MIL-STD)-499. Clinton-Gore acquisition reforms canceled all military standards and relegated systems engineering responsibility to defense contractors. Readers may recall the “total systems responsibility” philosophy, one of DoD’s more noteworthy arguably failed experiments.

During this time, EVM (which, thanks to extraordinary government-industry cooperation, not only survived but prospered during the Clinton-Gore reform era) was alternately praised and criticized. It was praised for retaining a semblance of balance between cost, schedule and technical performance management and was criticized for doing so imperfectly. Contract performance may be likened to a stool supported by those three legs. Knock out any one leg—what happens? Changing the technical performance leg changed the dynamic significantly, and EVM was not designed to fill the gap. That it managed to do so—not perfectly, but to some degree—is a tribute to its Pentagon leaders and to the Defense Acquisition University (DAU). DAU’s courses at all management levels, from EVM practitioner to executive, have consistently incorporated EVM as a core discipline integrating cost, schedule and technical performance management and measurement.

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DAU graduates have managed the successful development and delivery of innumerable defense programs that are among the most technologically advanced and complex systems in the world.

The late Gary Christle, then the author’s boss and the lead EVM executive in the Office of the Secretary of Defense, kept EVM from being scrapped during the Clinton-Gore acquisition reform era. By acknowledging that EVM’s implementation had not met expectations and making it a key element of acquisition reform, Christle turned (as one of his contemporaries said) “a negative into a positive.” Unfortunately, government policy too often depends on personalities, and EVM lost significant momentum when Christle left OSD. His successor did not build on the gains, leading to a lost decade of management evolution.

The loss was profound. Christle had built extraordinary relationships with industry; such relationships are difficult to establish and are extremely fragile. The critical interface is at the operational level, represented today by the National Defense Industrial Association’s (NDIA) Integrated Program Management Division (IPMD) and the government organizations that interface with IPMD, especially the Office of Performance Assessments and Root Cause Analyses (PARCA) in the Office of the Assistant Secretary of Defense for Acquisition and the Defense Contract Management Agency (DCMA).

As described above, EVM was conceived as the integrating discipline for cost, schedule and technical performance measurement and management and the basis for objective status
reporting. Sometimes it met that expectation well—as with the Navy’s F/A-18 E/F Super Hornet Program. But at other times it did not, as in the case of the Navy’s A-12 Avenger II Program. Why not? Simply put, the A-12 development contract’s performance objectives were not achievable within contractual cost and schedule requirements, leading to a termination for default (and perhaps there was an incentive for the contractor to propose aggressively, given the promise of a multibillion-dollar follow-on production program).

For whatever reason, the A-12 contractors and the customer did not rely on the development contract’s EVM reports. There can be little doubt that, given an informed dialogue based on those reports, the status of the program could have been widely understood sooner, and better decisions could have been made. Instead, litigation dragged on through several trials over more than two decades—an expensive, time-consuming and ultimately unsatisfactory ordeal (I testified as an expert witness in the fifth trial).

The F/A-18E/F was the Phoenix that arose from the ashes of the A-12. Embracing the lessons learned on the A-12 along with the new concepts of Integrated Product Teams (IPTs), leadership in both government and industry delivered one of the most noteworthy successes in major systems development in many years.

The success of the Super Hornet program was not consistently repeated on subsequent programs. Why? One factor in And there’s the rub. What is the need? As originally conceived, EVM was meant to provide timely, reliable management data reflecting performance on complex projects. In other words, a “good enough” snapshot of a moving train to inform management decisions. But as time passed, that objective increasingly was supplanted by a demand for more “accurate, timely” data, with emphasis on contractor compliance enforced by punitive contractual provisions. EVM’s original purpose—a timely, reliable management information system—is compromised to the extent it is redefined as an audit-oriented oversight system with punitive consequences for noncompliance.

Industry expertise in using EVM to manage is invaluable in helping the DoD understand how to write contracts that hold contractors responsible and accountable with minimal oversight. Good contract requirements that match management and reporting with appropriate contract type and effective incentives should be addressed before the contract is written. And when government program and project managers use the contractors’ EVM reports as a basis for data-driven management, data quality has a way of taking care of itself.

IPPM
In addition to collecting data and managing it in a constructive way, it is increasingly important that EVM be integrated more effectively, not only within projects and contracts but as part of larger program management systems, thereby including and contributing to knowledge and data of the larger system. The College of Performance Management (CPM), a not-for-profit professional association that I lead, has built a system that redefines EVM as the core discipline of IPPM, emphasizing and expanding EVM’s role in management systems integration. Nothing substantive has changed in EVM—what, then, is IPPM? In short, IPPM seeks to acknowledge the half-century legacy of EVM by building on its founding principles and its emphasis on schedule as the core integrating discipline, and by enhancing both technical performance and benefits realization.

IPPM adds emphasis to address emerging priorities of Technical/Benefits Management (TBM) practices. These systems engineering principles build on the advantages of EVM to ensure that measurable results toward business or mission goals are achieved. The new benefits realization focus of IPPM

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prioritizes measuring and managing for results that meet the business or mission needs.

IPPM also adds emphasis in the area of Schedule/Resource Management (SRM) practices necessary to accommodate more dynamic approaches to schedule planning and control that have emerged and been proven throughout the EVM experience. Methods such as Manufacturing Resource Planning (MRP), MRPII, Enterprise Resource Planning (ERP) and Agile methodologies can and should fit into the framework of integrated program master schedules. The SRM aspects within IPPM demonstrate that these dynamic planning and tracking methods complement and enhance the integrated program management environment.

Integrated program management, and IPPM in particular, covers a broad range of management specialties. At present there is little in the way of formal education or professional credentials addressing the subject as an integrated set of disciplines. However, there are several recognized and emerging professional education and certification programs. The IPPM Enterprise Professional Certification is one new career development program emerging in the integrated program management field.

The IPPM-EP is the highest level of professional certification capping three levels of expertise—Foundational, Practitioner and Enterprise Professional. The pyramid illustration (Figure 1) gives a broad overview of the program and how practical experience and career accomplishment build upon a knowledge base comprising the EVM, SRM and TBM disciplines referred to above.

The IPPM foundational level is open to anyone seeking to start a career involving integrated program management. The Foundation Certification is designed to show that those who hold the credential have been tested for and have demonstrated the general knowledge and basic concepts supporting the core principles of IPPM.

The intermediate (Practitioner) level builds on the foundation by requiring mastery of analytical principles and the abilities to apply basic principles to practical settings. Applicants for the IPPM Practitioner choose either program “business management” or a “technical management” certification path to match their situation. In all cases, gaining the IPPM-EP level will require mastering the integrated set of disciplines, practical experience and proven accomplishment.

The Path Forward
After 50 years, EVM is achieving the vision of its founders in becoming an industrial management technique informed by industry’s best management practices. It is evolving from its U.S. defense origins to a widely accepted practice, with new standards for EVM and Work Breakdown Structure (WBS) under development by the International Organization for Standardization (ISO). CPM has a seat at that table and will strive to ensure that the ultimate ISO standards are consistent with the essential principles embodied in DoD regulations and other standards.

The previous issue of Defense AT&L magazine included an article on the cost vs. benefit of EVM practices. This and other issues will include articles addressing respective government and industry views of EVM. There are many potential topics—some are perennial and others rise from management evolution. Among the former are the organization and implementation of EVM guidelines in contemporary management systems, the right levels of management data needed for supplier and customer needs, and the dollar threshold for mandatory implementation of EVM. Examples of the latter include the integration of EVM with Agile development, the scalable application of EVM, EVM as a business rule, and the role of the evolving ISO standards for EVM and WBS. Readers are invited to engage in the dialogue and contribute their experiences and suggestions to help define the future of defense cost and schedule contract performance management.

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