EVM: A Practical Approach – Effective and Efficient

Presented by Joe Houser, KM Systems Group
for National Institute of Health (NIH), Project Management Community

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Agenda

- Earned Value Management Background
- Value of EVM: Why should we use it?
- Best Practices for Federal Agencies: How do I get started?
  - Contract EVM
    - NOAA Case Study
  - Program EVM
    - FAA Case Study
  - Enterprise EVM
Why use Earned Value?

More than ever, Agency management needs to develop and maintain plans for making decisions that are based program needs, performance, and available resources.

– EV supports this by providing:
  ● Program baselines
  ● Portfolio / program performance metrics
  ● Early warning future performance indicators
  ● EVM consistent with OMB and GAO performance reporting standards

● June 1, 2011 GAO Congressional Testimony outlined Agency duplication in excess of $500B

● It is a national priority to reduce Government spending
EVM has been a standard for Government program performance reporting for 50 years

- 2005, OSD Reduces EVM Thresholds
- 2009, OMB IT Dashboard Reporting
- 2011, Congressional Reporting Proposed
- 2005, OMB Proposed EVM FAR Clause
- 2002, OMB A-11, Part 7
- 1998, ANSI/EIA 748
- 1997, DoD 5000.2 R EVMS Criteria
- 1999, OSD adopts Comm’L EVM Std
- 2001, OMB IT Dashboard Reporting
- 2005, OMB Proposed EVM FAR Clause
- 2002, OMB A-11, Part 7
- 1998, ANSI/EIA 748
- 1997, DoD 5000.2 R EVMS Criteria
- 1999, OSD adopts Comm’L EVM Std

1967  Early 90’s  Late 90’s  Current Environment

C/SCSC DoD 7000.2  - TQM / Streamlining  - 1997, DoD 5000.2 R EVMS Criteria
- OSD move to ACQ
Improved program management capabilities using EVMS improves business performance

**Program CPARS* Rating**

**Program Management Capability vs. Company Return on Sales**

**Program Award Fee Capture**

**Company Win Rate vs. Program Management Capability**

Source: 00-Mar 21 DCMC Conference
Improved Program Management Capability does not significantly increase cost

- Composite World Class
- Best in Class
- Qualified Participant
- Marginal Performer
- Minimal Capability

Program Office FTEs as % of Total Program FTEs

FTE — Full Time Equivalent
Program Manager(s), Deputy Program Manager(s), Financial Manager(s)/Financial Analyst(s), Scheduler(s)/Planner(s), Configuration and Data Manager(s), Chief Engineer(s)/Chief Technical Specialists, IPT or Functional Team Leads, Risk Focal Point(s), Subcontract Management, Administrative Support, Other Program Office functions

Source: 00-Mar 21 DCMC Conference
FAA Cost of Program Management Using EVM

- Quality of EVM implementation based on EVM assessments (FAA EVM Flag)
- PM% of total cost based on FY06 Resource Planning Document (RPD)

Email Dave Scott at dscott@kmsystemsgroup.com for a copy of the “Cost of Earned Value Management” report
What is Earned Value Management?

**Earned Value Management (EVM)** is the systematic integration and measurement of cost, schedule, and technical (scope) accomplishments in a project or task. EVM provides both the government and its contractors the ability to examine detailed schedule information, critical program data, technical milestones, and costs.

A Management Technique

- Focus on Disciplined Integration of Technical Performance with Associated Cost & Schedule Performance
- Objectively Measures Work Progress
- States Value of Work Completed in $$s and/or Resources
- Provides Objective Cost & Schedule Metrics
- Enables Trend Analysis & Change Control
- Governed by Industry Standard ANSI*/EIA-748

*American National Standards Institute
Earned Value Management (EVM)

ANSI/EIA 748 EVM Standard required for Government Contracting

- Provides common structure for multiple applications
  - Cost plus contracts
  - Firm Fixed Price contracts
  - Commodity acquisitions
  - Development acquisitions
  - Software development
  - Hardware development
  - Services

- Provides common metrics for portfolio management

- Provides increased discipline for program management
  - Minimal change to normal program management processes

Studies demonstrate positive return on EVM investment

• Acquisitions vary
• Program management processes vary
• Agency processes vary
Why Use Earned Value?

- Clinger Cohen Act (CCA) of 1996 aimed at improving the acquisition and management of information resources
  - Requires agencies to appoint a CIO
  - Implements a capital planning and investment control process that links to budget formulation and execution
- Office of Management and Budget (OMB) Circular A-11 and Memo 10-27 mandates the use of EVM for major IT investments
  - Agencies must report program milestone performance to the public through the Federal IT Dashboard
  - Performance is published on the Web (Federal IT Dashboard)

Additionally, program management processes using EVM result in improved business metrics
OMB is Requiring the Use of an EVMS for Managing Capital Assets

- “Agencies must use a performance-based acquisition management system, based on the ANSI/EIA-748 standard, to obtain timely information regarding the progress of capital investments”

- “The system must also measure progress towards milestones in an independently verifiable basis, in terms of cost, capability of the investment to meet specified requirements, timeliness, and quality”

- “Agencies are expected to achieve, on average, 90 percent of the cost, schedule, and performance goals for major acquisitions. Agency heads must review major acquisitions that are not achieving 90 percent of the goals to determine whether there is a continuing need and what corrective action, including termination, should be taken.”

*Agencies providing improved function and benefits will be more important in today’s environment*
Why Use Earned Value?

“EVM is one of the more powerful tools in my PM toolbox. EVM allows me to see the variations in program execution that enable me to take action to resolve issues that are often beyond the capability of the prime contractor to handle. With EVM, I am better able to manage planning and execution of program funds, better able to track program progress against a benchmark, and better able to work with the prime contractor and the support contractors to apply resources when needed...and where needed.”

-Dan Watts, Program Manager, ERAM

“Earned value data clearly identified schedule performance variances and got management attention quicker as compared to the traditional approach not using EVM.”

-Dieter Thigpen, Program Manager, NEXCOM
Best Practices for Federal Agencies

EVM should be implemented on several different levels, however, the entire PBMS does not have to be used at once!

- Contract Level EVM
- Program Level EVM
- Enterprise EVMS

Agency EVM implementations will mature overtime
What is Contract Level EVM?

- EVM on the contract level focuses on collecting and analyzing EVM data reported by a contractor
  - Ensure that the proper EVM reporting requirements are mandated in the contract
    - Example: CDRL / DID
  - Ensure that an EVM subject matter expert is consulted from the beginning of the acquisition
  - Make sure your project team has enough EVM knowledge to analyze the submitted data
## HHS EVM Contract requirements set forth in Memo 2008-02

### Category:
Major acquisitions for development (per OMB Circular A-11) and Acquisitions for development, modernization, or upgrade (non-major)

* Contractor’s EVM system must comply with ANSI/EIA Standard-748-A

** Contractor’s EVM system must be validated and accepted by the CFA.

<table>
<thead>
<tr>
<th>Contract Value</th>
<th>Contract Type</th>
<th>Full (Cost &amp; Schedule) EVM Required</th>
<th>Partial (Schedule Only) EVM Required</th>
<th>Not Required</th>
<th>Optional with HCA Prior Approval</th>
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<tr>
<td>&lt; $10 million</td>
<td>Any Type</td>
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### Category:
Acquisition of non-developmental services, routine services, steady state operations, basic and applied research, or commercial items

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Case Study

National Oceanic and Atmospheric Administration (NOAA) Contract EVM
National Polar-Orbiting Operational Environmental Satellite System (NPOESS)
NOAA Case Study: Program Overview (cont.)

- NPOESS is a collection of low earth orbiting environmental satellites
- Program represents a tri-agency effort between the Department of Commerce (DOC), Department of Defense (DoD) and National Aeronautics and Space Administration (NASA)
- First satellite in the system was scheduled for lift-off around 2013
  - Program has repeatedly experienced cost and schedule overruns that have delayed launch
- Integrated Program Office (IPO)
  - IPO needed a tool for generating a consolidated program view
  - Prime contract, Five subcontracts, and ~30 Microsoft Project schedules
NOAA Case Study: Contract EVM

- KMSG installed and configured the applications necessary for the EVMS including:
  - Deltek wInsight Dashboard
  - Windows Server 2003
  - Windows SharePoint Services 3.0
  - Microsoft Internet Information Services (IIS)
  - wInsight Desktop, wInsight Administrator, and Glue Viewer

- wInsight Dashboard provided consolidated performance data reported by the prime contractor and for each subcontract

Deputy Program Manager saw for the first time a $39M gap in the project Variance at Complete (VAC) being reported by one subcontractor, and the VAC being reported by the prime contractor for that subcontract.
What is Program Level EVM?

- Program Level EVM is utilized when both the agency and contractors are performing work towards achieving program objectives
  - EVM processes must be established for the selected project or program
    - May require input from EVM professionals
    - EVM principles for all project phases, beginning with initiating and through closing
  - EVM data is collected from the contractors but is also internally reported
  - Data from both sources are summarized to provide EVM metrics for the entire program

*There are situations when Program implementation provides better performance data at a lower cost than flowing EVM to the contractor*
Program Level EVM Requirements

- HHS does not specifically require EVM at the program level but...
  - EVM principles should be used when the program:
    - Is deemed a Major Program (based on agency portfolio)
    - Involves high risk
    - Has a critical Schedule
    - Is highly complex
    - Has a high dollar value

*Firm Fixed Price production and deployment can usually be implemented at the program level providing better performance data at a lower cost*
Implementing Program Level EVM

Program EVM enables customization of 32 ANSI-EIA Standards

- Define the scope of the project
- Determine the resources that will perform the defined work
- Schedule the work
- Create a time-phased budget for the defined work
- Determine the earned value metrics best suited for your agency
- Establish a performance measurement baseline consistent with agency IRB process
- Record actual costs (estimate)
- Measure and monitor earned value performance departures from the project’s baseline plan
- Forecast the final required costs (EAC) based on past performance
- Manage change, including changes to scope and baseline

Adapted from “Earned Value Lite: Earned Value for the Masses” by Quentin W. Fleming and Joel M. Koppelman
Case Study

Federal Aviation Administration (FAA)  
Program Level EVM  
Air/Ground Communications:  
NextGen Program
How the FAA Does Business

- All projects are completed *in-house*

- Engineered & executed by FAA Engineering Services (ES)

- Implemented via the FAA Corporate Work Plan (CWP)
  - System for tracking and managing F&E projects from initial needs assessment, through implementation planning and resource estimating, to project tracking and closeout
FAA Case Study: Program Overview

Air/Ground Communications: Sustaining the Radio infrastructure for Next Generation Air Transportation System (NextGen)

Air/Ground Communications Facilities

- 727 RCAGs*
  Remote Communications Air/Ground

- 21 ARTCCs & 3 CERAPs
  Air Route Traffic Control Center, Combined Center Radar Approach Control

- 21 AFSSs, 14 FSSs
  Automated Flight Service Stations, Flight Service Stations

- 1587 RCOs*
  Remote Communications Outlet

- 613 BUECs*
  Back up Emergency Communications

- 1020 RTRs*
  Remote Transmitter Receiver

- 162 TRACONs
  Terminal Radar Approach Control

* As of 04/23/09
FAA Case Study: Program Level EVM

- Program Level EVM for NEXCOM
  - Integrated technical, cost, and schedule
  - Tracking all activities and resources for entire investment – detailed level
    - Critical path and non-critical path activities
    - Contractor and FAA resources
  - Integrated with existing FAA systems (CWP, scheduling, accounting, etc.)
  - Better data at a lower cost

- Performance Data Usage
  - EVMS provides accurate, timely, and actionable performance information
  - Context appropriate reporting from detailed level to summary
  - Monthly performance reports reviewed by Technical Leads and Program Management
  - Monthly and quarterly program level reporting to FAA Management, DOT, and OMB
FAA’s Performance Based Management System

CWP / Primavera / MS Project

WBS/OBS
- Project Schedule
- Resource Planning
- Cost Estimating
- Baseline Definition

WlInsight Dashboard

Earned Value Management Engine

Cobra

Analysis & Reporting System
- Variance Reporting
- Corrective Actions
- Recovery Planning

PISA

Work Authorization (Contract) → Work Authorization (Project/Account System)

Delphi

Prime Contractor Contractors

Government Organizations

Reporting

SPIRE
- FAA Management

WorkLenz
- OMB Exhibit 300

OMB IT Dashboard
Earned Value Management (EVM) has improved the FAA’s ability to achieve program objectives by allowing for better planning, increased performance monitoring, increases communications, and enhanced reporting.

“Earned value data clearly identified schedule performance variances and got management attention quicker as compared to the traditional approach not using EVM.”

-Dieter Thigpen, Program Manager, NEXCOM
What is Enterprise EVMS?

- Enterprise EVMS establishes standardized and integrated EVM processes throughout the organization
- Should consider implementing when:
  - Portfolio management is required
  - Common metrics for all agency programs are required
  - Common skills and program management systems are desired to reduce costs
  - Standard milestones and checkpoints are use to measure technical progress
  - The organization wants to create a disciplined approach to program management
Implementing an Enterprise EVMS

- Create standardized processes
  - Develop System Description Document (SDD) that establishes how the EVMS will be executed
  - Create program performance metrics that can be reported to executive management
    - Example: FAA has created color coded (red, yellow, or green) metrics for easy reporting
- Integrate EVM processes with existing performance oversight processes to the extent possible
- Create a Center of Excellence (COE), EV Council, or EVM Focal Point
Implementing an Enterprise EVMS (cont.)

- Utilize standardized tools
  - Select an integrated EVMS technology solution for collecting cost, schedule, and performance data
  - Should interface with existing static systems to the greatest extent possible (specifically accounting systems)

- Define program management roles
  - Define program management support roles

- After EVM has been implemented across the organization, conduct program performance surveillance
### FAA Major Programs - EVMS Assessment Summary

**(November 2007 - Final)**

<table>
<thead>
<tr>
<th>Organizing</th>
<th>Planning</th>
<th>Performing</th>
<th>Analysis &amp; Reporting</th>
<th>Change Management</th>
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</table>

#### Program Name

- WBS
- OES
- WBS/CRS Integration
- Overhead Responsibility
- WBS/CRS Reporting
- Average
- Schedule Translations
- Time Phased Budget Baseline
- Direct Account WIP & PP
- Control Account Budgeting
- LOE Budgeting
- Overhead Budgeting
- MIR & UB
- Program Budgeting
- Average
- Summarize CAS into WBS
- Summarize CAS into OBS
- Identify indirect costs
- MARS
- Average
- Summarize CO on WBS
- Value Cost Variance
- Value Cost Variance
- Corrective Action
- Estimates at Completion
- Average
- Timely Change Planning
- Control Retroactive Changes
- Limit to Authorized Changes
- Document / PAB Changes
- Average

#### Planning Programs

- ATO/G
- NAS
- IAP
- NextGen

#### Acquisition Life Cycle

- ATOP
- GRAM
- SBS
- TMAC
- ASDE-X
- ASER-1a
- ASER-1b
- ASON
- ATC-B4
- TPS
- DARPA
- TAMS
- FTI
- IPAA
- NEXCOM
- SNMR
- NCO
- ASHEE
- RCO
- TPF
- FAA
- FAA Average

#### Legend

- Green: Meets the intent of the EVMS Standard
- Orange: Meets the intent of the EVMS Standard
- Red: Does not meet the intent of the EVMS Standard
- Gray: Not assessed
The current environment of reduced budgets and increased program re-baselines will be easier with Enterprise EVM being implemented.
FAA Gets Off the High Risk List

- GAO conducted EVM review in 2008 and documented findings
- FAA addressed GAO concerns and was removed from the High Risk List in 2009!

<table>
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<tr>
<th>Seven Key Components of an Effective EVM Policy Contribution</th>
<th>Assessment of FAA policy</th>
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<tbody>
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<td>Policy component</td>
<td>Assessment of FAA policy</td>
</tr>
<tr>
<td>Establish clear criteria for which programs are to use EVM</td>
<td>Fully met</td>
</tr>
<tr>
<td>Require programs to comply with national standards</td>
<td>Fully met</td>
</tr>
<tr>
<td>Require programs to use a standard structure for defining the work products that enables managers to track cost and schedule by defined deliverables (e.g., hardware or software component)</td>
<td>Partially met</td>
</tr>
<tr>
<td>Require programs to conduct detailed reviews of expected costs, schedules, and deliverables (called an integrated baseline review)</td>
<td>Fully met</td>
</tr>
<tr>
<td>Require and enforce EVM training</td>
<td>Partially met</td>
</tr>
<tr>
<td>Define when programs may revise cost and schedule baselines (called rebaselining)</td>
<td>Partially met</td>
</tr>
<tr>
<td>Require system surveillance—routine validation checks to ensure that major acquisitions continue to comply with agency policies and standards</td>
<td>Fully met</td>
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Proven Experience Implementing EVM for Government Agencies

- EVM basic & advanced training (PMI REP)
- EVMS System Design
- Deltek Cobra, MPM, w|Insight implementation and training
- EVMS Certification & Validation Reviews
- CPIC/Project Portfolio Mgmt.
- Business Process Improvement
We are **EVM experts** with broad corporate and individual expertise in the design, implementation, and evaluation of Earned Value Management Systems.

- Founded by key leaders in the development and evolution of Earned Value Management from a DOD-based standard to one which is recognized worldwide as an important and effective methodology to manage projects and programs

- Consultants to the Government in the development and implementation of EVM as an agency-wide methodology to manage all its IT programs

- EVM training and systems validation experts supporting both the government and commercial clients