



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**

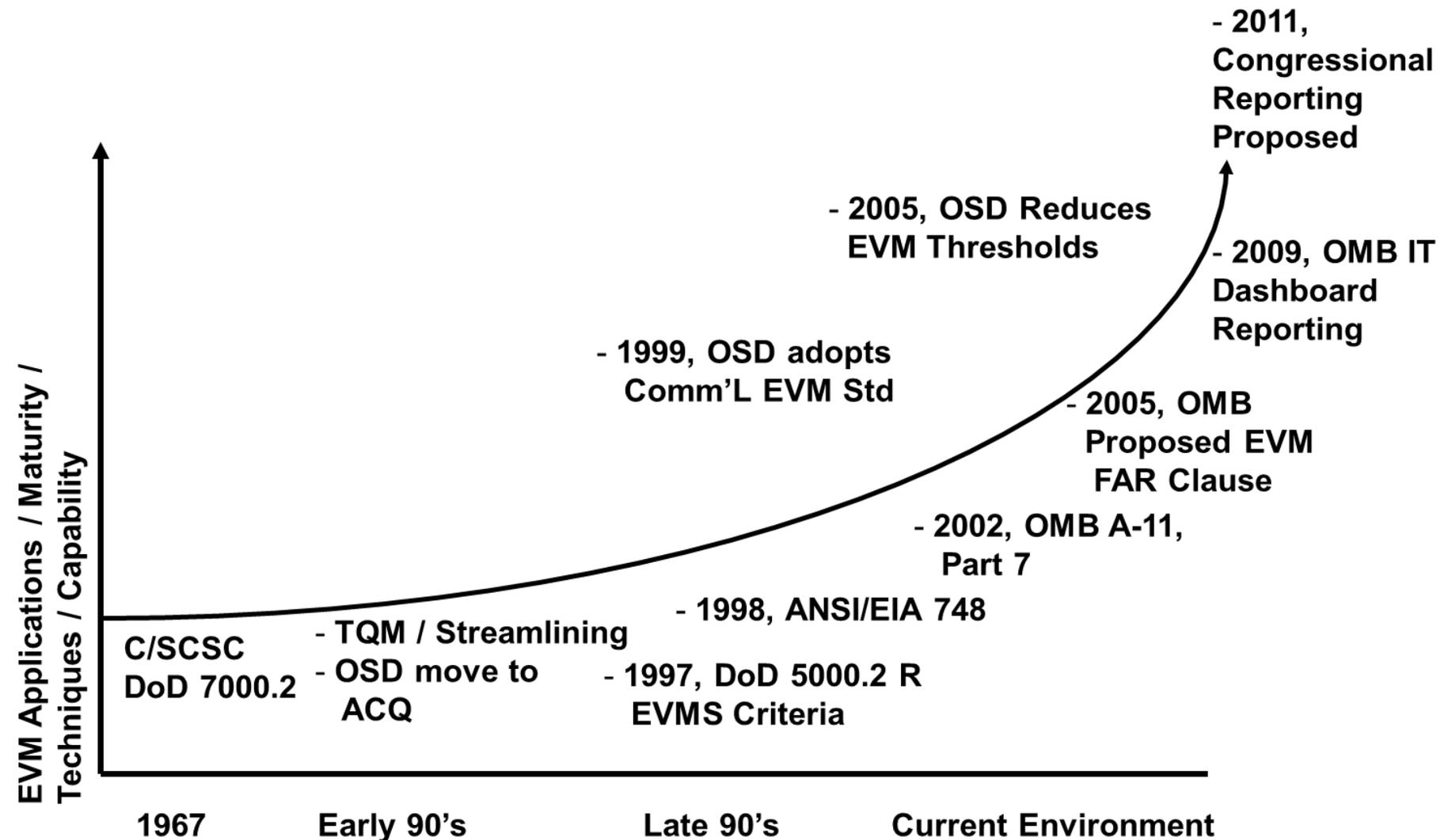
Why use Earned Value?

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

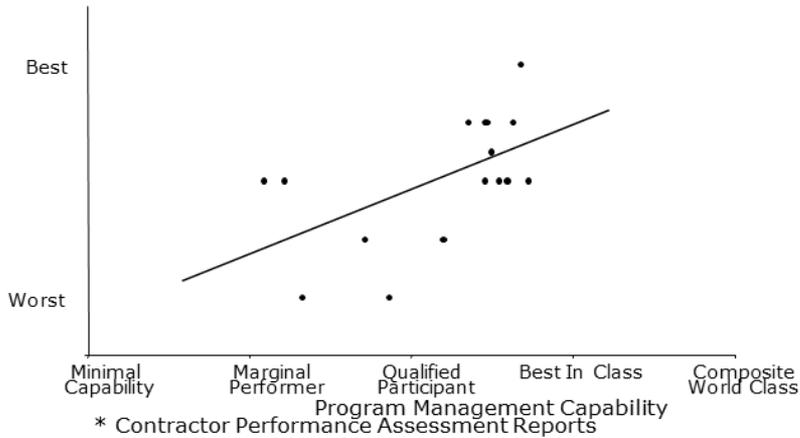
- **June 1, 2011 GAO Congressional Testimony outlined Agency duplication in excess of \$500B**
- **It is a national priority to reduce Government spending**

EVM has been a standard for Government program performance reporting for 50 years

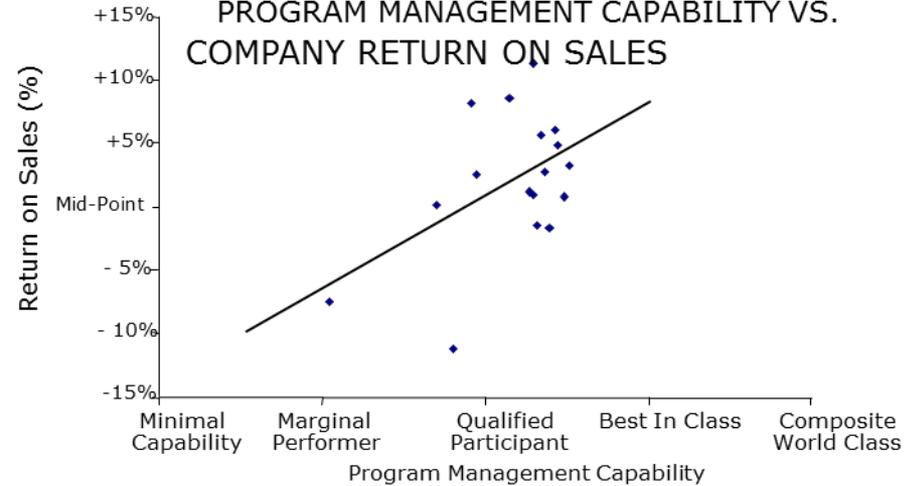


Improved program management capabilities using EVMS improves business performance

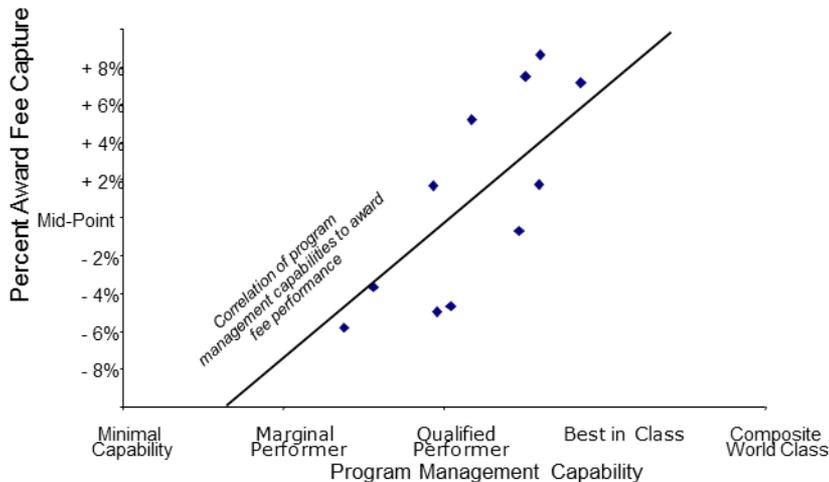
PROGRAM CPARS* RATING



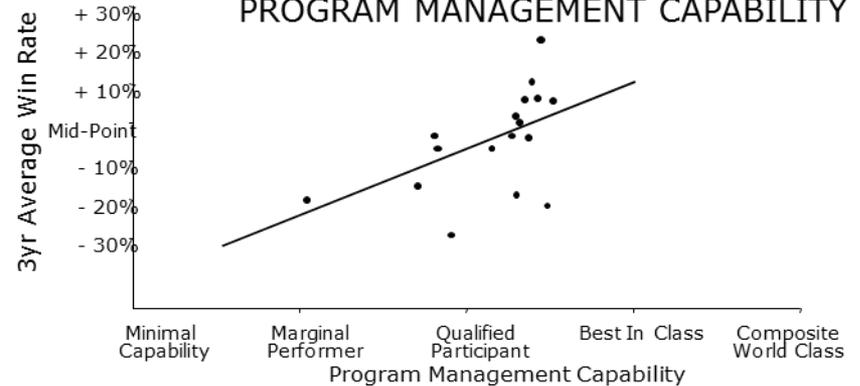
PROGRAM MANAGEMENT CAPABILITY VS. COMPANY RETURN ON SALES



PROGRAM AWARD FEE CAPTURE

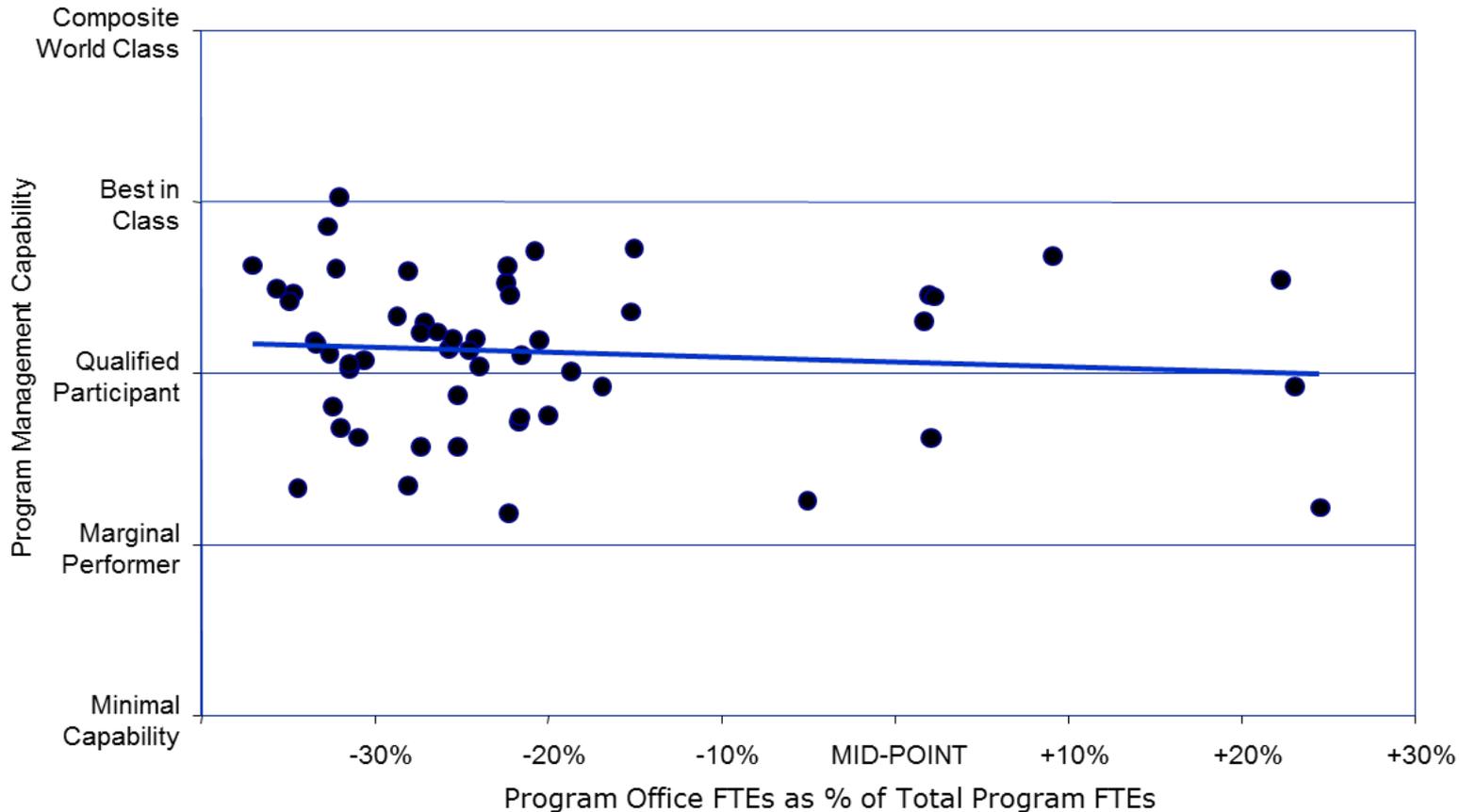


COMPANY WIN RATE VS. PROGRAM MANAGEMENT CAPABILITY



Source: 00-Mar 21 DCMC Conference

Improved Program Management Capability does not significantly increase cost

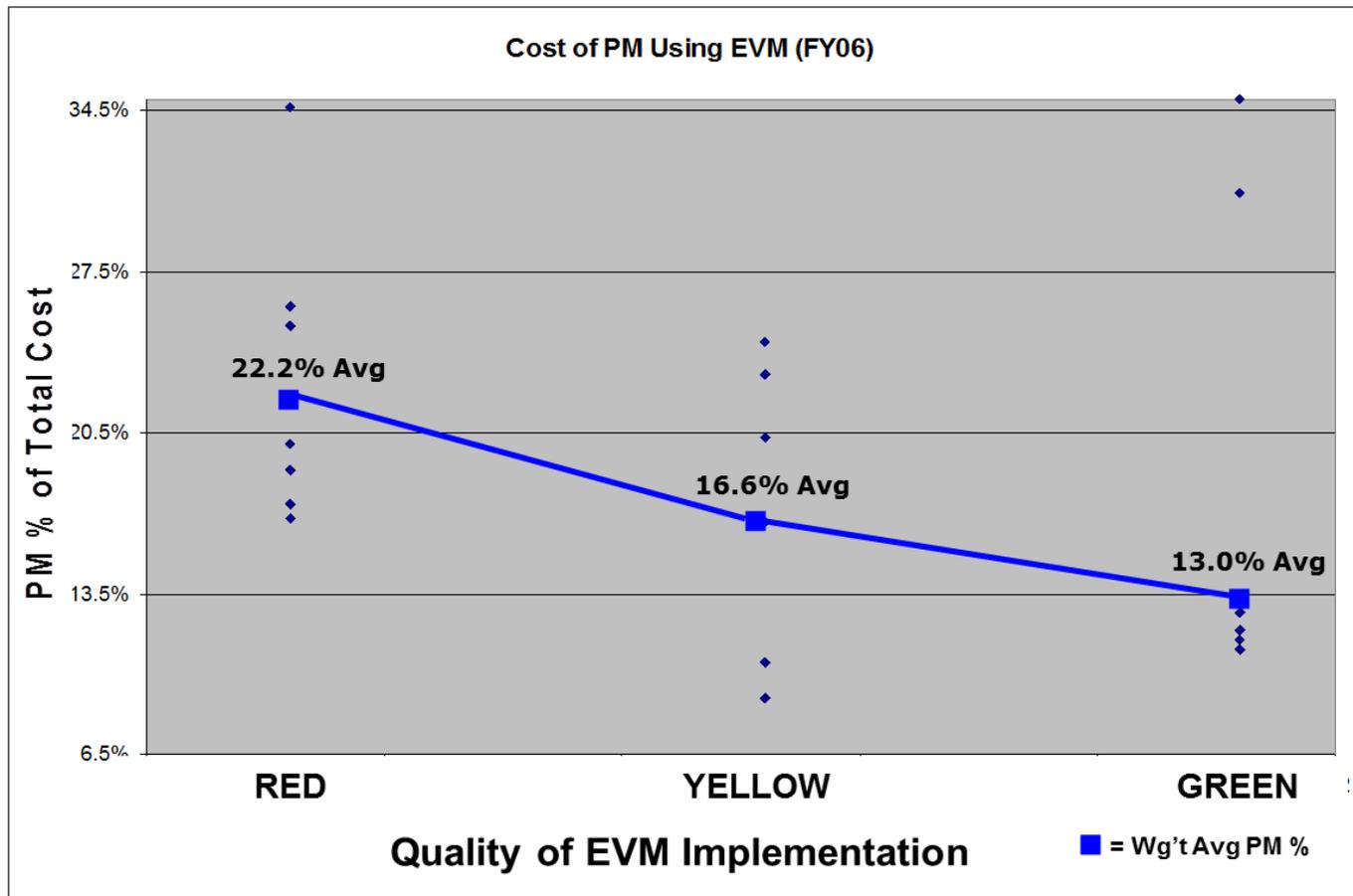


FTE — Full Time Equivalent

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

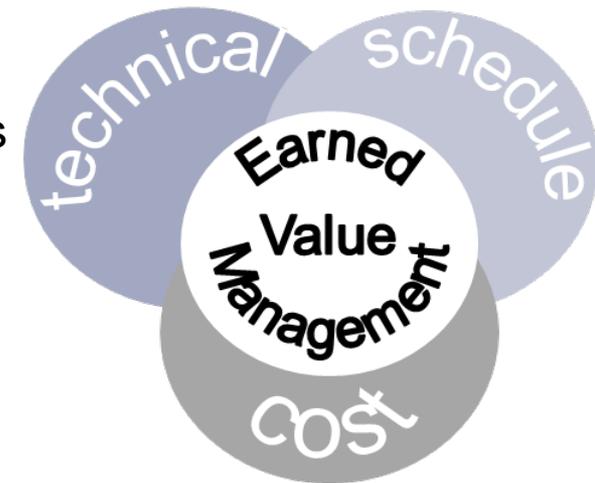
What is Earned Value Management?

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



• Acquisitions vary
• Program management processes vary
• Agency processes vary

Studies demonstrate positive return on EVM investment

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

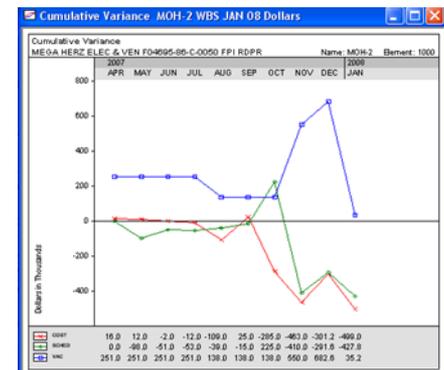
EVM should be implemented on several different levels, however, the entire PBMS does not have to be used at once!

- 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



Contract Level EVM Requirements

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.

Contract Value	Contract Type	Full (Cost & Schedule) EVM Required	Partial (Schedule Only) EVM Required	Not Required	Optional with HCA Prior Approval
< \$ 10 million	Any Type				X
=/> \$ 10 million to \$25 million	Cost Reimbursement/ Fixed Price Incentive (w/ incentive based on cost)	X *			
=/> \$10 million to \$25 million	FFP, T&M, Labor-hour, and Term form		X *		
> \$25 million	Cost Reimbursement/ Fixed Price Incentive (w/ incentive based on cost)	X **			
> \$25 million	FFP, T&M, Labor-hour, and Term form		X **		

Category:

Acquisition of non-developmental services, routine services, steady state operations, basic and applied research, or commercial items

Contract Value	Contract Type	Full (Cost & Schedule) EVM Required	Partial (Schedule Only) EVM Required	Not Required	Optional with HCA Prior Approval
Any value	Any type			X	

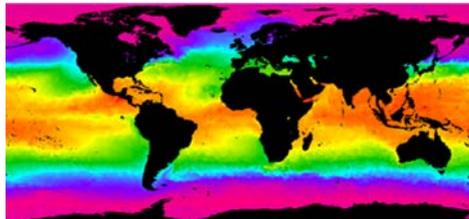
Case Study

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

Description	LVL	LL	SV	CV	VAC	VAR	SV	CV	VAC
PROJ MANAGEMENT	3	✓	T	→	→		-12.0	-17.4	-3.2
SYS ENGINEERING	3	✓	→	→	→	cC	6.4	-26.4	0.0
FUNC INTEGRA	3	✓	→	→	→	sc	-7.6	-17.4	-30.8
SENSORS	3	✓	→	→	→		-36.6	-10.6	-21.6
COMMUNICATIONS	3	✓	→	→	→	scSC	-203.2	-130.8	-87.0
AUX EQUIP	3	✓	→	→	→	scSC	-93.2	78.2	8.4
ADPE	3	✓	→	→	→	sc	-10.2	12.6	4.6
COMP PROGRAMS	3	✓	→	→	→		-0.2	3.4	-1.4
PCC	3	✓	→	→	→	C	-11.4	-296.2	-187.2
DATA DISPLAY	3	✓	→	→	→	eS	-113.0	0.0	0.0
I & A	3	✓	→	→	→	scS	83.0	-24.2	-24.8
SPARES	2	✓	→	→	→		1.2	-7.8	-6.2
ENG DATA	3	✓	→	→	→	scSC	-6.6	-4.6	0.0
MANAGEMENT DATA	3	✓	→	→	→	scCV	0.0	-13.2	-16.0
TEST FACILITIES	3	✓	→	→	→		-0.6	2.0	0.0
SYSTEM TEST	3	✓	→	→	→	c	12.0	-5.6	-2.0
PCC TEST	3	✓	→	→	→		3.2	4.2	0.0
GEN & ADMIN	2	✓	→	→	→	c	-39.0	-45.2	-36.8
MGT RESERVE	2	✓	→	→	→	V	0.0	0.0	439.2

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 a 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

Implement EVM based on Agency IRB and program management process

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

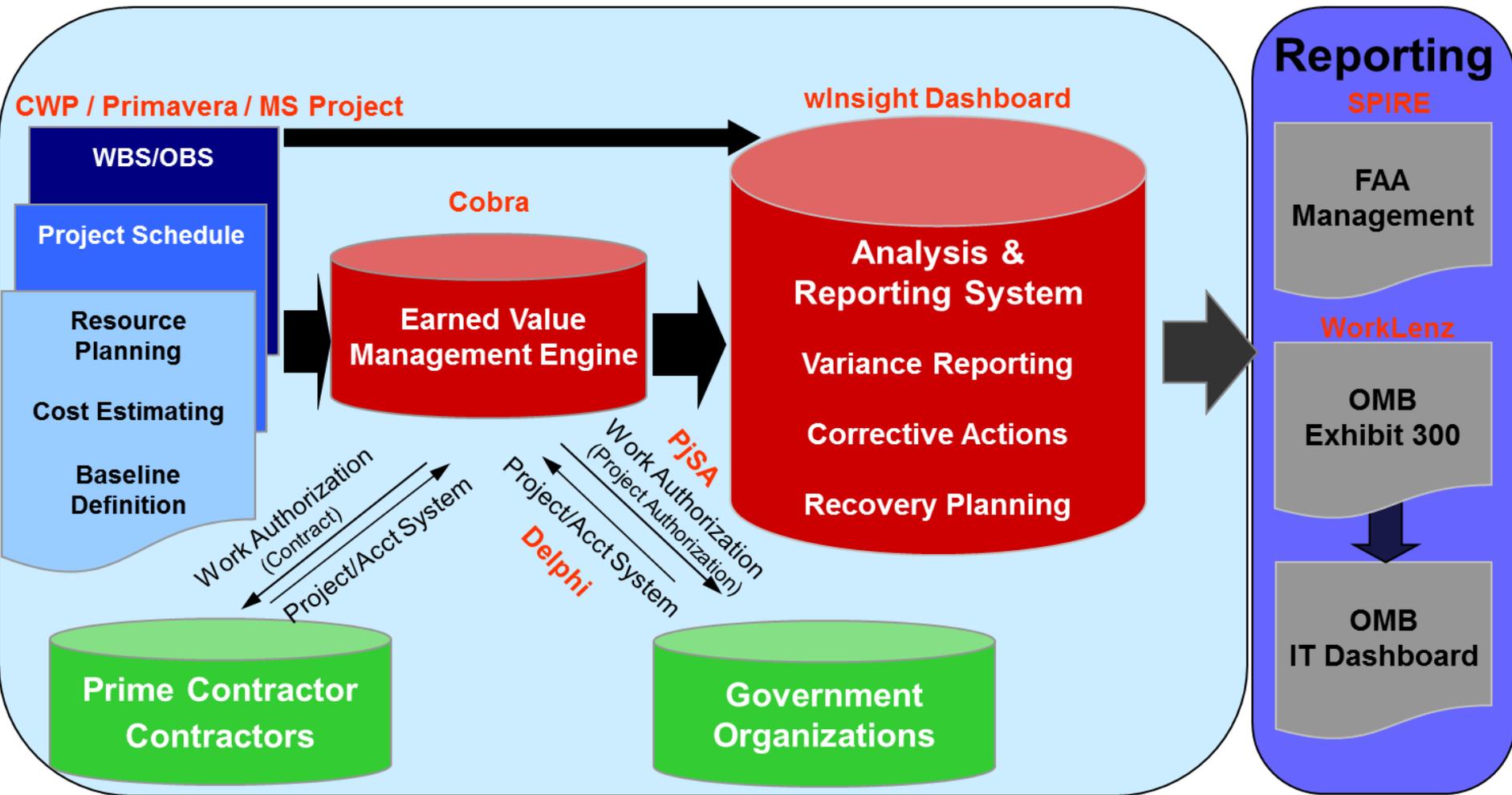
Air/Ground Communications: Sustaining the Radio infrastructure for Next Generation Air Transportation System (NextGen)



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
 - Analyst – Engineering Mgr – Program Manager – FAA Executive – DOT – OMB
 - 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



FAA Case Study

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

Program Summary Metrics					
Financial	Schedule	Technical	Resources	External Interest	Program Manager
G	G	R	G	Y	G

- 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

Enterprise EVM at the FAA - 2006

FAA Major Programs - EVMS Assessment Summary
(November 2007 - Final')

Program Name	Organizing						Planning						Performing					Analysis & Reporting					Change Management																
	1 WBS	2 OBS	3 WBS/OBS Integration	4 Overhead responsibility	5 WBS/OBS Reporting	Average	6 Schedule / Interdependencies	7 Schedule Milestones	8 Time Phased Budget Baseline	9 Budget Elements of Cost (EOC)	10 Control Account WP & PP	11 Control Account Budgeting	12 LOE budgeting	13 Overhead Budgeting	14 MR & UB	15 Program Budgeting	Average	16 Record direct costs (3)	17 Summarize CA's into WBS	18 Summarize CA's into OBS	19 Record indirect costs	20 Identify unit costs (3)	21 MMA S	Average	22 Cost & Schedule Variances	23 Variance Analysis Reports	24 Indirect Cost Variances	25 WBS/OBS Variances	26 Corrective Actions	27 Estimates at Completion	Average	28 Timely Change Planning	29 Reconcile Change	30 Control Retroactive Changes	31 Limit to Authorized Changes	32 Document PMB Changes	Average		
Planning Programs																																							
ASR-9 Phase II																																							
Data Comm																																							
NAS Voice Switch																																							
NextGen																																							
Acquisition / Mixed Life Cycle																																							
ATOP																																							
ERAM																																							
SBS																																							
TMA																																							
ASDE-X																																							
ASR-9 1a																																							
ASR-9 1b																																							
ASR-11																																							
ASWON																																							
ATCBI-6																																							
ITWS																																							
STARS																																							
TAMR																																							
FTI																																							
IFPA																																							
NEXCOM																																							
SWIM																																							
VSCS																																							
WAAS																																							
ASKME																																							
RCISS																																							
SASO																																							
TFM																																							
FAA Average																																							
Legend																																							
	Guideline Area and/or Guideline meets the intent of the EVMS Standard.																																						
	Guideline Area and/or Guideline partially meets the intent of the EVMS Standard.																																						
	Guideline Area and/or Guideline does not meet the intent of the EVMS Standard.																																						
	Guideline Area and/or Guideline has not been assessed.																																						

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!**

Seven Key Components of an Effective EVM Policy Contribution	
Policy component	Assessment of FAA policy
Establish clear criteria for which programs are to use EVM	Fully met
Require programs to comply with national standards	Fully met
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)	Partially met
Require programs to conduct detailed reviews of expected costs, schedules, and deliverables (called an integrated baseline review)	Fully met
Require and enforce EVM training	Partially met
Define when programs may revise cost and schedule baselines (called rebaselining)	Partially met
Require system surveillance—routine validation checks to ensure that major acquisitions continue to comply with agency policies and standards	Fully met

KM Systems Group

Proven Experience Implementing EVM for Government Agencies

- EVM basic & advanced training (PMI REP)
- EVMS System Design
- Deltek Cobra, MPM, wInsight implementation and training
- EVMS Certification & Validation Reviews
- CPIC/Project Portfolio Mgmt.
- Business Process Improvement



KM Systems Group – About Us

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

Thank You!

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