Earned Value Management (EVM)
Fact or Fiction?

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Outline

• EVM in a Nutshell
• Overall EVM Requirements
• NASA EVM Requirements
• Benefits
• EVM – Fact or Fiction?
• Summary
• Questions
EVM in a Nutshell
What is EVM?

- EVM is an integrated project management system for assessing, understanding and quantifying what a contractor or NASA project (in-house) are achieving with program dollars
- Integrates technical, cost, schedule, with risk management
- Allows objective assessment and quantification of current project performance
- Helps predict future performance based on trends.
- EVM provides project management with **objective**, accurate and timely data for effective decision making
  - It's not just metrics
  - Metrics are an output of a system
  - Garbage in, garbage out

**EVM is simply good project management!**
Consistent Project Management Approaches

Earned Value Management System
(EIA-748 EVMS Standard)

- Organization
- Planning, Scheduling and Budgeting
- Revisions & Data Maint.
- Accounting Considerations
- Analysis & Mgmt Reporting

Project Management Process Groups
(PMI’s Project Management Body of Knowledge)

- Monitoring & Controlling
  - Planning
  - Initiating
- Executing
- Closing

NASA Project Life Cycle
(NPR 7120.5 Space Flight Program & Project Management Requirements)

- Project Pre-Formulation
  - Pre-Phase A
- Project Formulation
  - Phase A
  - Phase B
- Project Implementation
  - Phase C
  - Phase D
  - Phase E
  - Phase F
- Project Evaluation

External Changes
Internal Changes
EVM and PP&C Synergies/Consistencies

We are trying to achieve the same goal!

NASA PP&C 10 Discipline Functions

- WBS
- Cost Estimating
- Budget
- Funds Control
- Scheduling
- EVM
- Risk Management
- Project Analysis
- Acquisition/Contract Mgmt
- CM / DM

NASA EVMS 10 Integrated Management Processes

- Organization Management
- Work/Budget Authorization
- Accounting Integration
- Indirect Cost Management
- Scheduling Integration
- Intra-Agency Work Agreement
- Material Management
- Managerial Analysis
- Subcontract Management
- Change Management

- Colors that match have the same objectives or very similar
- Some PP&C boxes have multiple colors that support multiple EVM processes
  - See example for budget above with lines to the appropriate boxes
- Lighter pattern in CM/DM represents a partial match

NOTE: * Agency PP&C supports all 10 EVM processes
EVMS Standard

- EIA-748, EVM System
  - “Industry Best Practice” for Project Management
  - Industry owns the EIA-748 Standards
  - Both government and industry EVM systems are measured against this standard
  - Guidelines define the required EVMS capabilities for both government and industry
  - Guidelines are at a high level, allowing for flexibility of implementation
  - Nine integrated management processes

Note: NASA In-house EVMS includes a 10th process, Intra-Agency Work Agreement.
Question - What is EVM?

A. The enemy
B. Integrated Project Management Process
C. A disease that nobody wants
D. A function that can be eliminated
E. The first item cut from the budget

Best Answer: B

- A project management system that integrates the technical scope with the cost, schedule and risks.
- Helps ensure that government projects/contractors have a consistent and disciplined project management standard that produces reliable data for decision making
Overall EVM Requirements
EVM Requirements Hierarchy

Defines “What”

Authority / Requirements
- OMB Circular A-11
- Federal Acquisition Regulations (FAR)
  - NASA Policy Directives (NPD)
  - NASA Procedures (NPR) 7120
    - Center/MD Directives
    - Center Requirements
    - Specific Work Instructions

Defines “How”

Handbooks / References
- EIA-748
- PMI PMBOK
- NDIA IPMD EVMS Intent Guide
- DoD EVMS Implementation Guide
- EVM Capability Documentation
- NASA Schedule Management HB
  - IBR Handbook
  - WBS Handbook
- EVM Implementation Handbook

Forms the foundation for EVM and facilitates training, mentoring, tool development, assessment, and integration.
Why is it a Requirement?

- Requires an integrated management system and its related subsystems that allow for:
  - planning all work scope to completion
  - assignment of authority and responsibility at the work performance level
  - integration of the cost, schedule, and technical aspects of the work into a detailed baseline plan
  - objective measurement of progress (earned value) at the work performance level
  - accumulation and assignment of actual costs
  - analysis of variances from plans
  - summarization and reporting of performance data to higher levels of management for action
  - forecast of achievement of milestones and completion of events
  - forecast of final costs
  - and disciplined baseline maintenance and incorporation of baseline revisions in a timely manner

(Source NPR 7120.5)
Question - Why do EVM?

A. To produce monthly metrics, e.g., CPI, SPI, TCPI, etc.
B. Project Managers want it
C. HQs wants it
D. EVM folks want it
E. Because it’s a requirement

Best Answer: E

• OMB requires it on all government development projects (in-house and contractor work) via the Circular A-11, Supplement to Part 7 - Capital Planning Guide and the Federal Acquisition Regulations (FAR)
• To ensure that government projects have consistent and disciplined project management standards that produce reliable data
• It typically flows down from sponsor to supplier because the sponsor needs a disciplined system that produces objective, reliable performance data
• Project Managers don’t have to like it, but it’s a requirement
NASA EVM Requirements
NASA EVM Requirements

• NPR 7120.5E, Section 2.2.8, requires projects in phases C and D to use an EIA-748 compliant EVMS
  – lessons learned show that you need to think about EVM from the beginning to avoid costly and cumbersome work-arounds

• EVM contractual requirements specified in the Federal Acquisition Regulation (FAR) Subpart 34-2 and codified in the NASA FAR Supplement (NFS) 1852.2 requires contractors to use an EVMS to manage the contract
  – All Development Contracts
  – =>$20M fully compliant, without government oversight
  – =>$100M fully compliant with government oversight
  – No organizations are excluded from the requirements
    • NASA has established guidance for one-time contracts
      – Small Business
      – Universities
      – Etc.
    – NASA Integrated Program Management Report (IPMR) Data Requirements Description (DRD) guide calls for initial submission between 60-90 days after authority to proceed
    – Conduct an IBR within 180 days of ATP
Question – When do we begin implementing EVM?

A. From the beginning
B. Phase C/D for NASA in-house programs and projects
C. Immediately after contract award
D. Phase C/D for contracts
E. Hopefully Never

A&C. Best Answer

- EVM contractual requirements specified in the Federal Acquisition Regulation (FAR) Subpart 34-2 and codified in the NASA FAR Supplement (NFS) 1852.2 requires contractors to use an EVMS to manage the contract.
- NASA Integrated Program Management Report (IPMR) Data Requirements Description (DRD) guide calls for initial submission between 60-90 days after authority to proceed.
- NPR 7120.5E, Section 2.2.8, requires projects in phases C and D to use an EIA-748 compliant EVMS – lessons learned show that you need to think about EVM from the beginning to avoid costly and cumbersome workarounds.
Question – Who does EVM?

A. Nobody
B. Federal Agencies
C. Industry
D. Universities
E. B, C & D

E. Best Answer
• Capital Programming Guide, Supplement to OMB Circular A-11, specifies requirements for EVM
• All major acquisitions with development effort will include the requirement for the contractor to use an EVMS that meets the guidelines in EIA-748.
• The in-house work must be managed with the same rigor as contractor work. In-house operations are expected to achieve the cost, schedule and performance goals to ensure success of the project, just as with contractors. While a project charter replaces the contract for in-house work, the other requirements for good project management, including the use of EVM in accordance with the EIA-748 standard are applicable for development efforts or multiple projects in a program.
 Benefits
Benefits

- Emphasis on **early, comprehensive planning** of the program/project and risk management
- Common communication tool on program/project technical, schedule and cost performance and risks
  - Promotes effective communication because it requires effective communication
- Provides Project Management with **objective, accurate and timely data for effective decision making** (much more than plan vs. actual)
  - Early warning of issues
  - Metrics are without bias or personal judgement
- EVM enhances the chances of program/project success
  - You can’t *succeed* if you can’t *manage*
  - You can’t *manage* what you can’t *measure*
  - You can’t *measure* what you can’t *define*
  - You can’t *define* what you can’t *understand*
EVM Planning Process – What’s not to like?

It’s a 3-step iterative planning process developed by the contractor or In-house project:

1. **DEFINE THE WORK**
   - **What? How? Who?**
   - Statement of Work (SOW)
   - Work Breakdown Structure (WBS)
   - Organizational Breakdown Structure (OBS)
   - Responsibility Assignment Matrix (RAM)

2. **SCHEDULE THE WORK**
   - **When?**
   - Integrated Master Schedule (IMS)
   - Logic network and critical path
   - Master Schedule
   - Intermediate Schedule
   - Detailed Schedules

3. **ALLOCATE BUDGETS**
   - **How much?**
   - Work/Budget Authorization System
   - Control Account Plan (CAP)
   - Work Packages (WP) & Planning Packages (PP)
   - Performance Measurement Techniques

[Diagram showing the planning process with technical, schedule, and budget baselines]
Question - What are the real benefits of EVM?

A. Produces performance metrics
B. Keeps the price of oil low
C. Requires a discipline project management system that produces reliable data
D. Forces upfront planning
E. A, C and D

E. Best Answer

- The EIA-748 guidelines require that projects plan, organize, schedule, budget, account for costs, analyze data, manage materials and subs, maintain a change control process and use data for management decisions.
- Emphasis on early, comprehensive planning of the program/project and risk management
## EVM – Fact or Fiction?

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<thead>
<tr>
<th>EVM Fiction</th>
<th>EVM Fact</th>
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<tbody>
<tr>
<td>• Costly to implement</td>
<td>• Normal management functions</td>
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<tr>
<td>• Normal management functions</td>
<td>• Costly not to implement (e.g., mismanagement, over-runs, program/project cancellations)</td>
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<tr>
<td>• Burdensome process</td>
<td>• Scalable, flexible, and tailorable process based on project size, complexity, and risk</td>
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<td>• “Bean Counter” (i.e., financial process)</td>
<td>• “Owned” and used by entire management team</td>
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<td>• Too much data</td>
<td>• Data is summarized for reporting and analysis (e.g., Empower)</td>
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<td>• Concepts are too hard to understand</td>
<td>• Simple concepts (Planned, Actuals, Earned Value, Variances)</td>
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<td>• Data not timely</td>
<td>• Shared databases and electronic submissions provide near-real-time information. Automated tools produce information with a few mouse clicks.</td>
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<td>• Baseline is always out of date</td>
<td>• EVM disciplined change-control process addresses this problem</td>
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<td>• Non-value added</td>
<td>• Provides critical insight into problems before they become unsolvable</td>
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Summary

• EVM is a structured Project Management System
  – Integrates Technical, Schedule, Cost and Risks

• EVM is a requirement
  – OMB A-11
  – FAR
  – NPR 7120.5

• EVM is owned by industry

• EVM has many benefits
  – Disciplined PM process
  – Upfront Planning
  – Reliable Performance Data

• Misconceptions are just that, misconceptions
Questions?