

Cost Data Sources



Foundational Learning



Workflow Learning



Performance Learning

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- Why cost estimating?
- Importance of Cost Data
- Data Sources
- Upcoming Changes

WHY COST ESTIMATING?

- A Cost Analyst's job is to collect and interpret information and translate it into \$ and ¢.
- Cost Analysts are not subject matter experts. Need to rely on:
 - Engineers
 - Program Managers
 - Contractors/Industry
 - Contract Specialists
 - Logisticians/Maintainers
 - Operators
 - Financial Managers



- Make or buy decisions
- Comparative studies
 - Analysis of Alternatives (AoA)
 - Economic Analyses (EA)
 - Cost-Benefit Analyses (CBA)
 - Business Case Analyses (BCA)
- Basis for program funding
 - Life Cycle Cost Estimates
 - Independent Cost Estimates
- Cost Realism before awarding contracts



IMPORTANCE OF COST DATA



Data introduction

- Historical and ‘good’ data forms the basis for most credible cost estimates.
 - Relevancy, accuracy, confidence, and defensibility
- Data is collected after the cost analyst/estimator has a thorough understanding of what needs to be estimated.
 - Purpose and Scope of the Estimate
 - Technical Baseline Description
 - WBS and CBS
 - Ground-Rules and Assumptions
- Analysts must be able to evaluate data quality and applicability for use in cost estimates.

- Primary Data
 - Obtained from or traceable to an Original Source
 - Unaltered or unchanged
 - Most defensible, best quality
 - Examples: Bill of Materials (BOMs), test results, actual man-hours incurred,
- Secondary Data
 - Derived from Primary Source
 - Changed or sanitized
 - Lesser overall quality, good for cross-check
 - Examples: factors, studies, prior estimates, ...
 - Hopefully, any data manipulations are well-documented



Data types Examples: Primary vs. Secondary

Data type	Primary	Secondary
Basic accounting records	x	
Data collection input forms	x	
Cost reports	x	x
Historical databases	x	x
Interviews	x	x
Program briefs	x	x
Subject matter experts	x	x
Technical databases	x	x
Other organizations	x	x
Contracts or contractor estimates		x
Cost proposals		x
Cost studies		x
Focus groups		x
Research papers		x
Surveys		x

Source: GAO Cost Estimating and Assessment Guide, March 2009

Data types: Objective vs. Subjective

- Objective Data
 - Measurable and Quantitative data is preferred
 - Collected through formal data collection process
 - Examples: Staff-hours, SLOC, Function Points, end items, etc.
- Subjective Data
 - Non-quantitative (e.g., judgmental) data
 - Based on “feeling” or “understanding” of a characteristic or condition of interest
 - Example: Complexity (e.g., predict 35% more complex)

Look to gather data from all credible sources, but **Primary** and **Objective** data are preferable!



Data Collection Plan

- Best practice to create a Data Collection Plan.
- Should address the following for each WBS/CBS Element:
 - Projected primary estimating approach.
 - Cross-check estimating approach.
 - Specific data required and source(s) of the data.
 - Point of Contact (POC) from the data source.
 - Any access and control requirements.
 - Start/End dates for obtaining the data relative to the overall cost estimate formulation/review schedule.
 - Alternative plans if primary data sources are unavailable.
- The Data Collection Plan is a **living document**.



DATA SOURCES

- Collecting data is one of the cost estimator's primary and most difficult roles.
- Data sources are limitless:
 - Contractors
 - Academia
 - Government Agencies
 - Anywhere





Data Categories

- Cost Data
 - Examples: Materials and Labor Costs, Other Direct Costs (ODCs), Overhead and Indirect Rates
- Technical Data
 - Identify cost drivers derived from performance requirements.
 - Examples: Size, weight, speed, mean-time between failure (MTBF), special security requirements, payload requirements, etc.
 - Also, includes operational parameters (time on station, crew composition, weapon types, activity rates, deployment plans, etc.).
- Programmatic Data
 - Parameters that explain a program and drive costs.
 - Examples: Schedule, quantity, multi-year procurement, contract type, acquisition strategy, etc.



Data sources

- Requirements Documents (ICD, CDD, CPD).
- Baseline Descriptions (CARD, ICBD).
- Technical Databases (Satellite Crosslinks Database, etc.).
- Contractor-Provided Documentation (data sheets, etc.).
- Contractor Accounting System and Cost Reports (CPR/IPMR, CFSR, CCCR).
- Software metrics (SRDRs).
- DoD Historical Databases (Naval VAMOSOC, AFTOC, OSMIS, AF C3I H/W Maintenance Database, Navy OARS, JCARD, etc.).

Acronyms

AFTOC	- Air Force Total Ownership Cost
C3I	- Command, Control, Communications and Intelligence
CARD	- Cost Analysis Requirements Description
CCDR	- Contractor Cost Data Reporting
CDD	- Capability Development Document
CFSR	- Contract Funds Status Report
CPD	- Capability Production Document
CPR	- Contract Performance Report
ICBD	- Intelligence Capability Baseline Description
ICD	- Initial Capabilities Document
IPMR	- Integrated Program Management Report
JCARD	- Joint Cost Analysis Research and Database
OARS	- Open Architectural Retrieval System
OSMIS	- Operating Support Management Information System
SRDRs	- Software Resource Data Report
VAMOSOC	- Visibility and Management of Operating and Support Cost



Data sources, continued

- SARs and DAES for high-level schedule, technical and cost data, and particularly for changes to the program.
- Labor Rate data from FPRRs, FPRAs, DCAA, DCMA.
- Other Organizations (FFRDCs, sister agencies).
- Other Information Systems (cost studies, GSA, catalogs, documented cost estimates, etc.).
- Contracts and Cost Proposals.
- President's Budget (PB).
- Testimony of Functional Specialists (SMEs).
- Competitive Intelligence, Market Analysis, Benchmarking.
- The Internet!

Acronyms

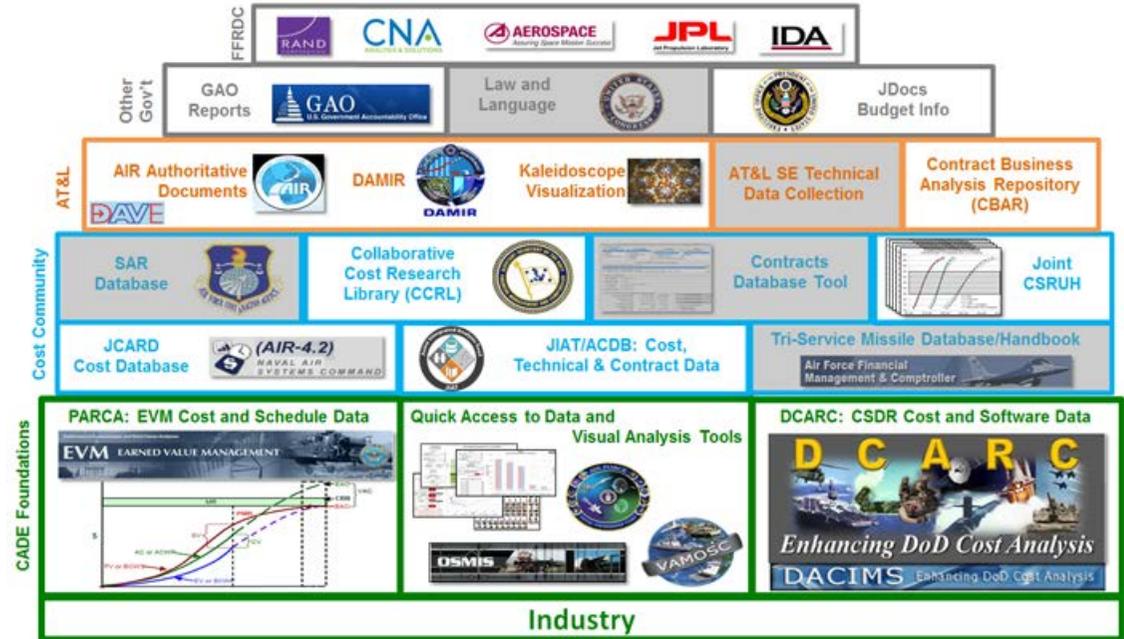
DAES	- Defense Acquisition Executive Summary
DCAA	- Defense Contract Audit Agency
DCMA	- Defense Contract Management Agency
FFRDCs	- Federally Funded Research and Development Centers
FPRAs	- Forward Pricing Rate Agreements
FPRRs	- Forward Pricing Rate Recommendations
GSA	- General Services Administration's
SARs	- Selected Acquisition Reports
SMEs	- Subject Matter Experts

- An OSD Cost Assessment and Program Evaluation (CAPE) initiative.
- Goal to increase analyst productivity and effectiveness by collecting, organizing and displaying data in an integrated single web-based application.
 - Increase analyst productivity
 - Improve data quality, reporting compliance and source data transparency

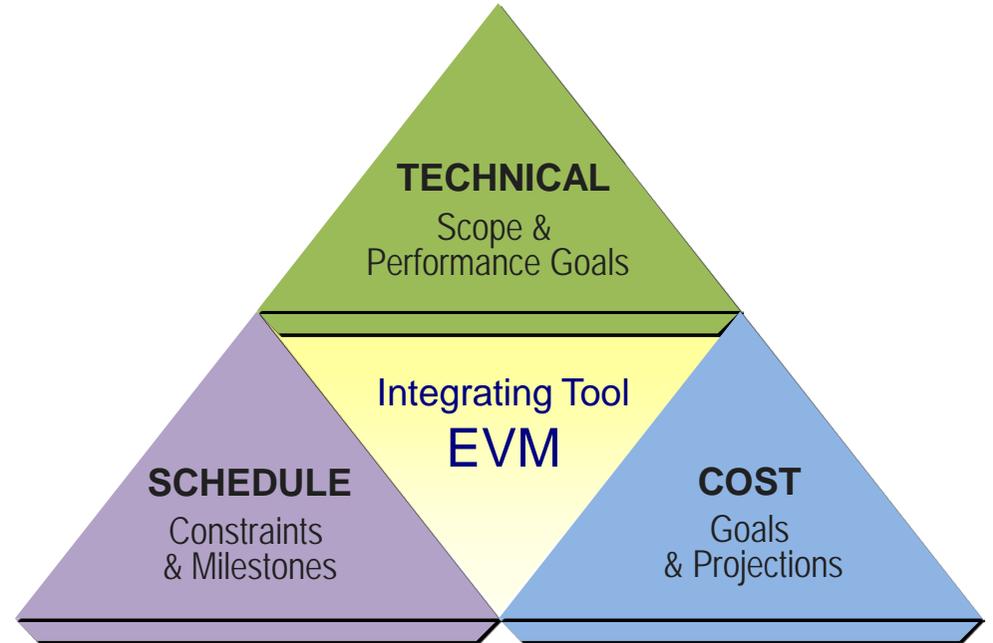


<http://cade.osd.mil/>

1. Earned Value Management (EVM) cost and schedule data
2. Service Operations and Support (O&S) visual analysis tools
3. Cost and Software Data Reports (CSDR)



- Measures cost and schedule performance against an established, realistic baseline.
- Vendors provide EVM data to the government on contracts when required.





EVM Policy Requirements

EVMS Surveillance/Compliance Requirement	FFP Contracts	Cost Reimbursement & Incentive Contracts			
	No mandatory requirements	No mandatory requirements	Compliant with EIA-748 Formal EVMS approval not required EVMS surveillance only conducted for cause	Compliant with EIA-748 Formal EVMS approval required Routine EVMS surveillance performed	
EVM IPMR Reporting Requirements*	IPMR at PM discretion. May elect to receive Format 6 only.**	No mandatory reporting requirements. Tailored IPMR may be used for reporting.	IPMR required. May be tailored. (Formats 1, 5, 6, and 7 are mandatory.)	IPMR required. All 7 Formats are mandatory.	
EVM DFARS Applicability	PM risk-based decision with waiver obtained from MDA	PM risk-based decision	EVM Required		
Contract Value		\$0	\$20M	\$50M	\$100M

EVM is discouraged on FFP, LOE, and T&M contracts, and contracts greater than or equal to 12 months in duration.

**Reporting may be used with or without a DFARS EVM requirement.*

***FFP: Format 6 does not require a waiver if DFARS 252.234-7002 is not on the contract.*

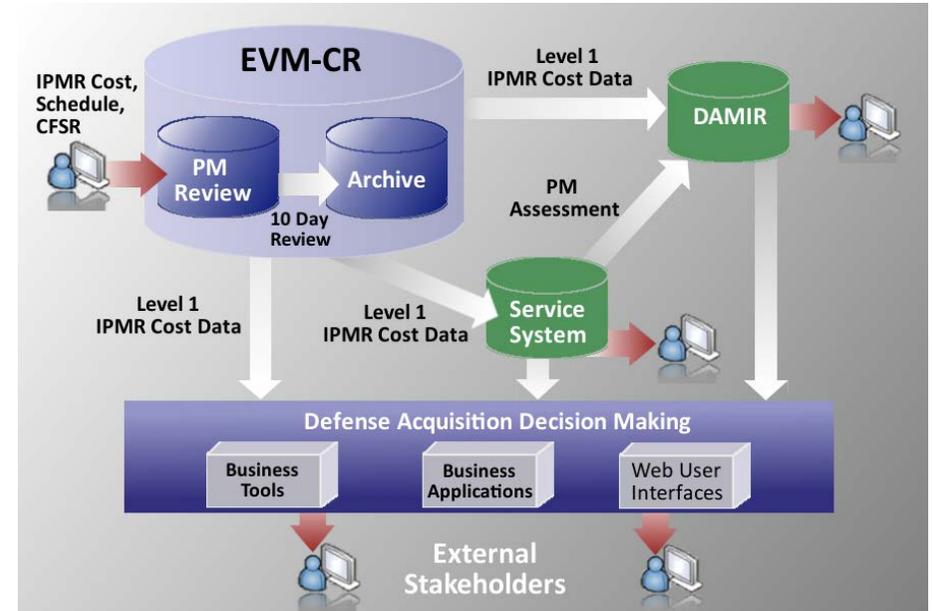
Policy References

- DoDI 5000.02, Encl. 1 Table 8
- DPAP Tracking Number: 2015-O0017, Class Deviation – Earned Value Management System Threshold Memo, 28 Sep 2015



EVM Central Depository

- Provides centralized reporting, collection, and distribution of:
 - Contract Performance Reports (CPRs)
 - Integrated Master Schedule (IMS)
 - Contract Funds Status Report (CFSR)
 - Integrated Program Management Report (IPMR)
- Mandatory for:
 - ACAT I – Major Defense Acquisition Program (MDAP) programs.
 - ACAT IA – Major Automated Information System (MAIS) programs.



<http://dcarc.cape.osd.mi/evm/evmoverview.aspx>

- 1974 OSD Asked Services to Develop an Information System to Report Actual O&S Costs
- Visibility And Management Of Operating and Support Costs (VAMOSOC)
 - Army: OSMIS (Operating and Support Management Information System)
 - Navy: Naval VAMOSOC
 - Air Force: AFTOC (Air Force Total Ownership Cost)



- Data collected on currently fielded major systems, personnel and installations.
- Partial list of available data:
 - Cost data
 - Financial & Contract Modification Data
 - OPTEMPO (Flying Hours, Miles Driven, Steaming Hours Underway)
 - Inventory Data
 - Performance Data
 - Personnel Data (Military and Civilian)
 - Logistics Data
 - Engine Data
 - Maintenance Data (maintenance man hours)
- Data can be used for:
 - Analogy and parametric estimates (between proposed systems and appropriate predecessor or reference systems).
 - “Bottom-up” engineering estimates.



Cost and Software Data Reports

Comprised of two components:

1. Contractor Cost Data Reporting (CCDR)
 - Focused on the collection of **actual** total contract costs.
 - Subdivided into standard categories for cost estimating purposes (e.g., by CBS, functional categories, and resource elements).
2. Software Resources Data Reporting (SRDR)
 - Collects software-specific data including software size, effort, activities and schedule data.





CSDR Policy

- Reporting required on MDAP/MAIS contracts and subcontracts:
 - Over \$50M.
 - Optional between \$20M and \$50M.
- OSD Approved Plans must be included within a contract Request for Proposal (RFP) **before** release.

- Defense Cost and Resource Center (DCARC):

<http://dcarc.cape.osd.mil/csdr/default.aspx>



CSDR Formats





UPCOMING CHANGES



CSDR Changes

- Software Data Update
 - New Data Item Description released (DI-MGMT-82035), 2 Jun 2016.
 - Combines Initial, Interim and Final Reports.
- Technical Data Report (1921-T, 1921-Q, 1921-*Repair Part*)
 - Standardized technical data collection.
 - Actuals reported from industry.
 - Examples:
 - Technical: Part ID #, Technical Parameters, Technical Value, Margin
 - Quantity: End item units by model/variant, spares, non-delivered units, GFE
 - Repair Part: Failure Data, Repair Data, Man Hours, Material Cost
- Flex Files
 - Gathering data according to the contractor's financial structure.
 - Reduction in labor to produce reports.

Combined EVM and CSDR Reporting

- Various organizations working on the new policy:
 - OSD CAPE (Cost Assessment and Program Evaluation).
 - PARCA (Performance Assessments and Root Cause Analyses).
 - Services/Agencies.
- Creating standardized reporting structures for different platforms/systems.
- Potential pilot programs being reviewed.



SUMMARY



Summary

- Cost Estimators need assistance in collecting, validating and understanding data.
- Don't blindly use data without validating the source.
- Data collection plans assist with documentation and organization.
- Cost Assessment Data Enterprise (CADE) is a web-based application integrating several DoD data sources. “***one-stop shop***”