Cost Assessment Data Enterprise (CADE) Project

CADE Vision for NDIA's Program Management Systems Committee (PMSC)

August 2015 Update

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ASSESSMENT & PROGRAM EVALUATION

CADE Agenda

- Objectives/KPPs
- Comprehensiveness
- Vision: Total Analyst Access
- Progress Since Last NDIA Briefing
- Coalition
- Working Group Status (CARD, 1921-T, SRDR, FlexFiles)
- Next 12 Month Plan
- Capability Roadmap
- Why It's Important



CADE Objectives/KPPs

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Provide decision makers with relevant, high quality, timely and actionable analyses for better acquisition strategies and execution

- Move from reactive to proactive
- Insight equates to trust and facilitates faster and more knowledgeable decision making
- Facilitate telling the program's "story", holistic analysis

Improve Analyst Productivity (at all levels: OSD, Services, PMOs)

- Increase output per unit time, without degrading confidence in results
- Provide near real-time access to data, more data, and less burden on the analyst to retrieve and process
- Reduce time for analyst to climb the program familiarization learning curve

Comprehensiveness

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 Having all DoD's relevant data at analysts' fingertips for comprehensive assessments, regardless of analysis type

Community Knowledge Sharing

- Gain insight from previous and fellow analysts and data stakeholders

Quality and Transparency of Source Data

- Where it comes from, what we know about it consistency
- Enterprise data stewardship Enterprise agreement and accountability for what data means and how it's used
- Reporting Compliance Improvement

Properly Secured



Comprehensiveness and Our Vision

OSD CAPE

Comprehensive Data Availability:

Having all information at the analyst's fingertips – a centralized virtual library with everything in it

- Cost Data (CCDRs/1921s): Contains all an analyst needs to build an estimate
 - **FlexFiles**: New generation of cost data collection
- Cost Analysis Requirements Description (CARD) / Technical Data ("1921-T"): Programmatic and technical descriptions analysts need to build estimates
- Software Resource Data Report (SRDR): Software effort, size, and schedule estimating approaches including analogy, parametric and commercial models
- Capturing Institutional Knowledge: What analysts need to know about the data
 - Harnessing knowledge of the entire community
- Policy Improvements
- Community Support

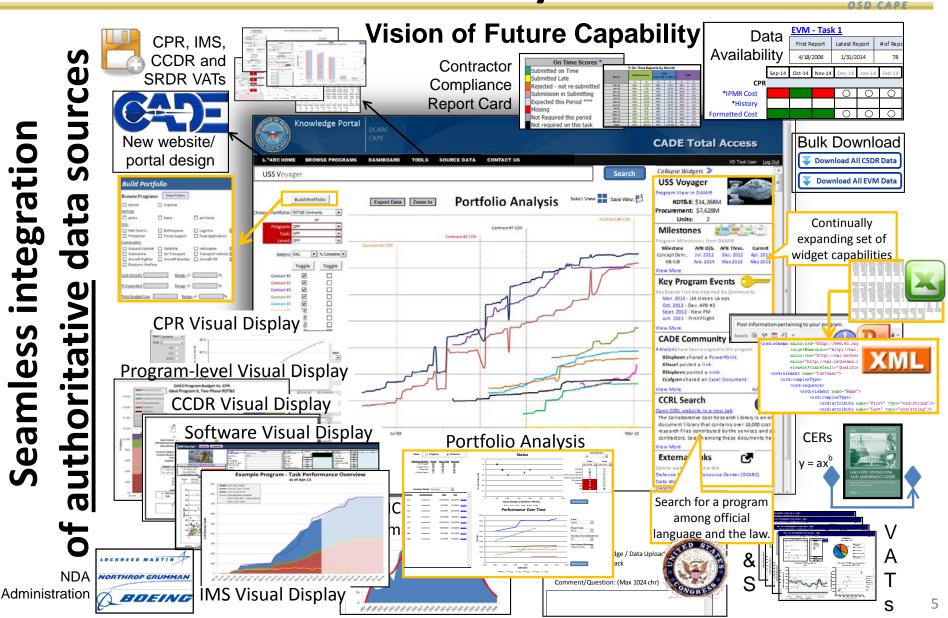
Our Vision for CADE:

Cost analysts will have all of this data and institutional knowledge at their fingertips. It will be the exception – not the rule – that we have to go back to industry to do our estimates.



CADE Vision of the Future: Total Analyst Access

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CADE Progress Since Last NDIA Meeting (1/14)

Policy:

- CCDR XML Requirement Letter
- 1921-5 DID Approval In-Process
- Draft SRDR DID
- Draft CARD Guidance

Business Processes:

- CADE Capability Roadmap, Integrated Master Schedule
- Functional Working Groups
- Data Gap Analysis Performed
- Forward Planning Requirements Defined
- CARD, Plan Standards and Tables Developed

IT Development (releases 1.5, 2.0, 2.5 & 3.0):

- CCDR and DAMIR authoritative data access
- Improved visual analytics
- CCDR and IPMR XML submissions
- Automation of DCARC memorandum notifications and distributions

CADE Coalition: The Cost Community, AT&L & Industry

Cross-Agency Working Groups:

1921, -1, -2: Duncan Thomas, NCCA

<u>1921-3</u>: Mike Biver, CAPE

Sustainment (1921-4/5): Tom Henry, CAPE

FlexFiles: John Fitch, NCCA

SRDR: Ranae Woods, AFCAA

CARD: Curt Khol, CAPE

Tech Data WG, Space & Launch Systems: Greg Hogan,

AFCAA

MAIS WG, AIS & Software Commodity Lead: Rich Mabe, AFCAA

AFCAA CEM Joint Effort: Ranae Woods, AFCAA

- Aircraft, UAV: Scott Adamson, AFCAA
- Missiles: John Cargill, AFCAA
- Radar, C2 Center and C4I Electronics: Cari Pullen, AFCAA
- ICBM: Patty Hach, AFCAA
- Operations & Support: Lisa Mably, AFCAA
- Navy Ships: Praful Patel, Benjamin Breaux, NCCA
- WTV: David Junkin, Eric Stough, Army

CSDR/EVM Co-Plan, WBS Alignment: Gordon Kranz, John McGregor, AT&L PARCA

Office Collaboration:

AFCAA Ranae Woods AFCAA CEM joint effort on CADE commodity leads, Aviation CIPT, Missile Contracts Database NCCA John Fitch FlexFiles, JCARD (NAVAIR), CCRL, DASNSHIPS, NAVSEA, Ships WG tech data for CARD/CCDR Army Sean Vessey JIAT, ACDB/WTV prototype, WTV tech data for CARD/CCDR, WTV CIPT MDA CCRG, MDA-DCARC alignment AT&L EVM-CR, CSDR/EVM Co-Plans DAVE (DAMIR, AIR, Kaleidoscope) DDR&E/SE tech data; Big Data initiative Industry: LM, BNA, NGC, BAE, GDLS, CSDR Focus Group, Joint Training, NDIA

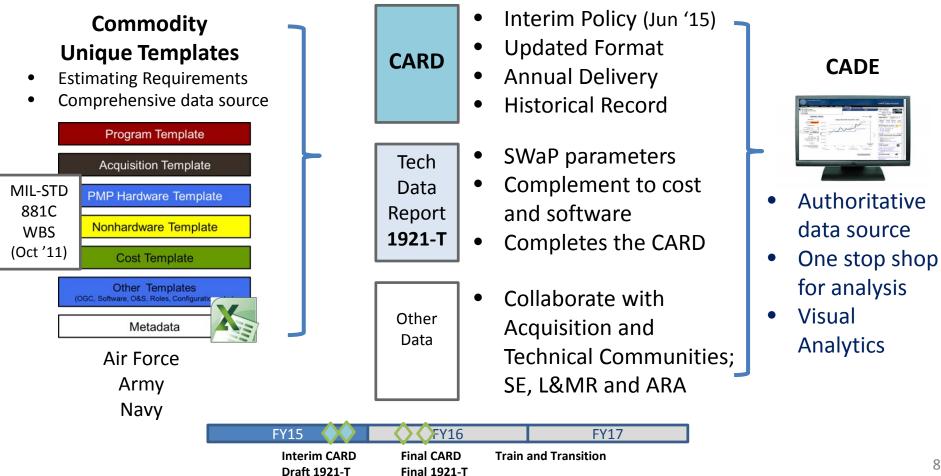


CARD Streamlining

Lessening Program Office Burden and Improving Data

Current State:

- Current data collection methods are ad-hoc, inefficient and scattered across the department
- Historically CARD has not been living document: too much narrative and not enough real data
- Result: We re-construct Technical analogous for nearly every estimate



DRAFT



Final Crosswalk - Development SRDR

Cost Estimating Need C	Issue	e <u>New SRDR Requirement</u>				
Estimate by CSCI (SW Size, Effort, Description, Schedule)	Lack of		CSCI-Level Reporting			
Standard size measures based on different system types (MDAP vs ERP)	Visibility		ERPs RICE-FW, all else SLOC Use Aerospace Unified Code Count			
Consistent logical DSLOC data by language to support Size and Effort		Inconsistency	(UCC), standard code counter; Use IFPUG for Function Points (FPs)			
Requirements as Size/Effort driver			Standard, clear Requirements counts			
Understanding of degree of effort for reused code relative to new code		Inco	DM/CM/IM % or AAFs			
Ability to estimate "full-up" SW effort			Prototype vs Production Representative Use ISO 12207:2008 Activities			
Dollarize SW effort estimates accurately	Lack of Visibility		Direct and Indirect Costs by CSCI in SRDR			
Accurately time-phase SW Dev estimates	VISIONICY		Report Monthly Effort in Final SRDR			
Phasing, Software Growth relationships			Require Interim Reports			
Stratify software efforts by Complexity, a key driver of effort (Productivity)	Too Complex		Reduce Application Domains from 119 to 17			
Capture Analyst Capability Productivity Impact	Subjective/Little Value		Remove Experience requirement			
Changes Enhance all Cost/Effort, Size, a Approaches: Analogy, Parametric, C		✓ Low Impact (Reduced Reqt) ✓ Medium Impact ✓ Significant Impact				

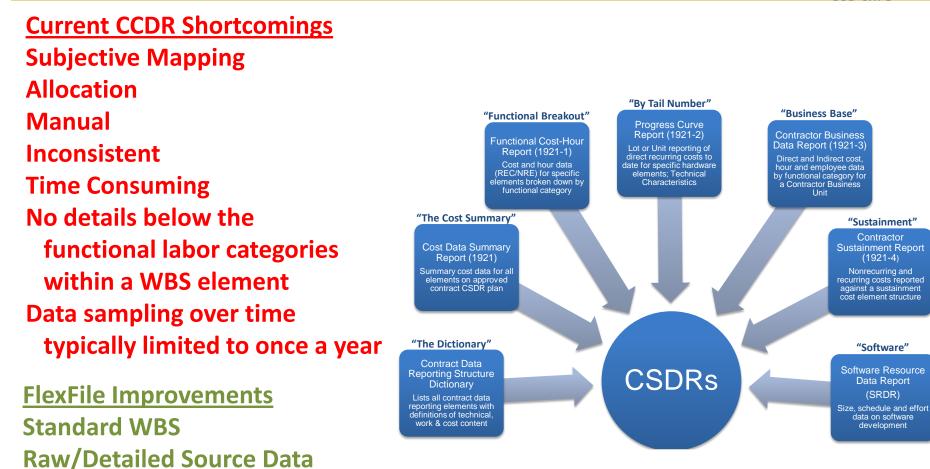


Automated

Consistent

CSDR Problem Statement

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CSDR Data We Collect Today

Traceable, Repeatable mapping



FlexFiles: Objectives

A Win-Win Government and Industry Partnership

OSD CAPE

1. Increase Efficiency:

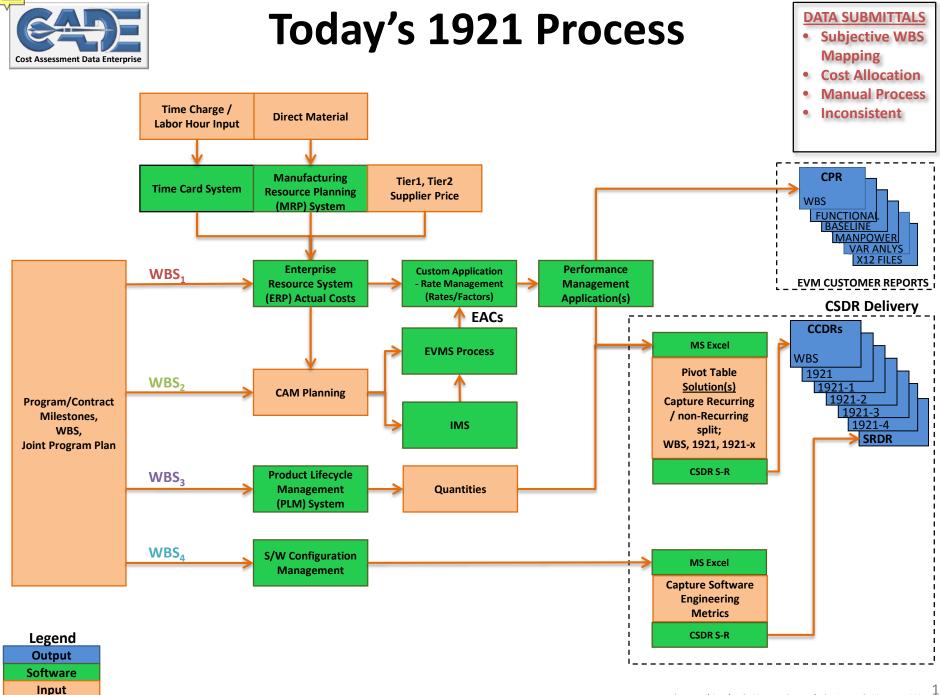
- Collect data according to the contractor's management structure
- Removal of legacy 1921 forms
- Reduce ad hoc/supplemental government data collection efforts
- Much easier and less time consuming for Industry allows them to reduce back end support
- Automation: data flows directly from contractor systems into ours

2. Improving Data Quality:

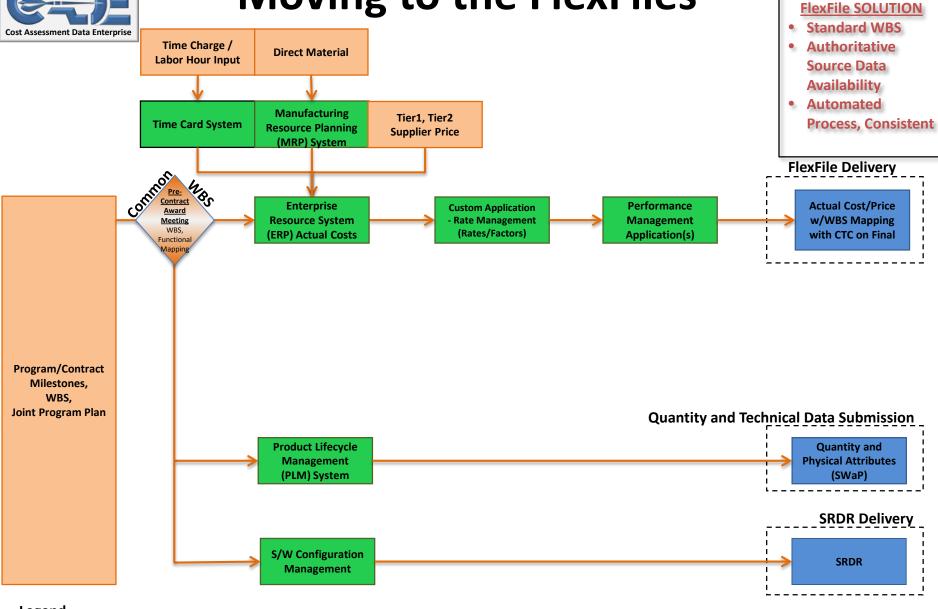
- Eliminate Human Error/Subjectivity
- Collect raw data, and use technology to eliminate arbitrary allocations and errors
- Consistent application of Mil-STD-881C to both EV and CSDR data data Alignment
- Review and mapping pre-contract award

3. Ensure Completeness:

- Provides much more insight and analysis flexibility
- Higher frequency of submissions
- Receive data over time
- Include cost and supporting technical data



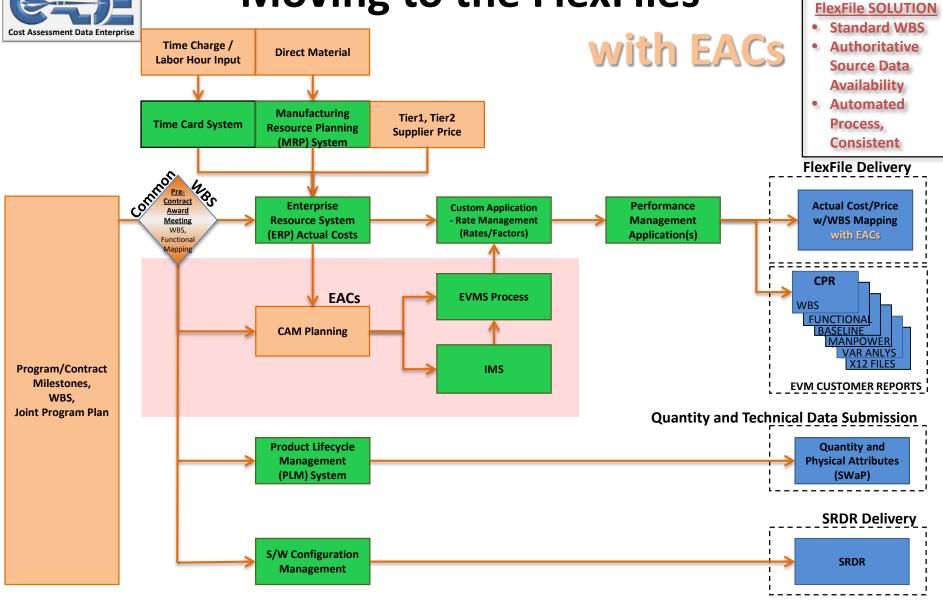
Moving to the FlexFiles



Legend Output Software Input

Filename: ...\CADE\X File CSDR Development\What is an XFile 20 Mar 15 JSCC Update

Moving to the FlexFiles







What is the "FlexFile"?

		C	DST DATA SU	IMMARY REPO	RT				Form Approved CIME No. 0704- 0188	
1. PROG	BAM	2. PRIM	E MISSION PR	3. CONTRACT	OR TYPE (X one	4. NAME	ADDRESS (Inclu	5. APPROVED	PLAN NUMBE	
a, MDAP	USS Voyager	119	S Voyager	x PRIME / ASSO	* PRIME / ASSOCIATE The Lef			ofgren Corp N019-210		
b. PHASE Development		USS Voyager			DRTING SUBCONT	J1 = '		14013-210		
6. CUSTOMER (DIRECT-REPORTING SUBCONTRA		7.	8. CONTRAC	9.	10. TYPE ACTI					
		CPIF			a. CONTRACT NOH! 102-C-0		9-0001	C. SOLICITATION	INO.:	
					5. LATEST MODIFICATION:			d. NAME:		
11. PEBI	OD OF PERFORMANCE	12. APPROPRIATION		13. BEPORT C	14. SUBMISSION NUMBE		15. RESUBMISS 16. REPORT AS O		SOF 77777	
	DATE / /////// 20021222	X BDT&E								
	ATE / //////// 20140430	PROCUREMENT		INTERIM	7		1 2014043		40430	
		O&M		X FINAL						
17. NAM	IE (Last, First, Middle Initial)	18. DEPARTMENT 19. TELEPHONE NU		E NUMBER (Inc 20. EMAIL ADDR		L ADDRESS	21. DATE PREPARED //YYY			
Lofgren, Eric M		the Eric Dept		(571) 25	(571) 256-9999			20141210		
VBS ELEME	WBS REPORTING ELEMENTS	NUMBE R OF			DATE NUMBER		COSTS INCURRED AT C		OMPLETION	
NT			NONRECURRING	RECURRING	TOTAL	UNITS AT	NONRECURRING	RECURRING	TOTAL	I
A	В	С	D	E	F	G	Н		J	1
1.0	Voyager System		\$884,593.0	\$260,718.0	\$1,145,311.0		\$811,994.0	\$531,310.0	\$1,343,304.0	L
1.1	Voyager Ship	2.0	\$40,167.0	\$12,265.0	\$52,432.0	2.0	\$31,920.0	\$55,383.0	\$87,305.0	L
1.1.1	Propulsion System		\$3,559.0	\$3,585.0	\$7,144.0		\$3,800.0	\$2,204.0	\$6,004.0	
1.1.1.1	Booster System		\$433.0	\$898.0	\$1,331.0		\$627.0	\$452.0	\$1,079.0	
1.1.1.1	Booster Motor	2.0	\$32.0	\$56.0	\$88.0	2.0	\$4.0	\$69.0	\$75.0	
1.1.1.1.2	Thrust Vector Actuator (TVA)	2.0	\$45.0	\$32.0	\$77.0	2.0	\$73.0	\$43.0	\$118.0	
1.1.1.1.3	Two-axis Rate Sensor (TARS)	2.0	\$77.0	\$58.0	\$135.0	2.0	\$32.0	\$64.0	\$98.0	
1.1.2	Kill Vehicle		\$6,413.0	\$1,556.0	\$7,969.0		\$5,773.0	\$1,292.0	\$7,065.0	
1.1.2.1	Forebody Structure	2.0	\$185.0	\$881.0	\$1,066.0	2.0	\$281.0	\$342.0	\$625.0	П
1.1.2.2	Seeker Divert & Attitude Control System (DACS)	2.0	\$277.0 \$297.0	\$519.0	\$796.0	2.0	\$698.0 \$392.0	\$745.0 \$484.0	\$1,445.0 \$878.0	П
1.1.2.3		2.0	\$297.0 \$568.0	\$755.0	\$1,190.0	2.0		\$484.0		
1.1.2.4	Mission Computer (MC) Canister	2.0	\$9,950.0		\$1,020.0	2.0	\$710.0 \$8,895.0	\$2,600.0	\$1,720.0 \$11,497.0	Г
1.1.3	Missile Round IAT&CO	2.0	\$2,598.0	\$0,043.0	\$14,993.0	2.0	\$8,601.0	\$2,800.0	\$11,497.0 \$14,139.0	
1.1.4	Missile Software	2.0	\$2,963.0	\$6,564.0	\$9,162.0	2.0	\$6,142.0	\$4,931.0	\$14,133.0	
1.1.6	Missile Bound SEI/PM		\$2,363.0	\$4,643.0	\$7,606.0 \$10.324.0		\$8,615.0	\$9,730.0	\$18,345.0	
1.2	Command and Launch		\$53,758.0	\$20,997.0	\$10,324.0 \$74,755.0		\$57,860.0	\$26,467.0	\$84,327.0	
1.2.1	Launch Control Station	2.0	\$4,275.0	\$2,640.0	\$6,915.0	2.0	\$3,462.0	\$1,614.0	\$5,078.0	
1.2.1	Battle Mgmt/CMD & Control (BMC2)	2.0	\$3,340.0	\$2,249.0	\$5,589.0	2.0	\$7,096.0	\$8,852.0	\$15,950.0	
1.3	Peculiar Support Equipment	2.0	\$61,781.0	\$81,579.0	\$143,360.0	2.0	\$26,183.0	\$30,717.0	\$56,900.0	
1.3	SE/PM		\$72.574.0	\$86,430.0	\$159,004.0		\$91.879.0	\$39,371.0	\$131,250.0	
1.4.1	Integrated Engineering		\$7,159.0	\$4,103.0	\$11,262.0		\$7,067.0	\$1,996.0	\$9.063.0	
1.4.2	Integrated Program Management		\$5,050.0	\$4,523.0	\$9,573.0		\$7,635.0	\$5,117.0	\$12,752.0	
1.4.7	CITIS/EDAMS		\$6,858.0	\$1,297.0	\$8,155.0		\$9,286.0	\$2,129.0	\$11,415.0	
1.5	System Test & Evaluation		\$75,999.0	\$17,902.0	\$93,901.0		\$30,863.0	\$53,015.0	\$83,878.0	
	-				••					
	Subtotal Cost:				\$1,145,311.0				\$1,343,304.0	
	G&A:				\$30,594.6				\$30,741.4	
	Undistributed Budget				\$0.0				\$0.0	
	Management Reserve				\$0.0				\$0.0	E
	Facilities Capital Cost of Money				\$2,152.0				\$2,156.6	H
	Total Cost				\$1,178,057.6				\$1,376,202.0	1
	Reporting Contractor Profit/Loss or Fee:				\$61,088.8				\$61,108.1	
	Total Price				\$1,239,146.4				\$1,437,310.1	
							Unclassified			

The costs reported for any WBS element on a 1921 are the aggregation of numerous lower level cost categories

 $= \sum_{i}^{j} L_{i} + \sum_{x}^{y} \alpha_{x} I_{x} + \sum_{a}^{b} M_{a}$

where:

- L_i = Direct Labor category "i"
- I_x = Indirect Labor category "x"
- α_x = allocation rate for "x"
- M_a = Materials category "a"

FlexFiles will report data at the component level with associated tags for analyst to roll-up

Notional FlexFiles example:

F.	WBS	Component	Cost Pool	NR/Rec	Date	Cost	Hours	
)	1.1.2.4	Eng. Design	Labor	NR	Mar-14	\$132.12	3.1	^
)	1.1.2.4	Eng. Design Bus MTL-XLS	Material	Rec	Nov-13	\$1,234.10		
_	1.1.2.4	MLT Handling	Indirect	Rec	Mar-14	\$44.80		-
	4							>



Planned Accomplishments – Next 12 months

CADE

OSD CAPE

Policy:

- Final CARD Guidance
- Final SRDR DID
- 1921-T DID
- CSDR Plans or Co-Plans
- FlexFiles FlexFile Prototype Instruction and Prototypes (Draft DID)
- CSDR Planning and Validation Coordination with the Services

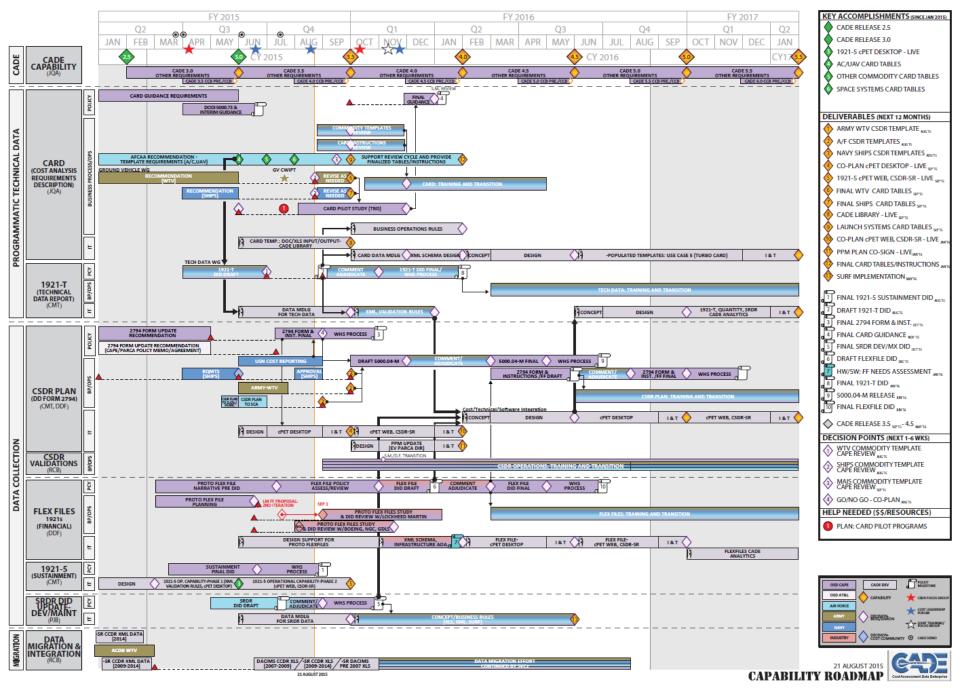
Business Processes:

- Co-Plan (DD Form 2794)
- Air Force CEM, MAIS, Army WTV, Navy Ships
- CARD Tables
- CSDR Plan Standards
- CADE Library

IT Development (release 3.5 to 4.5):

- Co-Plan cPET Desktop
- SRDR cPET Desktop
- FlexFile Development

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CADE Closing: Why It's Important

OSD CAPE

Improved Acquisition Outcomes:

- Authoritative Quality Data: Cooperative planning and compliance lead to better data and improved program management
- Cost Realism: Provide real-time cost data for analysis and facilitating quicker contract negotiations
- Full view of Weapons Systems Program Performance: Visual analytics, trend analysis and technical data to improve cost realism and make informed decisions

Efficient and Effective Analysis (at all levels: OSD, Services, PMOs):

- Improved Analytical Rigor and Productivity
- More time for analysis and execution; Less time collecting and feeding data
- More comprehensive assessments and reduced burden on industry

Cost Community Coordination:

- Revolutionizing cost data collection
- Cost community ownership of leadership, training and estimating responsibility
- Improving terminology and practices across Departments

Let's continue this effort together...

help us work to make us all more efficient

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