



Innovation in Defense Acquisition Oversight: An Exploration of the AT&L Acquisition Visibility SOA

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Agenda

- ▶ Acquisition Visibility Purpose
- ▶ Project History – AT&L AV SOA
- ▶ Architecture
- ▶ Data Elements and Programs included to date
- ▶ Implications for Academic Research



Acquisition Visibility

- ▶ The Department of Defense and others have noted deficiencies in the Department's ability to manage its \$1.6T portfolio of Major Defense Acquisition Programs.
- ▶ Undersecretary of Defense for Acquisition Technology & Logistics is addressing these deficiencies by focusing on Acquisition Visibility (AV)

Acquisition Visibility

Timely access to accurate, authoritative, and reliable information supporting acquisition oversight, accountability, and decision making throughout the Department for effective and efficient delivery of warfighter capabilities



Project History – AT&L AV SOA

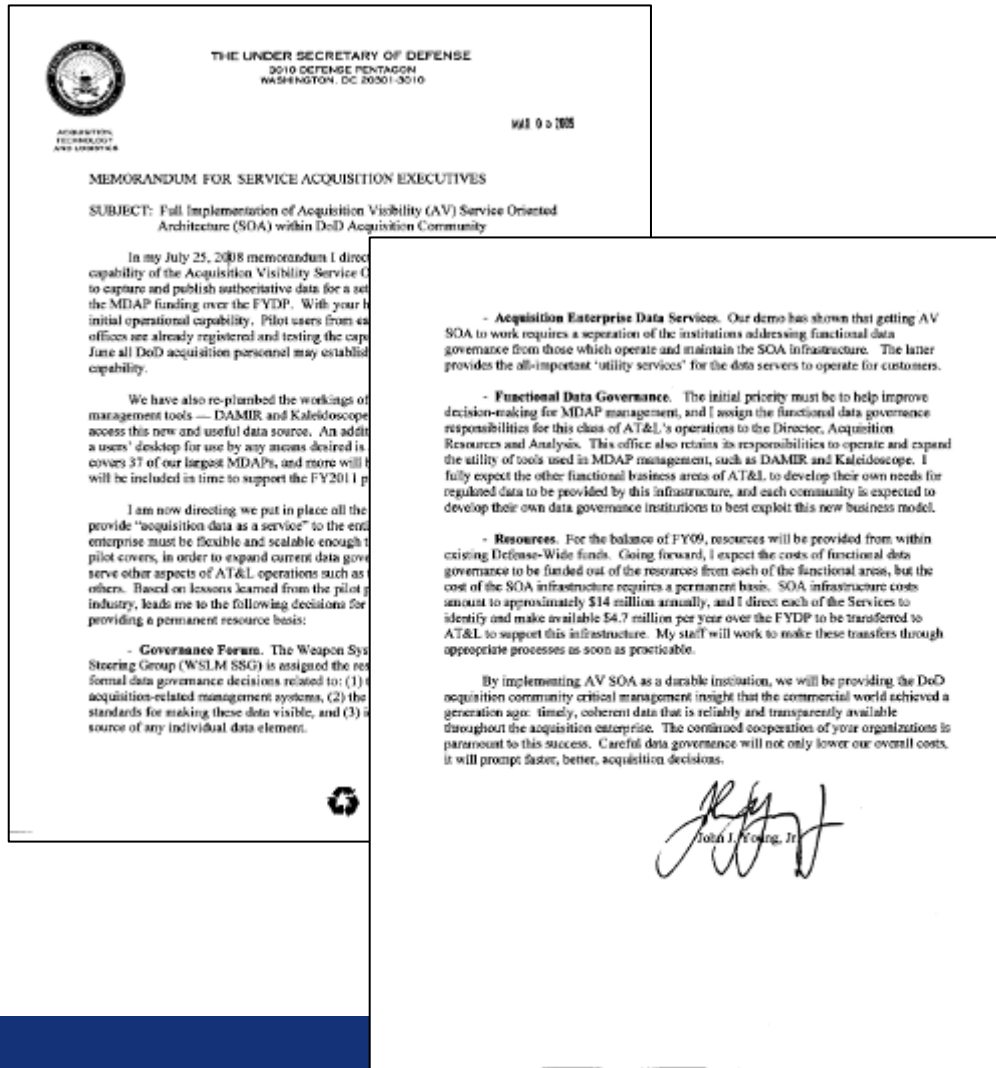
- ▶ **Demo:** February 2008 demonstration of data governance and Service Oriented Architecture to support major weapons system decision making. Completed in ~45 days.
 - Included 61 data elements (Earned Value Management and Unit Cost) for 12 Major Defense Acquisition Programs (MDAPs)—4 from each Military Service

- ▶ **Pilot:** 2008-2009 pilot to solidify governance and technical approach.
 - In December 2008, provided acquisition oversight decision-making information for 37 MDAPs, totaling ~\$1.2T in program value, ~75% of the FYDP.
 - In fall 2009, provided 103 MDAPs and other major programs totaling ~\$1.6T
 - ~148 data elements (Earned Value Management, Program Administration, Unit Cost, Science and Technology, Milestones, Budget/Current Estimate)



AT&L AV SOA – Full Implementation Approval

March 5, 2009



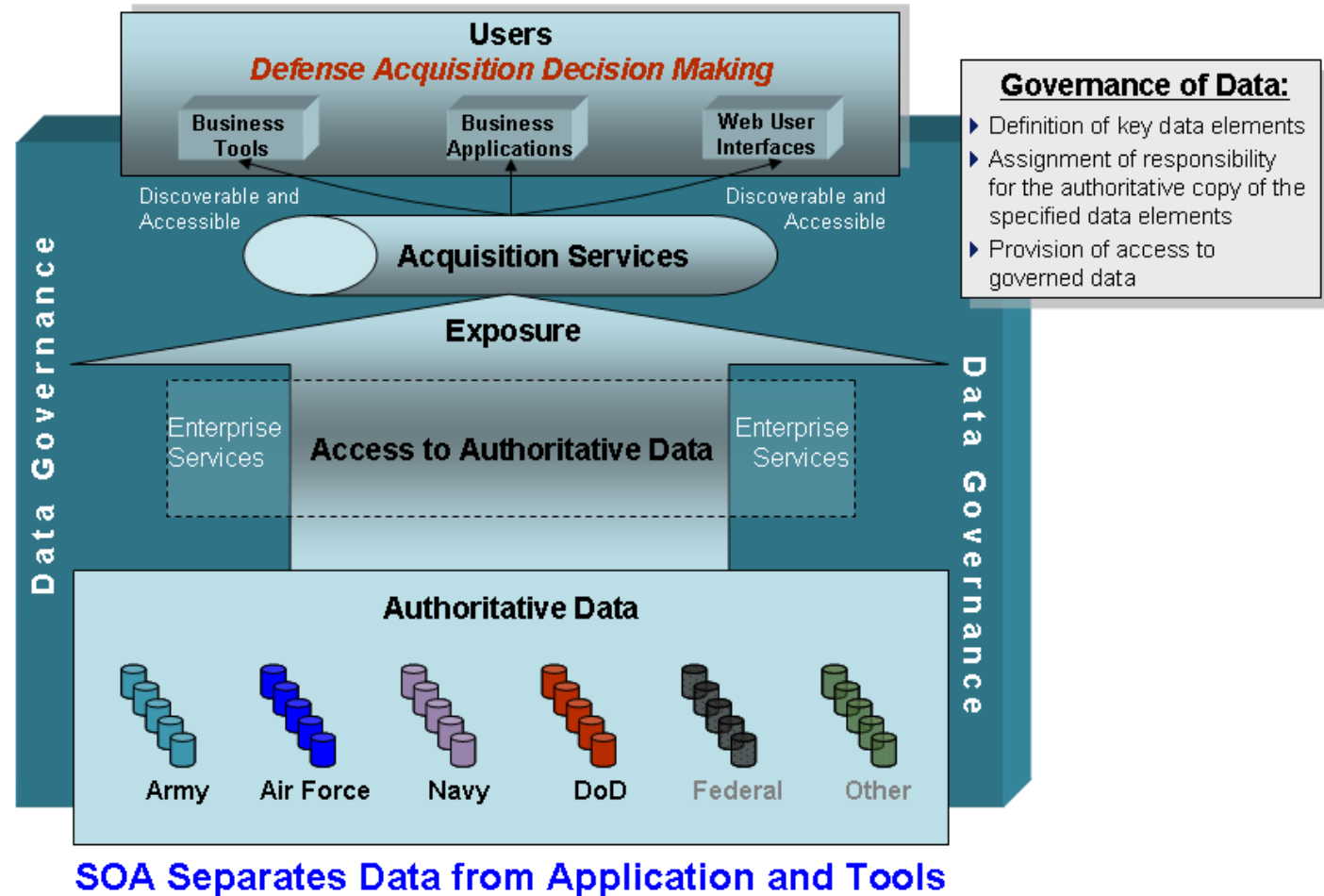
- ▶ USD AT&L issued AT&L AV SOA full implementation memo on March 5, 2009
- ▶ Directs AT&L to put in place all the elements of a durable solution to provide "acquisition data as a service" to the entire acquisition community.
 - Full Acquisition community access by June 09
 - All Major Defense Acquisition Programs (MDAPs) in time to support the FY 2011 program/budget review
- ▶ Separates data governance and SOA infrastructure responsibilities
- ▶ Weapon System Lifecycle Management Senior Steering Group to make all formal governance decisions
 - Director of Acquisition Resources and Analysis responsible for functional data governance for MDAP management
 - Other functional business areas to develop functional data governance to meet their decision-making information needs



Defense Acquisition Visibility via SOA

- ▶ **AV SOA Solution:**
Apply Service Oriented Architecture and data governance to create shared services

- ▶ **Results:**
 - Defense acquisition information transparency across the Department
 - Access to up-to-date, reliable data via any authorized application or analysis tool
 - An extensible platform available for Department-wide use

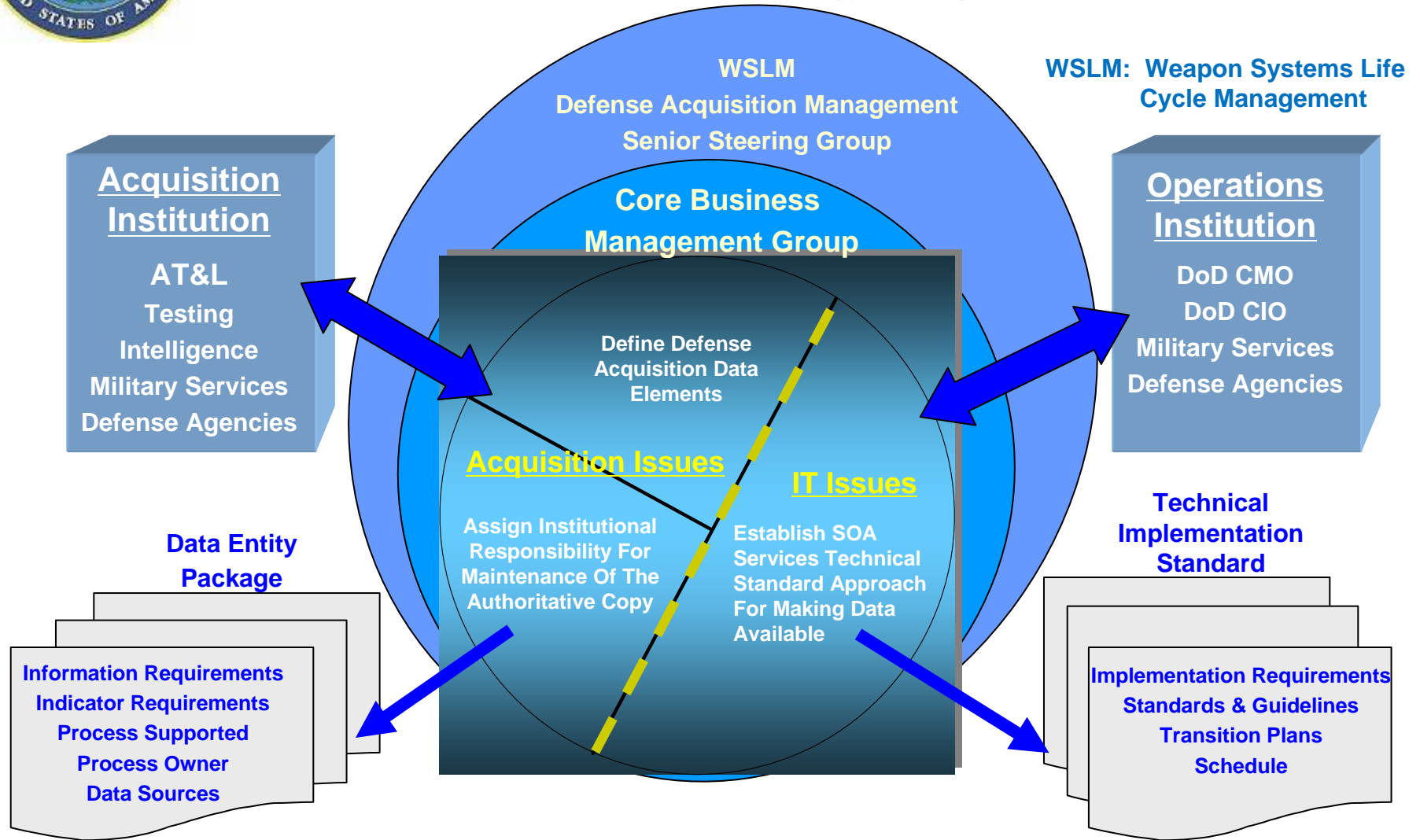


"I reject the idea that the federal government cannot innovate." – Vivek Kundra, Federal CIO



Balancing Functional and Technical Equities

Acquisition Technology & Logistics



Definition of Success

Demonstrating Data Governance

- Define selected Defense acquisition data elements to be exchanged
- Identification of authoritative sources
- Assign institutional responsibility for maintenance of the authoritative copy of each data element within a system

Demonstrating Data Definition Consistency

- Availability of data defined as requested by AT&L
- For the demo, the bar is low: primarily EV- and Nunn-McCurdy-related data

Demonstrating Data Access

- Implementing the SOA infrastructure



AV SOA Data Categories

- ▶ *EVM* – Contract elements included in DAMIR’s “Contract Data Point” and/or reported on the Contract Performance Report (CPR) to track progress
- ▶ *Unit Cost* – Current estimate vs. APB (current and original) at total-appropriation level (RDT&E, Procurement, MILCON, O&M), by fiscal year for comparison, to support risk identification
- ▶ *Budget* – Current President’s Budget and POM/BES submission, by appropriation and fiscal year, for identifying changes in budget positions
- ▶ *Milestone* – Program milestones as agreed upon in the APB, to provide a reference point for tracking progress
- ▶ *Science & Technology* – Compare Key Performance Parameters, thresholds, and objectives to current measurement and to identify critical technologies
- ▶ *Program Administration* – To organize/view information by program, sub-program, budget activity, program element, budget line item, and/or project code



AV SOA Data Elements – 148

Program Administration	Unit Cost (cont'd)
Program Name	Current Estimate - O&M (BY) - Total for all years
Program Number (PNO)	Current Estimate - Development Quantity
Program URI (Uniform Resource Identifier)	Current Estimate - Procurement Quantity
Sub-Program URI	Original Baseline (APB): Development Quantity
Sub-Program Name	Original Baseline (APB): Procurement Quantity
Budget Activity Identifier	Current Baseline (APB): Total RDT&E Cost
PE (Program Element)	Budget
Budget Line Item (formerly Procurement Line Item(PLI))	Original Quantity
PM Management Reserve	Current Quantity
Project Code	Scheduled Quantity
Unit Cost	Delivered Quantity
Current Baseline (APB): Total Procurement Cost	Budget Fiscal Year
Current Baseline (APB): Total MILCON Cost	OTB (Over Target Baseline) - Date
Current Baseline (APB): Total O&M Cost	OTB - BAC Adjustment (\$)
Current Baseline (APB): Total Development Quantity	OTB - SV Adjustment (\$)
Current Baseline (APB): Total Procurement Quantity	OTB - CV Adjustment (\$)
PAUC (Program Acquisition Unit Cost) - Current Estimate	NCC - Original
APUC (Average Procurement Unit Cost) - Current Estimate	NCC (Negotiated Contract Cost) - Current
Estimate Type	Target Price - Current
Base Year - Original APB	Target Price - Original
Base Year - Current APB	Estimated Price - Contractor
Original APB Date	Estimated Price - PM
Current APB Date	Ceiling Price - Current
Program Completion Year	Ceiling Price - Original
Escalation Index	Ceiling Price - Contractor's Estimated
Department Regular Code	Ceiling Price - PMs Estimated
Main Account Code	Completion Date (when BCWS = BAC)
Appropriation FY (Fiscal Year)	TAB (Total Allocated Budget)
Current Estimate - Research, Development, Test & Evaluation (RDT&E) costs	ACWP (Actual Cost of Work Performed)
Current Estimate - Procurement Costs	Current President's Budget RDT&E Submission
Current Estimate - Military Construction (MILCON) Costs	Current President's Budget Procurement Submission
Current Estimate - Operation & Maintenance (O&M) Costs	Current President's Budget MILCON Submission
Current Estimate - Development Quantity	Current President's Budget O&M Submission
Current Estimate - Procurement Quantity	Current President's Budget Development Quantity Submission
Original Baseline (APB): Total RDT&E Cost	Current President's Budget Procurement Quantity Submission
Original Baseline (APB): Total Procurement Cost	RDT&E POM/BES Submission
Original Baseline (APB): MILCON Cost	Procurement POM/BES Submission
Original Baseline (APB): O&M Cost	MILCON POM/BES Submission
Current Estimate - RDT&E (BY) - Total for all years	O&M POM/BES Submission
Current Estimate - Procurement (BY) - Total for all years	POM/BES Development Quantity
Current Estimate - MILCON (BY) - Total for all years	POM/BES Procurement Quantity



AV SOA Data Elements – 148 (cont'd)

Earned Value		Earned Value (cont'd)	
Contract Number		BCWS (Budgeted Cost of Work Scheduled)	
Contract Modification Identifier		CBB (Contract Budget Base)	
Contract Modification Date		EAC - Contractor (Estimate At Completion)	
Contract Type Code		EAC - Contractor Best Case	
Contractor Name		EAC - PM	
Contractor Division		EAC - Contractor Worst Case	
CAGE Code (Commercial And Government Entity Code)		MR (Management Reserve)	
Contractor Location - City		VAC (Variance At Completion)	
Contractor Location - State		% VAC	
Contractor Location - Zip Code + 4		PM VAC	
Contractor Location - Province		% Complete	
Contractor Location - Country		TCPI (To Complete Performance Index)	
Contract Award Date		TCPI - CPI	
Contract Definitization Date		% Schedule	
Contract Effort Number		CPI (Cost Performance Index)	
Contract Effort Name		SPI (Schedule Performance Index)	
Contract Effort Start Date		CV (Cost Variance)	
Contract Effort Completion Date		% CV	
Report Type		SV (Schedule Variance)	
Reporting Period End Date (formerly Report Date)		% SV	
PM Estimates - Reporting Period End Date			
Government-Contractor Share		Science & Technology	
System Name		Critical Technology Element(s)	
System Phase		Key Performance Parameter (KPP) URI	
IBR (Integrated Baseline Review) Date		Key Performance Parameter (KPP) Name(s)	
ECD (Estimated Completion Date) - Contractor		Key Performance Parameter (KPP) - APB Threshold	
ECD - PM		Key Performance Parameter (KPP) - APB Objective	
ECD - PM Significant Effort Completed		Key Performance Parameter (KPP) - Actual Measurement	
ECD - Original PM ECD		Key Performance Parameter (KPP) - Actual Measurement Date	
PAUC (Program Acquisition Unit Cost) - Original APB			
APUC (Average Procurement Unit Cost) - Original APB		Milestone	
PAUC (Program Acquisition Unit Cost) - Current APB		Milestone Identifier	
APUC (Average Procurement Unit Cost) - Current APB		Milestone Name	
BAC - Contractor (Budget At Completion)		Milestone Estimated Date	
BAC - PM		Milestone Date - Objective	
BCWP (Budgeted Cost of Work Performed)		Milestone Date - Threshold	



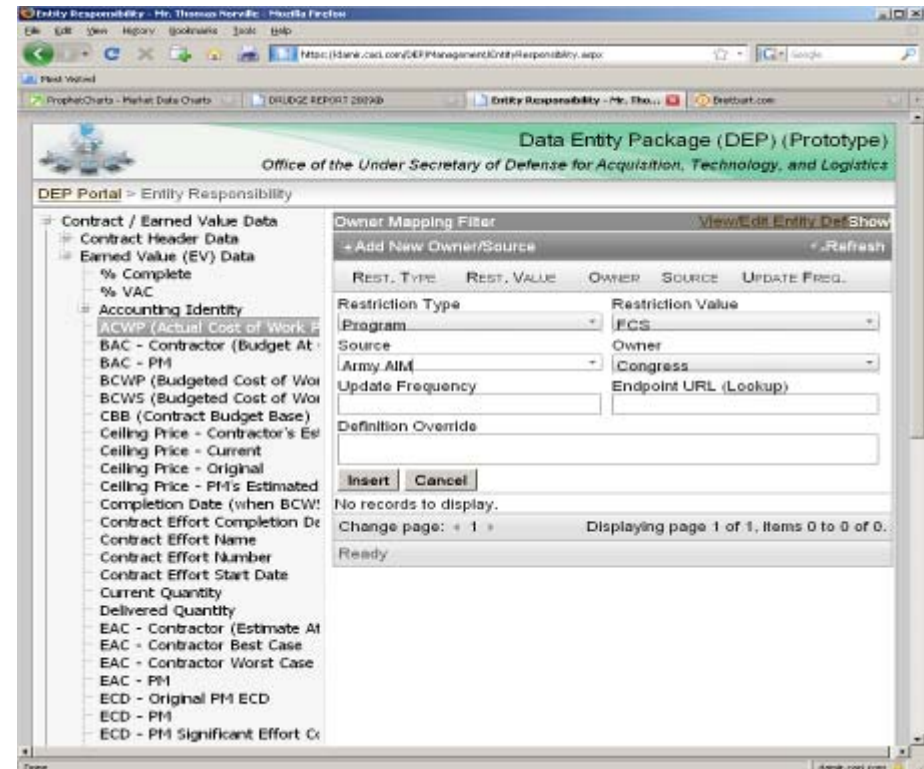
Backup



Defense Acquisition Data Governance: Enabling Acquisition Visibility

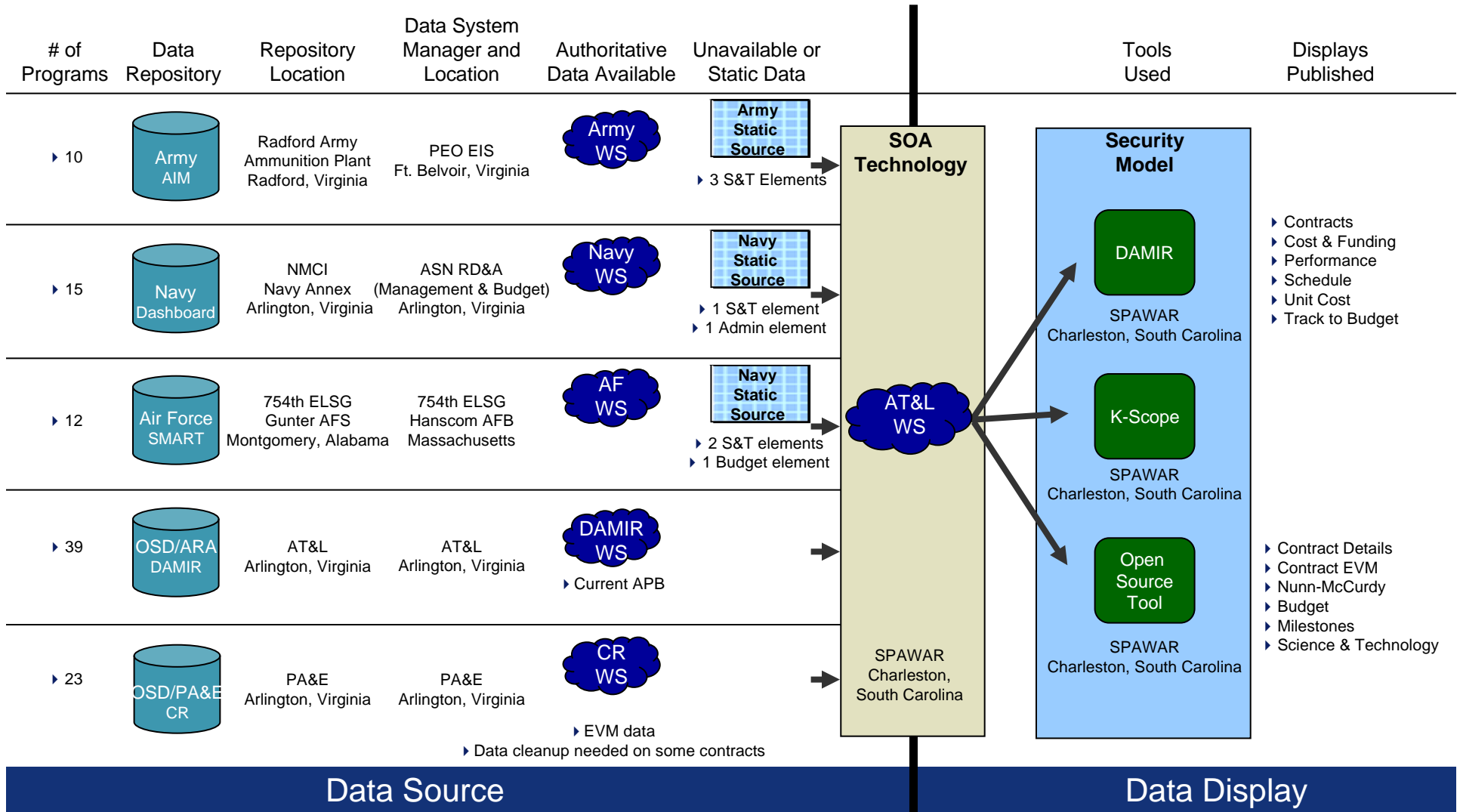
Data Entity Package

- ▶ Acquisition Technology & Logistics created an online tool, the Data Entity Package (DEP), for managing governance of Defense acquisition data
- ▶ For each element—by program—DEP specifies the data definition, authoritative source, individual responsible for maintaining the authoritative copy of that data element
- ▶ DEP is a ‘contract’ between players in the SOA environment
- ▶ Acquisition Technology & Logistics governance organization is the authority for establishing data priorities
- ▶ Having brought a new data element under governance, implementation requires technical integration to be included in the AV SOA





AT&L AV SOA Pilot Architecture



Data Source

Data Display



AT&L AV SOA Pilot – Army Programs

PNO#	SERVICE	TITLE	LONG TITLE
182	ARMY	LUH	Light Utility Helicopter
202	ARMY	AB3	Apache Block III
219	ARMY	ATIRCM/CMWS	Advance Threat Infrared Countermeasures / Common Missile Warning System
260	ARMY	GMLRS	Guided Multiple Launch Rocket System
278	ARMY	CH-47F	Cargo Helicopter
294	ARMY	FBCB2	Force XXI Battle Command Brigade and Below Program
299	ARMY	STRYKER	Armored Vehicle
301	ARMY	FCS	Future Combat Systems
341	ARMY	BLACK HAWK UPGRADE (UH-60M)	Utility Helicopter Upgrade Program
346	ARMY	WIN-T INCREMENT 1	Warfighter Information Network
347	ARMY	GCSS ARMY	Global Combat Support System Army
349	ARMY	WIN-T INCREMENT 2	Warfighter Information Network - Tactical Increment 2
350	ARMY	WIN-T INCREMENT 3	Warfighter Information Network - Tactical Increment 3
366	ARMY	EXCALIBUR	Family of Precision, 155mm Projectiles
367	ARMY	HIMARS	High Mobility Artillery Rocket System
372	ARMY	JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
420	ARMY	ER/MP UAS	Extended Range Multi-Purpose Unmanned Aircraft System
531	ARMY	PATRIOT/MEADS CAP	Patriot/Medium Extended Air Defense System Combined Aggregate Program
601	ARMY	BRADLEY UPGRADE	Bradley Fighting Vehicle System Upgrade
746	ARMY	FMTV	Family of Medium Tactical Vehicles
831	ARMY	LONGBOW APACHE	Airframe Modifications on the APACHE Helicopter

Bolded programs were included in Pilot Phase 1



AT&L AV SOA Pilot – Navy Programs

PNO#	SERVICE	TITLE	LONG TITLE
101	NAVY	H-1 UPGRADES (4BW/4BN)	United States Marine Corps Mid-Life Upgrade to AH-1W Attack Helicopter and UH-1N Utility Helicopter
161	NAVY	CVN 68	NIMITZ CLASS Nuclear Powered Aircraft Carrier
178	NAVY	TRIDENT II MISSILE	Sea Launched Ballistic Missile
180	NAVY	DDG 51	ARLEIGH BURKE CLASS Guided Missile Destroyer
191	NAVY	MH-60R	Multi-Mission Helicopter Upgrade
197	NAVY	DDG 1000	ZUMWALT CLASS Destroyer
212	NAVY	V-22	OSPREY Joint Advanced Vertical Lift Aircraft
223	NAVY	CVN 78	GERALD R. FORD CLASS Nuclear Aircraft Carrier
238	NAVY	JPALS	Joint Precision Approach and Landing System
247	NAVY	JHSV	Joint High Speed Vessel
253	NAVY	VTUAV	Vertical Takeoff and Land Tactical Unmanned Aerial Vehicle (Fire Scout)
282	NAVY	MH-60S	Multi-Mission Combat Support Helicopter
286	NAVY	RMS	Remote Minehunting System
289	NAVY	TACTICAL TOMAHAWK	Follow-on to TOMAHAWK Baseline missile program
290	NAVY	NMT	Advanced Extremely High Frequency Navy Multiband Terminal Satellite Program
333	NAVY	LHA 6 - AMERICA CLASS	Amphibious Assault Ship
334	NAVY	P-8A	Poseidon Program
345	NAVY	MUOS	Mobile User Objective System
353	NAVY	JOINT MRAP	Joint Mine Resistant Ambush Protected Vehicles
364	NAVY	E-2D AHE	E-2D Advanced Hawkeye
365	NAVY	COBRA JUDY REPLACEMENT	COBRA JUDY REPLACEMENT
368	NAVY	AGM-88E AARGM	AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) Program
373	NAVY	BAMS UAS	Broad Area Maritime Surveillance Unmanned Aircraft System
374	NAVY	LCS	Littoral Combat Ship
378	NAVY	EA-18G	Airborne Electronic Attack Variant of the F/A-18 Aircraft

PNO#	SERVICE	TITLE	LONG TITLE
390	NAVY	CH-53K	Heavy Lift Replacement Program
391	NAVY	SM-6	Standard Missile 6
418	NAVY	IDECM	Integrated Defensive Electronic Countermeasures
419	NAVY	EA-6B ICAP III	EA-6B Improved Capability (ICAP) III Program
515	NAVY	EFV	Expeditionary Fighting Vehicle
516	NAVY	SSN 774	VIRGINIA CLASS submarine
542	NAVY	LPD 17	SAN ANTONIO CLASS Amphibious Transport Dock Ship
549	NAVY	F/A-18E/F	SUPER HORNET Naval Strike Fighter
581	NAVY	AIM-9X	Air-to-Air Missile Upgrade
582	NAVY	CEC	Cooperative Engagement Capability
592	NAVY	T-AKE	LEWIS AND CLARK Class of Auxiliary Dry Cargo Ships
766	NAVY	JSOW (BASELINE/UNITARY)	Joint Standoff Weapon Baseline Variant and Unitary Warhead Variant

Bolded programs were included in Pilot Phase 1

Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA



AT&L AV SOA Pilot – Air Force Programs

PNO#	SERVICE	TITLE	LONG TITLE
166	USAF	NAVSTAR GPS	Global Positioning System
176	USAF	EELV	Evolved Expendable Launch Vehicle
185	USAF	AMRAAM	Advanced Medium Range Air-to-Air Missile
199	USAF	FAB-T	Family of Beyond Line-of-Sight Terminals
200	USAF	C-17A	GLOBEMASTER III Advanced Cargo Aircraft Program
210	USAF	SBIRS HIGH	Space-Based Infrared System Program, High Component
220	USAF	C-130J	HERCULES Cargo Aircraft Program
224	USAF	B-2 EHF INCREMENT I	B-2 Advanced Extremely High Frequency SatCom Capability
237	USAF	GBS	Global Broadcast Service
239	USAF	NPOESS	National Polar-Orbiting Operational Environmental Satellite System
248	USAF	Minuteman III PRP	Minuteman III Propulsion Replacement Program
252	USAF	GLOBAL HAWK (RQ-4A/B)	GLOBAL HAWK (RQ-4A/B)
261	USAF	AEHF	Advanced Extremely High Frequency Satellite Program
265	USAF	F-22	RAPTOR Advanced Tactical Fighter
271	USAF	PREDATOR	Unmanned Aircraft System
273	USAF	C-5 AMP	C-5 Aircraft Avionics Modernization Program
277	USAF	AWACS UPGRADE	AWACS Upgrade
292	USAF	GPS-III A	Global Positioning Satellite III
293	USAF	MP RTIP	Multi-Platform Radar Technology Insertion Program
298	USAF	C-130 AMP	C-130 Aircraft Avionics Modernization Program
326	USAF	WGS	Wideband Global SATCOM Program
327	USAF	C-5 RERP	C-5 Aircraft Reliability Enhancement and Re-engining Program
328	USAF	SBSS B10	Space-Based Space Surveillance Block 10
354	USAF	SDB-I	Small Diameter Bomb Increment I

PNO#	SERVICE	TITLE	LONG TITLE
357	USAF	LAIRCM	Large Aircraft InfraRed CounterMeasures Program
375	USAF	ASIP	Airborne Signals Intelligence Payload Program
376	USAF	B-2 RMP	B-2 Radar Modernization Program
387	USAF	KC-X	Tanker Replacement Program
394	USAF	MPS INCREMENTS I - III	Mission Planning System Increments I - III
424	USAF	REAPER	Unmanned Aircraft System
503	USAF	JDAM	Joint Direct Attack Munition
537	USAF	NAS	National Airspace System
555	USAF	JASSM	Joint Air-to-Surface Standoff Missile
560	USAF	JPATS	Joint Primary Aircraft Training System

Bolded programs were included in Pilot Phase 1

Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA



AT&L AV SOA Pilot – Joint Programs

PNO#	SERVICE	TITLE	LONG TITLE
183	JOINT	JCA	Joint Cargo Aircraft
198	JOINT-USAF	F-35 Lightning II	Joint Strike Fighter (JSF) Program
243	JOINT	CHEM DEMIL-ACWA	Chemical Demilitarization Program - Assembled Chemical Weapons Alternatives
284	JOINT	JTRS NED	Joint Tactical Radio System Network Enterprise Domain
285	JOINT	CHEM DEMIL-CMA	Chemical Demilitarization Program - Chemical Materials Agency Program
360	JOINT	JTRS GMR	Joint Tactical Radio System Ground Mobile Radio
362	JOINT	BMDS	Ballistic Missile Defense System Program
380	JOINT	AMF JTRS	Joint Tactical Radio System Airborne & Maritime/Fixed Station
385	JOINT	JTRS HMS	Joint Tactical Radio System Handheld, Manpack, and Small Form Fit Radios
554	JOINT	MIDS	Multi-Functional Information Distribution System

Bolded programs were included in Pilot Phase 1