



Lessons Learned from Implementing CADM for Integrated Architectures

Briefing to CISA Worldwide
30 October 2002

Department of the Navy
Chief Information Officer
Enterprise Architecture Team



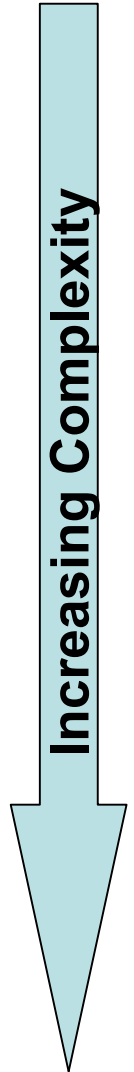
Briefing Outline

- Lessons Learned About:
 - Deciding that you need an Integrated Architecture Database
 - Managing Architecture Data
 - Building an Integrated Architecture Database
 - Using an Integrated Architecture Database
- Summary and Conclusion



Three Levels of Architecture Integration

- Stand-alone
 - Architecture “Gurus” or SMEs develop and promulgate for implementation
- Distributed
 - Multiple architecture teams work toward and interoperable solution
- Enterprise
 - All parts of the enterprise within the architecture space collaborate on information, issues, and decision-making, whether they are ‘architects’ or not.





Standalone

Pro's

- Easiest, quickest, and cheapest
- Sufficient for non-complex architectures
 - Size
 - Issues
- Very good when solution is known and just needs to be documented

Con's

- Solutions are typically non-interoperable
- Redundant effort
- Mirrors “stovepiped” systems
- Don't scale well



Distributed

Pro's

- Split the job into SME teams
- Reduces complexity by breaking up the job
- Less stovepiped

Con's

- Coordination on terms and objects
- Reconciliation of different conclusions
- Redundant effort
- Re-entry of ADS data
- Value not recognized by rest of enterprise



Enterprise

Pro's

- Holistic – many of the interdependent variables accounted for
- Becomes an Enterprise decision resource
 - Reduce ad-hoc and often redundant data calls
- Sub-enterprise architectures 'borrow from'

Con's

- Most expensive
- Difficult to demonstrate ROI up front
- Requires data management
- Requires solving the ADS problem
- Requires semantic data standards
- Sustain/maintain
 - Sr. Level Commitment
 - Refresh



Qualities of an Integrated Architecture Database (IAD)

- Consistency:
 - Within a product by levels of abstraction
 - Across products
 - Across Inter-project teams, mission areas, capabilities, functional areas, etc.
 - Inter-agency
- Easier to maintain and keep validated
- Relates to other enterprise data
- Multi-perspective views and re-use
- Authoritative Data Source Interfaces
- Real-time Decision Support
- Multiple Tools Interfaced to Common Repository



Integrated Architecture Data Mgmt

CIO
Acquisition Authority
Sub (Service) CIO's
Functional Area Mangers
Functional Data Managers
Echelon 2 Chief Engineers & CIO's
Program Managers
Doctrine and Training Commands

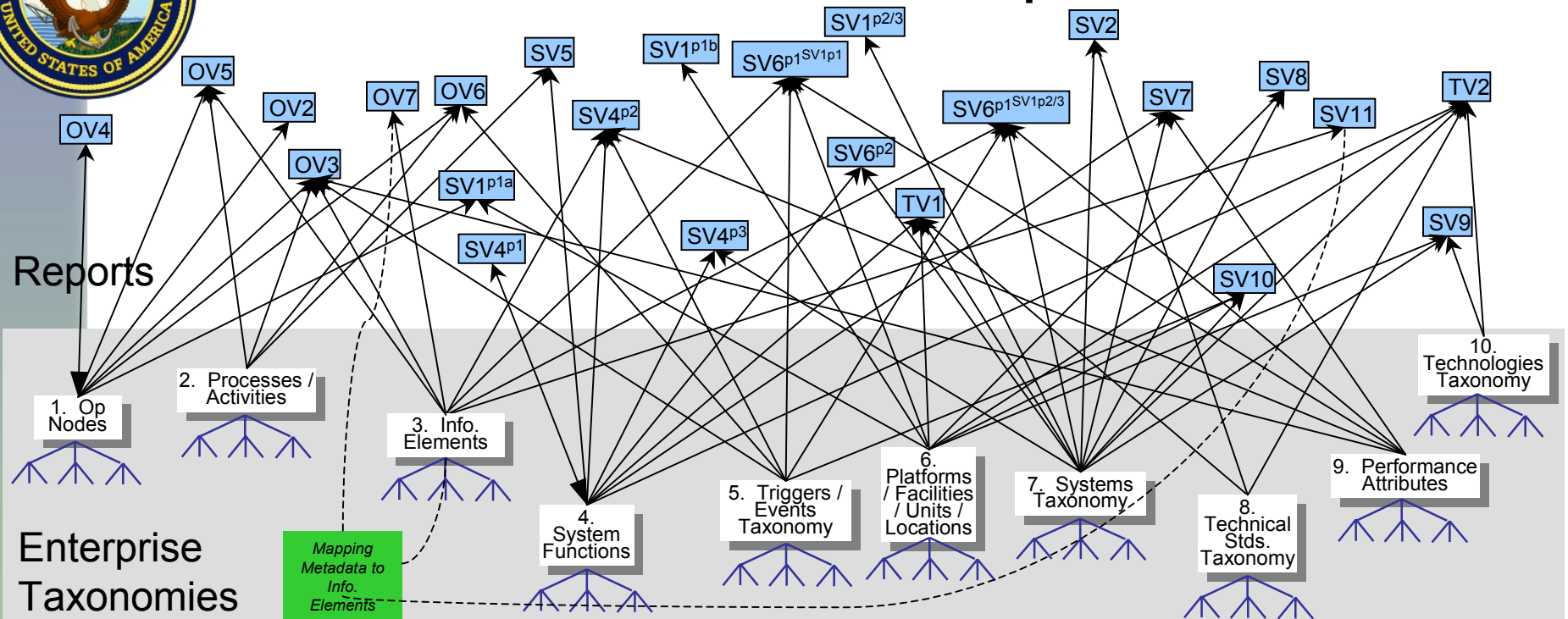
Architecture Data
Op Nodes <i>(Needlines, Command Relationships, Info Rqmts, FLUP rqmts)</i>
Activities/Tasks <i>(Activitylines, Sequences, Activity Info Rqmts)</i>
Information <i>(Data mapping, System / App, System Function, FLUP interfaces)</i>
Data <i>(System / App, FLUP, System Function interfaces)</i>
Systems/Apps <i>(Interfaces, Functional allocation, Performance & Tech Stds,</i>
System Functions <i>(Funcnional design, perf characteristics, tech stds per function)</i>
Performance Characteristics <i>(relate to Tech Stds, spec for FLUPs)</i>
Technical Stds <i>(Interdependency, spec to FLUPs)</i>
Facilities / Locations / Units / Platforms <i>(FLUP interfaces)</i>
Technology Areas <i>(Tech programs applic to systems, system functions, FLUPs,</i>
Triggers / Events <i>(to processes, nodes, systems, correlation)</i>

Taxonomies											
Op Nodes (Orgs, Org Types, & Occ. Spec.)	Activities/Tasks	Information	Data	Systems/Apps	System Functions	Performance Attributes	Technical Stds	Facilities / Locations / Units / Platforms	Technology Areas	Trigger Events	
o	o	o	o	o	o	o	A	o	o	o	
				o	A	A	s	s	A		
		s	s	s	s				s		
s	A			A	A	s	s	A	s	s	
		A	A								
		s	s	s	s	A	s		s		
			s	s	s	s			s		
A	A	s						s		A	
(symmetric)											
(Needlines, Command Relationships, Info Rqmts, FLUP rqmts)											
(Activitylines, Sequences, Activity Info Rqmts)											
(Data mapping, System / App, System Function, FLUP interfaces)											
(System / App, FLUP, System Function interfaces)											
(Interfaces, Functional allocation, Performance & Tech Stds,											
(Funcnional design, perf characteristics, tech stds per function)											
(relate to Tech Stds, spec for FLUPs)											
(Interdependency, spec to FLUPs)											
(FLUP interfaces)											
(Tech programs applic to systems, system functions, FLUPs,											
(to processes, nodes, systems, correlation)											

DRAFT Notional Fill



Taxonomies Relationships to Architecture Reports



Reports Subparts Legend:

SV4^{p1} = System Functions Taxonomy

SV4^{p2} = Function Information Flow Spec./Desc.

SV4^{p3} = Functional Allocation

SV1^{p1a} = Operational Node PFU Operation Rqmts/Desc.

SV1^{p1b} = System Interface Description, Internodal

SV1^{p2/3} = System Interface Description, Intranodal and Intrasystem

SV6^{p1SV1p1} = System Information Exchange Description, Internodal

SV6^{p1SV1p2/3} = System Information Exchange Description, Intranodal and Intrasystem

Taxonomies = {
 The dictionary of words or terms used in the architecture
 The Enterprise common terms of reference
 The Enterprise essential elements of architecture
 The categories and composition of those objects and elements

Select a Taxonomy Type

Process Activities

Taxonomy Mode

Change Mode

- 0 - PROCESS ACTIVITIES
 - 1 - Provide Operational C2
 - 1.1 - Lead the Force
 - 1.2 - Provide Command and Control
 - 1.2.1 - Act on a COA
 - 1.2.1.1 - Assess Operations
 - 1.2.1.2 - Command Subordinate Forces (Execute)
 - 1.2.1.3 - Prepare Plans & Orders
 - 1.2.1.3.1 - Approve Plans & Orders
 - 1.2.1.3.2 - Coordinate and Integrate Joint/Multinational and Interagency
 - 1.2.1.3.2.1 - Approve Plans and Orders
 - 1.2.1.3.2.2 - Coordinate Coalition Support
 - 1.2.1.3.2.3 - Coordinate Host Nation Support
 - 1.2.1.3.2.4 - Coordinate Host-Nation Support
 - 1.2.1.3.2.5 - Coordinate Plans with non-DOD Organizations
 - 1.2.1.3.2.6 - Develop Multinational Intelligence/Information Sharing S
 - 1.2.1.3.3 - Prepare Campaign Plans & Orders
 - 1.2.2 - Decide on a COA
 - 1.2.3 - Observe the JOA
 - 1.2.4 - Orient on the Operational Situation
 - 1.3 - Unspecified
 - 2 - Tasks
 - 2.1 - Distribute
 - 2.2 - NTA
 - 2.3 - OP
 - 2.3.1 - CONDUCT OPERATIONAL MOVEMENT AND MANEUVER (OP - 1)
 - 2.3.2 - EMPLOY OPERATIONAL FIREPOWER (OP - 3)
 - 2.3.3 - PROVIDE OPERATIONAL COMMAND AND CONTROL (C2) (OP - 5)
 - 2.3.4 - PROVIDE OPERATIONAL FORCE PROTECTION (OP - 6)
 - 2.3.5 - PROVIDE OPERATIONAL INTELLIGENCE, SURVEILLANCE, AND RE
 - 2.3.6 - PROVIDE OPERATIONAL LOGISTICS AND PERSONNEL SUPPORT
 - 2.4 - SM

Full Name	Coordinate Host-Nation Support
Description	A2.4.1.2.2 Coordinate Host-Nation Support

DIAD Message

Process Activities

Do you want to move or merge these items.

Move Merge Cancel

Create New Delete Count Usage Undo Save Changes

Export Import Respec. Check here to redo specification numbers manually.

To move a node, hold down the shift key BEFORE selecting the node to drag.

Database Actions Backup/Restore

Select a Taxonomy Type

Process Activities

Taxonomy Mode

Change Mode

- [-] 0 - PROCESS ACTIVITIES
 - [-] 1 - Acquisition
 - [+] 1.1 - Acquisition Logistics
 - [+] 1.2 - Auditing
 - [+] 1.3 - Business, Cost Estimating, and Financial Management
 - [+] 1.4 - Contracting
 - [+] 1.5 - Facilities Engineering
 - [+] 1.6 - Industrial and/or Contract Property Management
 - [+] 1.7 - Information Technology
 - [+] 1.8 - Manufacturing, Production, and Quality Assurance
 - [+] 1.9 - Program Management
 - [+] 1.10 - Purchasing
 - [+] 1.11 - Science and Technology
 - [+] 1.12 - Systems Planning, Research, Development and Engineering
 - [+] 1.13 - Test and Evaluation
 - [-] 2 - Administration
 - [-] 3 - Civilian Personnel
 - [-] 4 - Command and Control
 - [-] 5 - Financial Management
 - [-] 6 - Information Warfare
 - [-] 7 - Intelligence and Cryptology
 - [-] 8 - Legal
 - [+] 8.1 - ADR
 - [+] 8.2 - Ethics Program Management
 - [+] 8.3 - Internal Organization Management
 - [+] 8.4 - Investigations and Audits
 - [+] 8.5 - IP
 - [+] 8.6 - Legal Advice
 - [+] 8.7 - Legal Assistance for Military Personnel
 - [+] 8.8 - Legal Oversight and Activity Management
 - [+] 8.9 - Legal Research
 - [+] 8.10 - Legal Writing
 - [+] 8.11 - Litigation and Appellate Management
 - [+] 8.12 - Military Justice
 - [+] 8.13 - Protection of Privileged Information
 - [+] 8.14 - Representation of the Department of the Navy
 - [+] 8.15 - Training
 - [-] 9 - Logistics
 - [-] 10 - Manpower and Personnel
 - [-] 11 - Medical
 - [-] 12 - Meteorology, Oceanography, GI&S
 - [-] 13 - Modeling and Simulation
 - [-] 14 - Naval Nuclear Propulsion
 - [-] 15 - Naval Reserve
 - [-] 16 - Precise Time and Astrometry
 - [-] 17 - Readiness
 - [-] 18 - Religious Ministries
 - [-] 19 - Resources, Requirements, and Assessments
 - [-] 20 - Scientific and Technical
 - [-] 21 - Test & Evaluation
 - [-] 22 - Training and Education
 - [-] 23 - Weapons Planning and Control

Full Name	PROCESS ACTIVITIES
Description	<p>A. DEFINITION</p> <p>1. AFD 2.0: Process -- A group of logically related activities required to execute a specific task or group of tasks (Army Systems Architecture Framework). Note: Multiple activities make up a process (SPAWAR). Task -- A discrete unit of work, not specific to a single organization, weapon system, or individual, that enables missions or functions to be accomplished. (Extension from UJTL, JCSM 3500.04A, 1996) Note: Multiple processes accomplish a task; a single process may support multiple tasks (SPAWAR).</p> <p>2. CADM 2.0: PROCESS-ACTIVITY (4204/2) (A) -- THE REPRESENTATION OF A MEANS BY WHICH A PROCESS ACTS ON SOME INPUT TO PRODUCE A SPECIFIC OUTPUT. (DDDS, June 1998)</p> <p>3. Discussion. An activity is a defined task that is performed by a person or group of people performing in the role of an organization type. An activity could be a high level task such as PREPARATION of forces for a mission or exercise, or could be a low-level task such as 'Patrol Law Enforcement Area.'</p> <p>B. USAGE</p> <p>Activities are used in OV-3, OV-5, SV-4 (System Functionality Description) and SV-5 (Operational Activity to System Function Traceability Matrix).</p>

Check here to redo specification numbers manually.

To move a node, hold down the shift key BEFORE selecting the node to drag.

Select a Taxonomy Type

Information Elements

Mapping Mode

Change Mode

DADMS Interface

- 0 - INFORMATION ELEMENTS
 - 1 - ACTION INFO
 - 2 - ADMINISTRATIVE INFO
 - 3 - FINANCE INFO
 - 4 - GEOPHYSICAL INFO
 - 5 - HEALTH SERVICES INFORMATION
 - 6 - LEVELS OF SUPPORT
 - 7 - LOGISTICS INFORMATION
 - 8 - MAGT (Abstract) INFO
 - 9 - MEASUREMENT INFORMATION
 - 9.1 - Acoustic
 - 9.2 - Communications
 - 9.3 - Emitter
 - 9.4 - ED/Visual
 - 9.5 - Exploitation
 - 9.6 - HUMINT
 - 9.7 - IR
 - 9.8 - MASINT
 - 9.9 - Navigation
 - 9.10 - Other Intelligence Data
 - 9.11 - Other Intelligence Data About Track/Point
 - 9.12 - Radar
 - 9.13 - Sensor Exchange
 - 9.14 - Space
 - 10 - PERSONNEL INFORMATION
 - 11 - PLATFORM / FAC / UNIT INFO
 - 11.1 - Activity/ Intent
 - 11.2 - Associations
 - 11.3 - Attributes
 - 11.4 - Classification
 - 11.5 - DRMS Reports
 - 11.6 - Fusion Structure
 - 11.7 - Identification
 - 11.8 - Kinematics
 - 11.9 - Platfac C&P
 - 11.10 - Platfac Indicators
 - 12 - Rationalization/NMCI Info
 - 13 - SITUATION INFO
 - 14 - SYSTEM INFO
 - 14.1 - AAM C&P
 - 14.2 - Acoustic C&P
 - 14.3 - Aerial Bomb C&P
 - 14.4 - Aerial Guns C&P
 - 14.5 - Aerial Rocket C&P
 - 14.6 - Airfield Equipment C&P
 - 14.7 - BM C&P
 - 14.8 - Communications Equipment
 - 14.9 - Decoy C&P
 - 14.10 - Depth Charge/Bomb C&P
 - 14.11 - Elex Systems CPCS
 - 14.12 - ED C&P
 - 14.13 - Fusion Systems C&P

- 0 - DATA SOURCES
 - 1 - : : ADDR
 - 2 - : : TADILJ
 - 2.1 - : : J18.2
 - 2.2 - : : J0.0
 - 2.3 - : : J18.1
 - 2.4 - J0.2: The J0.2 Network Time Update message adjusts the system time to a standard time.
 - 2.5 - J0.3: The J0.3 Time Slot Assignment message is used to permit dynamic assignment of time slots to JUs by a responsible JU.
 - 2.6 - J0.4: The J0.4 Radio Relay Control message provides the means for the JU responsible for relay control to assign and deassign the paired s
 - 2.7 - J0.5: The J0.5 Repromulgation Relay message is used to request that those messages in the same time slot containing the J0.5 message b
 - 2.8 - J0.6: The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communications and
 - 2.9 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of time slots
 - 2.10 - J10.2: The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Target TN.
 - 2.11 - J10.3: The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between controlling unit
 - 2.12 - J10.5: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission correlat
 - 2.13 - J10.6: The J10.6 Pairing message provides a means to indicate a pairing (not engagement status) between a friendly track and another tr
 - 2.14 - J12.0: The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target information to e
 - 2.15 - J12.1: The J12.1 Vector message is used by C2 JUs to send vector information and vector discrettes specifically to air units operating on it
 - 2.16 - J12.3: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.
 - 2.17 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to handoff to the
 - 2.17.1 - J12.4: Link 4 Frequency
 - 2.17.2 - J12.4: Radio Type
 - 2.17.3 - J12.4: Secure Radio Indicator
 - 2.17.4 - J12.4: Track Number, Addressee
 - 2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance
 - 2.17.6 - J12.4: Receipt/Compliance
 - 2.17.7 - J12.4: Control Channel
 - 2.17.8 - J12.4: Control Change Indicator
 - 2.17.9 - J12.4: Voice Frequency/Channel Indicator
 - 2.17.10 - J12.4: Voice Frequency/Channel
 - 2.17.11 - J12.4: Mode III Code
 - 2.17.12 - J12.4: Message Only
 - 2.17.13 - J12.4: Track Number, New Control Agency
 - 2.17.14 - J12.4: Squawk Flash Indicator
 - 2.17.15 - J12.4: Voice Call Sign, New Control Agency
 - 2.18 - J12.5: The J12.5 Target/Track Correlation message is used by controlling C2 JUs to (a) correlate a target and a track, (b) decorrelate a t
 - 2.19 - J12.6: The J12.6 Target Sorting message is used to (a) enable nonC2 JUs to distinguish targets among themselves, (b) pass uncorrelated
 - 2.20 - J12.7: The J12.7 Target Bearing Message
 - 2.21 - J13.2: The J13.2 Air Platform and System Status message provides the current status of an air platform to include ordnance load, fuel, ope
 - 2.22 - J13.3: The J13.3 Surface (Maritime) Platform and System Status message provides the current status of a surface (maritime) platform to inc
 - 2.23 - J14.0: The J14.0 Electronic Warfare Parametric message provides ESM/ECM parametric data
 - 2.24 - J14.2: The J14.2 Electronic Warfare Control/Coordination message provides the means for EW participants to coordinate EW activities ar
 - 2.25 - J17.0: The J17.0 Target Nomination/Engagement Point Location msg.
 - 2.26 - J17.1: The J17.1 Weapon-Target Pairing (WTP) msg
 - 2.27 - J17.2: The J17.2 Weather Message
 - 2.28 - J17.3: The J17.3 Radar Service Request/Response msg
 - 2.29 - J17.4: The J17.4 MTI detections resulting from a complet WAS radar coverage
 - 2.30 - J17.6: The J17.6 Radar Service Request/Response msg
 - 2.31 - J18.0: The J18.0 Handover
 - 2.32 - J2.0: The J2.0 Indirect Interface Unit PPLI message is used to provide Participating Unit/Reporting Unit information on the Link 16 network
 - 2.33 - J2.2: The J2.2 Air PPLI message is used to provide all ILL information about airborne ILLs on the Link 16 network. It is used by airborne

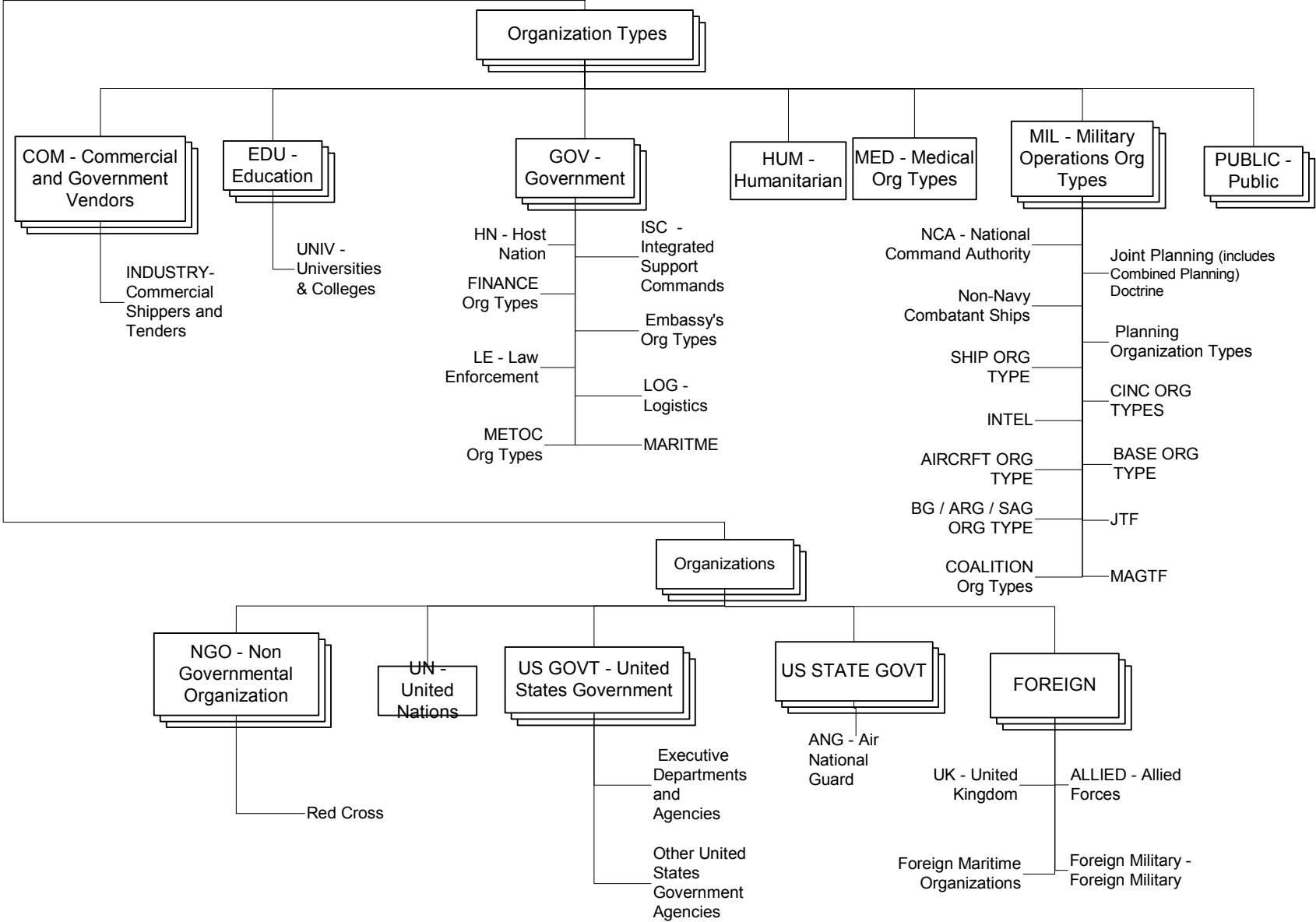
Description:

Sensor measurements resulting from reflected man-made electromagnetic waves in the 100 to 25,000 MHz spectrum.

Description

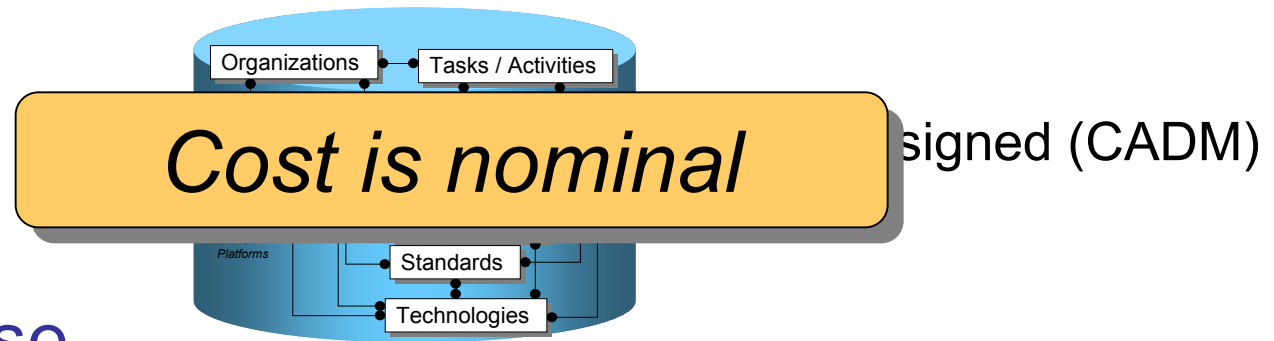
No Description

OPERATIONAL NODES - Organizations,
Organization Types, and Occupational



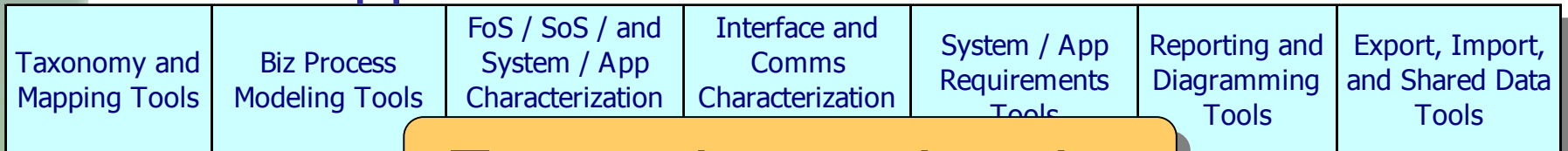


An Implementation

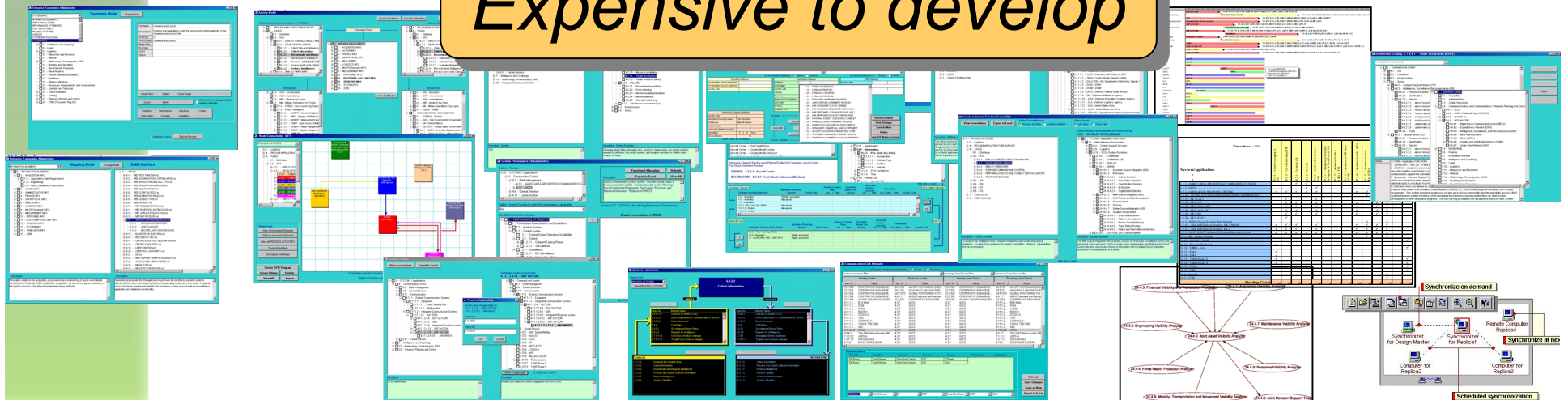


A Database

Set of Applications

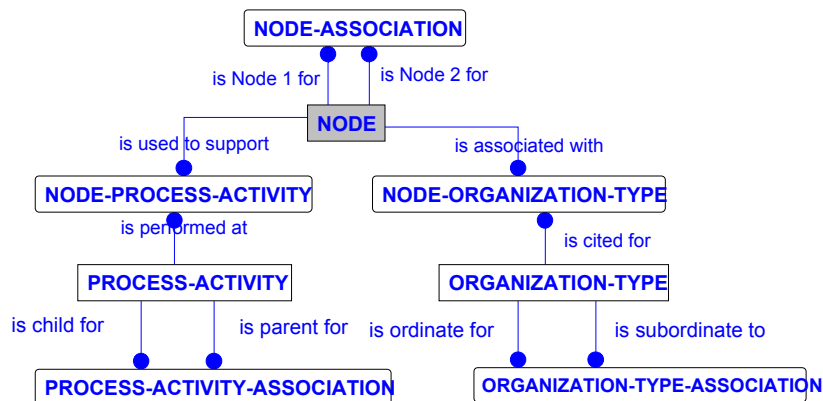


Expensive to develop





GUI vs. Data Structure



Node_1	NODE	Node_2	NODE	NA_ID	NA_nm	NA_descr_tx	NA_cat_cd	NA_ty_cd	DOC-ID	NA_colloc_ind
	373			0			01	01		
210	330			0			01	01		
210	5714			0	Joint Intelligenc		04	01		
220	3585			0	ANTIETAM to A		04	01		
228	3585			0	ANTIETAM to A		04	01		
233	3585			0	ANTIETAM to C		04	01		
233	8023			0			04	01		
236	2427			0			04	01		
243	449			0			01	01		

14515

NODE_ID	NODE_nm	NODE_descr_tx	NODE_cat_cd	NODE_phy_ind_cd	NODE_lim_descr_tx
202	ACE		OT	01	
203	AE		OT	01	
204	AFRL		OT	01	
205	AFSC		OT	01	
206	AFWA		OT	01	
207	AGF		OT	01	
208	AJR CTRL		OT	01	
209	AJR WING		OT	01	

17454

NODE_ID	PROC-ACT-ID	PROC-ACT-V	NODE_PA_id	NODE_PA_rot
475	1184	0	0	03
475	1987	0	0	03
479	641	0	0	03
481	643	0	0	03
483	1233	0	0	03
485	1229	0	0	03
487	1470	0	0	03
491	1351	0	0	03

7328

NODE_ID	ORGT_id	NODE_ORGT_role_cd	NODE_ORGT_id
202	216	01	0
203	167	01	0
204	76	01	0
205	50	01	0
206	77	01	0
207	136	01	0
208	245	01	0
209	221	01	0
210	2	01	0

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PROC-ACT-ID	PROC-#	DOC-ID	PROC-ACT-NM	PROC-ACT-DSC-TX	PA_cat_cd	PROC-ACT\PRCS-AC	PRC-ACT-SCI	PA_valid_ind_cd	ACT_ID
3	0	6557	DEPLOY FORCES/CONDUCT MANEUVER	To move forces to achieve a position of advantage with respect to enemy forces. This task includes the employment of forces	98				
4	0	6558	Conduct Countermobility	To delay, disrupt, fix, channel, block, or stop the enemy's offensive movement (both on sea and/or land) in order to destroy	98				
5	0	6559	Conduct Alien Migrant Interdiction Operations	To intercept alien migrants at sea and prevent their passage to US waters and territory.	98				
6	0	6560	Conduct Blockade	To blockade designated areas in conjunction with US policy.	98				
7	0	6561	Conduct Maritime Counter-Drug Operations	To coordinate with all applicable agencies to provide vessels and qualified boarding teams to intercept, board and search vessels	98				
8	0	6562	Conduct Maritime Interception	To intercept commercial, private or other non-defense or non-naval vessels by conducting Maritime Interception Operations	98				

7328

PROC-ACT-ID	PROC-#	DOC-ID	PROC-ACT-NM	PROC-ACT-DSC-TX	PA_cat_cd	PROC-ACT\PRCS-AC	PRC-ACT-SCI	PA_valid_ind_cd	ACT_ID
3	0	6557	DEPLOY FORCES/CONDUCT MANEUVER	To move forces to achieve a position of advantage with respect to enemy forces. This task includes the employment of forces	98				
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**Select a node by double-clicking on it.
Right click in tree to search for node.**

- 1 - JC2 OP NODES - JC2 OP NODES
 - 1.1 - AADC - AADC
 - 1.2 - AFFOR - AFFOR
 - 1.3 - ARFOR - ARFOR
 - 1.4 - AWACS - AWACS
 - 1.5 - CIA - Central Intelligence Agency
 - 1.6 - CMOC - CMOC
 - 1.7 - CMOTF - CMOTF
 - 1.8 - COALITION - Coalition Forces
 - 1.9 - CSG - CSG
 - 1.10 - DIA - DIA
 - 1.11 - DISA - DISA
 - 1.12 - DLA - DLA
 - 1.13 - FBI - Federal Bureau of Investigation
 - 1.14 - FEMA - Federal Emergency Management Agency
 - 1.15 - FOREIGN - Foreign Military
 - 1.16 - HOST NATION - Host Nation
 - 1.17 - HQ JTF - HQ Joint Task Force
 - 1.18 - INS - INS
 - 1.19 - JC2WC - JC2WC
 - 1.20 - JCMOTF - JCMOTF
 - 1.21 - JCS - JCS
 - 1.22 - JCSE - JCSE
 - 1.23 - JFACC - JFACC
 - 1.24 - JFLCC - JFLCC
 - 1.25 - JFMCC - JFMCC
 - 1.26 - JISE - JISE
 - 1.27 - JPOTF - JPOTF
 - 1.28 - JSOTF - JSOTF
 - 1.29 - JSTARS - JSTARS
 - 1.30 - JTF - JTF
 - 1.31 - JTF HQ - JTF HQ
 - 1.32 - MARFOR - MARFOR
 - 1.33 - NAVFOR - NAVFOR
 - 1.34 - NGO - NGO
 - 1.35 - NIMA - NIMA
 - 1.36 - NIST - NIST
 - 1.37 - NSA - NSA
 - 1.38 - POLAD - POLAD
 - 1.39 - PVO - PVO
 - 1.40 - RAOC - RAOC
 - 1.41 - SOC - SOC
 - 1.42 - SPACECOM - SPACECOM
 - 1.43 - STATE - STATE
 - 1.44 - THEATER HQ - Theater Headquarters
 - 1.45 - TOC - TOC
 - 1.46 - TRANSCOM - TRANSCOM
 - 1.47 - TREAS - Treasury
 - 1.48 - UCOM HQ - Unified Command HQ
 - 1.49 - UN - United Nations
 - 1.50 - US EMBASSY - US Embassy

Description - Operational Nodes

To be determined.

Process Activities performed by the Operational Node:

- 1.5 - CIA - Central Intelligence Agency
 - 0 - PROCESS ACTIVITIES
 - 1 - Provide Operational C2
 - 1.1 - Lead the Force
 - 1.2 - Provide Command and Control
 - 1.2.1 - Act on a COA
 - 1.2.1.1 - Assess Operations
 - 1.2.1.2 - Command Subordinate Forces (Execute)
 - 1.2.1.2.1 - Conduct Consequence Management
 - 1.2.1.2.2 - Execute (C4) Policies & Procedures for the JOA
 - 1.2.1.2.3 - Execute Operations
 - 1.2.1.2.4 - Integrate Operational Information Operations
 - 1.2.1.2.5 - Synchronize & Integrate Operations
 - 1.2.1.3 - Prepare Plans & Orders
 - 1.2.1.3.1 - Approve Plans & Orders
 - 1.2.1.3.2 - Coordinate and Integrate Joint/Multinational and Interagency Support
 - 1.2.1.3.2.1 - Approve Plans and Orders
 - 1.2.1.3.2.2 - Coordinate Coalition Support
 - 1.2.1.3.2.3 - Coordinate Plans with non-DOD Organizations
 - 1.2.1.3.2.4 - Develop Multinational Intelligence/Information Sharing Structure
 - 1.2.1.3.3 - Prepare Campaign Plans & Orders
 - 1.2.2 - Decide on a COA
 - 1.2.3 - Observe the JOA
 - 1.2.3.1 - Display Operational & Strategic Information
 - 1.2.3.2 - Integrate Operational & Strategic Information
 - 1.2.3.2.1 - Determine Quality of Information
 - 1.2.3.2.1.1 - Determine Accuracy
 - 1.2.3.2.1.2 - Determine Completeness
 - 1.2.3.2.1.3 - Determine Relevancy
 - 1.2.3.2.2 - Fuse Friendly Force and Intelligence Data
 - 1.2.3.2.3 - Fuse Friendly Force Information & Intelligence Data
 - 1.2.3.2.4 - Obtain Friendly Information
 - 1.2.3.2.5 - Obtain Multi-Source Intelligence Data
 - 1.2.3.2.6 - Post Map Boards, Databases, and Screen Displays
 - 1.2.3.2.7 - Prepare Information for Integrated View of Battle Space
 - 1.2.3.2.8 - Prepare Information for Integrated View of Battlespace
 - 1.2.3.3 - Maintain Operational Information & Force Status
 - 1.2.4 - Orient on the Operational Situation
 - 1.2.4.1 - Conduct Operational Mission Analysis
 - 1.2.4.2 - Formulate Assessment
 - 1.2.4.3 - Manage CCIR
 - 1.2.4.3.1 - Consolidate CCI
 - 1.2.4.3.2 - Consolidate CCIR
 - 1.2.4.3.3 - Determine CCIR
 - 1.2.4.3.4 - Task Priority Intelligence Requirements (PIRs)
 - 1.2.4.4 - Monitor Strategic Situation
 - 1.3 - Unspecified
 - 2 - Tasks

Description - Process Activities

A. DEFINITION
1. AFD 2.0: Process -- A group of logically related activities required to execute a specific task or group of tasks (Army Systems Architecture Framework). Note: Multiple activities make up a process (SPAWAR). Task -- A discrete unit of work, not specific to a single organization, weapon system, or individual, that enables missions or functions to be accomplished. [Extension from UJTL, JC5M 3500.04A, 1996] Note: Multiple processes accomplish a task; a single process may support multiple tasks (SPAWAR).
2. CADM 2.0: PROCESS-ACTIVITY (4204/2) (A) -- THE REPRESENTATION OF A MEANS BY WHICH A PROCESS ACTS ON SOME INPUT TO PRODUCE A SPECIFIC OUTPUT. (DDDS, June 1998)
3. Discussion. An activity is a defined task that is performed by a person or group of people performing in the role of an organization type. An activity could be a high level task such as PREPARATION of forces for a mission or exercise, or could be a low-level task such as 'Patrol Law Enforcement Area.'
B. USAGE
Activities are used in OV-3, OV-5, SV-4 (System Functionality Description) and SV-5 (Operational Activity to System Function Traceability Matrix).

IER Browser / Editor

View Org / Org-Type by: Acronym Name

Record count: 1681 IERs

Filter by:

Information Element	Producing Org / Org-Type	Consuming Org / Org-Type	Producing Activity	Consuming Activity
Spec. No. Name	Spec. No. Acronym	Spec. No. Acronym	Spec. No. Name	Spec. No. Name
5.3.4 NetOps Capabilities Asses			1.2.1.2.4.3 Coordinate Information As	1.2.1.2.4.2 Control Information Op
5.67.9.7 JIPB Indications and Warr			1.2.3.2.5 Obtain Multi-Source Intelli	1.2.3.2.1 Determine Quality of Ir
3.2.2.1.3.3 Strategic Military Objectiv			1.2.4.4.1 Monitor Geographic Com	1.2.4.1.5 Review Current Situati
1.3.5.1.1.2 JCMEC GMI Products			1.2.3.2.5 Obtain Multi-Source Intelli	1.2.3.2.1 Determine Quality of Ir
1.3.6.1 Public Affairs Plan			1.2.1.2.4.2 Control Information Opera	1.2.1.2.3 Execute Operations
5.53.1.17 NetOps Performance Gos			1.2.1.2.4.3 Coordinate Information As	1.2.1.2.4.2 Control Information Op
5.46.1.1 Force Protection OPOrd			1.2.2.3.3 Prepare Campaign Plans	1.2.1.3.2.1 Approve Plans and Oi
5.53.4.5 JFC Center of Gravity Sts			1.2.2.2.5 Prepare Planning Guidanc	1.2.2.2.1 Conduct Mission Planr
3.2.2 Situation Assessment			1.2.4.2.1 Prepare Assessment	1.2.4.1 Conduct Operational h
5.67.8.8 JIPB Targeting Products			1.2.3.2.5 Obtain Multi-Source Intelli	1.2.3.2.1 Determine Quality of Ir
5.53.1.6 Force Protection Guidanc			1.2.2.2.5 Prepare Planning Guidanc	1.2.2.2.1 Conduct Mission Planr

Select Needline that Accomplishes Activityline

Select Activityline Satisfied by Needline

Sort Satisfied Activityline by: Producer Consumer

Sort Satisfied Activityline by: Producer Consumer

Needline Attributes

non-reputation sender requirement	
non-reputation receiver requirement	
security code	

Information Element Attributes

security code		
automated processing required		
format type		
# graphic pages	3	3
voice-video duration (seconds)		
perishability		
IE size (KBytes)		

OP Nodes

Process Activities

frequency

pixels (FOV / resolution)

pixel depth

accuracy

availability effort

effective date

status

objects

mission segment / phase

Specifying the Needline for a 'partial IER' implied by an Activity Model artifact, constrained to just those Needlines consistent with other data declarations

IER Browser / Editor

View Org / Org-Type by: Acronym Name

Record count: 1681 IERs

Filter by:

Information Element	Producing Org / Org-Type	Consuming Org / Org-Type	Producing Activity	Consuming Activity
Spec. No. Name	Spec. No. Acronym	Spec. No. Acronym	Spec. No. Name	Spec. No. Name
3.2.2.7.6.1 SITREP	1.41 SOC	1.28 JSOTF	1.2.3.3.4 Receive Data	1.2.3.2.4 Obtain Friendly Inform
1.4.2.1 Liaison	1.41 SOC	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.42 SPACECOM	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.46 TRANSCOM	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
5.53.4.7 JFC Joint Fires Guidance	1.48 UCOM HQ	1.31 JTF HQ	1.2.2.2.5 Prepare Planning Guidanc	1.2.2.2.1 Conduct Mission Planr
1.4.2.1 Liaison	1.51 USDA	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.52 USDEA	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.53 USDOC	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.54 USDOE	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.55 USDOJ	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss
1.4.2.1 Liaison	1.56 USIA	1.31 JTF HQ	1.2.1.2.3 Execute Operations	1.2.1.1.5 Conduct Combat Asss

Select Needline that Accomplishes Activityline

Select Activityline Satisfied by Needline

Sort Accomplishing Needline by: Producer Consumer

Sort Satisfied Activityline by: Producer Consumer

Needline Attributes

non-reputation sender requirement	
non-reputation receiver requirement	
security code	

Activityline Attributes

timeliness	
event trigger	
security code	
criticality	
frequency	
# pixels (FOV / resolution)	
pixel depth	
accuracy	
availability effort	

Information Element Attributes

security code		
automated processing required		
format type		
# graphic pages	2	2
voice-video duration (seconds)		
perishability		
IE size (KBytes)		

OP Nodes

Process Activities

EVENTS

- ADMINISTRATIVE INQUIRY CULPABILITY REPORT SENT TO I
- ADMINISTRATIVE INQUIRY FINAL REPORT SENT TO USER A
- ADMINISTRATIVE INQUIRY PRELIMINARY NOTICE OF INCIDENT TO USER AGENCY
- ADMINISTRATIVE INQUIRY REPORT SENT TO DIS HQ
- ADMINISTRATIVE INQUIRY VIOLATION CASE OPENED
- ALS SENT TO OTHER DIS OFFICE
- DEBARRED BIDDERS LIST CHECKED
- DISCUSSED FSO TRAINING REQUIREMENTS DURING SURVE
- DISCUSSED PERSONNEL CLEARANCE LEVEL LIMITS
- EXECUTIVE COMMITTEE AGREEMENT RECEIVED
- FACILITY CLEARANCE LEVEL REQUEST RECEIVED
- FACILITY CLEARANCE LEVEL REQUEST REJECTED
- FOCI CASE ADJUDICATED
- FOCI CASE FORWARDED TO DIS HEADQUARTERS
- FOCI CASE RECEIVED
- FOCI CASE RETURNED TO FACILITY

Refresh Browser

Save Changes

Save As New

Delete

Export IER Matrix to Excel

Specifying the Event/Trigger(s) for an IER, from the "Events" taxonomy.

Functional Allocation View Associations Export to Excel Select a node by double-clicking on it. Right click in tree to search for node.

- 0 - SYSTEMS / Applications
 - 4 - Command and Control
 - 7 - Intelligence and Cryptology
 - 12 - Meteorology, Oceanography, GI&S
 - 23 - Weapons Planning and Control
 - 23.1 - Acoustic Countermeasures
 - 23.2 - Aircraft Systems
 - 23.3 - Electronic Warfare
 - 23.3.1 - ALQ-126
 - 23.3.2 - ALQ-142
 - 23.3.3 - ALQ-165
 - 23.3.4 - ALQ-210
 - 23.3.5 - ALQ-214 IDECM
 - 23.3.6 - ALQ-217
 - 23.3.7 - ALQ-99 ICAP II
 - 23.3.8 - ALQ-99 ICAP III
 - 23.3.9 - ALR-66/ALR-78
 - 23.3.10 - ALR-73
 - 23.3.11 - ALR-76
 - 23.3.12 - AN/AAR-47
 - 23.3.13 - AN/ALR-67(V)3
 - 23.3.14 - AN/AVR-2 Laser Warning System
 - 23.3.15 - AN/BLA-4
 - 23.3.16 - AN/BLD-1 (SSN)

Performance Characteristics of the following System/Apps
23.3.2 - ALQ-142

- 0 - PERFORMANCE ATTRIBUTES
 - 1 - Performance Characteristics and Conditions
 - 1.1 - Aviation Systems
 - 1.1.1 - ATC Surveillance Radar
 - 1.1.2 - MK XII IFF
 - 1.1.3 - Precision Landing
 - 1.1.4 - Precision Landing Independent Monitor
 - 1.2 - Combat System
 - 1.2.1 - Combat System Operational Availability
 - 1.2.2 - Control
 - 1.2.3 - Surveillance
 - 1.2.3.1 - EW Surveillance
 - 1.2.3.1.1 - Angular Measurement Accuracy
 - 1.2.3.1.2 - EW Surveillance Coverage
 - 1.2.3.1.3 - EW Surveillance Frequency
 - 1.2.3.1.4 - Probability of Classification
 - 1.2.3.2 - Horizon Surveillance
 - 1.2.3.3 - IR Surveillance
 - 1.2.3.4 - Volume Surveillance

Select a System/App Function for which this performance is applicable

NA

Description - System/Apps

Airborne electronic support (ES) system on SH-60

System Performance Characteristic Attribute

Select the amplifying attributes for the following Performance Characteristic.

1.2.3.1.1 - Angular Measurement Accuracy

Unit	Low Value	High Value
Degrees	.1	.2
Degrees		

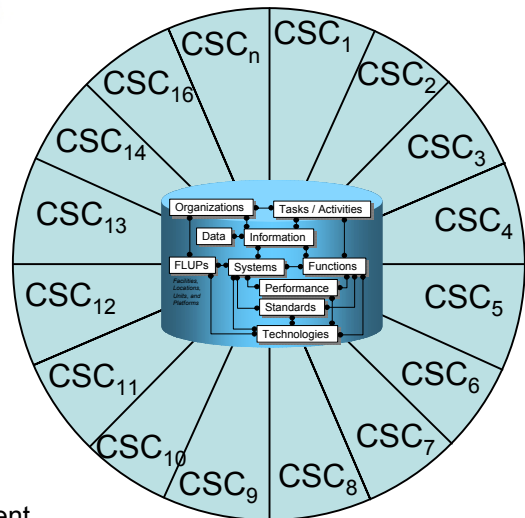
OK Cancel

eristics

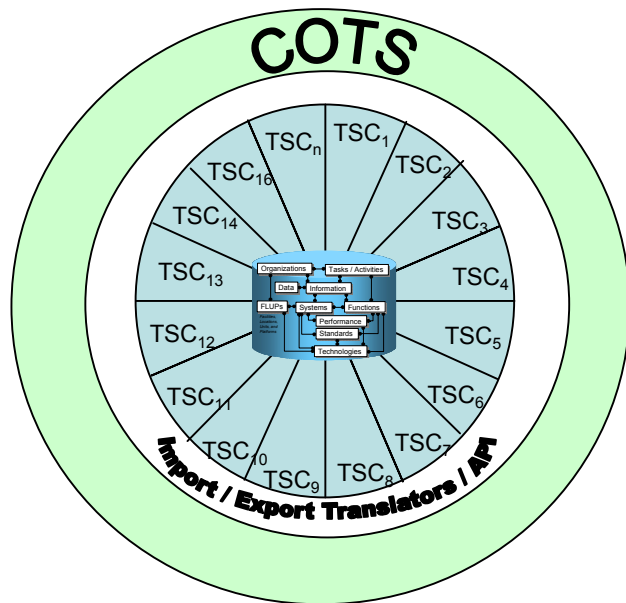
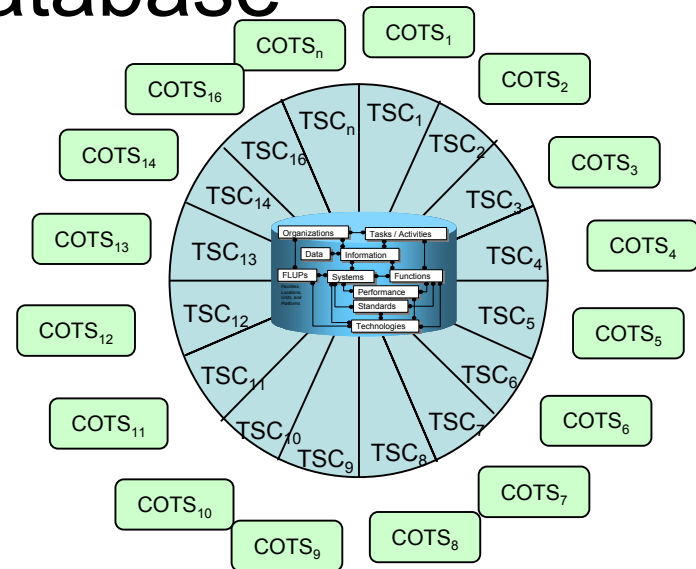
Empty text area for performance characteristics.



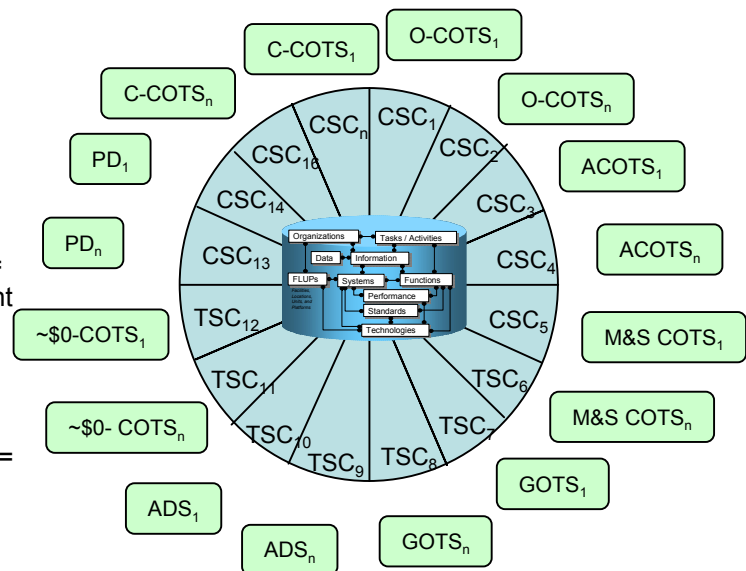
Ways to Access the Integrated Architecture Database



CSC =
Custom
Software
Component



- O-COTS = Office COTS
- C-COTS = Common
- PD = Public Domain
- A-COTS = Arch COTS
- ~\$0-COTS = Unlimited Right to Distribute
- ADS = Authoritative Data Source
- M&S COTS = Modeling & Simulation

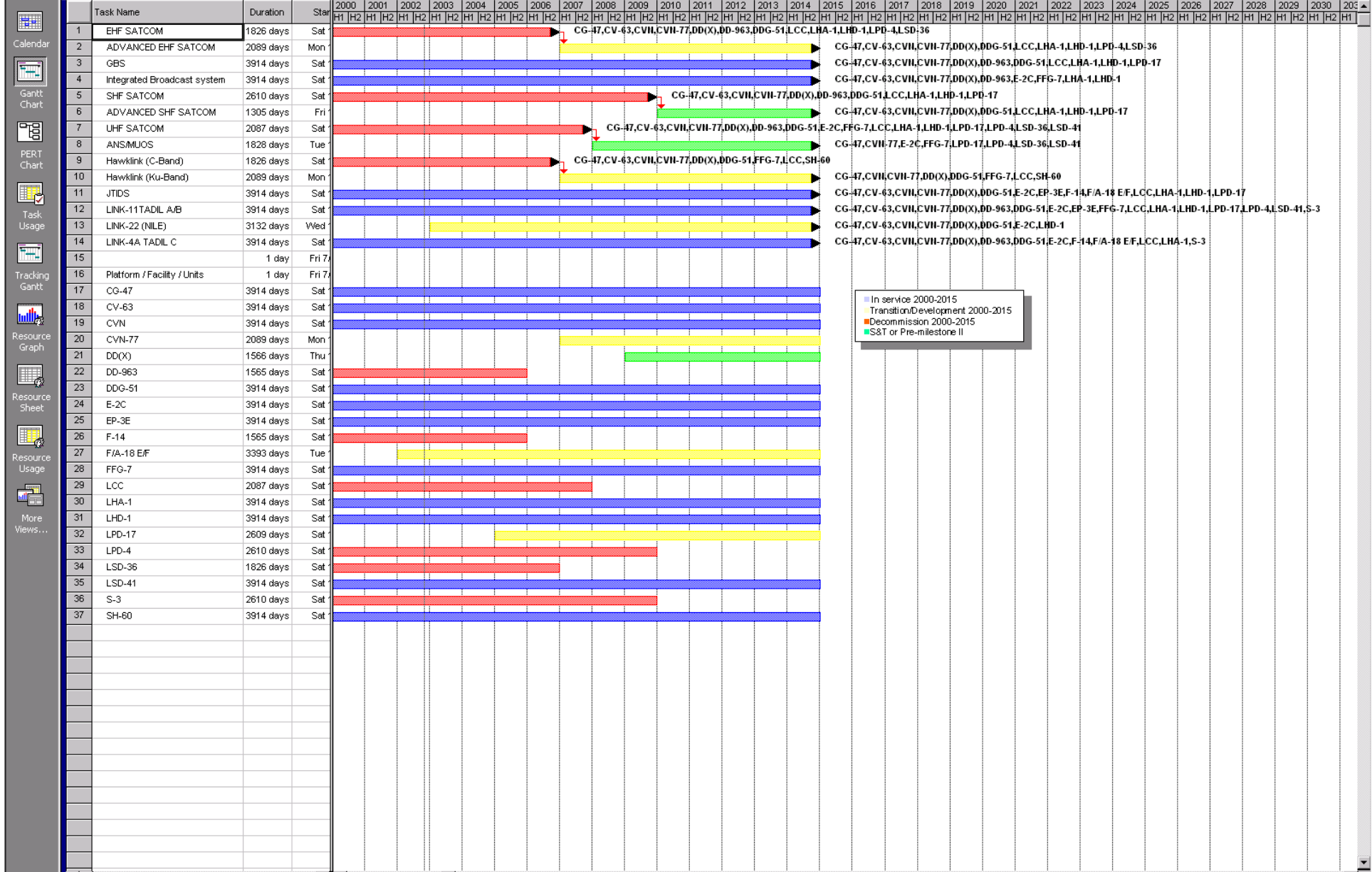


File Edit View Insert Format Tools Project Window Help

8 Arial All Tasks

Draw

EHF SATCOM



Legend:

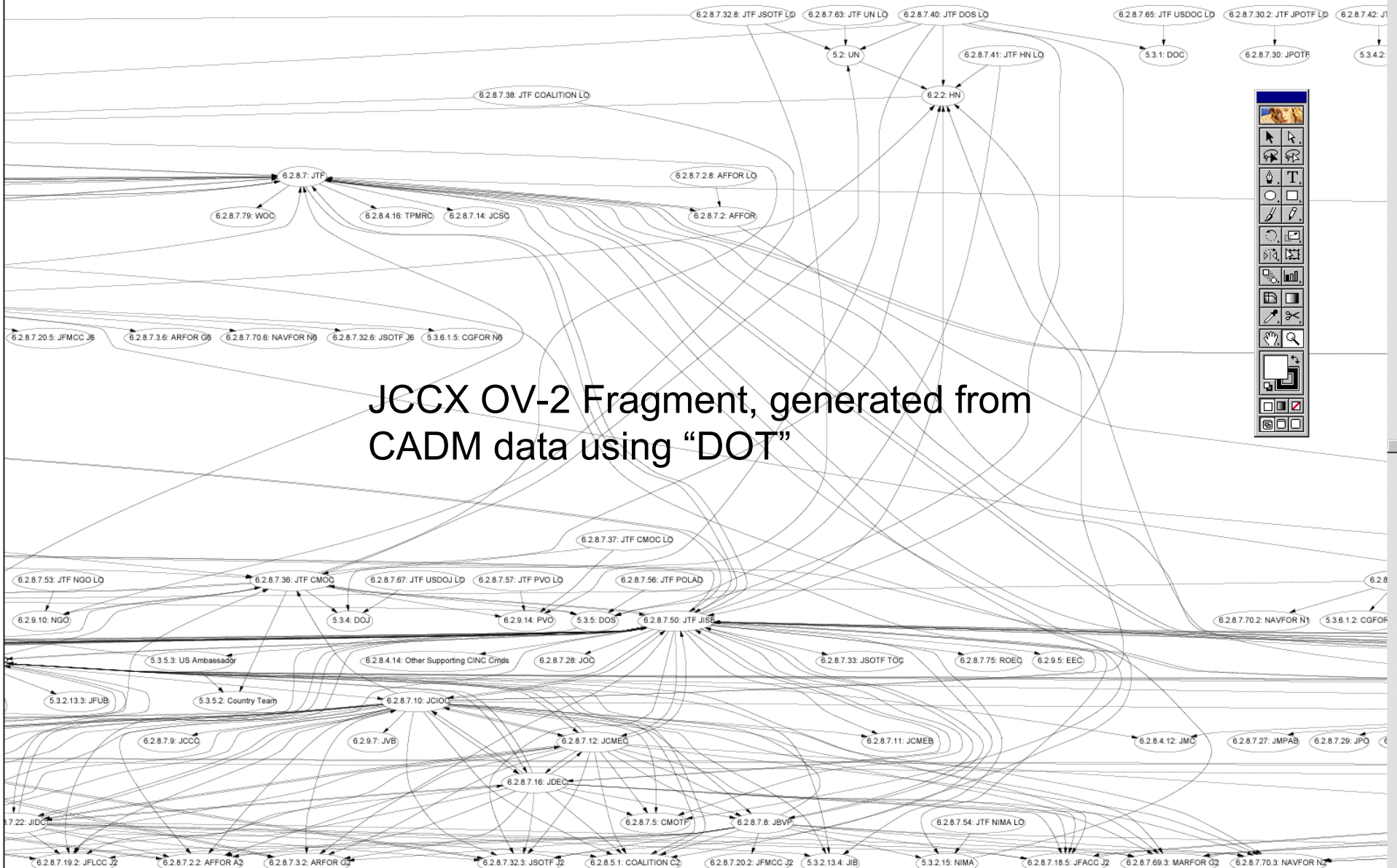
- In service 2000-2015
- Transition/Development 2000-2015
- Decommission 2000-2015
- S&T or Pre-milestone II

Microsoft Excel - Functional Overlap Report (TAMD MCP).xls

File Edit View Insert Format Tools Data Window Help

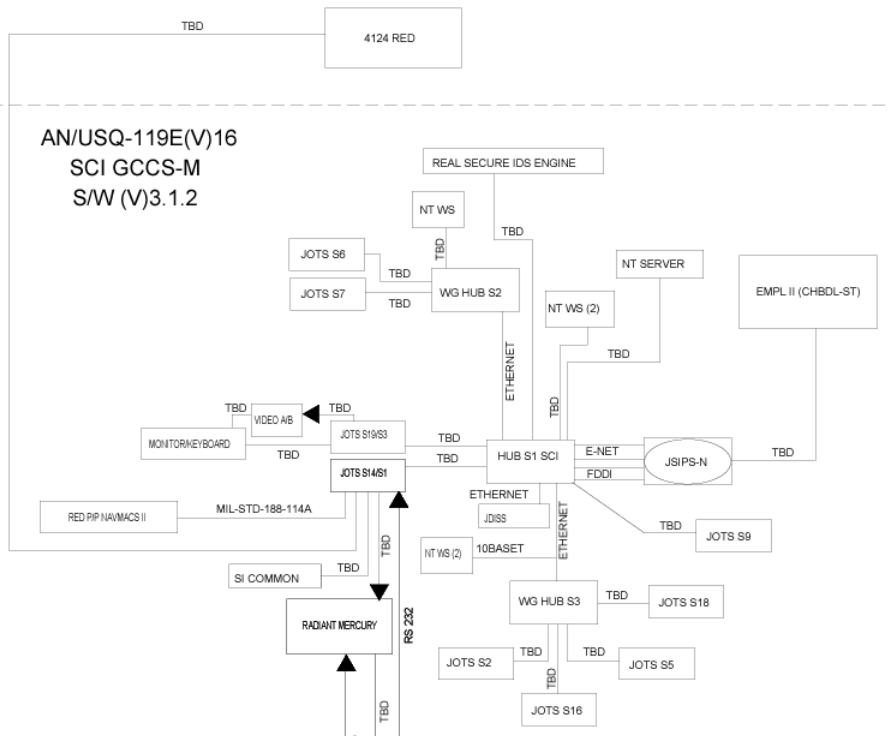
MS Sans Serif 10 B I

G137		D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Functions -->>>		24.1.1 - Execute engagement (EE)	24.1.2 - Force Positioning (FP)	24.2.1 - Decision (D)	24.2.2 - Plan (P)	24.2.3 - Situational Assessment (SA)	24.3.1 - Communicate Common Navigation & Time Data (CNT)	24.3.2 - Communicate force orders (CFO)	24.3.3 - Communicate ISR Data (CISR)	24.3.4 - Communicate order (CO)	24.3.5 - Communicate sense data (CSD)	24.3.6 - Communicate status (CS)	24.4.1 - Common Tactical Picture (CTP)	24.4.2 - Intelligence, Surveillance, Reconnaissance (ISR)	24.4.3 - Tactical Sense (TS)
System/Application															
76	2.1.7.1.45 - LINK-22 (NILE)									✓	✓	✓			
77	2.1.7.1.47 - LINK-4A TADIL C									✓					
78	2.1.7.3.28 - Hawklink (C-Band)										✓				
79	2.1.7.3.29 - Hawklink (Ku-Band)										✓				
80	2.1.8.1 - ADVANCED EHF SATCOM									✓					
81	2.1.8.10 - UHF									✓					
82	2.1.8.2 - ADVANCED SHF SATCOM							✓		✓					
83	2.1.8.3 - AN/SMUOS							✓		✓					
84	2.1.8.5 - EHF									✓					
85	2.1.8.9 - SHF							✓		✓					
86	4.1.6.1.1 - (AT)FLIR														✓
87	4.1.6.1.10 - SPACE BASED INFRARED SYSTEM-LOW													✓	✓
88	4.1.6.1.11 - TFLIR														✓
89	4.1.6.1.12 - The Thermal Imaging Sensor System (TISS)														✓
90	4.1.6.1.5 - DEFENSE SATELLITE PROGRAM													✓	✓
91	4.1.6.1.6 - FLIR w/IRST														✓
92	4.1.6.1.7 - LANTIRN/IRST														✓
93	4.1.6.1.8 - LITENING pod														✓
94	4.1.6.1.9 - SPACE BASED INFRARED SYSTEM-HIGH													✓	✓
95	4.1.6.3.1.1 - AN/SPS-40														✓
96	4.1.6.3.1.2 - AN/SPS-49														✓
97	4.1.6.3.1.3 - TAS MK 23														✓
98	4.1.6.3.2.1 - AN/SPS-48														✓
99	4.1.6.3.4.7 - AN/APS-138														✓
100	4.1.6.3.4.9 - AN/APS-145														✓
101	4.1.6.3.5.11 - AN/UPX-34 SHIPBOARD ADVANCED RADAR TARGET IDENTIF														✓
102	4.1.6.3.7.1 - AN/SPY-1	✓													✓
103	4.1.7.2.2 - AN/SRS-1														✓
104	4.1.7.2.5 - JMOD													✓	
105	7.3.1 - AN/SSN-6 Navigation Sensor System Interface (NAVSSI)							✓							
106	7.3.3 - PATHFINDER							✓							
107	7.3.4 - VMS							✓							
108	7.5.13 - GPS - NAVSTAR							✓							
109	* rows 29-108 hidden for presentation purposes														
Overlap Count		46	10	10	4	10	4	3	5	18	12	12	15	5	28



JCCX OV-2 Fragment, generated from
CADM data using "DOT"

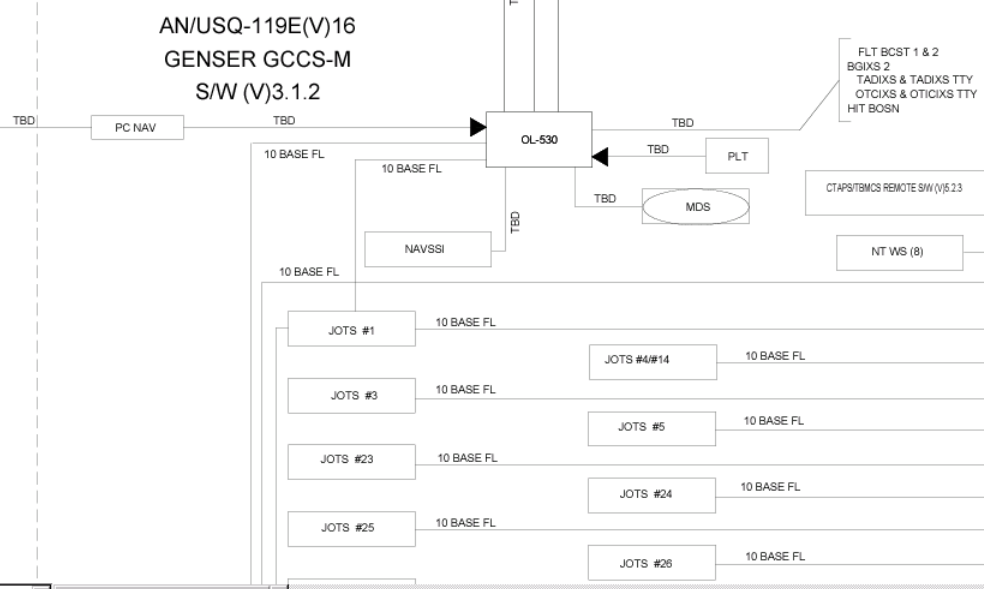
AN/USQ-119E(V)16
SCI GCCS-M
S/W (V)3.1.2



Fragment of
Navy C4ISR SV-
2 AutoCAD file,
auto-generated
from CADM data
to AutoCAD
using AppliCAD®



AN/USQ-119E(V)16
GENSER GCCS-M
S/W (V)3.1.2



ISNS CLASSIFIED LAN
AN/USQ-153(V)3
GOTS DELTA LOAD 3.18.2.1.8.P4



DON Integrated Architecture Database and CADM

From the development view

Pro's

- Powerful and expressive model
 - Object class hierarchy provides tremendous capability at relatively little complexity
- Enforces proper architecture object relationships and semantics
- Being based on DoD data standards, should support interfacing to ADS's
- Auto-generate DB from CADM physical model

Con's

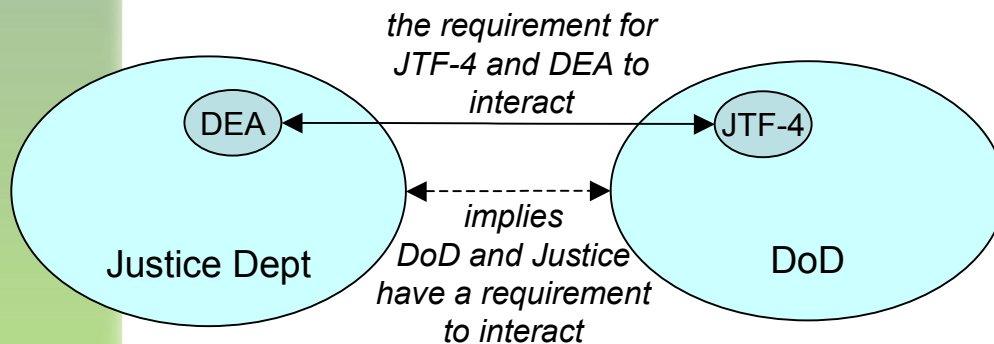
- Hard to program applications to handle
 - Inheritance, Rollup-Drilldown rules
 - Recursive entities to hierarchy trees
- “Live” interface to graphics and modeling tools is difficult to infeasible
- “ADS's” typically are non-compliant with DoD data standards



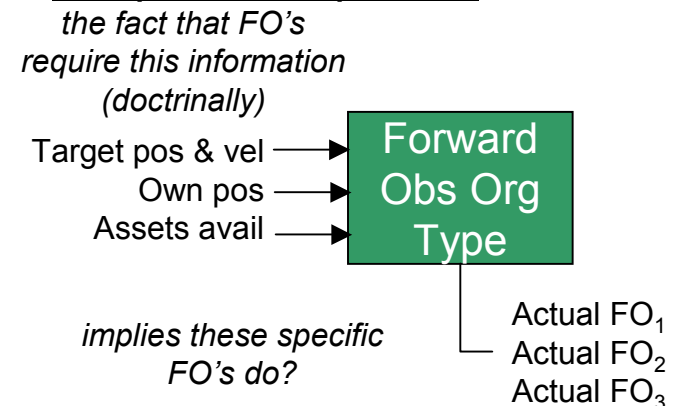
Rollup/Drilldown

- A key feature of the architectural approach
 - Allows data developed at one level of abstraction (or composition) to imply data at another level
- Problem
 - Rules don't exist (Navy has proposed some)
 - Very hard to program
- But ignoring causes inconsistent results at different levels
 - a common problem in CASE tools

Simple Example # 1



Simple Example # 2





Experience with Architecture Data Import / Export Translation Software

- “New” imports
 - How does the importer know if it is new or update?
 - How does it know what architecture is being updated?
 - How does it know if the source has the authority to overwrite?
 - What happens when a biz rule is violated? Abort?
- Update imports –
 - How to tell the importer about deleted items
 - How to tell the importer about a subset or different “slice-and-dice” that is being imported
- Export generation
 - How to get CADM data exported?
 - How to tell what to export, in terms of product, level of detail, and scope
 - What exporter should do if export is rejected
 - How to re-import
 - How to generate exports for custom reports and diagrams
- Taxonomies
 - How to force external tools to comply

Import / export translation can be harder than apps development



Integrated Architecture Database and CADM

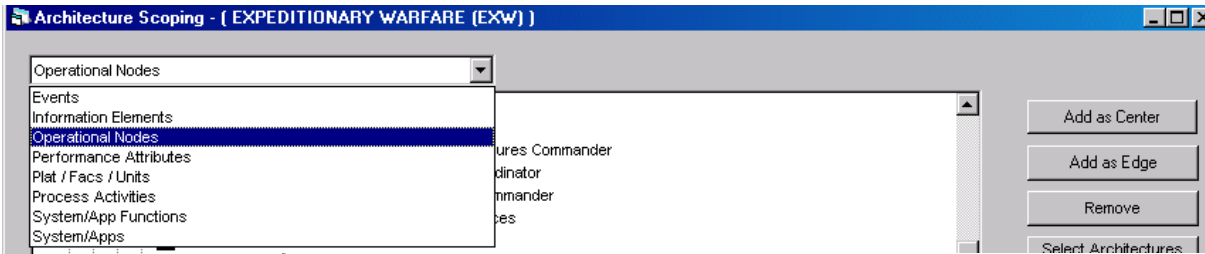
From the User's View

Pro's

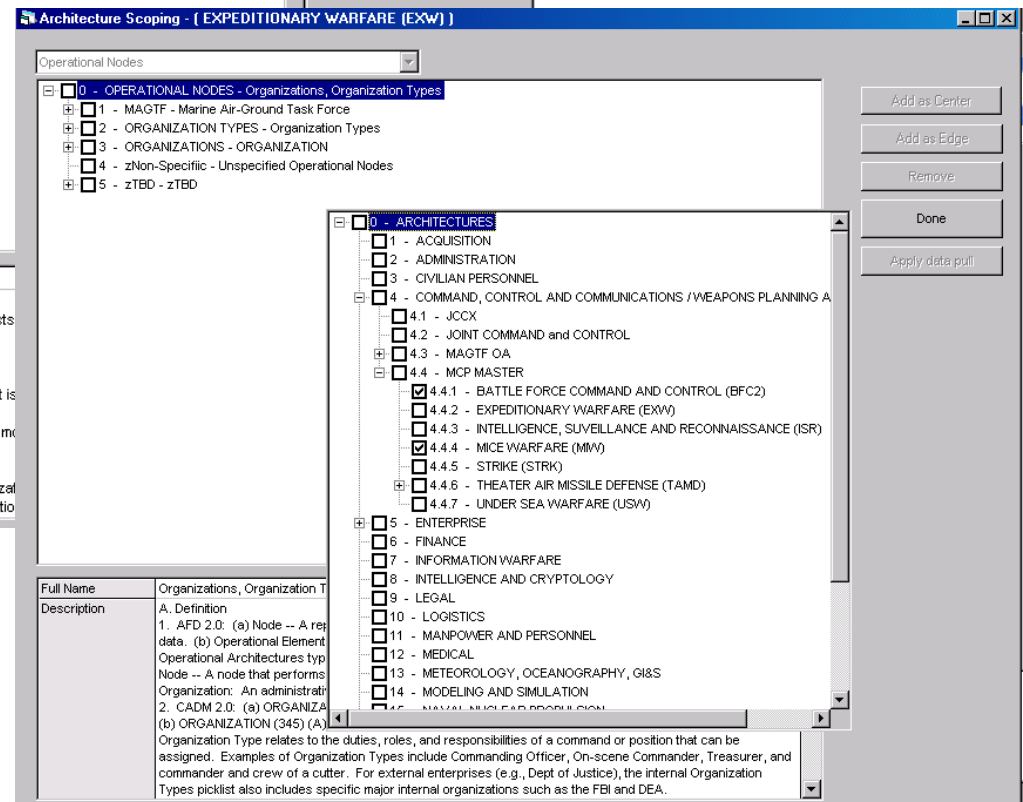
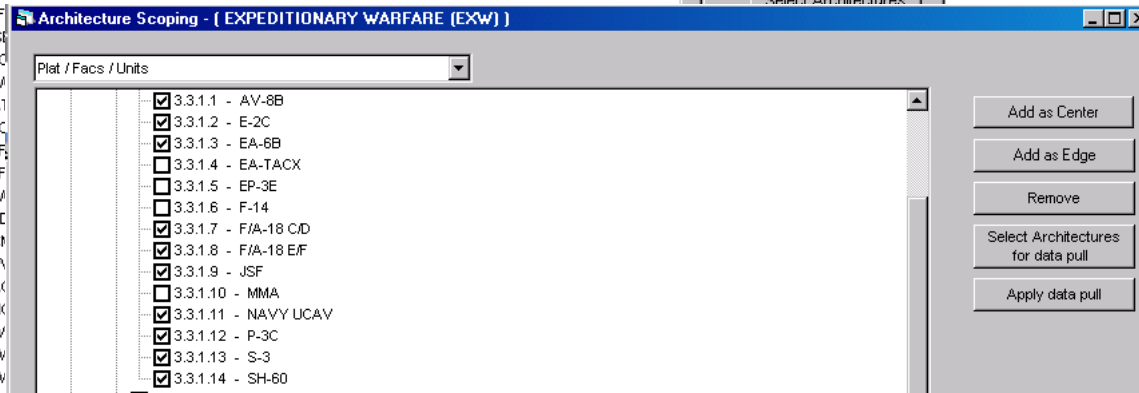
- Enforces consistency so don't have to reconcile later
- Allows reuse and "slicing and dicing" the data by mission area, functional area, capability, etc.
- Open so ad-hoc reports and queries can be run or interfaced to other tools for analysis

Con's

- Referential integrity rules require all objects to be defined
- Multi-use of taxonomies requires collaboration and CM; require continuous data quality and integrity monitoring
- Shared architecture data requires authority to see, change, and CM
- CADM misunderstanding
- Custom reports and diagram styles – you have to know CADM
- Data management and repositing cultural issues



Select Taxonomic elements in scope of architecture



Select architecture data set(s) to share data with



- ▶ CRISR_DATA_SPEC
- ▶ DATA_ATTR
- ▶ DATA_ATTR_ASSOC
- ▶ DATA_DICT
- ▶ DATA_DICT_EL
- ▶ DATA_DICT_EL_ASSOC
- ▶ DATA_DICT_SPEC
- ▶ DATA_DOMAIN
- ▶ DATA_DOMAIN_LST
- ▶ DATA_DOMAIN_LSTVE
- ▶ DATA_DOMAIN_RANGE
- ▶ DATA_DOMAIN_VALUE
- ▶ DATA_ENT
- ▶ DATA_ENT_ACTIV_ICOM
- ▶ DATA_ENTITY_DATA_ATTRIBUTE
- ▶ DATA_ENTITY_RELATIONSHIP
- ▶ DATA_ITEM
- ▶ DATA_ITEM_TYPE
- ▶ DATA_MODEL_STD
- ▶ DATA_STANDARD
- ▶ DATA_STORE
- ▶ DATABASE_RULE
- ▶ DCMNT-ASSCTN
- ▶ DOC
- ▶ Document_Structure
- ▶ ENL_OCCU_SPECIALTY
- ▶ ENTITY_DATA_STD
- ▶ EQUIP_TYPE
- ▶ EQUIP_TYPE_SW_ITEM
- ▶ EV_NODE_CROSS_LINK
- ▶ EV_TRC_DESCR
- ▶ EV_TRC_SCEN_EL
- ▶ EV_TRC_SCEN_EL_ASS
- ▶ EVENT
- ▶ EVENT_ASSOC
- ▶ Event_Structure
- ▶ EVENT-DOC
- ▶ EXCH_NEED_LINE_REQ
- ▶ FAC_TY
- ▶ FACILITY
- ▶ FUNCL_AREA
- ▶ GRPHC
- ▶ GUID_ASSOC
- ▶ GUIDANCE
- ▶ GUIDANCE_DOCUMENT
- ▶ IER
- ▶ IER_TRIGGER
- ▶ IER_TRIGGER_RULE
- ▶ IMPL_TIMEFRAME
- ▶ INF_REQ_DAT_ITM_TY
- ▶ INFO_ASSET
- ▶ INFO_ASSET_AGR
- ▶ INFO_ASSET_DOC
- ▶ INFO_ASSET_GUID
- ▶ INFO_ASSET_INFO_EL
- ▶ INFO_ASSET_RELTN
- ▶ INFO_ELEM
- ▶ INFO_ELEM_ASSOC
- ▶ INFO_ELEM_DOC
- ▶ Info_Elem_Structure
- ▶ INFO_EXCH_MATRX
- ▶ INFO_EXCH_MATRX_EL
- ▶ INFO_PROC_SYSTEM
- ▶ INFO_REQ
- ▶ INFO_SYS
- ▶ INFO_SYS_SYS_PLT
- ▶ Information_Asset_Structu
- ▶ INTNT_ADRS
- ▶ INTNT_ADRS_ASSOC
- ▶ LOG_DATA_MDL_DOC
- ▶ MAT_ITEM_ESTB
- ▶ MATERIEL_ITEM

▶ MATI_CAP_NORM

SYS_ASSOC : Table				
Ord_SYS_id	Sub_SYS_id	SYSA_id	SYSA_ty_cd	
657	-1	0	13	
658	-1	0	13	
659	657	0	13	
660	658	0	13	
666	658	0	13	
667	666	0	13	
669	667	0	13	
670	667	0	13	
671	667	0	13	
672	667	0	13	
673	666	0	13	
674	673	0	13	
675	673	0	13	
676	673	0	13	
677	673	0	13	
678	666	0	13	
679	666	0	13	
680	666	0	13	
682	658	0	13	
683	682	0	13	
685	211000089	0	13	
686	757	0	13	
687	685	0	13	
688	6981	0	13	
689	688	0	13	
690	688	0	13	
691	688	0	13	
692	688	0	13	
693	6981	0	13	
694	693	0	13	
695	693	0	13	
696	693	0	13	
697	693	0	13	
698	693	0	13	
699	685	0	13	
700	685	0	13	

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Open
Design
New



Summary

- An Integrated Architecture Database is more than “just” a database
 - The database is not the hard part to build
- Data Management is required
 - Multiple authoritative data sources
 - Collaboration on taxonomies
- Presentation vs. Structure
 - Must have an application to access the data
 - There is no simple solution to the application problem; you will wind up building a bunch of software
- Users
 - They “do and don’t” like the CADM structure
 - Hard to prove the ROI up front



Conclusions

- If your objective is an integrated architecture:
 - The database must have certain features (Slide 7)
 - All the usual data management challenges apply
 - Enterprise taxonomies, collaboratively developed, validated, maintained, and managed, are essential
 - Applications to access the database have to be built
 - Custom
 - Translators to/from COTS and GOTS
 - Hybrid
 - Rules, e.g., rollup/drilldown, need to be developed
 - Users need indoctrination