

OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE



Enterprise Architecture in the Intelligence Community: The Joint Architecture Working Group (JAWG)

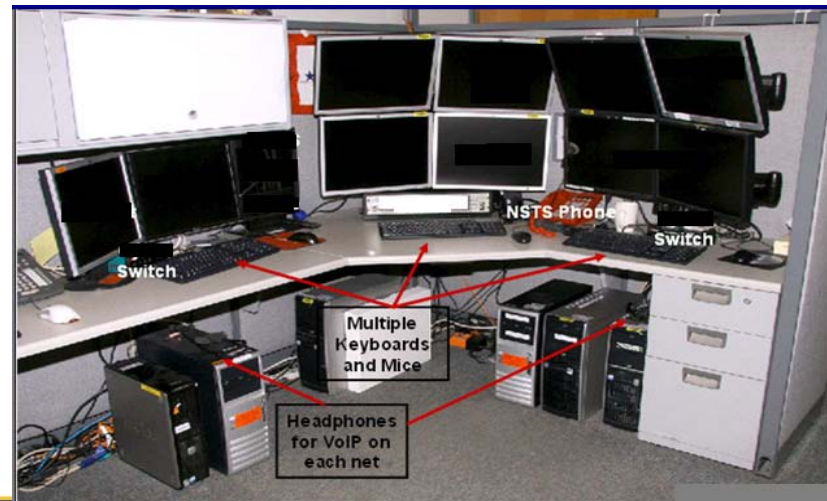
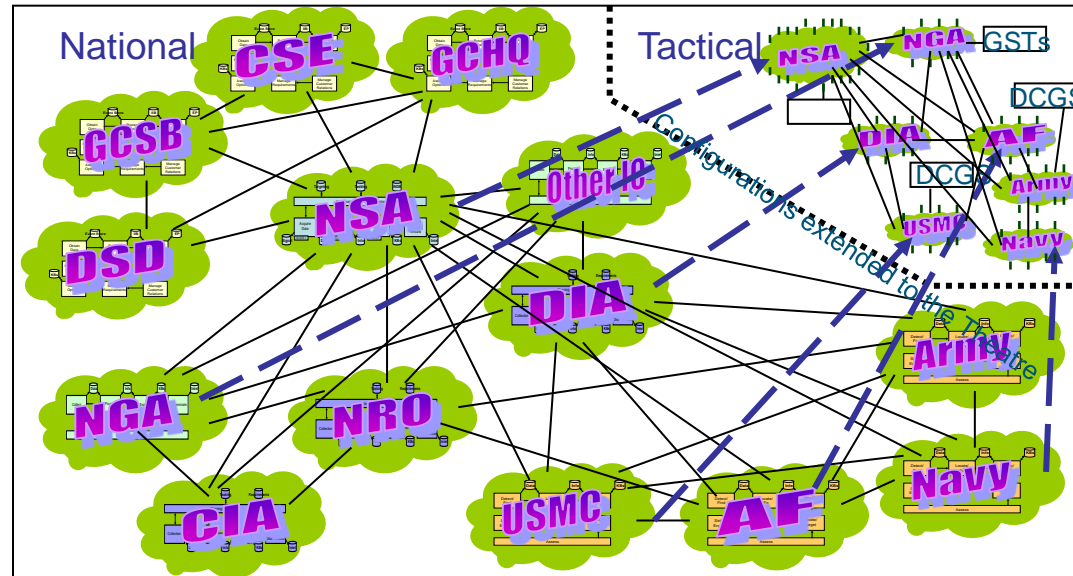
L E A D I N G I N T E L L I G E N C E I N T E G R A T I O N

Randy Marks; Chair, Joint Architecture Working Group
NSA/TE Deputy Chief System Engineer for Enterprise Architecture



- Info Sharing/Integration is a grassroots effort – not an enterprise principle
 - Phone call, email, word of mouth
 - Warfighters are unaware of solutions
- Current implementation hampers ~~Information~~ Integration
 - Point-to-point interfaces
 - Inability to find information
 - Service provider
 - Private libraries
- Standards need to be enterprise focused

Intelligence





~~Enterprise Architecture
to the rescue!~~



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L E A D I N G I N T E L L I G E N C E I N T E G R A T I O N

Federal

- Clinger-Cohen (Public Law 104-106) - 1996
- E-Government Act - 2002

Guidance

DOD

- DoDD 8000.1: Global Information Grid Overarching Policy
- DoDI 5000.2: Operations of the Defense Acquisition System

Federal Enterprise Architecture

Global Information Grid

Solution space

Capabilities

Systems

Technology





The Architecture Trifecta

- The “AS IS” Architecture
- The “To Be” Architecture
- The Architecture Transition Plan - Roadmap



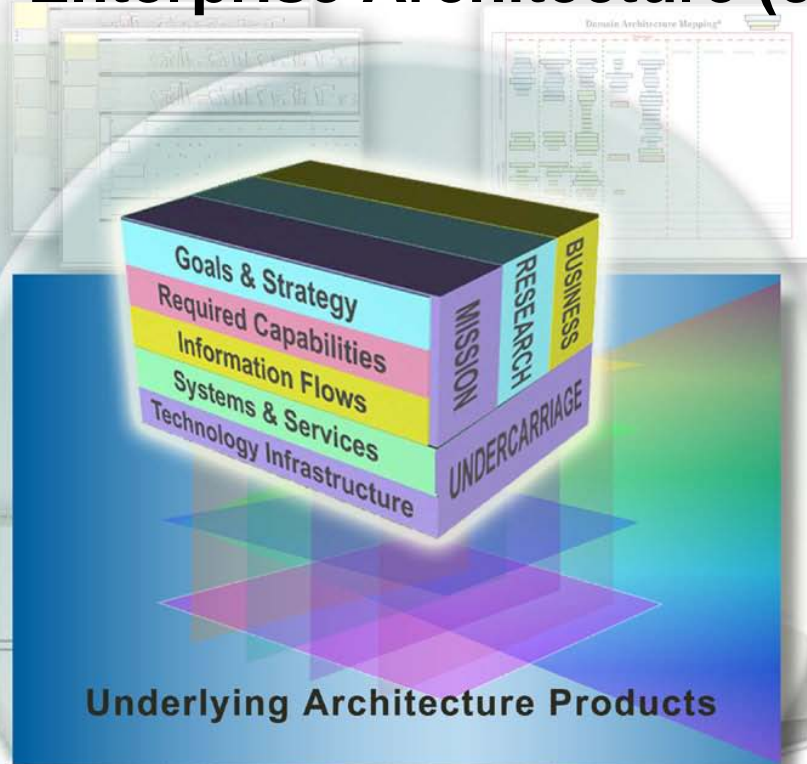
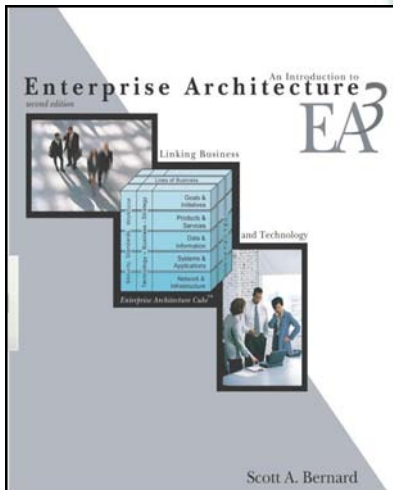
Multiple ways to produce an architecture...



Enterprise Architecture (circa 2006)

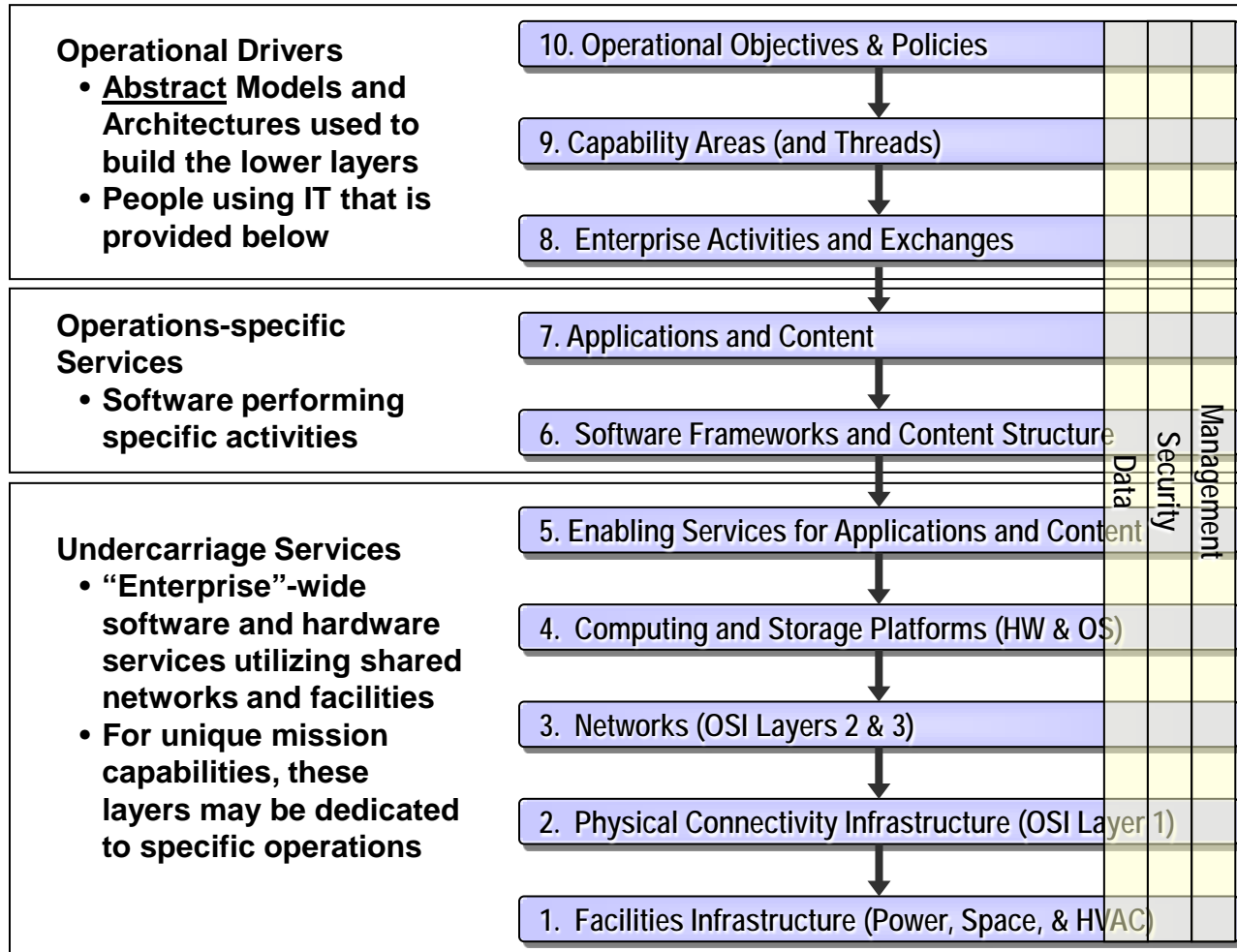


1. Enterprise Architecture



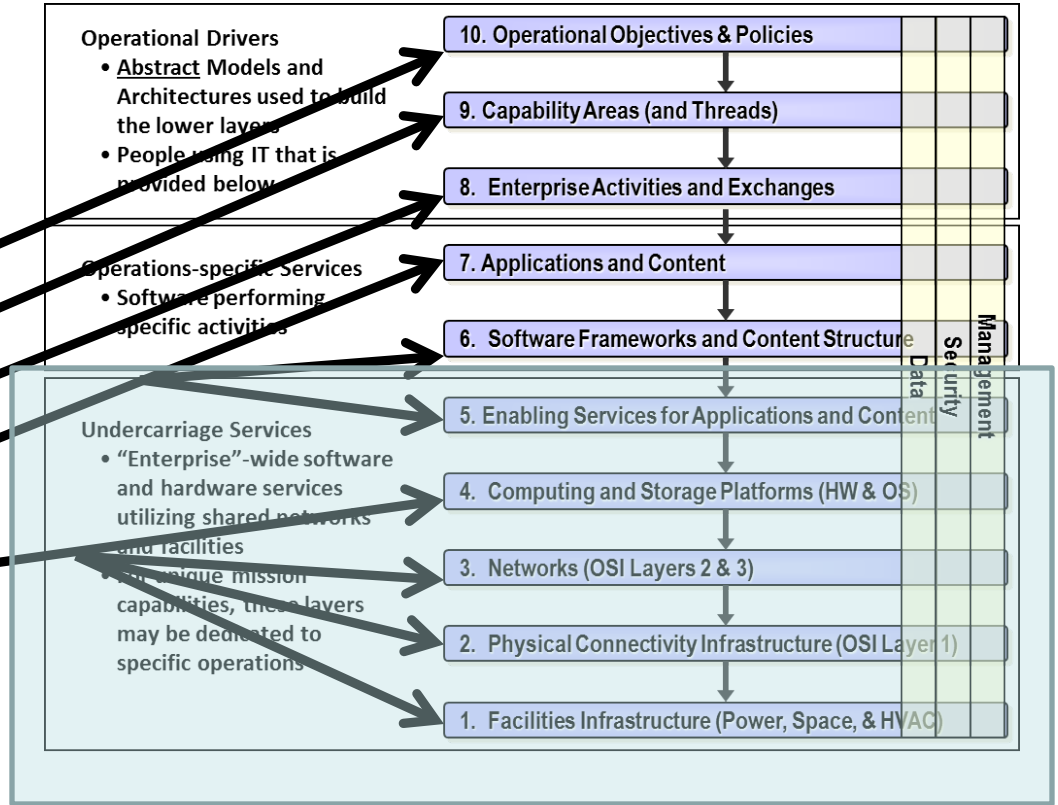
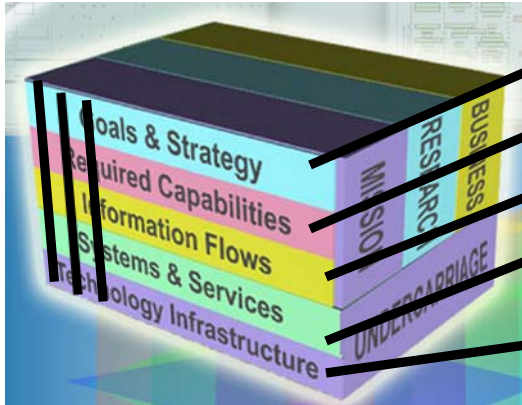


The Joint Architecture Reference Model: 10 Layer Model





Model Comparisons



Other Enablers



Example of the way we did EA

Enter the Joint Architecture Working Group

JAWG



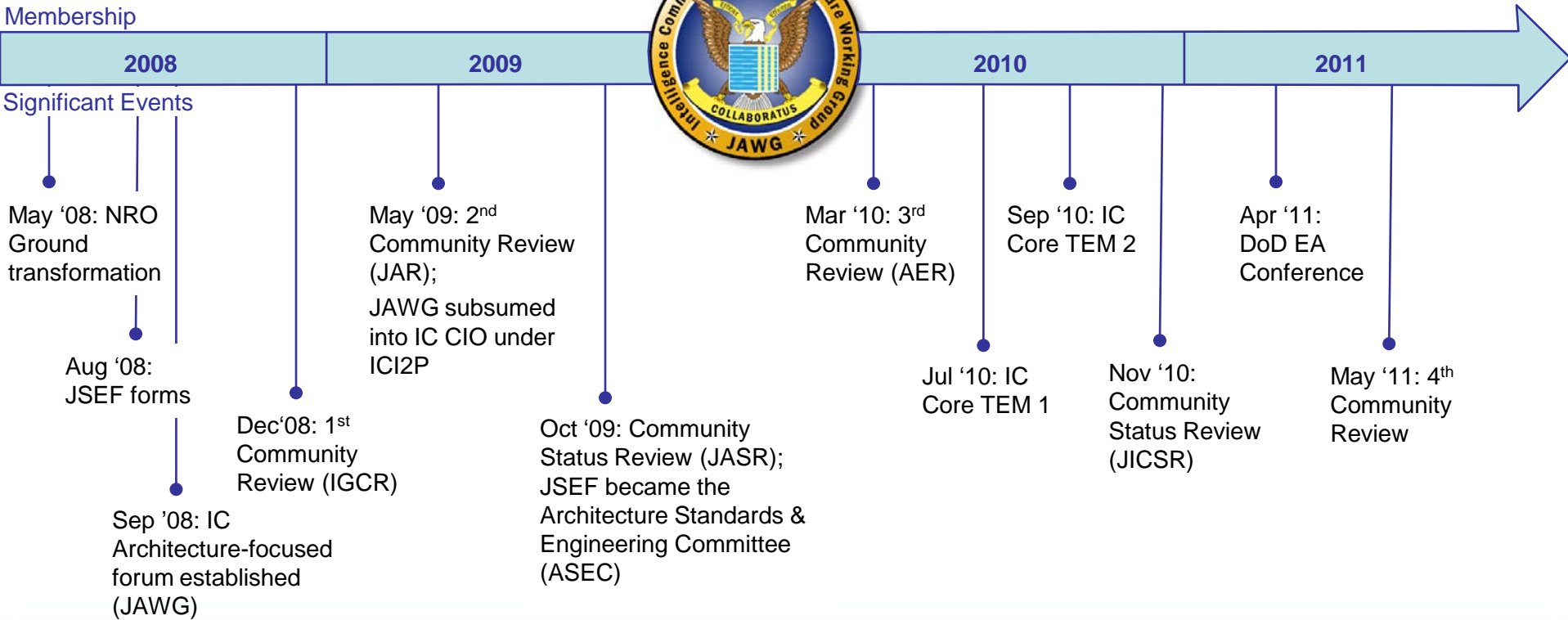
The JAWG's Objective

...to define the IC Federated Enterprise Architecture and provide tools to support IC Element and IC Enterprise investment (acquisition) decisions across the IC



JAWG Timeline

NRO	NSA	NGA	ODNI	DIA	OUSD(I)	CIA	FBI	DHS	USN (N2)	DoD CIO	JCS
Sep '08	Sep '08	Sep '08	Oct '08	Oct '08	Nov '08	Dec '08	Jan '09	Feb '09	Jul '09	Aug '09	Apr '10





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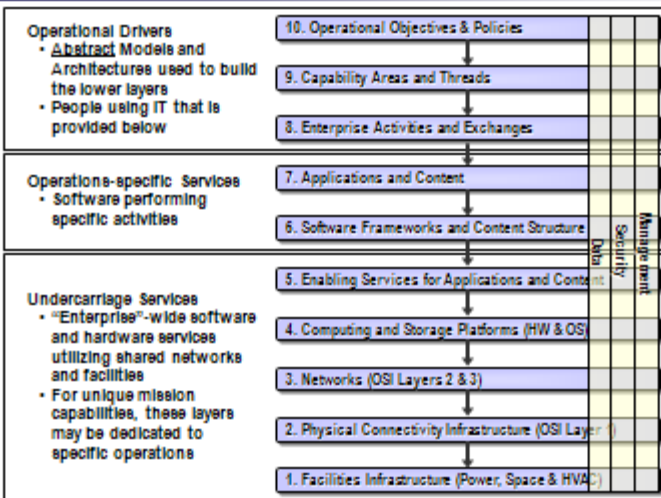
LEADING INTELLIGENCE INTEGRATION





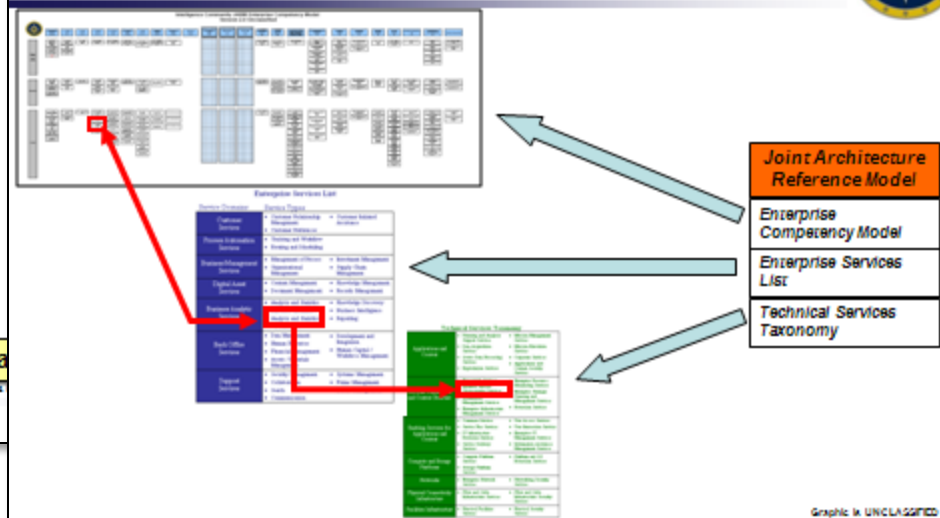
The Joint Architecture Reference Model The Tools

(U) The JARM 10 Layer Model



(U) A Structure for Partner Interoperability – Promoting a common understanding

(U) How the JARM Products Work Together



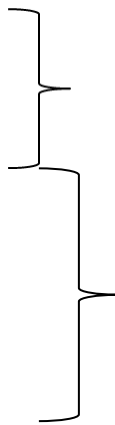
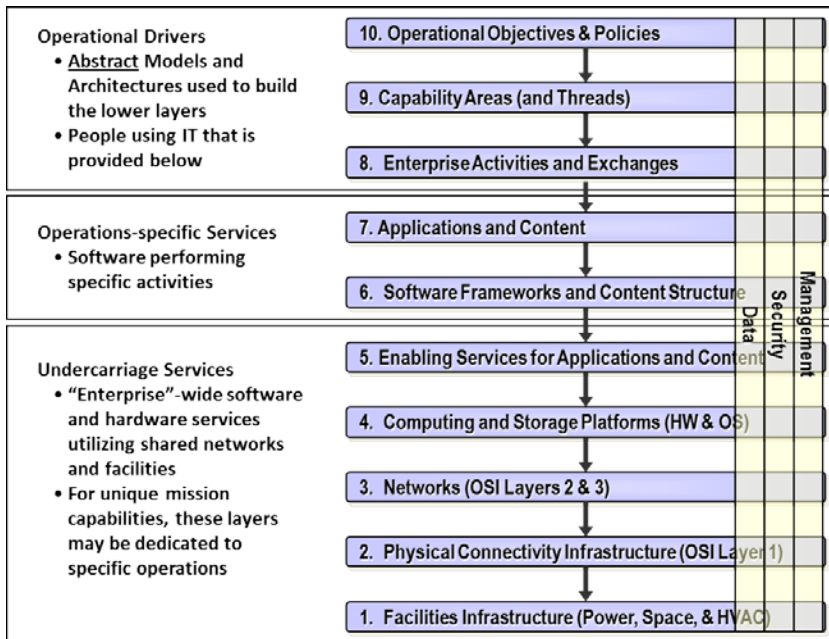
(U) Facilitates Communication, Investment Decision-Making, and Analysis

To be effective, we need to use the JARM in a standard way toward a shared goal...



The Joint Architecture Reference Model: 10 Layer Model

Supports



Specific Areas of Interest

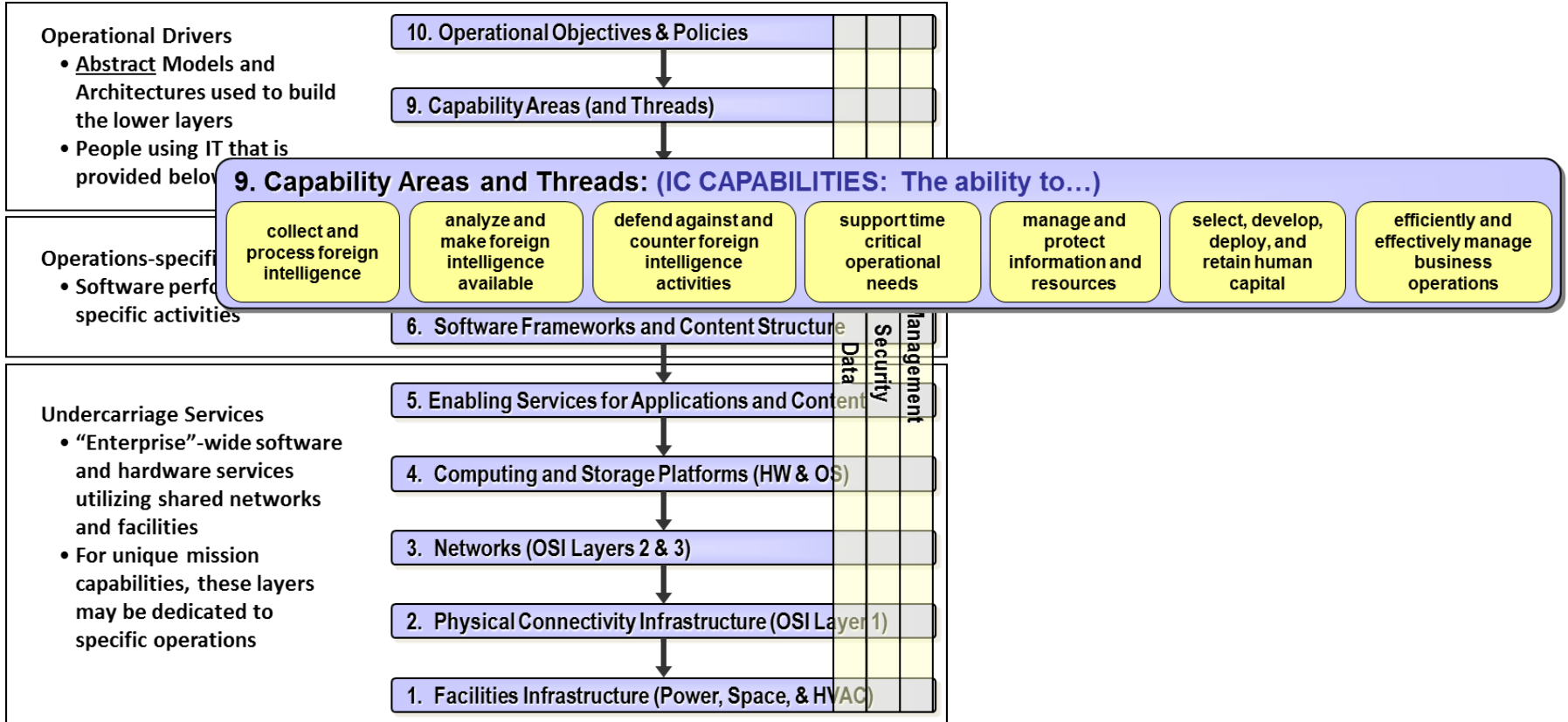
Top Down



Bottoms Up

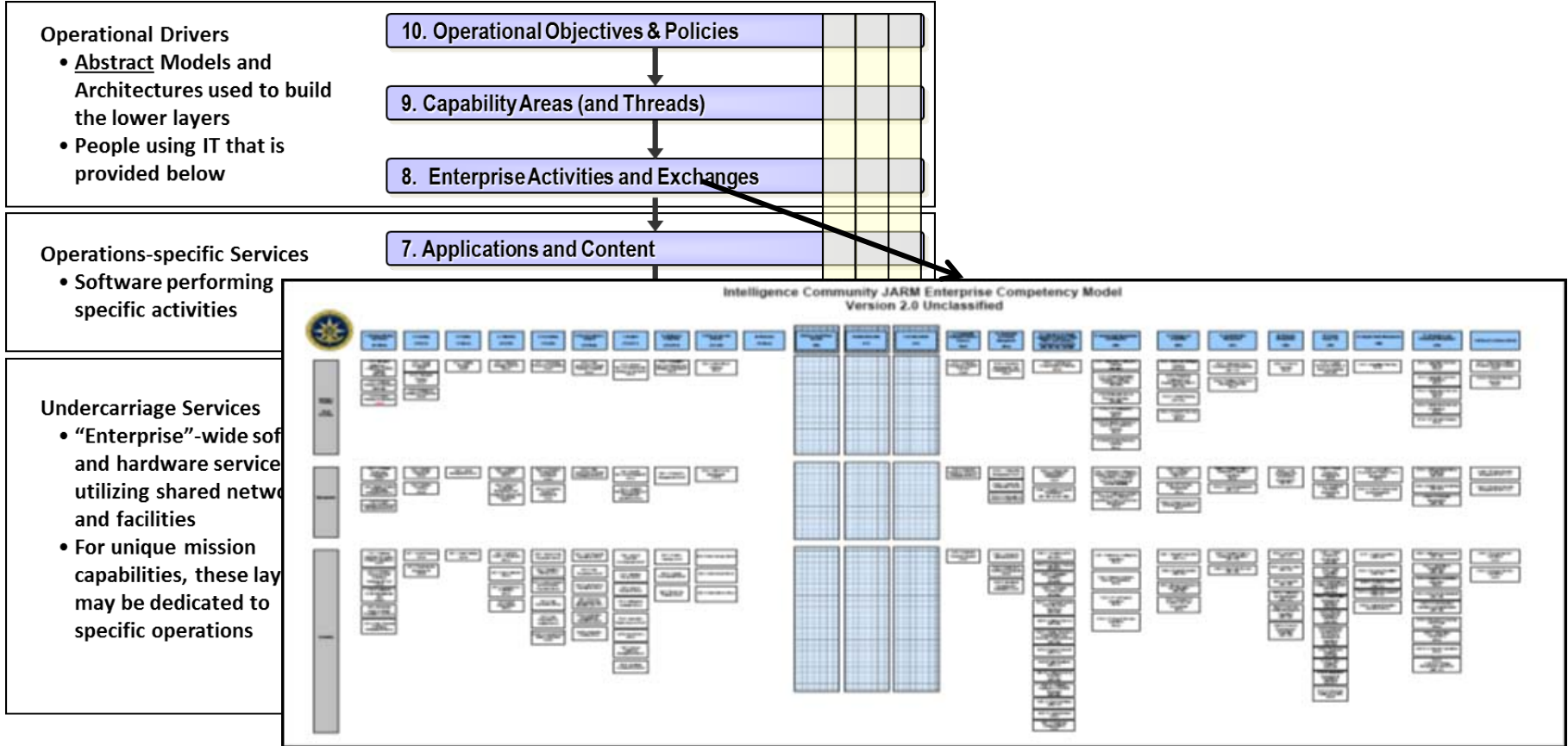


The Joint Architecture Reference Model: 10 Layer Model





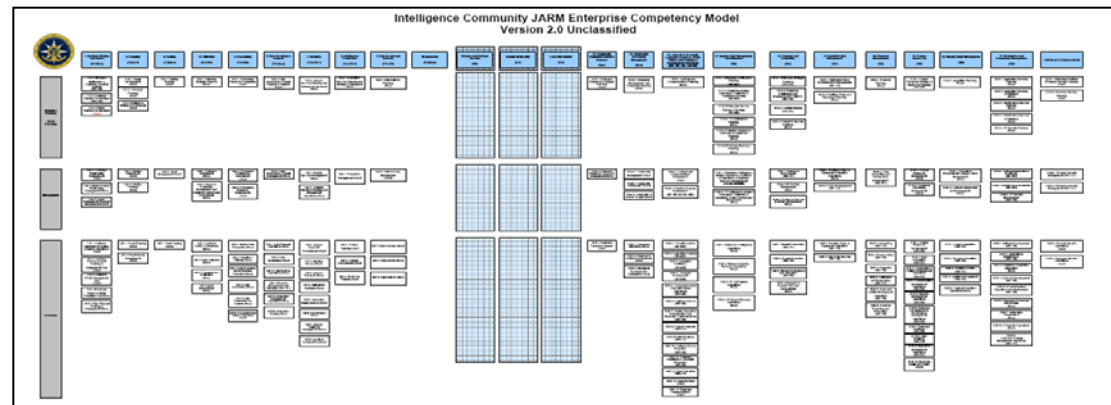
The Joint Architecture Reference Model: 10 Layer Model





Enterprise Competency Model (ECM)

- The ECM is a standard characterization of mission and business **functions and activities**
 - It's a way to represent what our agencies do
 - It's related to the FEA Business Reference Model
- Functions identified within the ECM represent Layer 8 “Enterprise Activities and Exchanges”
- The ECM introduces three concepts
 - Enterprise Competencies
 - Enterprise Components
 - Accountability Levels



The ECM provides a more in-depth representation of IC mission and business functions than the current IC BRM



Enterprise Services List (ESL)

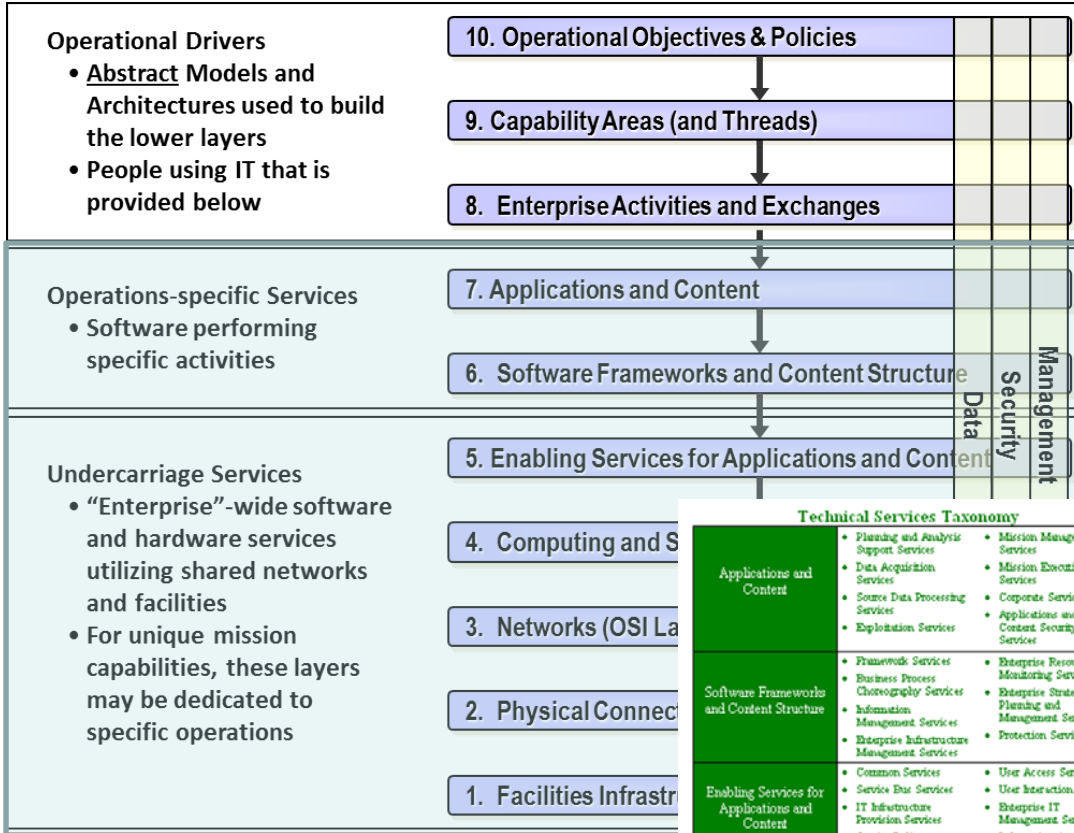
- The ESL provides a mission/business-driven, functional framework classifying enterprise services
- ESL terminology is consistent with the FEA Service Reference Model
 - Service Domains
 - Service Types
 - Service Components

Enterprise Services List		
Service Domains	Service Types	
Customer Services	<ul style="list-style-type: none"> • Customer Relationship Management • Customer Preferences 	<ul style="list-style-type: none"> • Customer Initiated Assistance
Process Automation Services	<ul style="list-style-type: none"> • Tracking and Workflow • Routing and Scheduling 	
Business Management Services	<ul style="list-style-type: none"> • Management of Process • Organizational Management 	<ul style="list-style-type: none"> • Investment Management • Supply Chain Management
Digital Asset Services	<ul style="list-style-type: none"> • Content Management • Document Management 	<ul style="list-style-type: none"> • Knowledge Management • Records Management
Business Analytic Services	<ul style="list-style-type: none"> • Analysis and Statistics • Mission Performance • Analysis and Statistics • Visualization 	<ul style="list-style-type: none"> • Knowledge Discovery • Business Intelligence • Reporting
Back Office Services	<ul style="list-style-type: none"> • Data Management • Human Resources • Financial Management • Assets / Materials Management 	<ul style="list-style-type: none"> • Development and Integration • Human Capital / Workforce Management
Support Services	<ul style="list-style-type: none"> • Security Management • Collaboration • Search • Communication 	<ul style="list-style-type: none"> • Systems Management • Forms Management • Service Management

The ESL provides a more comprehensive list of enabling services for the IC

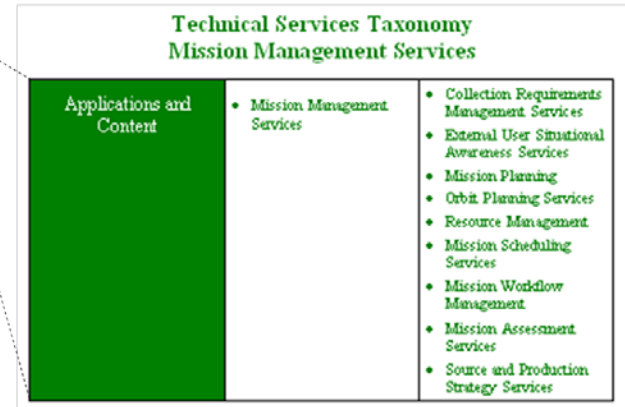


The Joint Architecture Reference Model: 10 Layer Model



Technical Services Taxonomy

Applications and Content	<ul style="list-style-type: none"> • Planning and Analysis Support Services • Data Acquisition Services • Source Data Processing Services • Exploitation Services 	<ul style="list-style-type: none"> • Mission Management Services • Mission Execution Services • Corporate Services • Applications and Content Security Services
Software Frameworks and Content Structure	<ul style="list-style-type: none"> • Framework Services • Business Process Choreography Services • Information Management Services • Enterprise Infrastructure Management Services 	<ul style="list-style-type: none"> • Enterprise Resource Monitoring Services • Enterprise Strategic Planning and Management Services • Protection Services
Enabling Services for Applications and Content	<ul style="list-style-type: none"> • Common Services • Service Bus Services • IT Infrastructure Provision Services • Service Delivery Services 	<ul style="list-style-type: none"> • User Access Services • User Interaction Services • Enterprise IT Management Services • Information Assurance Management Services
Compute and Storage Platforms	<ul style="list-style-type: none"> • Compute Platform Services • Storage Platform Services 	<ul style="list-style-type: none"> • Platform and OS Protection Services
Networks	<ul style="list-style-type: none"> • Enterprise Network Services 	<ul style="list-style-type: none"> • Networking Security Services
Physical Connectivity Infrastructure	<ul style="list-style-type: none"> • Fiber and Cable Infrastructure Services 	<ul style="list-style-type: none"> • Fiber and Cable Infrastructure Security Services
Facilities Infrastructure	<ul style="list-style-type: none"> • Physical Facilities Services 	<ul style="list-style-type: none"> • Physical Security Services





So why do we care?



Start With A Common Language

(U) Sprechen Sie Deutsch?



Parlez-vous français?

אתה מדבר עברית?

uspktxt? :-)

Вы говорите по-русски?

Parli Italiano?

¿Habla usted español?

**(U) We all speak different "languages;"
The IC Enterprise Architecture bridges these 'gaps';
The Joint Architecture Reference Model (JARM) is the common lexicon**

UNCLASSIFIED

12

(U) What do you mean by "tank?"



TANK
TANKS ARE COMMON TO MANY INDUSTRIES



Pictures are UNCLASSIFIED



That's the Enterprise...
let's narrow our focus a bit more...



A Federated Environment Enabling Information Integration



“Any data, any time, any place, usable by any authorized consumer; preventable only by law or policy, not technology.”



The IC Core Defined

- The IC Core is *a focused set* of joint & community services, specifications and standards, processes, and policies for enabling the Business of Intelligence for the federated Intelligence Community Enterprise
- IC Core elements must:
 - be foundational
 - enable the Business of Intelligence, and
 - foster interoperability and integration

The focus of the IC Core is on the technical service capabilities and discrete services



IC Core Baseline Increment 1

Service Offering:

Identity & Access Management (IdAM)

- Access Control
- Digital Policy Management
- Intrusion Prevention
- Cryptography
- Digital Resource Identification
- Audit Trail Capture & Analysis
- Forensics
- Identification and Authentication
- Digital Signature Management

Computers / Automation Management

Collaboration

- Email
- Organizational Messaging
- Voice Communication
- Audio Conferencing
- Workgroup / Groupware
- Video Conferencing
- Computer / Telephony Integration
- Real-Time Chat
- Threaded Discussion
- Shared Calendaring
- Instant Messaging
- Personalization
- Community Management
- Document Library
- Task Management
- Text Messaging
- Multimedia

Content Discovery & Retrieval (CDR)

- Information Retrieval
- Subscriptions
- Alerts & Notifications
- Data Exchange
- Metadata Management
- Knowledge Distribution and Delivery
- Knowledge Categorization
- Precision / Recall Ranking

Infrastructure Enablers

- Network Management
- Communications
- Enterprise Infrastructure Assessment
- Virus Protection
- Intrusion Detection
- Incident Response
- Cross Domain Data Transfer

General Enterprise Enablers

- Document Categorization
- Indexing
- Document Classification
- Security Classification
- Service Monitoring
- Service Discovery
- Service Publication
- Content Acquisition
- Directory Services
- Workforce / Directory Locator
- Information Mapping / Taxonomy
- Mission Assessment
- Personnel Administration

Legend

- Service Offering
- IC Core Enterprise Service Component
- Enterprise Service Component

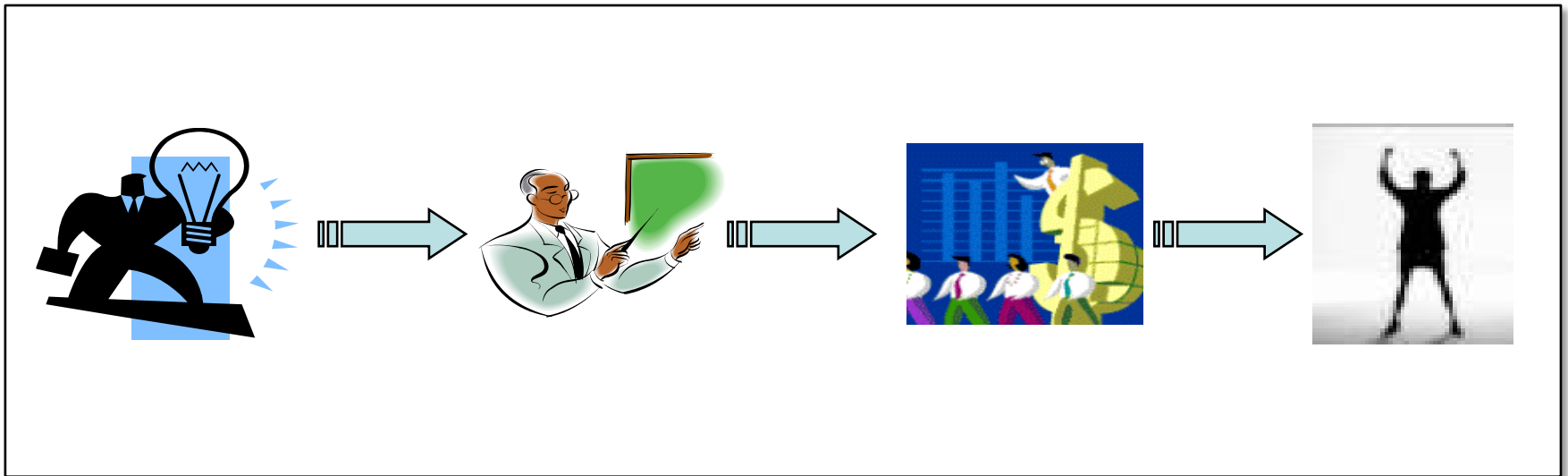
Requires synchronization with ESL



So we've got another framework, another taxonomy...
What do we do with it?



Need to make acquisition decisions based on functions (capabilities) rather than individual programs

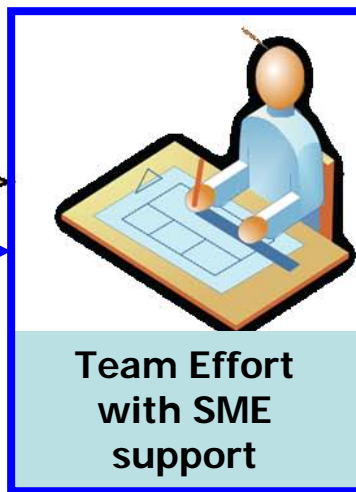
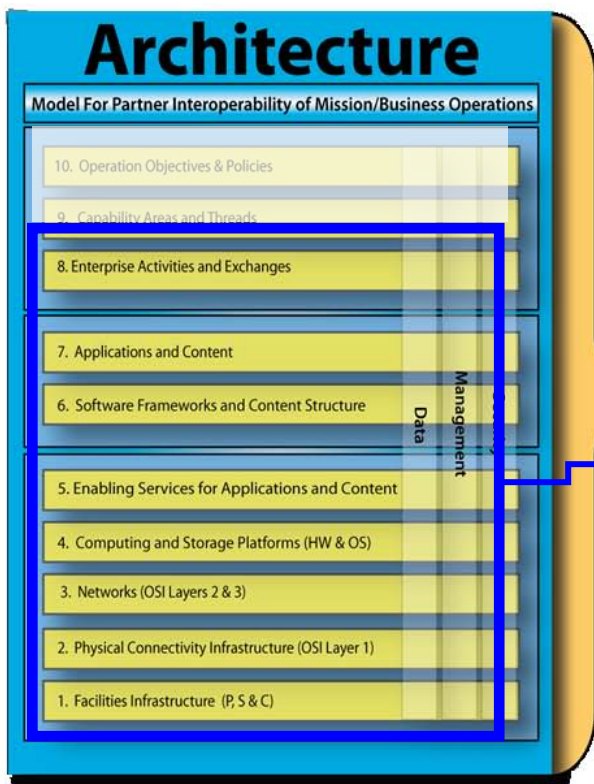


So how do we use the JAWG products to better inform acquisition decisions?

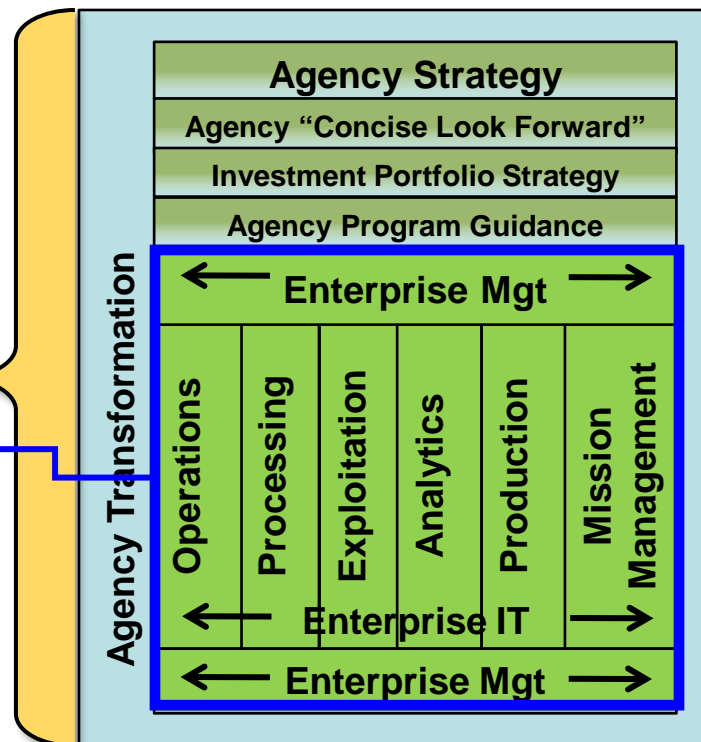


Enterprise Architecture to Investment Portfolio Alignment

10 Layer Architecture Model



Information Portfolio (IP) Structure





Overlaps, Possible Duplication, or areas of Common Concern

Then – look for hotspots or concentrations of activity

Budget Center Bxxx

Effort 1

- Material
- Labor
- Mgmt, Sys Engr, HW Main, SW Dev ...
- Travel, Transportation & Supplies
- Infrastructure
- Facilities

Effort 2

- Material
- Labor
- Mgmt, Sys Engr, HW Main, SW Dev ...
- Travel, Transportation & Supplies
- Infrastructure
- Facilities

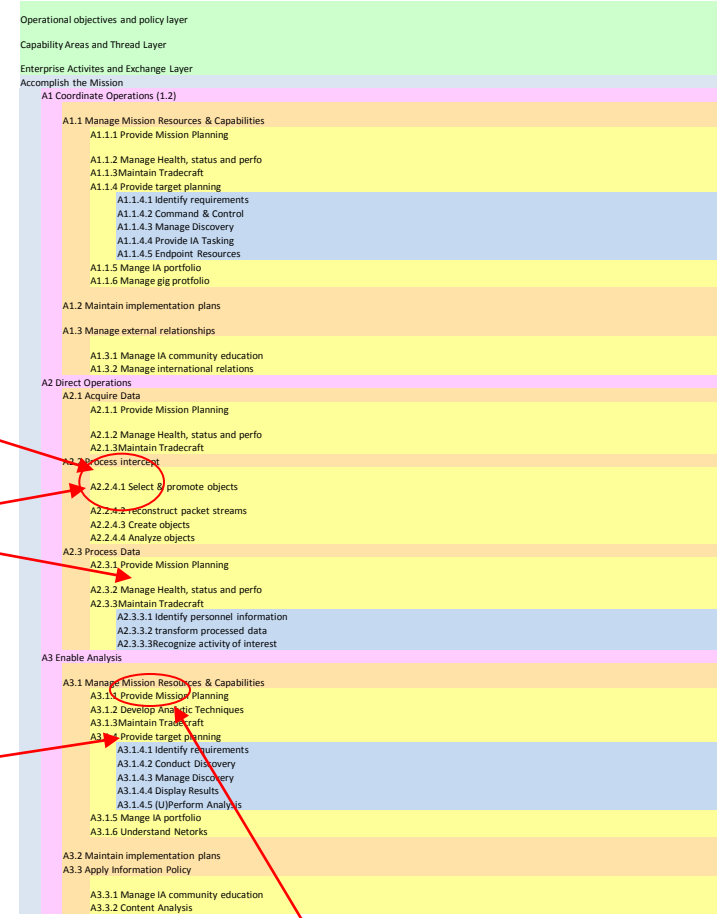
Budget Center Byyy

Effort 1

- Material
- Labor
- Mgmt, Sys Engr, HW Main, SW Dev ...
- Travel, Transportation & Supplies
- Infrastructure
- Facilities

Effort 2

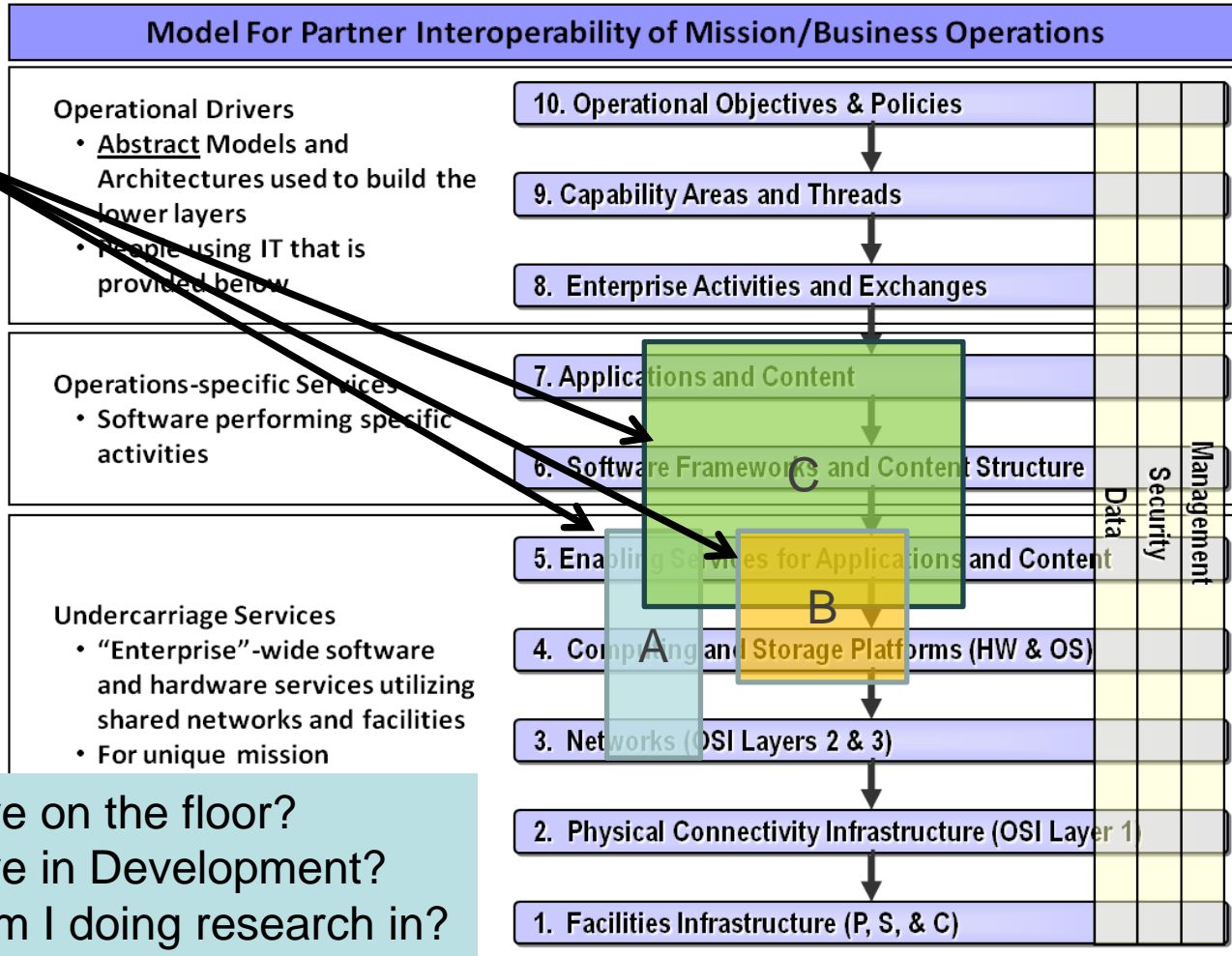
- Material
- Labor
- Mgmt, Sys Engr, HW Main, SW Dev ...
- Travel, Transportation & Supplies
- Infrastructure
- Facilities



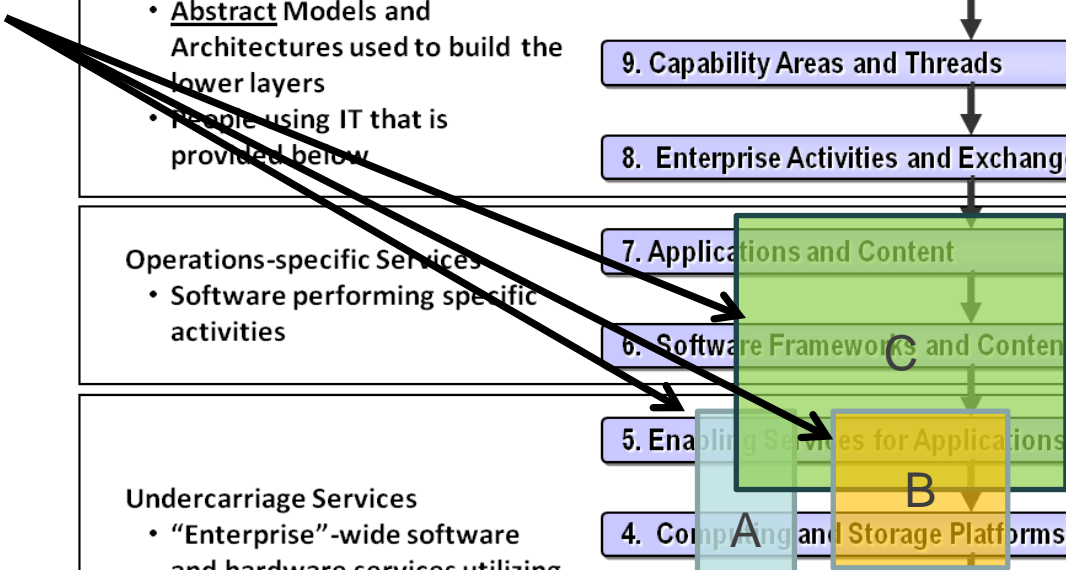
Capability GAP!
Mission Critical Capability but no evidence of financial support



Within an Agency



Programs A, B & C



What do I have on the floor?
 What do I have in Development?
 What areas am I doing research in?



So why not do it on a grander scale?

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IC CIO Requirement for FY12 Program Build Exhibit 53 & 300 Mapping to the JARM

- Exhibit 300 Data
 - Required: Mapping to the ECM
 - Required: Mapping to the ESL
- Exhibit 53 Data
 - Optional: Mapping to the ECM
 - Optional: Mapping to the ESL
- Required pre-2010
 - Reporting data for the FYDP, not just a single FY
 - Percentage of the Budget allocated to the BRM
 - Percentage of the Budget allocated to the SRM



JARM Enterprise Competency Model (ECM)

JARM Enterprise Services List (ESL)

Service Domain		Customer Services			Process Automation Services	Business Management Services	Digital Asset Services	Business Analytics Services	Back Office Services	Support Services												
Service Components	Service Types			1	2	3	Intelligence Community JARM Enterprise Competency Model Version 2.0 Unclassified										0	31	32	33		
	Customer Relationship Management	Customer Preferences	Customer Initiated				[Diagram Content]															
1	8.1.1	8.2.1	8.3																8.1.1	8.32.1	8.33.1	
2	8.1.2	8.2.2	8.3																	8.31.2	8.32.2	8.33.2
3	8.1.3	8.2.3	8.3																			
4	8.1.4		8.3																	8.31.3		8.33.3
5	8.1.5		8.3																	8.31.4		8.33.4
6	8.1.6		8.3																	8.31.5		8.33.5
7	8.1.7		8.3																	8.31.6		
8	8.1.8																			8.31.7		
9	8.1.9																					
10	8.1.10																					
11	8.1.11																					
12	8.1.12																					
13	8.1.13																					
14	8.1.14																					
15																						
16																						
17																						
18																						
19																						
20																						
21																						
22																						
23																						



All (22) Ex 300 Programs Mapped to ESL for FY12

(U) Do the circled boxes indicate potential critical business service gaps? We do not know. Data set is incomplete.

Service Components	Service Domain																																		
	Customer Services			Process Automation Services		Business Management Services			Digital Asset Services			Business Analytics Services							Back Office Services					Support Services											
	Customer Relationship Management	Customer Preferences	Customer Initiated Assistance	Tracking & Workflow	Routing & Scheduling	Management of Process	Organizational Management	Investment Management	Supply Chain Management	Content Management	Document Management	Knowledge Management	Records Management	Analysis & Statistics	Mission Performance	Intelligence Analysis	Visualization	Knowledge Discovery	Business Intelligence	Reporting	Data Management	Human Resources	Financial Management	Assets / Materials Management	Development & Integration	Human Capital / Workforce Management	Security Management	Collaboration	Search	Communication	Systems Management	Forms Management	Service Management		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33			
1	4	6	6	10	3	12	4	8	11	4	4	9	4	1	1	0	4	4	3	9	10	1	6	8	10	2	13	7	9	4	10	2	8		
2	2	4	6	4	3	12	8	3	5	4	3	6	8	1	0	2	1	3	2	8	7	1	5	6	9	1	13	5	1	4	6	2	4		
3	2	6	6	1		13		4	7	2	4	7	3	0	2	1	1	5	4	5	9	2	5	7	9	4	7	6	3	4	10		4		
4	7		2			15			5	3	7	6	0	0	3	2	2				5	2	2	5	9	1	8	6	2	3	7		5		
5	2		0			9			8	0	4	4		2	2	1	2				4	3	4	8	9	0	7	3	4	5	9		9		
6	8					13			10		3	7			0	0	0				4	1	4		1	8	4			5	12				
7	4					8			3		4	5			2	0	3				7	1	2		0	6	4			1	11				
8	8					14			4		5	2			0	3					10	1	4		0	9				4					
9	5					10			1						1	2					6	3	4		0	10									
10	7								2						0						4	1	2			5									
11	4								3						0						9	2	1			6									
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19															1						3					2									
20															0						1					2									
21															1						1					5									
22															2						1					2									
23															3						1					1									

(U) ESL Component 8.3.5 Multi-Lingual Support defines the set of capabilities that allow access to data and information in multiple languages.



Most Common JARM ESL Mappings in Ex 300s for FY12

At least five (out of six) of the reporting agencies mapped to each of the following service components for FY12 within the JARM ESL:

- Product Management
- Customer/Account Management
- Alerts and Notifications
- Process Tracking
- Requirements Management
- Program/Project Management
- Governance/Policy Management
- Quality Management
- Business Rule Management
- Risk Management
- Procurement
- Invoice Requisition Track/Approve
- Library Storage
- Document Creation/Validation
- Information Retrieval
- Information Mapping/Taxonomy
- Information Sharing
- Knowledge Capture
- Document Classification
- Ad-Hoc
- Standardized/Canned
- Data Exchange
- Data Warehouse
- Data Recovery
- Data Access
- Cross Domain Data Transfer
- Software Development
- Identification and Authentication
- Access Control
- Query
- Systems Engineering

Mapping of all Ex 300 reporting programs across the community highlights areas where the IC might collaborate today in our respective development efforts

The “heat map” shows all service component mappings across all six agencies [for illustration only]

(Source: Exhibit 300s)



ESL Mapping Snapshot: IC Core Overlay

(U) The circled boxes indicate Enterprise Service components in which 1 or fewer of the 6 reporting agencies are investing. (Exhibit 300s, FY12)

Service Components	Service Domain																																			
	Customer Services			Process Automation Services		Business Management Services				Digital Asset Services			Business Analytics Services							Back Office Services						Support Services										
	Customer Relationship Management	Customer Preferences	Customer Initiated Assistance	Tracking & Workflow	Routing & Scheduling	Management of Process	Organizational Management	Investment Management	Supply Chain Management	Content Management	Document Management	Knowledge Management	Records Management	Analysis & Statistics	Mission Performance	Intelligence Analysis	Visualization	Knowledge Discovery	Business Intelligence	Reporting	Data Management	Human Resources	Financial Management	Assets / Materials Management	Development & Integration	Human Capital / Workforce Management	Security Management	Collaboration	Search	Communication	Systems Management	Forms Management	Service Management			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33			
1		4				4						6									5					5	3	3	6	2			3			
2		4				4						5														5	3	1	2					4		
3		5												0		1										2	2	4						3		
4										3		4									3					3	3							4		
5														2								3			3	2								4		
6																								3	2											
7												4	4									1				4	2								3	
8												4													3	2									1	
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8.29.2 Precision / Recall Ranking – Defines the set of capabilities that support selection and retrieval of records ranked 1 to optimize precision against recall.



Less than 5% of the budget accounted for in the Exhibit 300's yet we still find overlaps in capability.

Think about what we might find if everything was aligned to a common framework



Some Final Thoughts regarding IT Efficiencies and Enterprise Architecture

Where will the cost savings come from?



People attending the conference	~600
Annual Loaded Cost to Government (\$300K/per year)	\$180,000,000/year
(\$300K per contractor, \$250K per govie, say, 2/3 of audience is contractor, 1/3 govie)	\$120,000,000
	+ \$ 50,000,000

	\$170,000,000/year

Associated Activity: Architecture

50% to 75% of an Agency's budget goes to manpower!



The Bottom Line on the JAWG

- We work together collaboratively
- Each IC Element has unique skills and abilities, that when combined with other IC Elements' respective skills and abilities supports the overarching Mission of the Intelligence Community
- **IT** is all about providing agility for the Mission; a force multiplier!
- Our JARM tools can scale and are usable at multiple levels of an organization/enterprise/community, for many different perspectives.
- It is all about providing “...*any data, any time, any place, usable by any authorized consumer; preventable only by law or policy, not technology.*”



For More Information:



▶ JAWG on Intelink:

- (JWICS) www.intelink.ic.gov/wiki/Joint_Architecture_Working_Group
- (NIPR) www.intelink.gov/wiki/Joint_Architecture_Working_Group

▶ More Questions:

- jawgleadershipsupport@ugov.gov
- randy.c.marks@ugov.gov



Questions

The greater danger for most of us lies not in setting our aim high and falling short; but in setting our aim too low, And achieving our mark.”

...Michelangelo

