

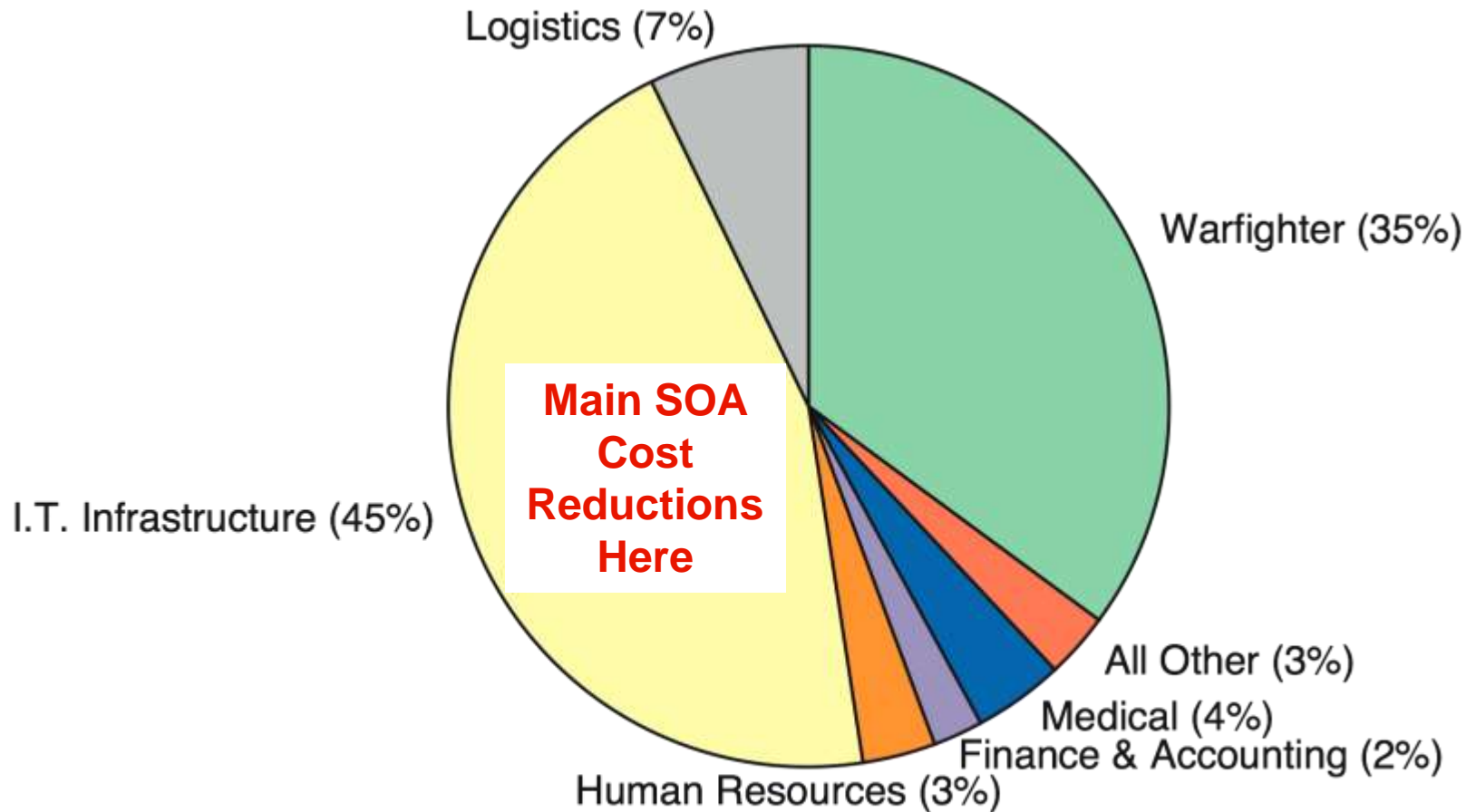
Service Oriented Architecture (SOA) for DoD

Prof. Paul A. Strassmann, George Mason University
2009 SOA Symposium: Government and Industry Best Practices
April 2, 2009

Part 1

What is SOA?

DoD I.T. Spending (\$ Millions)



Total DoD FY09 Budget: \$33,031 M

Spending does not include Services labor costs, avionics, weapon electronics, intelligence

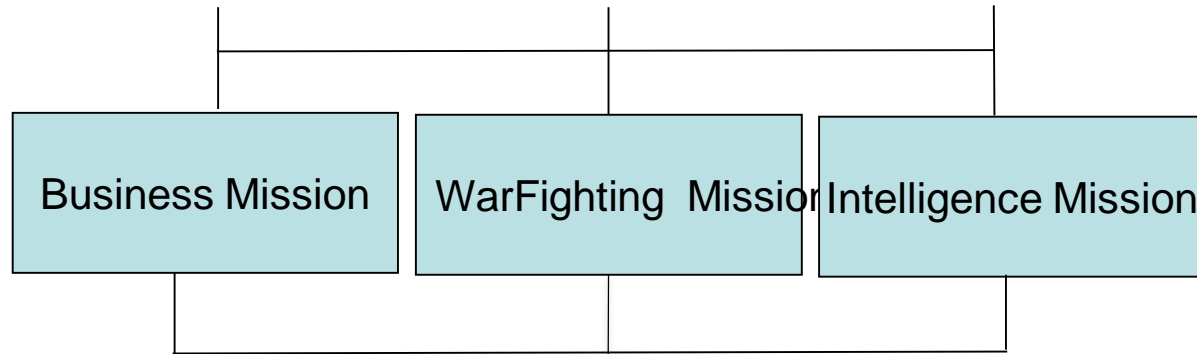
What is the Objective of SOA in DoD?

- The capacity to:
 - Discover Applications Anywhere;
 - Display the Capabilities of All Applications;
 - Discover Network Data from a Data Registry;
 - Mediate the Extraction of Data from Data Bases;
 - Execute Requests from Multiple Servers;
 - Provide Credentials Validation to Everyone;
 - Deliver Results at “Google Speed” of <0.25 second;
 - Operate Network with Downtime of < 5 minutes/year.

Part 2

Focus of SOA

Where is the SOA Infrastructure? (FY09)

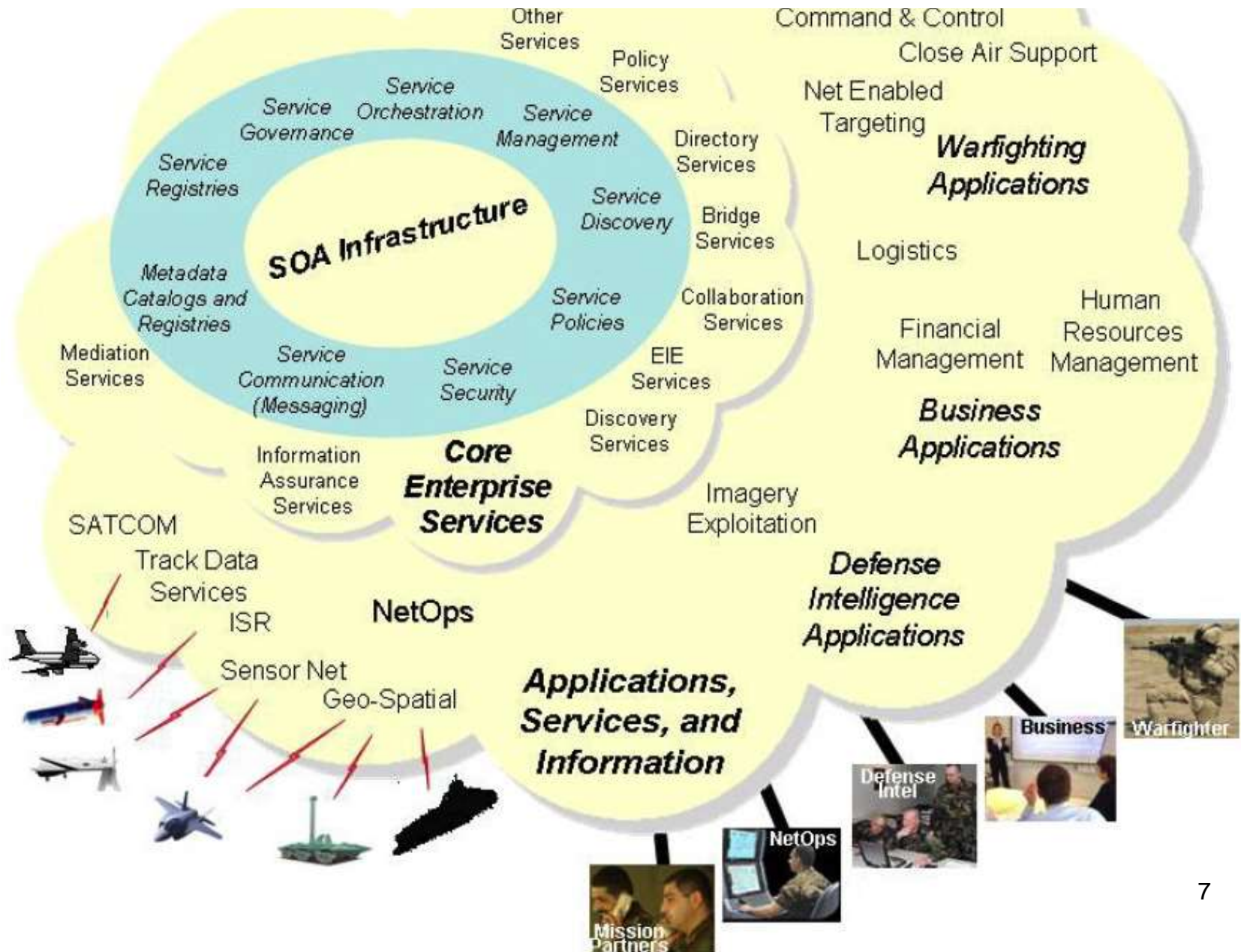


Cost of Infrastructure: \$14.9 Billion

583 Infrastructure Projects

% of Total DoD Spending: 45%

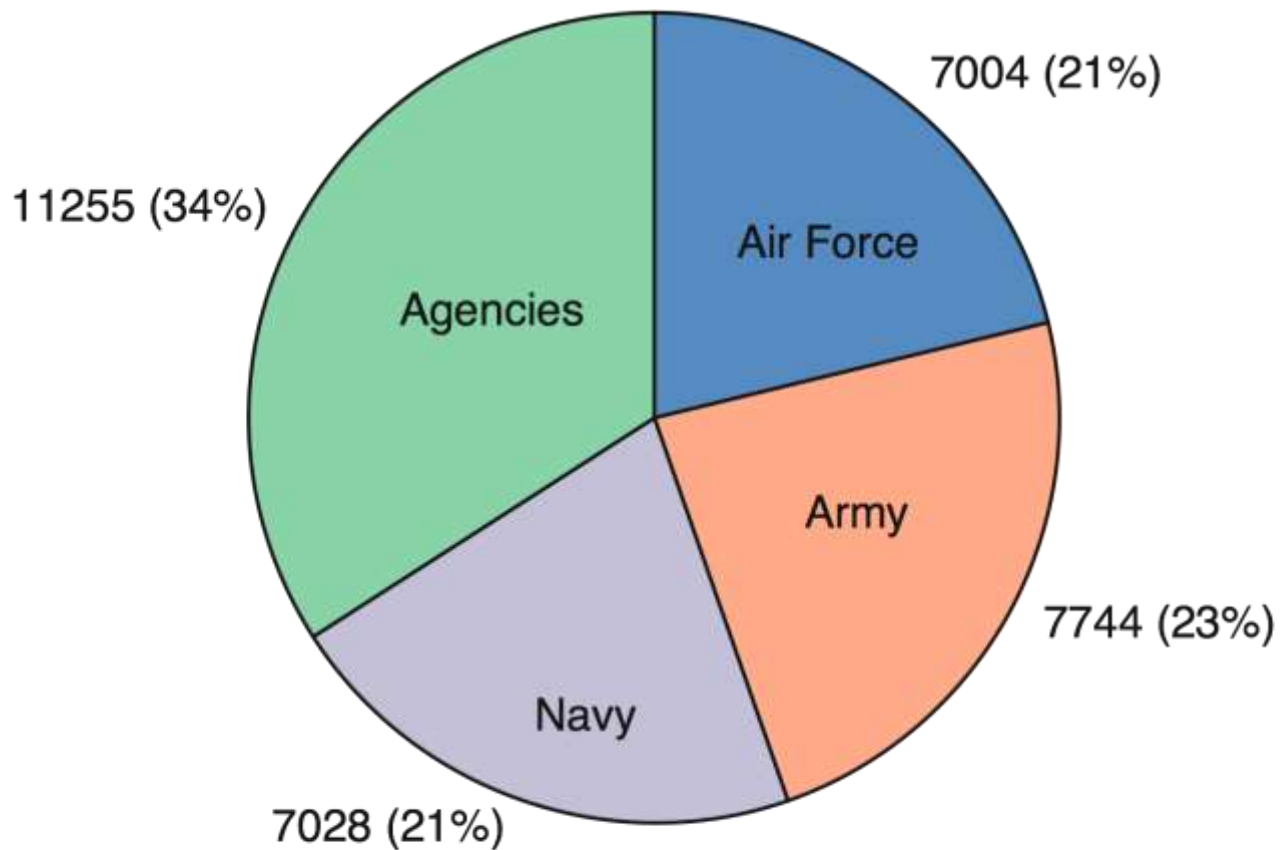
The Roots of SOA Are in a Shared Infrastructure



Top 10 DoD Projects Support Mostly the Infrastructure

Component	Investment Title	FY2009 I.T. spending - \$ Millions	Service Type
Navy	NAVY MARINE CORPS INTRANET	\$1,610	Infrastructure
Agencies	DEFENSE INFORMATION SYSTEM NETWORK	\$1,518	Infrastructure
Agencies	Non-DISN Telecomm	\$901	Infrastructure
Agencies	DEFENSE ENTERPRISE COMPUTING CENTERS	\$740	Infrastructure
Army	WARFIGHTER INFORMATION NETWORK-TACTICAL	\$616	Warfare
Army	NETWORK ENTERPRISE TECHNOLOGY COMMAND	\$453	Infrastructure
Agencies	PROTECT INFORMATION	\$437	Infrastructure
Army	BASE LEVEL COMMUNICATION INFRASTRUCTURE	\$392	Infrastructure
Air Force	Combat Information Transport System	\$342	Warfare
Air Force	Tactical Data Link System	\$327	Warfare
	Top 10 Projects - 22.2% of total; 82.5% for Infrastructure	\$7,335	
	Next 1,980 Projects - 77.7% of total	\$25,697	
	Total FY09 DoD	\$33,032	

Concentration of Costs in Agencies (34%)



Total DoD I.T. Spending = \$ 33,032 M

Where Are the Agencies?

- Defense Information Systems Agency (DISA)
- Defense Finance and Accounting Service (DFAS)
- Defense Logistics Agency (DLA)
- Business Transformation Agency (BTA)
- Defense Commissary Agency (DeCA)
- TRICARE Military Health System
- Defense Manpower Data Center (DMDC)
- Defense Technical Information Center (DTIC)
- Defense Contract Audit Agency (DCAA)
- Defense Security Services (DSS)
- Washington Headquarters Services

Importance of Agencies is Rising

Agency - \$ Millions	FY2007	FY2008	FY2009	Change - FY09 over FY07
Department of the Air Force	\$6,822	\$6,863	\$7,004	2.7%
Department of the Army	\$9,468	\$7,771	\$7,744	-18.2%
Department of the Navy	\$7,768	\$7,080	\$7,028	-9.5%
Department of Defense Agencies	\$10,326	\$10,368	\$11,256	9.0%
Department of Defense	\$34,384	\$32,082	\$33,032	-3.9%

Agencies Have a Large Share of I.T. Spending

FY2009 (\$M)	Development/ Modernization/ Enhancement	Operations & Maintenance
Air Force	\$2,440.0	\$4,564.2
Army	\$4,241.2	\$3,502.7
Navy	\$2,076.6	\$4,951.5
Agencies	\$3,187.2	\$8,068.6
Total	\$11,945.0	\$21,087.0

Does not include costs of Military and Civilian Employees

Does not include costs of DIA, NGA, NRO, NSA, etc.

Does not include avionics, weapon electronics, shipboard electronics

SOA Policies & Governance

SOA Related Policies (Partial List)

- DoD Directive 8000.1, “Management of DoD Info Resources”, November 21, 2003
- DoD Manual 8020.1-M, “Functional Improvement Process”, August 1992
- DoD Directive 8100.1, “GIG Overarching Policy”, September 19, 2002
- DoD Directive 8100.2, “Wireless Technologies and the GIG”, April 14, 2004
- DoDI 8110.1 “Multinational Information Sharing Networks Implementation”.
- DoD Directive 8115.1, “I.T. Portfolio Management”, October 10, 2005
- DoD Manual 8320.1-M, “Data Administration Procedures”, March 1994.
- DoD Manual 8320.1-M-1, “Standard Data Element Development”, May 1992.
- DoD Directive 8320.2, “Data Sharing in DoD”, December 2, 2004.
- DoD Directive 8320.03, “Identification Standards”, March 23, 2007.
- DoD Directive 8500.1, “Information Assurance”, October 24, 2004.
- DoD Net-Centric Data Management Strategy: Metadata Registration, April 3, 2003
- DoD Net Centric Strategy, May 9, 2003
- Department of Defense Discovery Metadata Specifications
- DEPSECDEF Memorandum on “Information Technology Portfolio Management”, March 22, 2004
- Director of Central Intelligence, “Intelligence Information Sharing”, June 9, 2004

Example of Foundations of SOA

- DoD Directive 8320.02, Data Sharing
 - Data shall be visible, accessible, and understandable to any user.
 - Data assets shall be made visible by associating metadata (“tagging”) for each data asset.
 - Data assets shall be made understandable by publishing semantic and structural metadata in a DoD metadata registry.

DoD Directive 7045.20 Defines Capability Portfolios

- Example of SOA Implementation
 - Command & Control: ASD(NII)
 - Net Centric Systems: ASD(NII)
 - Force Protection: USD(AT&L)
 - Force Applications: USD(AT&L)
 - Force Support: USD(P&R)
 - Logistics: USD(AT&L)
 - Battle Space Awareness: USD(I)
 - Building Partnerships: USD(P)
 - USD(P) JROC
 - Corporate Management: DCMO

Example of Implementation of Business Mission

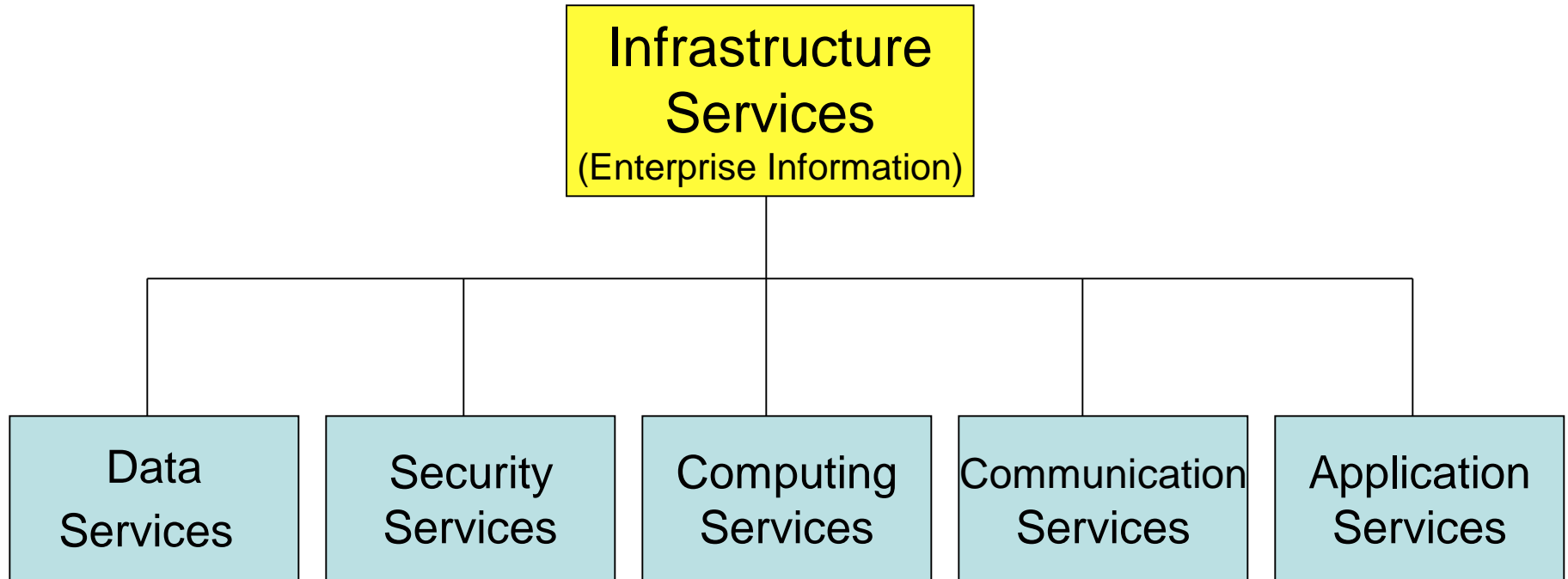
- Functions of the Chief Management Officer
 - Planning and budgeting, including performance measurement.
 - Acquisition.
 - Logistics.
 - Facilities, installations, and environment.
 - Financial management.
 - Human resources and personnel.
 - Management of information resources, including information technology, networks, and telecommunications functions related to above.

Problem: Who Oversees SOA? (Partial List)

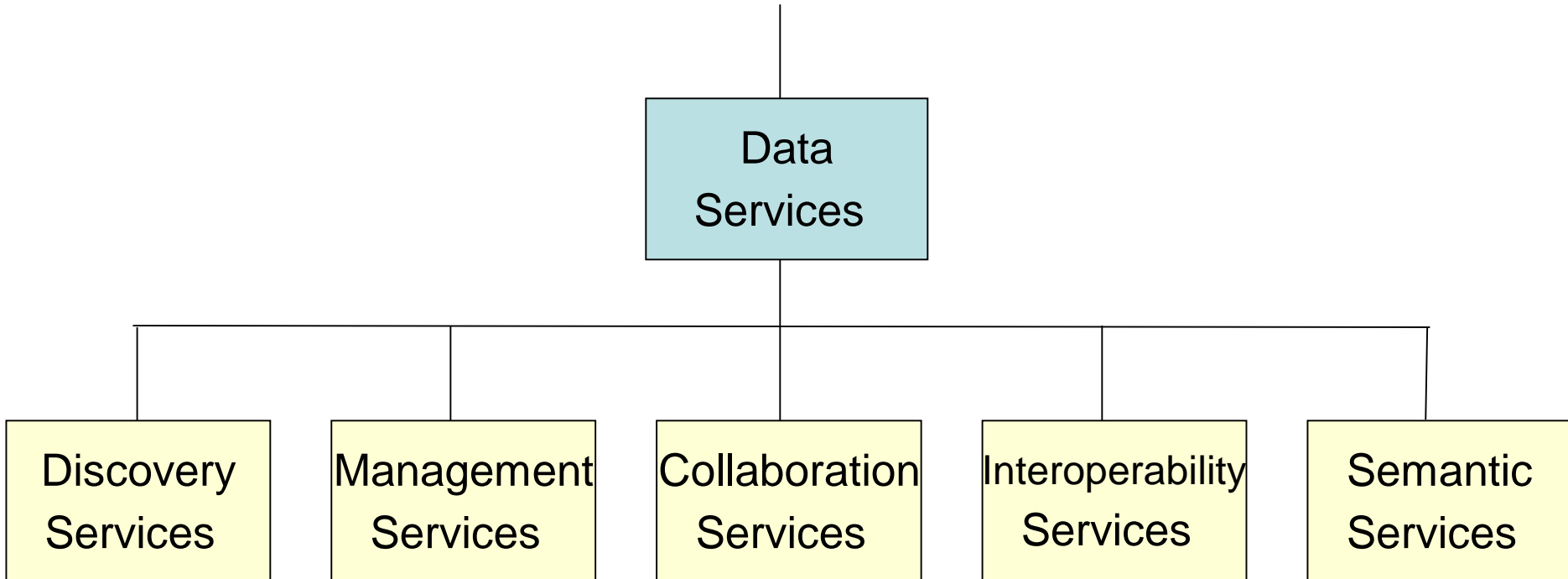
- DoD CIO Executive Board (CIO EB)
- Military Communications and Electronics Board (MCEB)
- GIG E2E Systems Engineering Advisory Board (SSEB)
- IT Standards Oversight Panel (ISOP)
- Information Assurance Senior Leadership Group (IASLG)
- Interoperability Senior Review Panel (ISRP)
- GIG Waiver Board and Panel
- DISN Flag Panel
- DISN Designated Approving Authority (DAA)
- DISN Security Accreditation Working Group (DSAWG)
- DIAP (Defense-Wide Information Assurance Program.)
- Joint Battle Management Board (JBMC2 BoD)
- Defense Business Systems Management Committee (DBSMC)
- CCB (Configuration Control Board)

Organizing for SOA

Organization of Infrastructure Services for SOA



Organization of Data Services



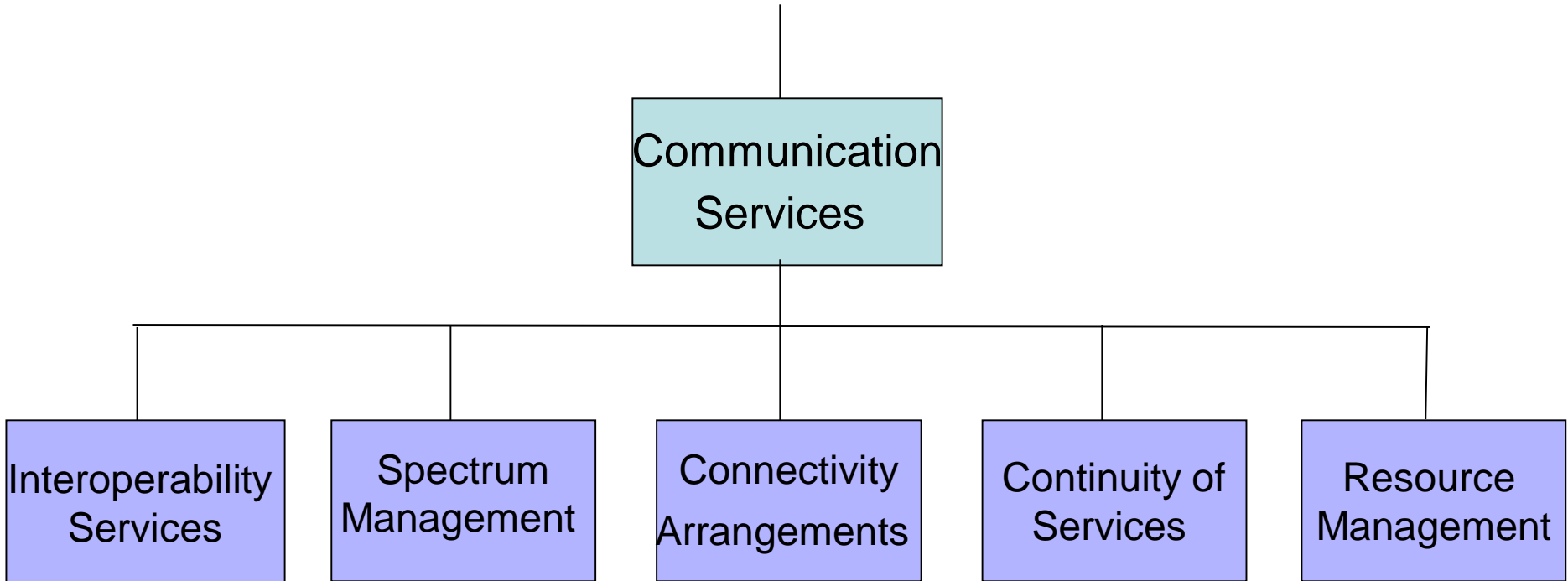
DoD Projects Have Own Data

Projects	07 Budget \$ Millions	Number of Projects	% of Total Budget \$	% of Projects
Project - > \$100 Million	\$10,301	43	33.9%	1.3%
Projects - > \$10 Million	\$15,013	525	49.4%	15.4%
Projects - < \$10 Million	\$5,066	2,832	16.7%	83.3%
Total	\$30,380	3,400	100.0%	100.0%

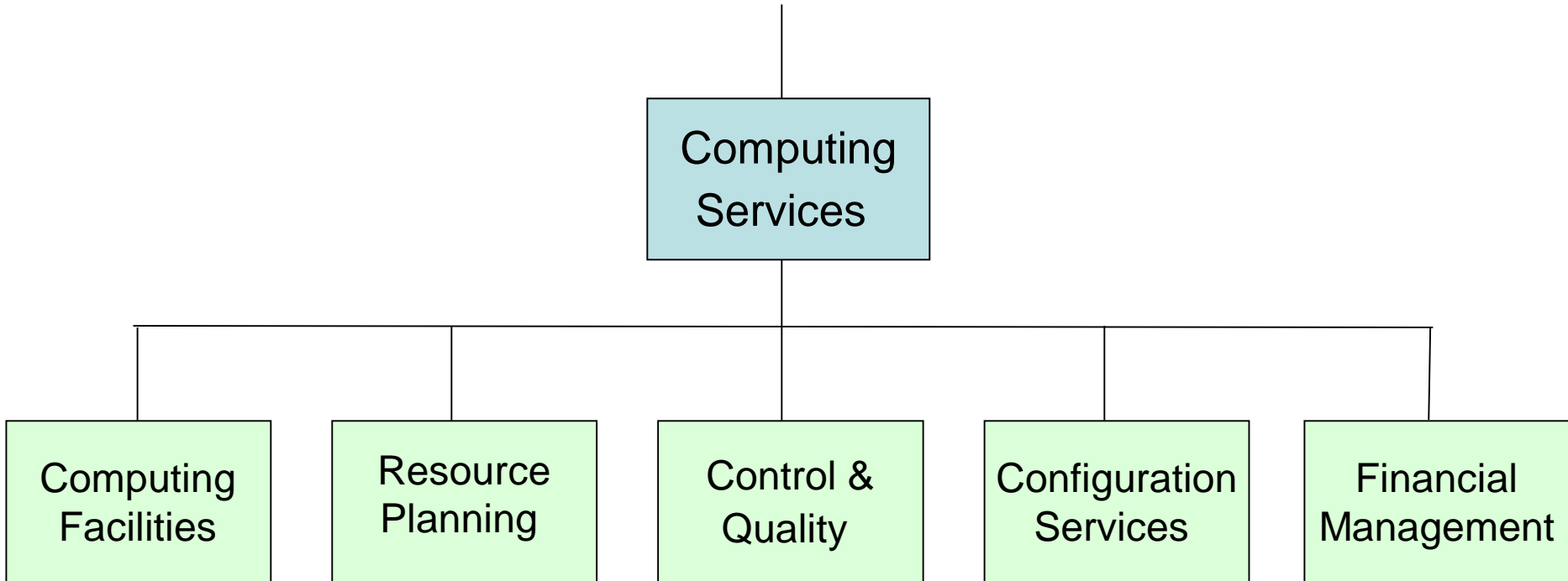
DoD Contractors Build Separate Infrastructures & Dictionaries

\$ Billions	FY05	FY06	FY07
Total DoD I.T. Spending	\$28.7	\$29.9	\$30.4
DoD Spending on Contractors	\$21.1	\$22.6	\$24.1
% of I.T. Spending Contracted Out	73.5%	75.6%	79.3%

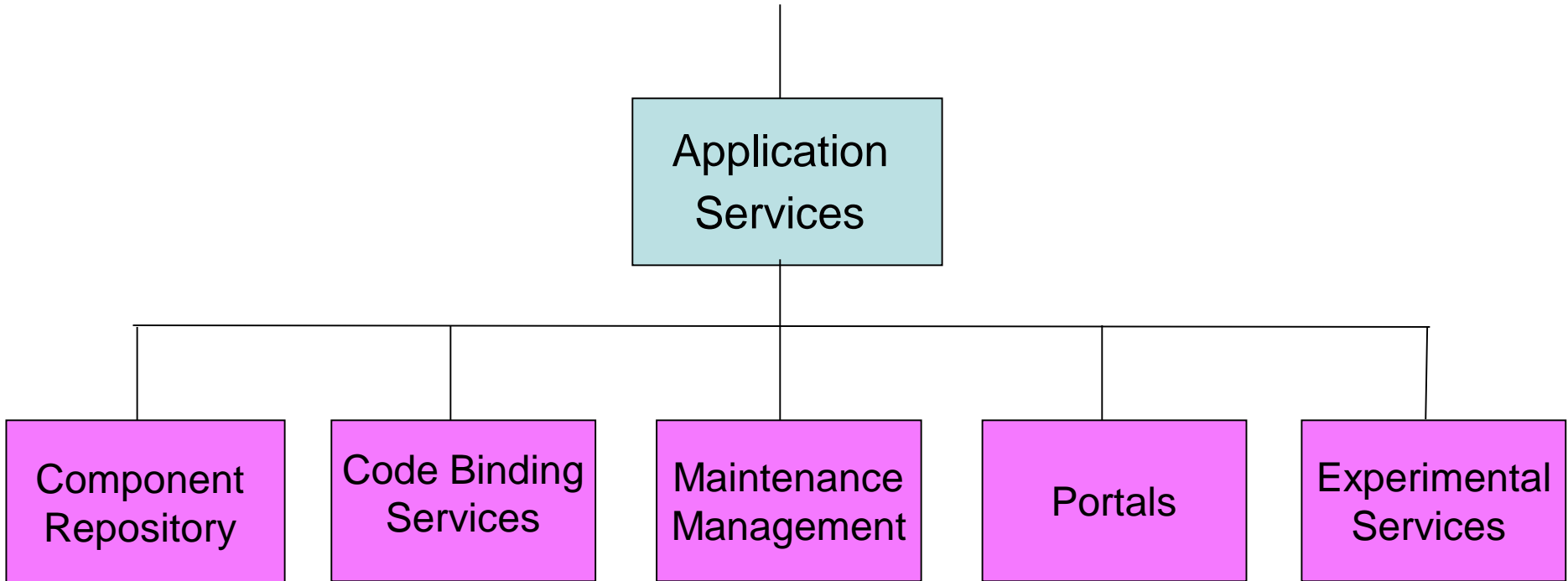
Organization of Communication Services



Organization of Computing Services

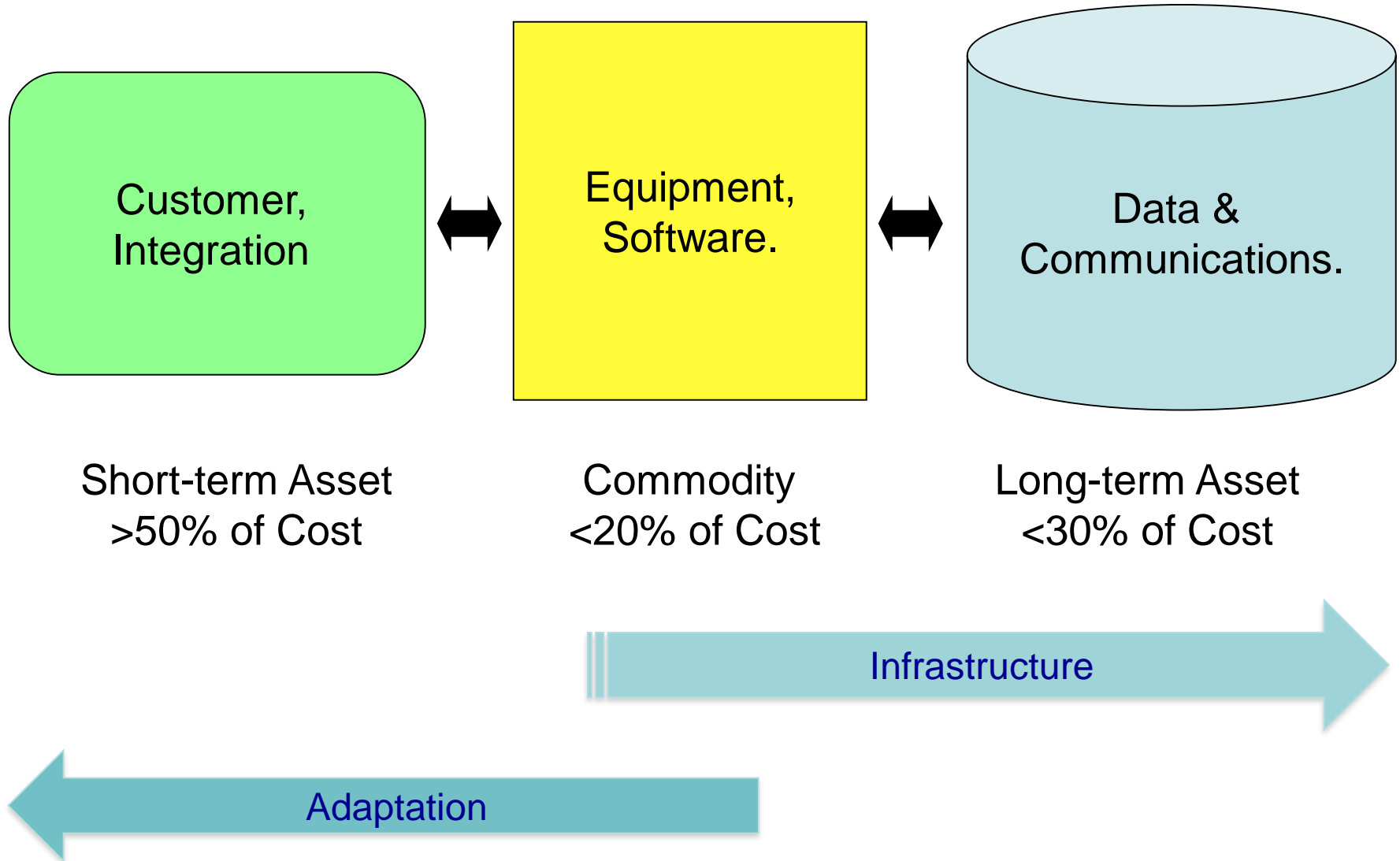


Organization of Application Services



Why SOA?

The Economics of Transformation Through SOA



2025 SOA Forecast: >1,000 Billion Transactions / Hour

<i>Generation</i>	<i>Period</i>	<i>Missions for National Security Systems</i>	<i>Interoperability: Number of Data Sources</i>
1	1955 - 1975	Automate Separate Applications	100
2	1975 - 1995	Automate Separate Processes	1,000
3	1995 - 2005	Integrate Processes within a Function	100,000
4	2005 - 2015	Integrate Functions within an Organization	10 Million
5	2015 - 2020	Innovate Processes As Needed	1 Billion
6	2025 -	Sense and Respond	1,000 Billion

Summary

- SOA requires standardization.
 - SOA requires discarding of obsolete assets.
 - SOA is a driver in an “arms race”.
 - SOA enables a weapon of Information Warfare.
-
- Current pace of SOA implementation is unsatisfactory.
 - WW IV has already started.
 - WW IV requires Information Superiority.
 - SOA is necessary for DoD Information Superiority.

References:

Questions? E-mail: pstrassm@gmu.edu

Further Reference: www.strassmann.com

AFCEA Signal article: <http://www.strassmann.com/pubs/afcea/2008-11.html>

Video Lecture: “What is a Service Oriented Architecture”

<http://video.google.com/videoplay?docid=-2644274303432509757>