



DoD Transformation to Service-Oriented Information Enterprise via Net-Centric Strategies

AV SOA Conference

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Service-Oriented Architecture (SOA)



S

Service

Capabilities performed by one on behalf of another to achieve a desired outcome

O

Oriented

An alignment of resources to enable services to be linked to solve business problems

A

Architecture

A system that is organized by its capabilities, their interactions, and the enterprise environment

SOA is an approach for organizing and using services to enable interoperability between data assets, applications, and users

It is a construct.....



Term "SOA" has become a catch-all



- More often than not, SOA is used to describe:
 - Web Services
 - An Architecture
 - "Service-Oriented" as a descriptor
 - "Service-Oriented Enterprise" to label the whole subject.
- SOA – the architecture – brings with it the right concepts for a Service-Oriented Enterprise:
 - Web Services
 - Enterprise Services (Security, Publish and Subscribe...)
 - Reuse of code and process
 - Information Sharing – from need to know, to need to access

The SOA "challenge" is really about addressing the broader challenges of moving to a Service Oriented Information Enterprise.



Service-Oriented Architecture (SOA)



A construct that....

- Puts business rules first - - - technology second.
- Focuses on functional services that are needed by users—and demands cross-organizational cooperation.
- Provides a framework for building / leveraging net-centric solutions that are: Scalable, more cost effective, supporting incremental (spiral) fielding of capabilities, promoting re-using and web service interfacing with existing systems and services....
- Most importantly, it requires a new approach to IT acquisition and strong governance.

SOA enables agility and flexibility required for change



Service-Oriented Architecture (SOA)



Influence Acquisition Strategy needs for....

- Smaller, shorter, spiral deliverables that allows the government to “task as you learn,”—reduces risk and delivers capabilities faster.
- More use of standards and open architecture—reduces the dependence on proprietary technologies.
- Shared IT resources / infrastructure—provides a platform for rapid innovation and streamlines the development process.

Requires new models for funding, requirements, acquisition, and testing to achieve the mission agility and information ubiquity enabled by SOA.



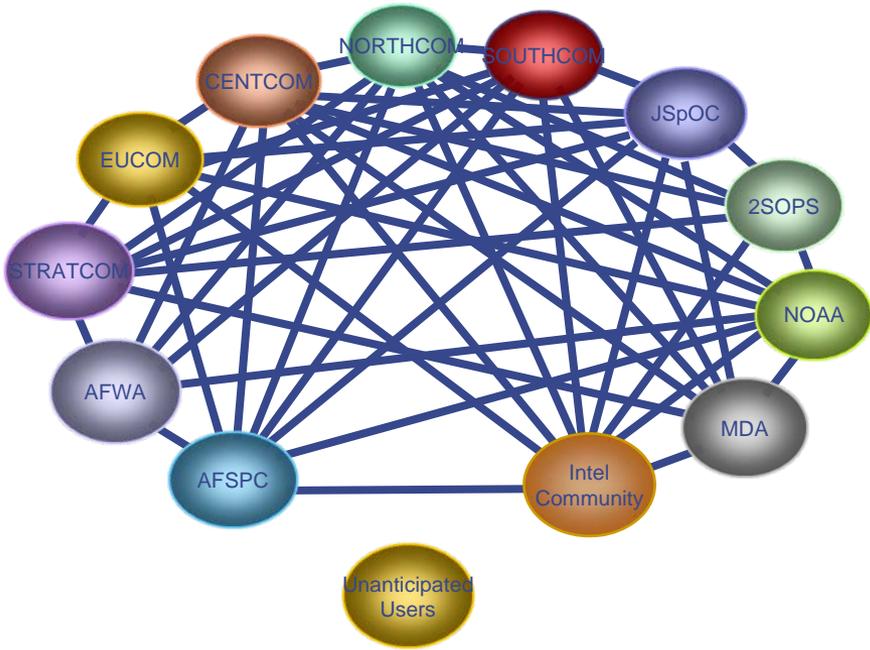
SOA supporting paradigm shift



Yesterday

Today

Tomorrow



... Point-to-point (coupled) data sharing ...
 ... Not extensible, agile or flexible ...
 ... Grows exponentially in both complexity and expense ...



... Net-Centric data sharing ...
 ... Decouples data providers and consumers ...
 ... Extensible, flexible and responsive ...

SOA enables information discovery – moving from a “need to know”, to a “need to share”



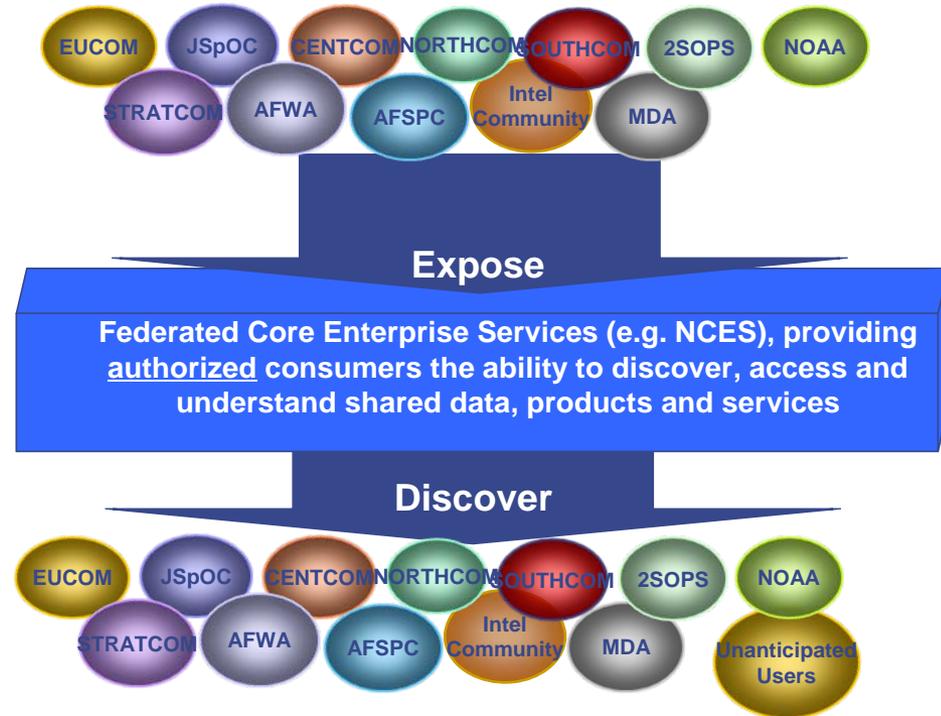
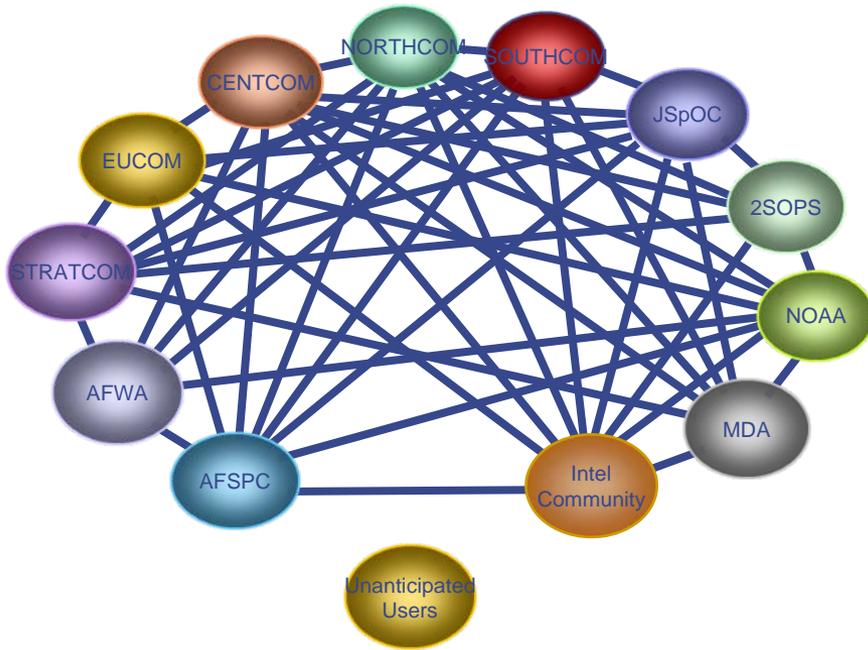
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Isn't this what the AV SOA effort is trying to achieve?



DoD Net-Centric Data Strategy (9 May 2003)



“The...DoD Net-Centric Data Strategy provides a key enabler of the Department’s Transformation by establishing the foundation for managing the Department’s data in a net-centric environment.... The strategy also introduces management of data within communities of interest (COIs) rather than standardizing data elements across the Department.” - John P. Stenbit (former DoD CIO)

- Purpose
 - Describes a vision for a net-centric information sharing environment and the data goals for achieving that vision
 - Defines approaches and actions that DoD personnel will have to take as users—whether in a role as consumers and producers of data or as system and application developers

- DoD Directive 8320.02 (signed Dec 2, 2004) directs the implementation of the DoD Net-Centric Data Strategy



Key components of the DOD Net-Centric Data Strategy



Make Data Visible

Is an information resource discoverable by end-users?

Make Data Accessible

Is it connected to the network(s), and are tools readily available to use and allow assured access to it?

Make Data Understandable

Can it be used intelligibly?
Are the semantics well documented?

Make Data Governable

Are data processes governed with sustained leadership?

Enable Data to Be Trusted

Is the authority (pedigree, security level, and access control level) known and available?

Make Data Interoperable

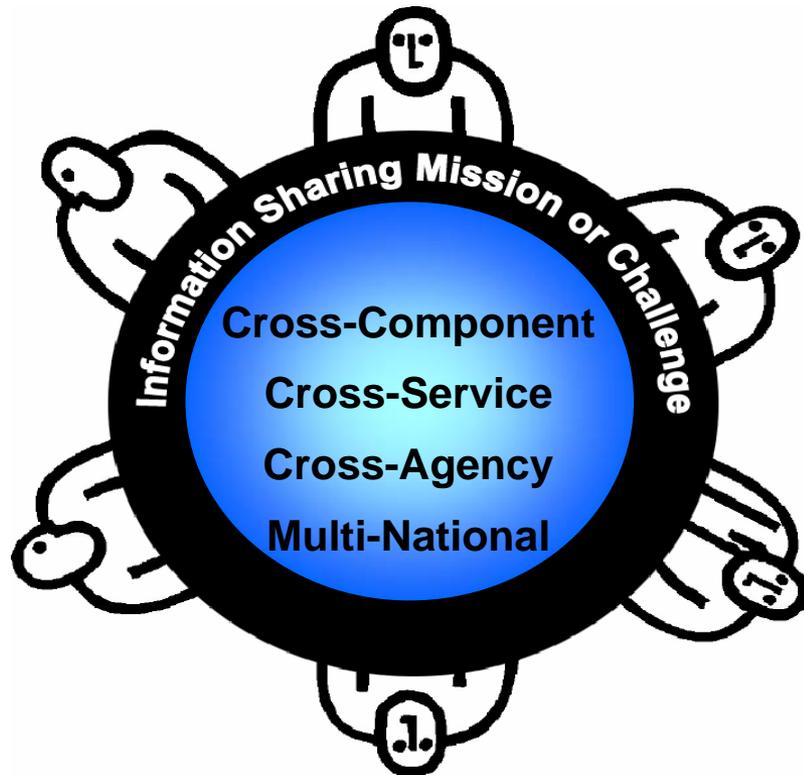
Can it be easily combined or compared with other information and/or mediated?

Be Responsive to User Needs

Are users involved in COIs?
Are robust, direct user feedback mechanisms in place to guide development?



What is a COI?



“COIs ... come together to address a specific information sharing mission or challenge that the COI can solve by exposing and sharing data.”—DoD 8320.02G, April 12, 2006

“A collaborative group of users that must exchange information in pursuit of its shared goals, interests, missions, or business processes and therefore must have shared vocabulary for the information exchanges.”—DoDD 8320.02, December 2, 2004

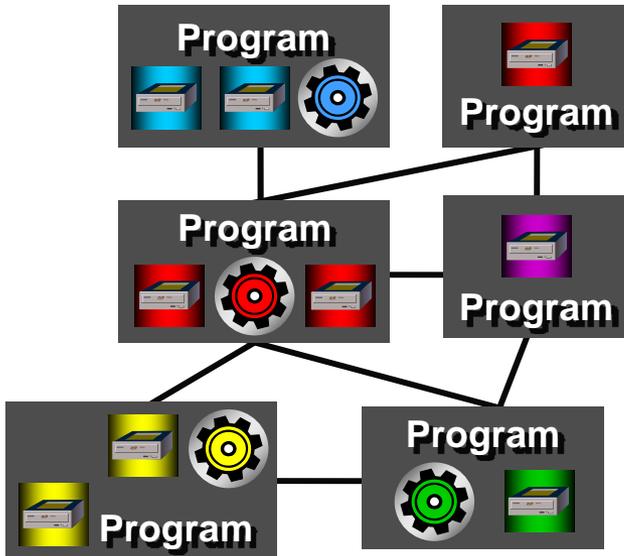


COIs enable DoD transformation

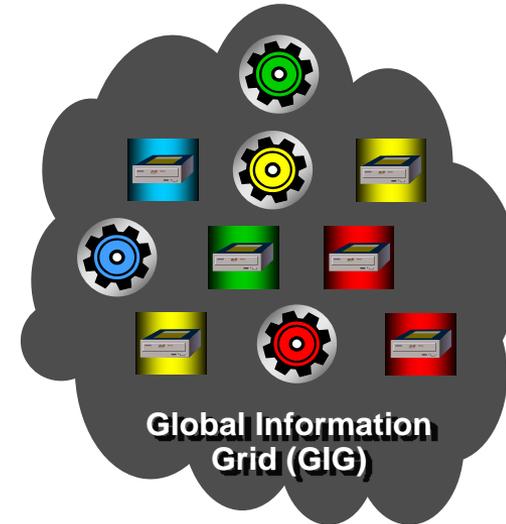
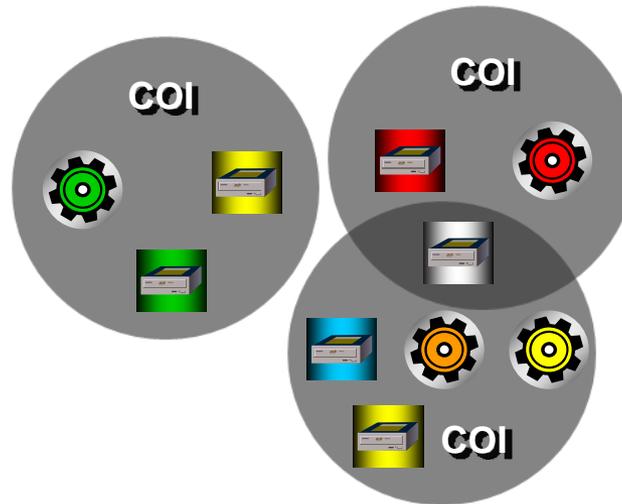


TIME

Deliver Systems



Deliver Services



- Data & Services tightly coupled to applications
- System specific vocabularies
- Services start to emerge
- N^2 integration problem

- Decouple data from applications
- Service enable data sharing
- Create standards-based vocabularies (community & core) to enable interoperability

- PoRs transform into Service providers
- Reusable & composable Services available on the GIG

Organization & processes tied to IT

COIs cut across organizations using existing processes

Organization & processes independent of IT



DoD Net-Centric Services Strategy (May 2007)



“The Department of Defense (DoD) Net-Centric Services Strategy (NCSS) reflects the recognition by the DoD that this **services oriented approach can result in an explosion of capabilities** for our warfighters and decision makers, thereby **increasing operational effectiveness.**” - John G. Grimes (DOD CIO)

- Purpose
 - Describes the DoD’s vision for establishing a net-centric information sharing environment that increasingly leverages shared services and Service Oriented Architecture (SOA)
 - Expands upon the DoD Net-Centric Data Strategy by connecting services to the Data Strategy goals
- July 13, 2007 - DoD and Intelligence Community (IC) committed to a shared vision for Services-Based Environment to
 - Improve interoperability within and across the DoD and IC
 - Enable better analysis and decision-making through increased access to information within and across the DoD and IC



Key Components of the DOD Net-Centric Services Strategy



Provide Services

Are information resources and functional capabilities available as services on the network? Are services visible, accessible, and understandable?

Use Services

Are existing services (including Core Enterprise Services) used to satisfy mission needs before creating duplicative capabilities?

Govern the Infrastructure and Services

Are policies and processes established to govern how to provide, secure, use and operate services?

Monitor and Manage Services via GIG NetOps

Are services implemented in accordance with DoD's GIG NetOps Strategy and concept of operations to ensure situational awareness of the net-centric information sharing environment?

COIs Help To Define



Get off the stage...



- Remember these five things...
 - SOA is not dead
 - SOA is “A” key enabler to make Service-Oriented Information Enterprise a reality
 - It’s “NOT” the only enabler
 - Need to address broader challenges associated with funding, requirements, acquisition, testing, and governance
 - SOA is a mind-set not a tool-set
 - SOA is an approach for organizing and using services to enable interoperability and reuse
 - SOA is a construct -- an architecture



Get off the stage...



Greatly appreciate your time
and attention.....

Thank you.



BACKUP



The Situation and Proposed Solution



NET-CENTRIC DATA STRATEGY TENETS (DoD Directive 8320.02)

IMPLEMENTATION APPROACHES

CURRENT INFORMATION SHARING CHALLENGES

User **UNAWARE** information exists

Visible →

Advertise Information Holdings ("Tag" Data)

User knows it exists, but **CANNOT ACCESS IT**

Accessible →

*Web Enable Sources
Provide assured access
Remove Impediments —
"Need to Share"*

User can access information, but cannot exploit it due to **LACK OF UNDERSTANDING**

Understandable →

*Communities of Interest (COIs) —
Shared Vocabularies*



The Situation and Proposed Solution (Cont..)



CURRENT INFORMATION SHARING CHALLENGES

CHANGE NEEDED FOR DATA & SERVICES STRATEGY TO SUCCEED

IMPLEMENTATION APPROACHES



Implement Automated Access Control and Enterprise Security Services

Tag Data with Classification, Pedigree

Identify Authoritative Sources

Implement Governance of Standards, Rules, Services

Manage and Monitor Services

Institutionalize Sharing via Processes, Education

TRUST



Web Services and SOA



Service Oriented Architecture is a *mind-set*, not a *tool-set*. Therefore, SOA itself does not dictate the use of a specific technology

Web services fill in this gap, and provide the specific technical infrastructure to enable the objectives defined within an SOA

“A Web service is a software component that is described via web services description language (WSDL) and is capable of being accessed via standard network protocols such as (not limited to) SOAP over HTTP.”¹ – Org. for Advancement of Structured Information Standards (OASIS)

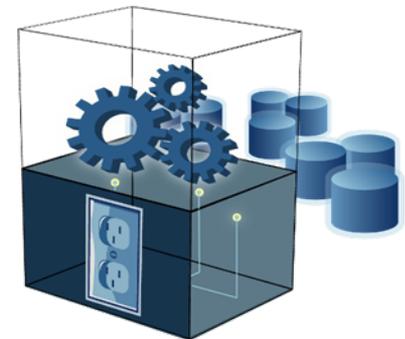
¹www.oasis-open.org/committees/wsia/glossary/wsia-draft-glossary-03.htm

Service Oriented Architecture



Provided By

Web services



SOA is an approach for organizing and using services



AFEI SOA Acquisition Report* Recommendations



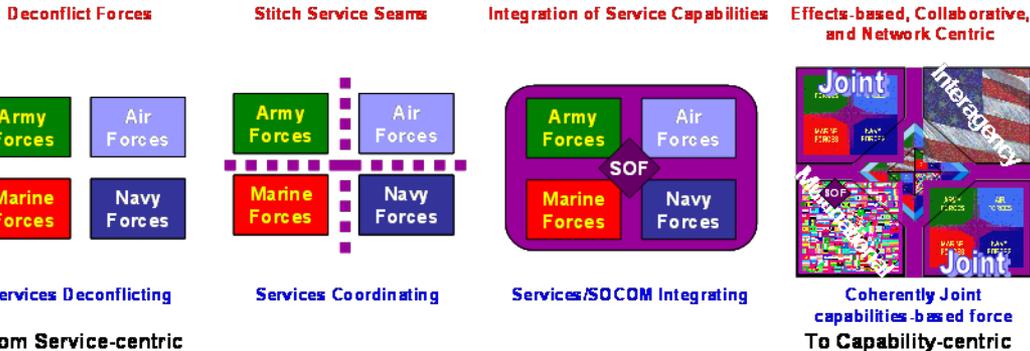
- Specify Open Architecture (OA) and Capabilities-based modeling in RFP
 - More SOO focus on enterprise aspects and interfaces
 - Reduces OCI concerns
- Increase adoption of agile model based on mission threads
 - Accommodates evolving requirements
 - Gets the right capability faster
- Start small, continuously evolve
- Continue to explore innovative risk management and cost models for services



A Co-evolution



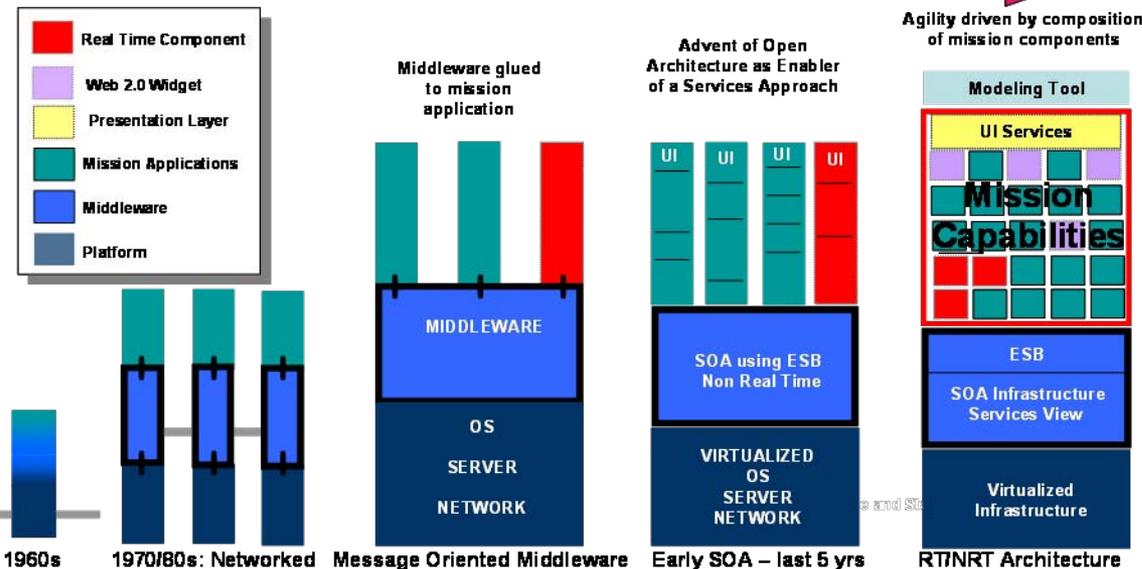
Evolution of DoD Operational Environment



Mission requires this transformation

Challenge is to achieve and maintain alignment and balance

Transforming of Information Environments



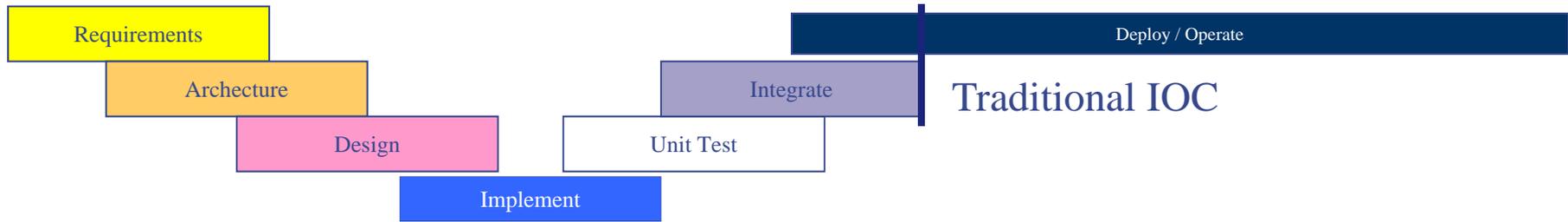
IT is driving this transformation



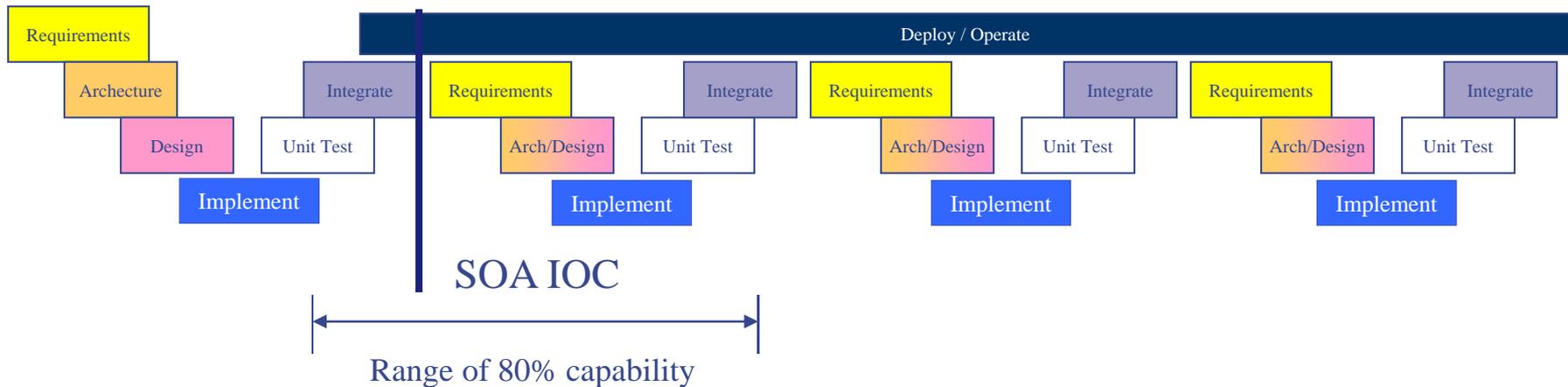
SOA Gets Results Quicker



Traditional "Vee" (DoD 5000)



SOA's "Saw tooth" (Spirals in an agile environment)



Gartner research indicates organizations embarked upon SOAs are twice as likely to use agile delivery model
 Implication: role of requirements, color of money and process different

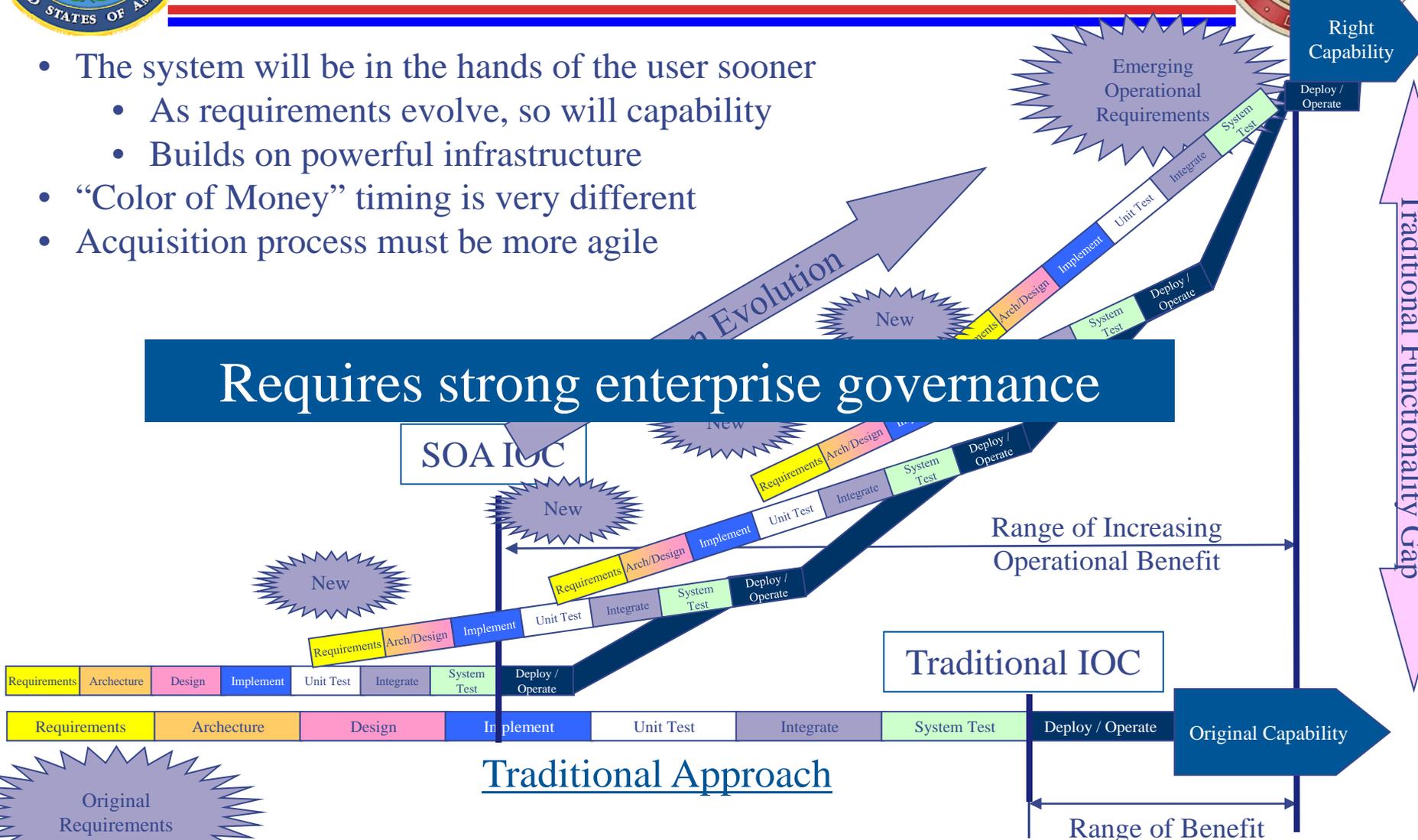


SOA Creates New Value



- The system will be in the hands of the user sooner
 - As requirements evolve, so will capability
 - Builds on powerful infrastructure
- “Color of Money” timing is very different
- Acquisition process must be more agile

Requires strong enterprise governance



Traditional Approach



SOA Needs Governance

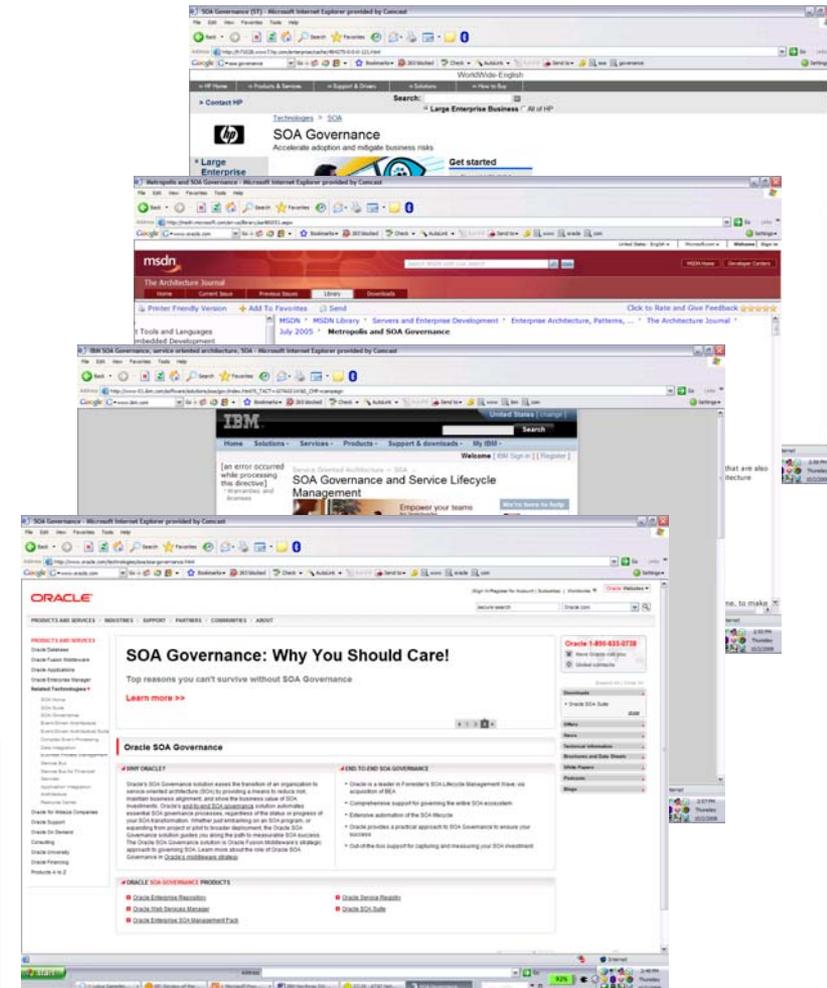


- Critical because
 - central “gate” to SOA value creation at the enterprise level
 - drives investments in technology and service delivery

“SOA is about behavior, not something you build or buy. You have to change behavior to make it effective.”

Anne Thomas Manes, *The Elephant has Left the Building*, Intelligent Enterprise,

July 2005





Evolution of Roles



- Services environment means different roles
 - Government
 - Enterprise-wide standards and architectures
 - Emerging DoD enterprise-wide governance models
 - New models for funding, requirements, acquisition, testing
 - Industry
 - “Prime” role is deconstructed and re-assembled (loosely coupled)
 - Interface between infrastructure providers and mission experts moves “up the stack”
 - Risk/reward model transacted in smaller delivery units
 - OCI model will permit more opportunity to deliver high-value from capabilities
 - Opportunity grows for small business