10th Annual NDIA Science & Engineering / DoD Tech Expo
"Reducing Technology Risk in Acquisition Programs"

# Testing Concept of Operations (CONOPS) in DoD's Net-Centric Environment


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SCRA
Collaborating To Advance Technology

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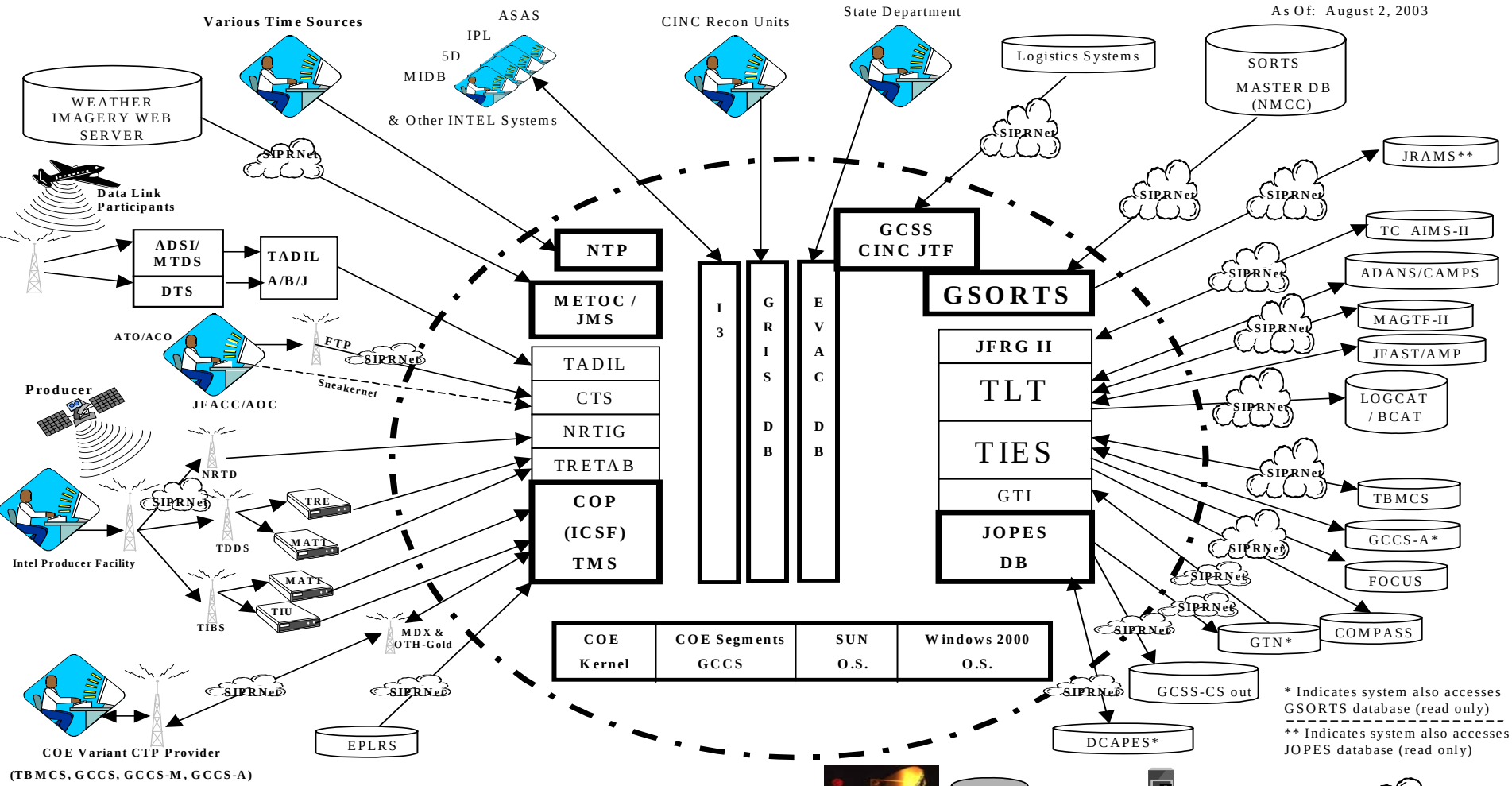
# We get lost in diagrams like this… don't we?

## GCCS-J 4.x External Interface Architecture




*External Interface* – A system which provides data to, or receives data from, the GCCS.

Producers/Track Originators are Service/National assets

Infrastructure and Equipment is managed by Site

Comm Equipment is managed by Executive Agencies (varies)

SIPRNet is managed by DISA/ITESO

# Basic Doctrinal Requirements

**DoD's responsibility is the management of violence.** → **Regardless the of Technology**

## Principles of War

- **Objective**
  Clearly defined, decisive and attainable objective. Each operation must contribute to the ultimate strategic aim. ...
- **Offensive**
  Seize, retain, & exploit the common objectives. Means to maintain freedom of action & achieve decisive results.
- **Mass**
  Synchronizing all the elements of combat power. Mass the effects not necessarily the forces.
- **Economy of Force**
  No part of the force should ever be left without a purpose
- **Maneuver**
  Movement of forces in relation to the enemy to gain positional advantage. Continually pose new problems for the enemy by rendering his actions ineffective & eventually defeating him.
- **Unity of Command**
  For every objective, seek unity of command and unity of effort. Unity of command means that all the forces are under one responsible commander
- **Security**
  Never permit the enemy to acquire unexpected advantage. Protecting the force increases friendly combat power..
- **Surprise**
  Strike the enemy at a time or place or in a manner for which he is unprepared
- **Simplicity**
  Prepare clear, uncomplicated plans and concise orders to ensure thorough understanding effectiveness

# What USJFCOM Does to Support the Joint War

**First and foremost USJFCOM is the Joint Warfighter Advocate**


Concept Development & Experimentation

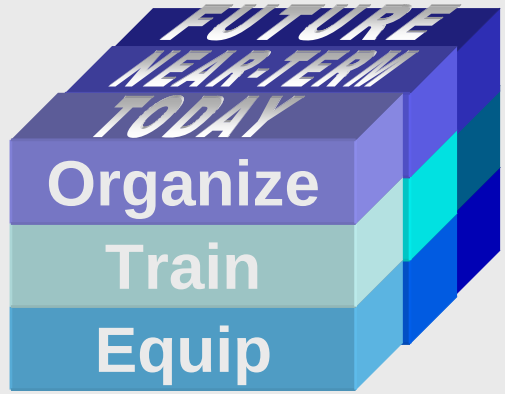
Integration & Interoperability

Training

Joint Enabling Capabilities

Joint Force Provider

Operational Analysis And Lessons Learned

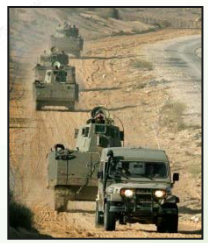



**JOINT CAPABLE FORCES**

# Major Mission Command & Control (C2) Capabilities Areas

**FORCE PROJECTION**

Joint Operation Planning & Execution System (JOPES)



**FORCE EMPLOYMENT**

Air, Land, and Sea Operations
CAS Planning and Execution

**SITUATIONAL AWARENESS**

Common Operational Picture (COP)

**SITUATIONAL AWARENESS**

**ADAPTIVE PLANNING**

**EXECUTION**

**FORCE READINESS**

Readiness Assessment System (RAS)

Global Status of Resources and Training System (GSORTS)

**FORCE PROTECTION**

Early Warning and Integrated Air and Missile Defense

**INTELLIGENCE**

Integrated Imagery Intel (I3)

# DoD's Approach to Developing Net Centricity

**Program Decision Memorandum (PDM) III, December 20, 2005, Tasked the Assistant SecDef for Networks & Information Integration / DoD Chief Information Officer (ASD(NII) / DoD CIO….**
**"To accelerate the provisioning & adoption of Core Enterprise Services (CES) across DoD.**

**In commercial industry speak, that means to start developing a System Oriented Architecture (SOA) approach for C2.**

# Perspective

The DoD must continue to evaluate/assess technology's impact on the current war. And quickly adopt approaches that increase our combat capabilities


- Emerging technologies, like SOA and innovative CONOPS must accelerate, <u>together</u>
- Viable technologies must be rapidly integrated into current C2 practices, allied operations, training, and doctrine for **maximum** effectiveness
- Warfighter needs are dynamic, our coalition arrangements are unique, and the "funding-requirement-acquisition" process is unacceptable in the 'immediate' for the soldier on the patrol

**We believe that Net-Centric Environment "e.g. SOA approach" is the next principal mechanism for enhanced Command Capability of Joint C2.**

# Changing Business Model

| Where we are | | Where we need to be |
|---|---|---|
| Familiar | | Less familiar |
| What we use | *FOCUS* | What we use and how we use it |
| Technology affects on system capability | *SOLUTION* | Technology + method + people affect on operational capability |
| Developers' perspective | *PERSPECTIVES* | Warfighter perspective |
| Hardware and software must be developed together | *CENTRAL RULE or CONCEPT* | Materiel and non-materiel must be developed together |
| SoS assessment<br>- OT&E focus on the system | *APPROACH* | MCP assessment<br>- Holistic focus on all components |
| System centric | *CENTRICITY* | Capability centric (Warrior) |

***Focus on Joint Warfighter's urgent operational need -- solution providers must forge a single 'integrated' enterprise to reduce risk in satisfaction of that need.***

***Changing the Business Model Requires:***

***(1) Willingness to work together to leverage each others core competencies***

***(2) Focus on Joint Warfighter as central driver – solution need originator and evaluator***

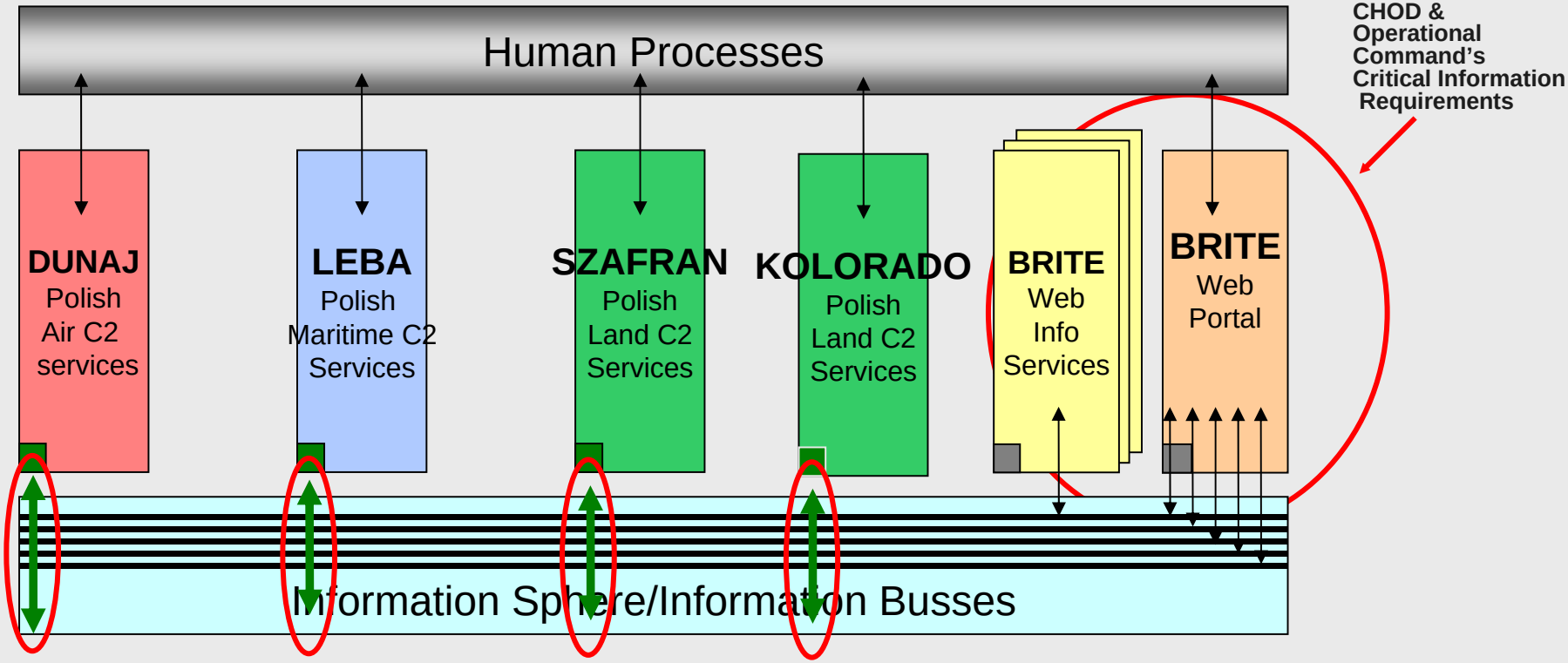
***(3) Commitment to providing meaningful services rather than inflexible "products"***

# Poland's Case Study

- **TRANSFORMATION EFFORTS:**
  - ***Moving away from a Soviet based system***
  - ***Moving to a professional as apposed to a conscript based force***
  - ***Moving to a capitalistic based economic model***
  - ***Moving to asymmetric warfare***
  - ***Moving to a net-centric combat capable force***

- **At the request of Poland's Chief of Defense (CHOD), a combined NATO and USJFCOM, Poland's Military staff, plus Industry and Academia constructed a near term Common Operating Picture (COP).**
- **Constructed a near term SOA environment to integrate Poland's Air, Land and Sea into a combined Common Operational Picture.**
- **Supported Poland's role as a NATO member & US strategic partner**

# Poland's Case Study

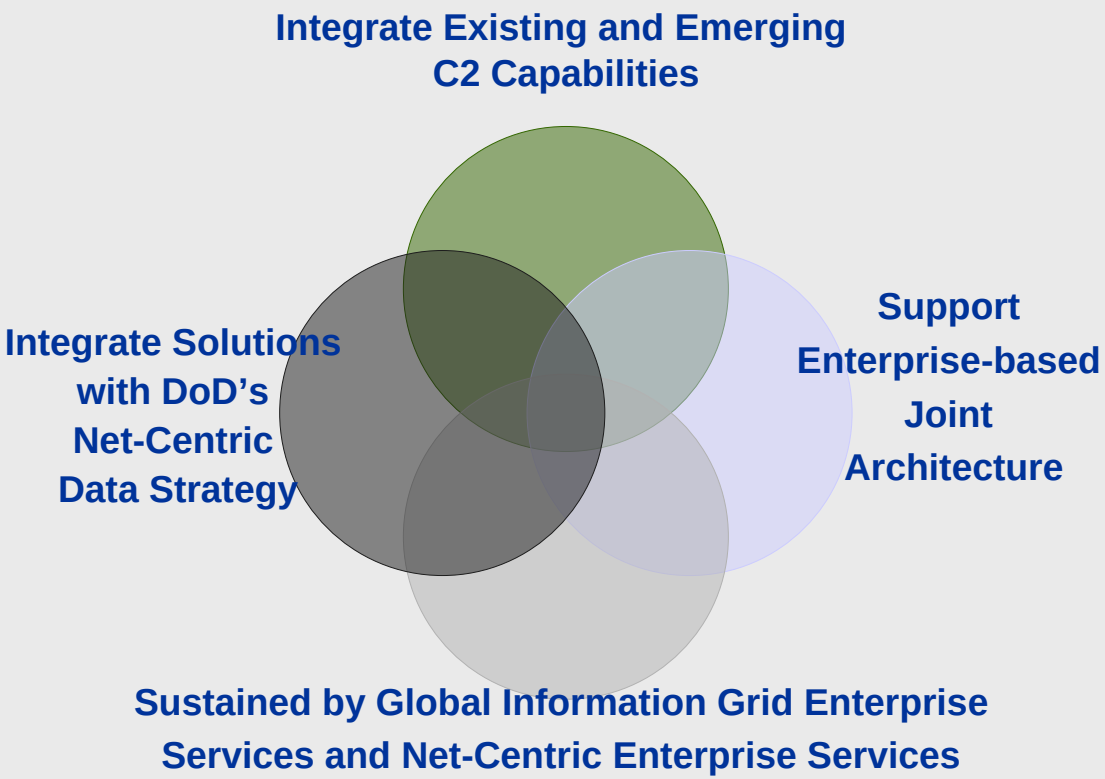



**BRITE interface incorporated in every system**

Automatic discovery add-ons

**BRITE = Baseline for Rapid Iterative Transformational Experimentation**

# DoD's Web Services Characteristic




These web systems and services will have a unique combination of characteristics that differentiate them from more conventional legacy client server applications. In particular, they tend to include:

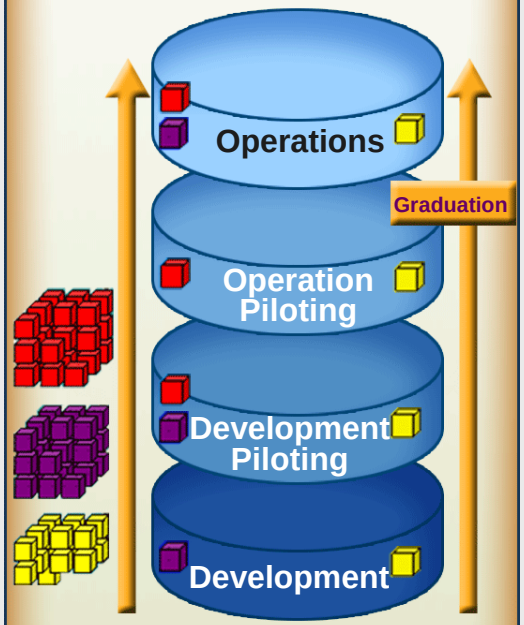
- Architecture places data at the center of its design: Enterprise Resource Pattern (ERP) & Enterprise Service Bus (ESB)
- ERP standardizes access to any C2 domain object (APIs)
- ESB publishes messages based on an event/trigger
- Rapidly changing technologies, e.g. more actors, platforms, networks, and services not applications

# Joint Capability of Net-Enabled Command Capability (NECC)

## Current C2 Systems

OTHER C2 SYSTEMS

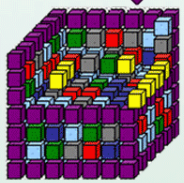
Systems Focus
Stove-piped systems
Information push




"The Sandbox"

## Net-Enabled Command Capability

Systems transformed into discreet service capabilities



C2 Capabilities

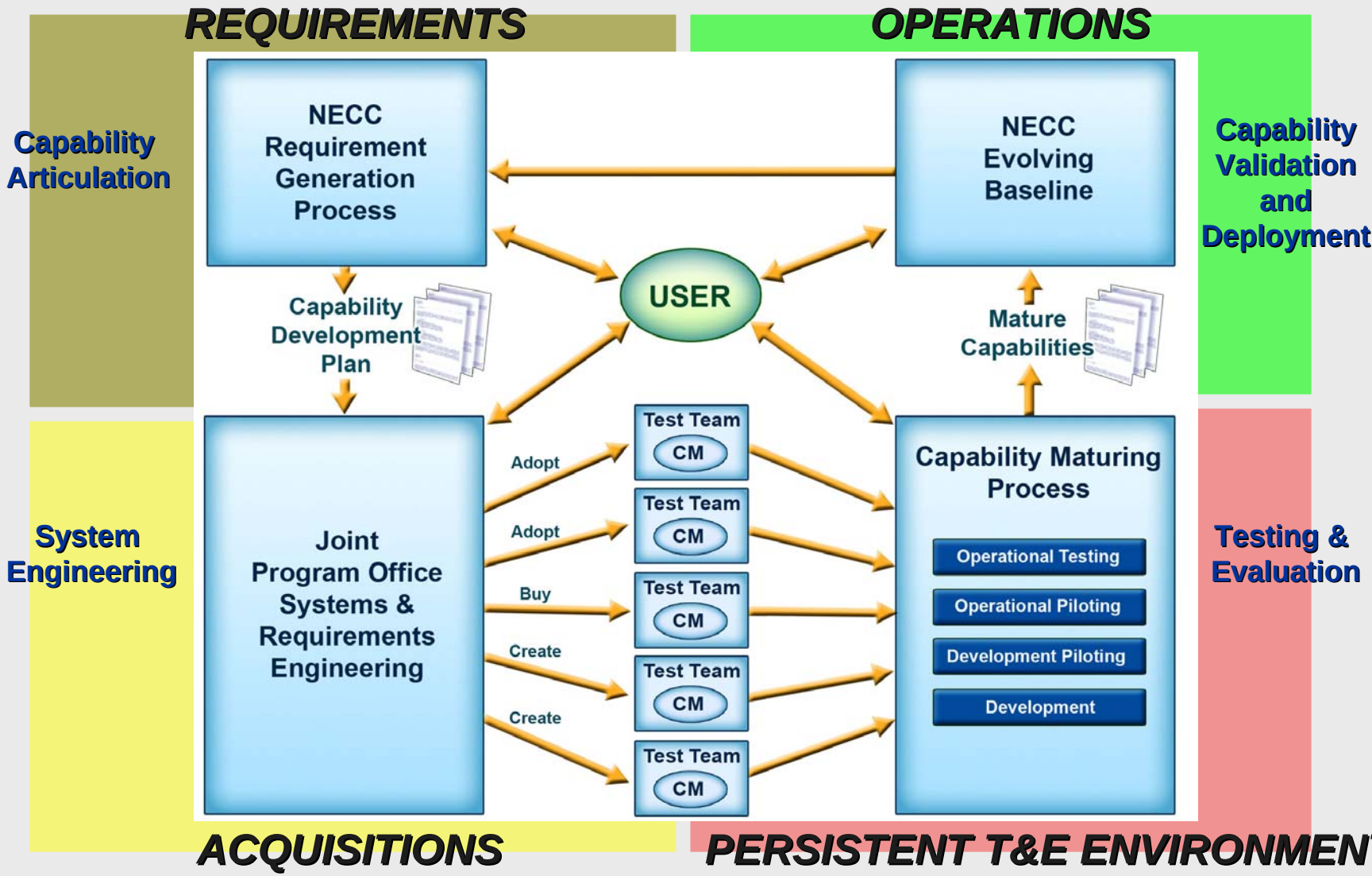
Services used to support Joint 'business' processes

Operations Focus
Net & Data Centric
Information Pull

**Joint Warfighters Command and Control Need Driven**

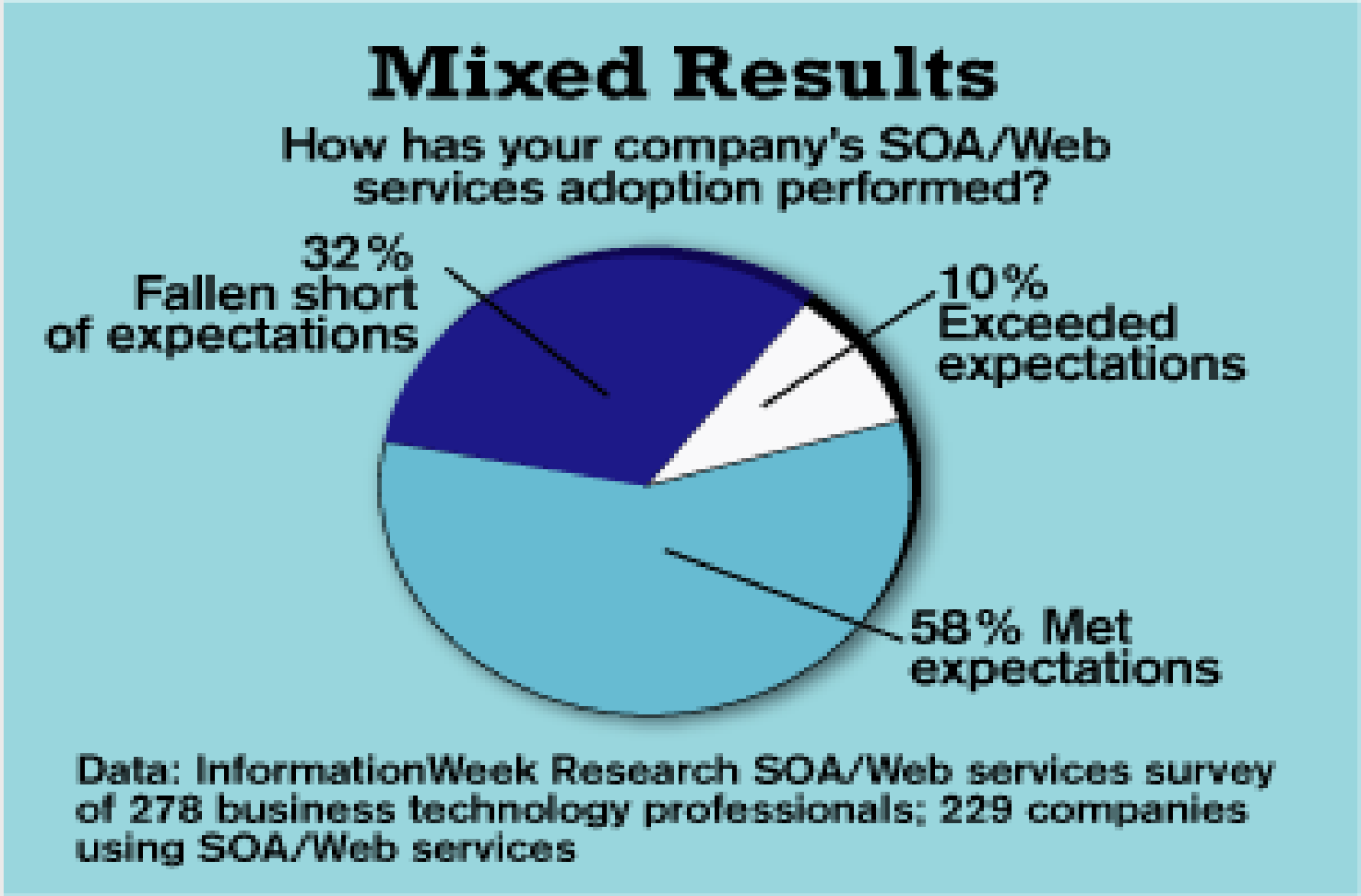
***With the net centric approach, user engagement occurs in the "sandbox" during the combined evaluation referred to as the "piloting" events.***

# Integrated Enterprise Process



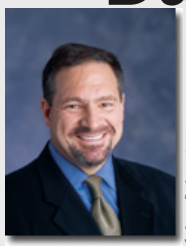
# Challenge/Approach

## Industries Mixed Results



# Challenge/Approach

## David Linthicum



Linthicum Group

*Top 5 Mistakes w/ SOA,*

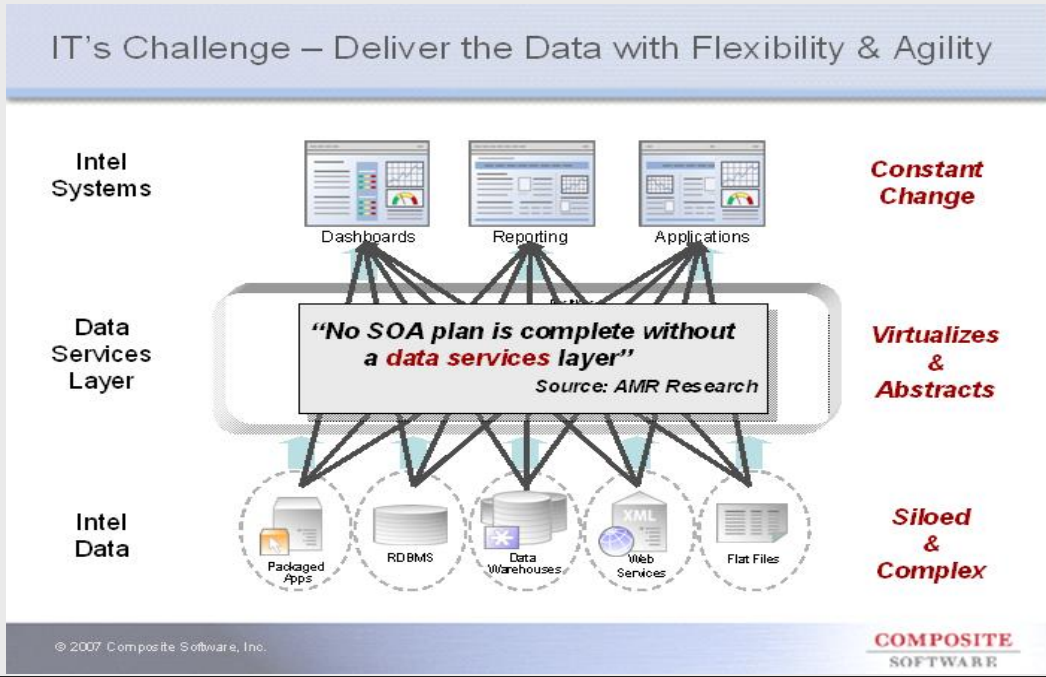
1. Not enough trained IT/SOA architects to put on the problem.
2. "Manage by Magazine" approach to SOA.
3. Don't understand the unique nature of their problem domains.
4. Treat SOA as a project, not a journey.
5. Unable to define the value.

**Oh, by the way: David said, "I Actively tracks 120 different SOA standards 20% to 30% are duplicative At any one point in time."**

## Jim Green,

Designing Reusable Software,

**- Types of services:**
**(1) put data in, (2) get data out**
**- SOA & error handling => careful planning**



# Challenge/Approach

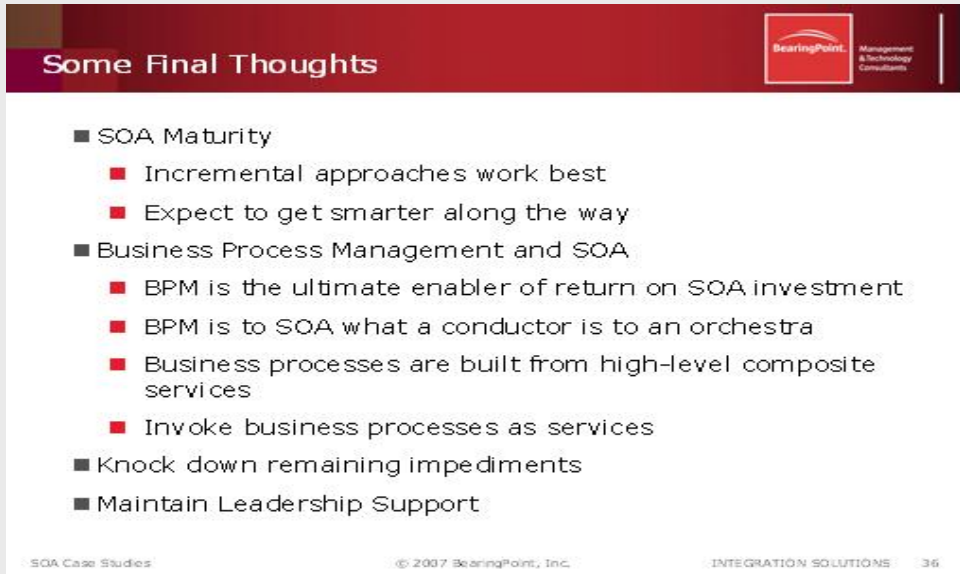
## **Hub Vandervoort,** CTO, Progress/Sonic

- ***His Key concept was Enterprise Service Bus (ESB)***
  - **Service Requires alignment across 4 dimensions**
  - **Functional, (2) Structural (3) Behavioral (4) Performance**
  - **Interaction Model (-Request Reply, -Store & Forward, -Pub/Sub, –Bulk transfers)**

BearingPoint. Management & Technology Consultants

## Steve Kahn, **Bearing Point**

- Discussed two SOA projects (Insurance Company & Commercial packaging firm)
- Focus on the business…, technology is never enough.



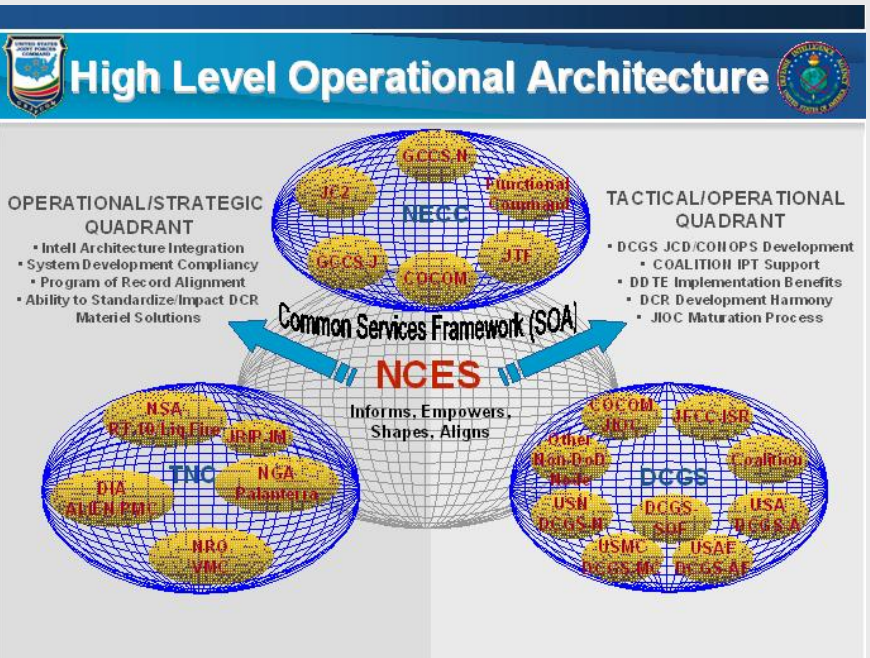
# Challenge/Approach

Booz | Allen | Hamilton
90 years delivering results that endure

## **Melissa Soley, BAH,** Trans-National COP

- **BAH Mission Engineering (ME) method is a bottom-up IER data capture approach**

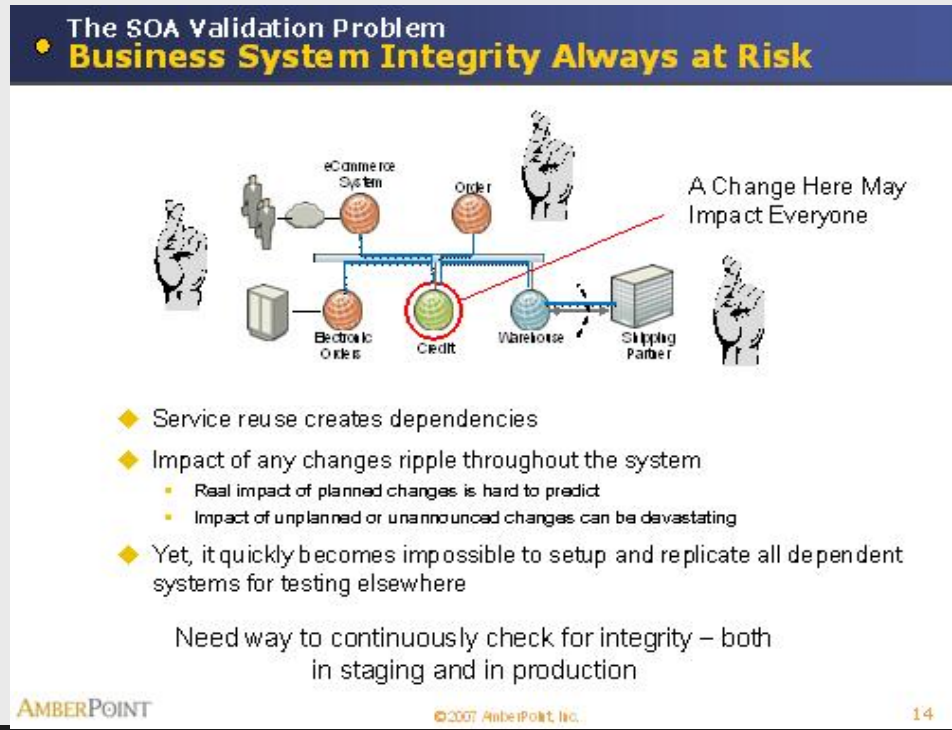
  Very intensive data capture approach
- **Point of interest: 80% of an Intel Analyst's time is spent simply retrieving data not analyzing.**



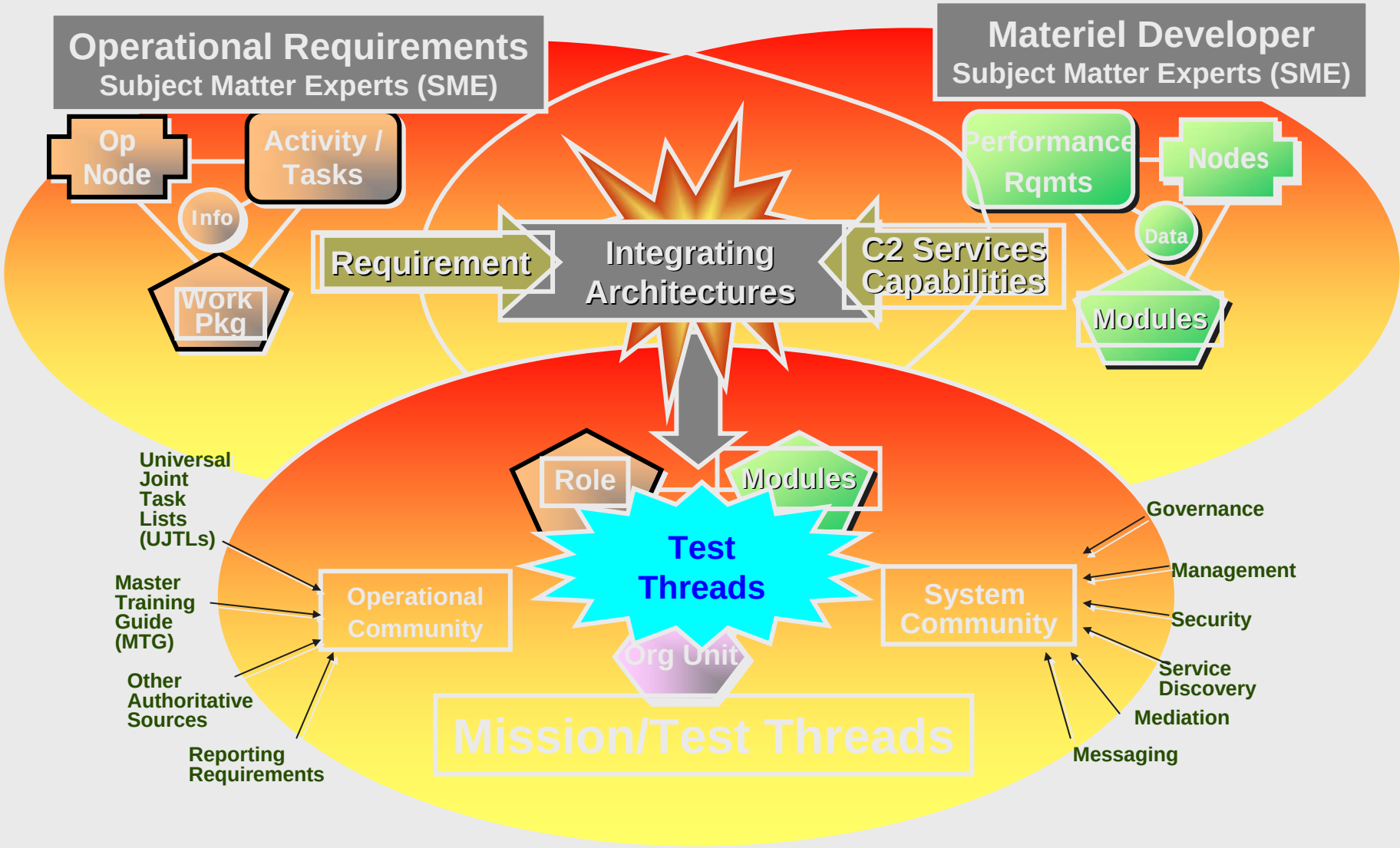

AMBERPOINT

## **Sean Fitts,** Amber Point

- ***Keys to SOA Runtime Gov'n***
  - **Visibility => what is going on & who is using it?**
  - **Control => Actions to prevent or correct issues**
  - **Integrity => Ensuring changes don't impact the whole infrastructure**



# What is our Testing Approach?

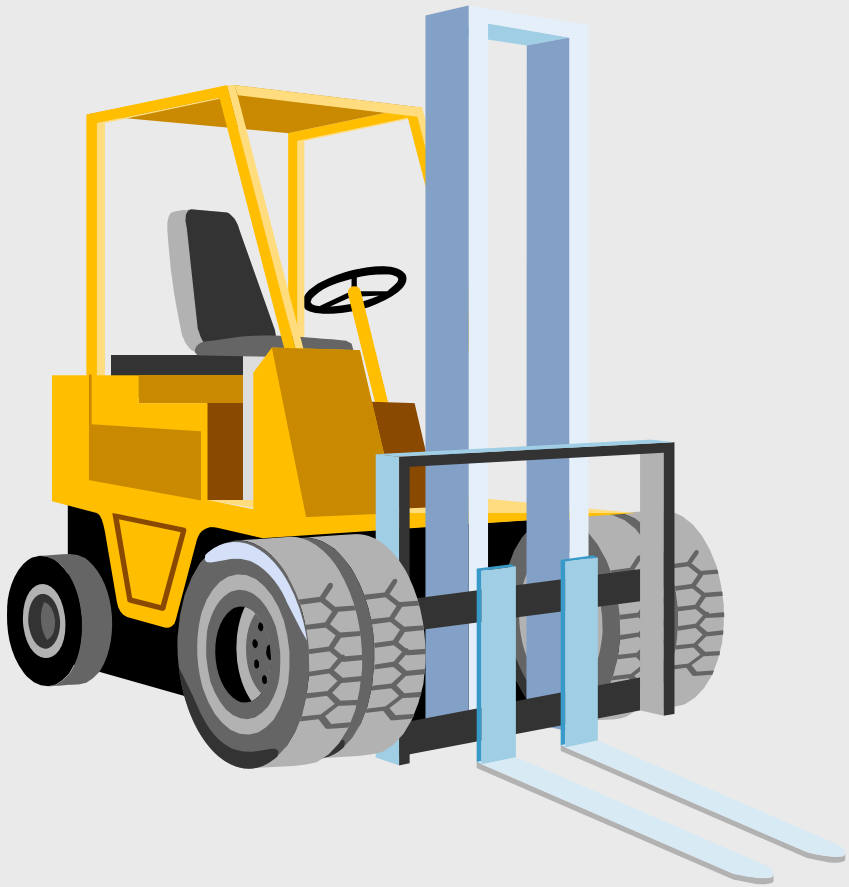


# Testing CONOPS in DoD's Net-Centric Environment

## So what did he say?

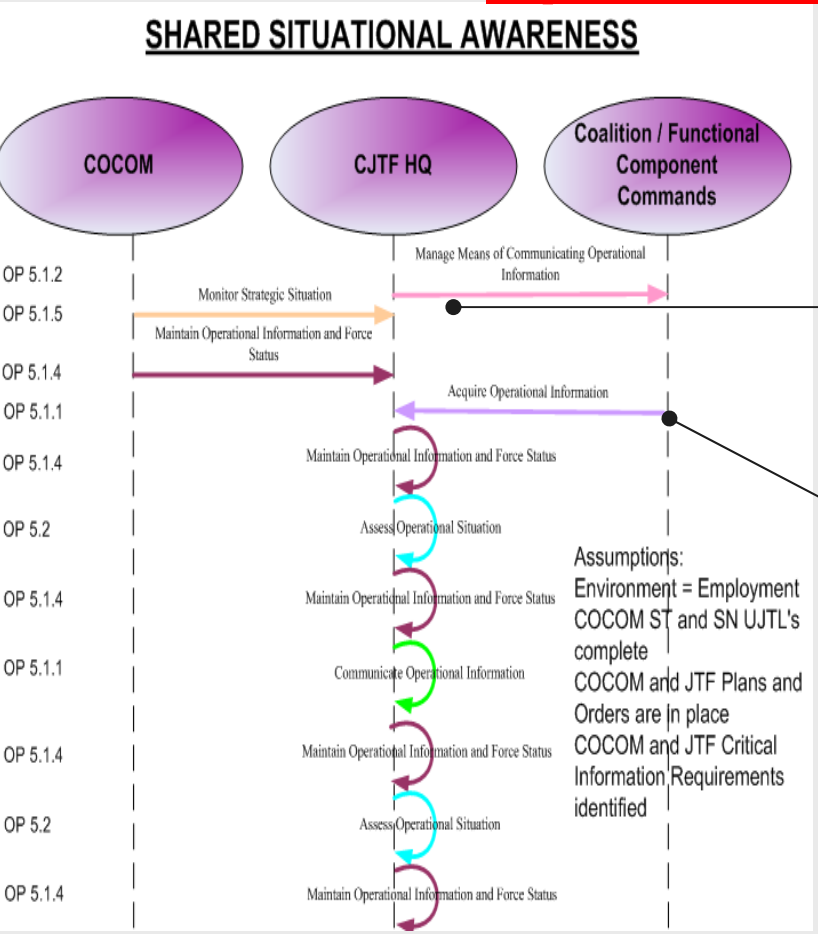
- DoD's C2 environment has @ 7 million customers
- Our business is the management of violence
- JFCOM is the Joint Warfighter Advocate
- DoD is moving to Net Centric C2
- DoD will continue to adapt to change
- Poland's military transformation & movement toward Net Centricity
- NECC programmatic processes
- Industries views
- NECC testing concept
- DoD is in the early stages of SOA adoption

# BACKUP SLIDES



# What is our Approach?

## *Use an Operational Mission Thread Concept*




**Operational Event Trace Description (OV-6c)**

**Event Table**