Realizing the Army Net-Centric Data Strategy (ANCDS) in a Service Oriented Architecture (SOA)

A presentation to GMU/AFCEA symposium "Critical Issues in C4I"

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Deliver the power of information to ensure mission success through an agile enterprise with freedom of maneuverability across the information environment.
Current Information-Sharing Challenges

Visible?
- User UNAWARE information exists

Accessible?
- User knows it exists, but CANNOT ACCESS IT

Understandable?
- User can access information, but cannot exploit it due to LACK OF UNDERSTANDING

Source: OASD(NII)/DoD CIO COI Training Package

Net-Centric Data Sharing Concepts

Net-Centric Approach
- Tag and Post Data for Visibility
- To Catalogs and Shared Spaces for Accessibility
- Using Common Vocabulary for Understandability
- Common Data Schema for Interoperability
- Common Authoritative Data Sources for Trust
- Communities of Interest to develop and manage the common approach

Paradigm Shift: From ownership to stewardship; From need-to-know to right-to-know; From stovepipes to enterprise; From programs to portfolios.
Army Enterprise SOA Foundation

Tenets of Net-Centric Operations

Global connectivity, real-time collaboration, and rapid and continuous information exchange
The Question

Okay, I get it. Data Strategy is important to achieving Net-Centricity. Service Oriented Architecture is important to achieving Net-Centricity. But how does SOA help me achieve the Data Strategy? How are they related?

Please explain in 30 words or less, Provide a PowerPoint Slide on the topic and an elevator speech so I can explain it to my General on his way to the to the next Net-Centric Discussion.*

*Graphic is for dramatization purposes only. The G3 staff officer wasn’t actually holding weapon on us when he asked for the explanation. He was, however wearing sun glasses.

Data Strategy Goals and their meaning

Implementing the Strategy will enable data to be:

<table>
<thead>
<tr>
<th>DoD Goals</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>Visible</td>
<td>Who has what data available?</td>
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<tr>
<td>Accessible</td>
<td>Where is this data and in what format?</td>
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<tr>
<td>Institutionalized</td>
<td>What and who governs the definition, lifecycle, and use of this data?</td>
</tr>
<tr>
<td>Understandable</td>
<td>What does this data mean?</td>
</tr>
<tr>
<td>Trusted</td>
<td>Is this data trustworthy, accurate, and authoritative?</td>
</tr>
<tr>
<td>Interoperable</td>
<td>Can my application use this data?</td>
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<tr>
<td>Responsive</td>
<td>Is this data timely?</td>
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### SOA Core Standards

<table>
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<tr>
<th>DISCOVER (UDDI, XML Registries)</th>
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<tr>
<td>UDDI Registry is a conceptual phone book for Web Services. Organizations can register information about their Web Services and types of services with UDDI.</td>
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<th>DESCRIBE (WSDL)</th>
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<td>WSDL describes the operational information – where the service is located, what the service does, and how to talk to, or invoke the service.</td>
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<th>ACCESS (SOAP)</th>
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<td>SOAP is the envelope syntax for sending and receiving XML messages.</td>
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<th>XML</th>
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<tr>
<td>XML is a text-based method and set of syntax rules for encoding (tagging) meta-data, allowing COIs to develop mission specific markup language. Does not provide semantic meaning and rules for information exchange.</td>
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SOA Core Standards provide the technical application and approach discussed in the Net-Centric Data Strategy supporting visibility, and accessibility, but ….. Semantic meaning and exchange rules are not addressed. The specification that captures the elements of the COI Ontology (Common understanding of Entities, Relationships, Properties, Values and Axioms/Rules) used by the XML markup language, UDDI Registries and COI defined Rules-based engines for information exchange is not addressed.

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### Supporting SOA Infrastructure Capabilities

- **Service Discovery** - provides the capabilities to publish and discover data, metadata, and services.

- **Security** - provides information assurance capabilities such as controlling access to services and data, management of user profiles and access control policies, message-level encryption and non-repudiation, etc.

- **Reliable Messaging** - provides the capability to reliably exchange messages between services and their consumers.

- **Message and Protocol Mediation** - provides the capability to adapt data formats and exchange protocols to enable interoperability in a heterogeneous environment.

- **Service Orchestration** - provides the capability to compose and orchestrate individual services into larger aggregates of functionality or business processes.

- **Enterprise Service Management** - provides the capabilities to monitor and control services to ensure compliance with defined contracts and service level agreements.
Data Strategy and SOA Roles in Net-Centric Data Exchange

Service Oriented Architecture provides the **framework for orchestration** of data exchange.

Data Strategy provides the **governance approach, language and format** for data exchange.

The two strategies **intersect** in the areas of **Data Discovery and Retrieval** and **Data Mediation**.

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The different focuses of a data strategy versus an SOA strategy make them in fact **complementary**. The data strategy by itself does not address the detailed messaging mechanisms for sending and receiving data across heterogeneous environments in a seamless and robust manner. This is precisely the purpose of the services environment that is created through an SOA strategy. On the other hand, the SOA strategy just provides a generic framework for exposing and sharing services—it says nothing about what should be shared through those services. This is where the data strategy comes in—it prescribes a strategy for identifying the data to be shared, where that data should be coming from (i.e. authoritative sources) and standard representations for sharing that data.

The intersection of these two strategies results in the creation of an enterprise **data services layer** that enables sharing and management of data that is distributed across the enterprise.
What is ADSL?

Data and SOA Strategies Driving Net-Centric Transformation

The close alignment of the Army Data and SOA strategies and the synergy between the two will help expedite the migration process towards building truly Net-Centric data capabilities, improve the effectiveness of enterprise governance, and increase community participation.
**Data Strategy-SOA Relationship**

**Net-Centric Data Strategy**

- Tag and Test Data for Visibility
- To Catalog and Enrich Openness to Accountability
- Using Generic Vocabulary and Usability
- Common Data Science for Interoperability
- Common Authorization Data, Assurance for Trust
- Consistency of Metadata in Developing and maintain the correct approach

**Data Strategy and SOA Roles in Data Exchange**

**Relationship Between Data and SOA Strategies**

**Net-Centric Data Strategy in Action**

**Questions?**

- Service Portfolio Management
- Service Life Cycle
- Service Metrics

[SOA Foundation]
- Security
- Service Discovery
- Messaging
- Orchestration