Evolutionary SOA Layered Health Care Framework: Special Health Modules, Integrated Governance, Measures and Agile Journey

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Layered SOA used for new and evolutionary approach for evolving SOA initiatives

MITA Background and Layered SOA- Spindle “Candy Tray”….with Governance as Core….

Evolutionary not revolutionary- phased approach

Leveraging SOA Center of Excellence- DISA SOA Foundation, Army Services Life Cycle Management… and GH Center of Excellence and ties to the FEA Service Initiatives and other initiatives SOA Consortium, HL7/OMG, SEI Services, etc

Agile Journey- Paths forward

Enablers and Roadblocks Ahead

Next Steps
Service Delivery Process and Service Oriented Architecture both are needed and must fit together.

Service Delivery Process
- Health Service Value Chains
- Consumer-Driven Health
- Basic Health Coverage with choices
- Health Service Life Cycle Models

Service Oriented Architecture in Health Care
- Layered approach and leverage what is maturing and emerging in the SOA area
- Alignment with EA Models and HL7/OMG
- Commonality- Variant Management
- Shared Services and Common Solution Elements
- Models and Variant at each layer
Layered SOA Structure —
Our SOA Health Care Reference Architecture

Built on SOA Foundation with Governance As Core

SOA Health Care Reference Architecture

- Employees
  - Case Workers, State Agencies
  - Recipients and Providers
  - Public Health, Other

- Citizens

- Partners

- Integration Services Layer
  - Security Services
  - Collaboration
  - Security
  - Interface Management
  - Workflow Processing (BPM)
  - Business Rule Integration

- Business Services Layer
  - Eligibility
  - EDI
  - TPL
  - EDMS
  - Reference

- Data Services Layer
  - Provider
  - Recipient
  - Claims
  - EDMS
  - Reference

Layered Architecture Can evolve with Technology- aligned to Agency-State- Enterprise Architecture build upon SOA Foundation and extendible Health Data Standards, Semantics, SOA Patterns, etc.
Maturing and Evolving SOA

- **SOA What? Working through the Hype Cycle**
  - Initial Successes and going beyond definitions and showing results

- **Layered Services with Governance as Core**
  - Estimation
  - Paths of Change
  - Service Oriented Software Product Families: Common Core, Variant Management and Design for Change

- **New Service Delivery Models and approaches at the top**

- **Common Service Solution Elements**

- **New standards such as:**
  - Service Component Assembly (SCA)
  - Service Data Object (SDO)
  - Processes and Life cycles for Services
    - Catalyst for Services
    - Service Life Cycle Methodology
    - Practical Guide to Services
Leverage Foundation and Evolve Healthcare

- MITA
- HL7
- HIE
- FHA
- NHS
- RHIN

FHA: Scenarios and Vignettes

Government Healthcare Center of Excellence

SOA and Healthcare

Roadmap and Approach for Main Thrust Bids
  Strategy, Concept Formulation

Innovation
  Model-based, Technology, Vendor

Common Business Processes
  Healthcare BPM, Catalysts, Collaboration, Knowledge,

MMIS Architecture
  Business Architecture, Technical Architecture

Pilot Programs
  Requirements Management, Configuration Management, Testing

- Common Enabling Services
- SOA Foundation Services
- Infrastructure Services
- Service Life Cycle Management:
  Catalyst Updates
- Service Design/Development/Testing Tools

Evidence based Healthcare

Personal Health Records

Quality Report Services

Health Service Grids

Personalized Medicine
Create a SOA Agile Target Architecture

Service Oriented Enterprise
- Agreed behaviors and clear incentives for collaboration
- Mutually leveraged investments
- Enhanced mission outcomes

Service Oriented Architecture
- Interoperability at build time based on open standards and composable adapters
  - Agile recapitalization
  - Centrally-managed registries and repositories

Service Oriented Infrastructure
- Secure, scalable infrastructure as a service
  - Interoperability at run time
  - Service enabled network

SOA-Based : Data-Services-Framework
Security and Privacy Community Framework

Use, Utilization and Distribution

Application Service View

Application Data Collection

Logical Channels

Common Payloads & Operations

Information Model View

Security Exchange Services

Business Components

Service Registry

Data Space Connection

Component Mgrs

Data Segmentation

Service Registry

Data to Information Continuum

Data Objects

Security Tags

Physical Data Store

Privacy Tags

Structured, Document & Fuzzy Data Storage

Data Service

Security and Privacy Built into Elements

Integrated Security and Privacy by Community

Data Security and Privacy Protections

Information Management and Sharing Policies

English Policy

Policies with SAML-like Features WS-Federation

WS-Policy

SAML

UDDI

Component Mgrs

Component Libs

XACML: Special Control Elements Entitlement Systems

Security Tags

Structured, Document & Fuzzy Data Storage

Security and Privacy by Community

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## Key Proposed Features

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<thead>
<tr>
<th>COTS Based solution:</th>
<th>Early Success, Maximum Impact, Trusted Partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven, industry leading components</td>
<td>Trustworthy solution that scales</td>
</tr>
<tr>
<td>Integrated suite of components</td>
<td>Maximum interoperability; solution isn’t “cobbled together”</td>
</tr>
<tr>
<td>Interoperable in heterogeneous environments</td>
<td>Functionality more responsive to evolving demand</td>
</tr>
<tr>
<td>“One Stop Shopping” for solution support</td>
<td>Streamlined business relationships lower risk</td>
</tr>
<tr>
<td>Components already familiar to NCES Users</td>
<td>Facilitates rapid, successful transition of existing users</td>
</tr>
</tbody>
</table>

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<tr>
<th>Flexible, standards-based, platform independent architecture adapted from CSC’s Managed SOA Foundation Offering</th>
<th>Maximum Impact, Trusted Partnership</th>
</tr>
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<tbody>
<tr>
<td>Flexibility to respond to diverse customer needs</td>
<td></td>
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<tr>
<td>Avoids “vendor lock-in”; CSC isn’t driven by product sales</td>
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</table>

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<tr>
<th>Rigorous yet flexible service life-cycle and DoD governance processes enabled; based on Federated Development &amp; Certification Environment</th>
<th>Early Success, Maximum Impact, Trusted Partnership</th>
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<tr>
<td>Enables collaborative service development</td>
<td>Maximizes trustworthiness and compliance at scale</td>
</tr>
<tr>
<td>Securely isolates development environments</td>
<td>Accelerates speed to deployment to meet milestones</td>
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<tr>
<td>Policy enforcement ensures trustworthy services</td>
<td>Facilitates wider usage (“build on stone, not on sand”)</td>
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<th>Managed service support proven at world scale Pioneering, ITIL-aligned life-cycle processes Proven experience of our key staff in DoD Vast BEA, IA, and managed services resources</th>
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Enhances DISA NCES’ ability to act as the SOA Enablement Center for DoD.

- Demand Generation
- Transition Facilitation and Support
- Innovation Insertion
- Governance Facilitation and Support
- Training and Knowledge Exchange
- Policy Enforcement
- Services Roadmap Evolution

## Key Benefits

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<th>Early Success, Maximum Impact, Trusted Partnership</th>
<th>Comprehensive approach to DoD SOA Enablement:</th>
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<td>Trustworthy solution that scales</td>
<td>Attracts SOAF customers and accelerates impacts</td>
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<td>Maximum interoperability; solution isn’t “cobbled together”</td>
<td>Streamlines SOAF customer adoption</td>
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<tr>
<td>Functionality more responsive to evolving demand</td>
<td>Speeds SOAF improvements</td>
</tr>
<tr>
<td>Streamlined business relationships lower risk</td>
<td>Sharpens SOAF decision making</td>
</tr>
<tr>
<td>Facilitates rapid, successful transition of existing users</td>
<td>Empowers SOAF customers and increases impacts</td>
</tr>
<tr>
<td>Protects SOAF stakeholder interests</td>
<td>Inspires accomplishments</td>
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"Leverage" SOA Foundation Services Architecture

Empower the Services Architect to Find, Connect To, and Use Trustworthy Information Services Provided Throughout A Community

**FIND**
- Service Discovery

**CONNECT TO**
- Machine To Machine Messaging
- Mediation
  - Protocol Adaptation
  - Data Transformation
- Orchestration

**USE**
- Enterprise Service Management

**TRUSTWORTHY**
- AquaLogic Service Registry
- AquaLogic Service Bus
- AquaLogic Service Bus
- AquaLogic Service Bus
- AmberPoint SOA Management System

**Tools**
- AquaLogic Service Repository
- WebLogic JMS Service
- Layer7 XML Acceleration
- AquaLogic Business Process Manager
- Layer7 XML Security
Leveraging DISA SOA Foundation

Arch team

Developers

Discovery

AquaLogic Enterprise Repository & AquaLogic Service Registry

Integration Competency Center (ICC)

AquaLogic Service Bus

Service Control Center

Service network operations

Web

BPM

SOA Management System

Service network operations

Service

Service

Service

Service

Service

Service

Service

Service

Service
Notional…….

**Service Infrastructure and Health Services Weaved Roadmap**

**STAGE 1**
- IT Feasibility
- IT Services
- Process Orientation

1) Pilot Service Projects
   - Test that the time is right
     a) Build SOA delivery knowledge
     b) Discover the internal capability gap
     c) Early engagement with key vendors
     d) Understand what makes success

**STAGE 2**
- Rationalised
- Common IT Services
- Common Process

2) Service Governance
   - Setting the Conditions for Success
     a) Communication
     b) Levels of Authority
     c) Decision gates for projects
     d) Rules of Engagement

**STAGE 3**
- Distributed common services
- (ESB)

3) Setup Infrastructure
   - Build one common platform and mandate its usage
     a) Deploy physical instances
     b) Create Operational Wrappers
     c) Define processes and procedures
     d) Supports test, integration & production

**STAGE 4**
- Logical Domain services
- Organisational common services

4) Manage Services
   - Project and Application Management Methodology for Services
     a) Service lifecycle processes
     b) Updates to Project Management processes to support SOA
     c) Physical implementation of governance model
     d) Defined business interfaces

**STAGE 5**
- Managed (Orchestrated) services between logical domains

5) Contract Driven Delivery
   - Services defined through contracts with business consumers
     a) Single contract defines the business need, and the technology requirement
     b) Implementation separate from requirement
     c) Quality of Service definitions
     d) Defines how a service is implemented and operated

**STAGE 6**
- Enterprise wide Process Oriented Architecture

6) Real-Time Service Charging
   - Charge by service usage - whether internal or external
     a) Service costs are recovered through usage
     b) Enables internal services to be compared with external vendors
     c) Pay for usage not development
     d) Encourage suppliers to match internal model

**SOA Journey - roadmap**

**HIE/RHIO Services**

**Quality Report Services**

**Personal Health Records**

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Traditional Transformation Approach
• Focus on Applications - Large Projects

Advantages
• Range of manageable, self-contained projects
• Fast results / quick payback
• Transparency, risk control
• Improved feedback loop => better alignment

Downside
• Many, complex processes at the same time
• Long Project Duration
• High Risk
• No intermediate feedback
• No business value before completion
• Difficult to react quickly to changes

Transformation Projects

CSC Strategic Services Approach
Apply IT Portfolio Management strategies to Service-Components, not entire applications!

Advantages
• Range of manageable, self-contained projects
• Fast results / quick payback
• Transparency, risk control
• Improved feedback loop => better alignment

Future of Medicine and Technology
Health Care Reform will occur?

Today: Problems-Frustrations

Political Drivers: Budget Constraints

Transformation Alternatives

Future….Target Value-Based Architecture

Future….Future of Medicine: Predict-Prevent-Treat
Health Care Reform will occur?: Creating a Multi-Dimensional Approach

Today: Problems-Frustrations

Political Drivers: Budget Constraints

Understand the Range of Policy Possibilities

Create a Series of Significant Value Chains!

Future....Target Value-Based Architecture

Transform alternatives

Create a layered Services Oriented Architecture

Understand Future Medicine Possibilities-Scenarios-Services

Future....Future of Medicine: Predict-Prevent-Treat

Create a Service Pilot and Roadmap

Understand the Current Issues and Create Stable Foundation
Where are we going from here?

Challenges and Issues:
- Growing Expenses
- Fragmented
- Practice Gap
- Errors
- Overhead
- Hidden Expenses
- Interoperability
- Semantics

Future of Medicine - Megatrends in Health Care...

Schimptiff...

Diagnose and predict outcome

…..1950’s Marcus Welby

…..1970’s Scientific Medicine

…..Today

Diagnose and Treat

Predict and Prevent-Treat

Reinventing Health Care

Leveraging from others

Research

IT and Standards

Health Service Grids

Personalized Medicine
Value-Based Service Oriented Architecture: Key Enablers

**Value of Health Care Delivered:**
Patient Outcomes per dollar spent

**Today:**
- Costs High & Rising
- Services short of Recommended Care
- Some Areas Overuse Services
- Many Errors Preventable Treatment Errors
- Huge quality and cost differences by Provider-geography

**Inhibitors:**
- Innovation Resisted
- Best Practices Slow to Spread

**Design for Dramatically Improved Value**

- **Value-Chains**
- **Business Process Services**

**Create Dynamic System that continuously improves**

- **Improve Underlying Service Infrastructure**

**Pilot**
Next Steps

- Individual Health Care Services taken from pilots into general abstract levels....
- Building SOA-Based Health Care Services on SOA Foundation- pilot effort
- Scenario driven Health Examples and Proofs of Concepts…”Start with the End in Mind”
- Support Definition of a Healthcare Information Sharing Environment
- Refine the set of Health Services…and dependency maps and related change scenarios
- Focus on the challenges: integration, migration and governance issues
- Sharing results with the standards organizations and groups such as MITA- Private Sector Technology Group, etc
- Being Ready for Reform and Transition in Government