HL7 and Service-oriented Architecture (SOA) Ambassador Briefing
Topics

- Understanding Service-oriented Architecture (SOA)
- The case for Healthcare SOA Standards
- Introducing HSSP
- Status of Standards Work
- Summary
Understanding SOA
A Twenty-Second Interoperability Quiz...

Are you interoperable...

- … if you and your business partners “speak” different languages
- … if gender = “01” means “male” in your business and “female” for your business partner?
- …if the primary context for information sharing is e-mail or fax?
- …if electronic data is exchanged via CD-ROM, or DVD-ROM?
- …if you use XML?
- …if you use Web Services?
The 20 Second Agility Quiz

How well does your organization’s IT adapt to…

- … address the new business rules that resulted from a legislated policy?
- … deployment changes resulting from adding a data center?
- … integrating clinical information with a new business partner?
- … integrating with “the new <place clinical specialty here> system”
- … rapid growth and public interest in personal health records?
Wouldn’t it be nice if...

- ...your organization could use any MPI you chose without re-integrating?
- ...you could painlessly integrate data from new clinical systems into a patient’s health summary / cover sheet?
- ...heterogeneous systems could be accessed consistently from your installed application base?
- ...standards supported your ability to redeploy or distribute hardware and software without breaking things?
<table>
<thead>
<tr>
<th></th>
<th>SOA</th>
<th>Web Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a technology platform?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Is a transport protocol?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Primary ownership is business-line owned?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Affects workflow and business processes?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Is an enabler for business and IT transformation?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Is an industry standard?</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
How *is* SOA different from messaging?

- A common practice in healthcare, just not yet in healthcare IT
- Many key products use them but do not expose interfaces
- Ensures functional consistency across applications
- Accepted industry best practice
- Furthers authoritative sources of data
- Minimizes duplication across applications, provides reuse
- Messages can be either payloads in or infrastructure beneath services
- Service-oriented architecture provides the framework for automation of common services
- Still, SOA has to be done well. It is cheaper and easier than ever to create badly designed applications and spaghetti integration
Interoperability Realized

Context
Requirements
Constraints

Model

Services
Documents
Messages

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Why SOA Healthcare Standards?
Why develop healthcare SOA standards?

- Healthcare organizations are being driven to interoperate
- “Messaging” is not the ideal approach for every interoperability challenge
- SOA has demonstrated viability and benefits for many organizations and in many vertical-markets
Understanding Interoperability

- Information & Semantics
  - Proprietary or Local Semantics
  - Standardized Data Types
  - Ontology
  - Reference Information Model
  - Archetypes (Knowledge & Structure)
  - Templates (Model Fragments)

- Standardized Domain Services
  - Custom "Vertical" Domain Services
  - Enterprise Service Bus
  - Web Services/Middleware
  - Message Routing
  - Messaging Specifications (H7, others)
  - Point-to-point Infrastructure

- Design & Technology
  - High
  - Low
Introducing HSSP
What is the Healthcare Service Specification Project?

- A joint standards development activity occurring in multiple organizations, including Health Level 7 (HL7), the Object Management Group (OMG), IHE, Open Health Tools, and others.
- An effort to create common “service interface specifications” tractable within Health IT.
- Its objectives are:
  - To create useful, usable healthcare standards that address business functions, semantics and technologies.
  - To complement existing work and leverage existing standards.
  - To focus on *practical* needs and *not perfection*.
  - To capitalize on industry talent through open community participation.
The Benefits of HSSP Standards...

- Define industry standard behaviors for healthcare-oriented service functions
- Eliminate “different flavors” of web services from occurring in different organizations
- Rapid-pace stds development: ~18-24 months
- Methodology embracing cross-group standards development
Cross-Organizational Standards Development

HL7

- Service Functional Model
- HL7 Draft Stds for Trial Use
- ANSI Standard

OMG

OMG Request for Proposal (RFP)

Technical Specification

OMG HDTF

RFP Responders
## Asset Inventory

<table>
<thead>
<tr>
<th>Asset</th>
<th>Purpose</th>
<th>Functional Specification</th>
<th>Technical Specification</th>
<th>Implementation Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification Service (IS)</td>
<td>To manage and correlate identities and identifying traits (e.g., MPI)</td>
<td>Complete* (Ballot refresh now)</td>
<td>Complete</td>
<td>Commercially Available</td>
</tr>
<tr>
<td>Retrieve Locate Update Service (RLUS)</td>
<td>To manage location and retrieval of healthcare content</td>
<td>Complete</td>
<td>Complete</td>
<td>In Development</td>
</tr>
<tr>
<td>Decision Support Service (DSS)</td>
<td>To analyze patient data / assess knowledge rules.</td>
<td>Complete</td>
<td>Complete</td>
<td>Open Source</td>
</tr>
<tr>
<td>Common Terminology Service (CTS II)</td>
<td>Defines behavior for managing/maintaining terminologies</td>
<td>Trial Use Standard, Final</td>
<td>Complete</td>
<td>Open Source</td>
</tr>
<tr>
<td>PASS [Healthcare] Access Control Service</td>
<td>Manages security policy as pertaining to access to health information</td>
<td>Trial Use Standard</td>
<td>Complete (Beta)</td>
<td>Commercially Available</td>
</tr>
<tr>
<td>PASS [Healthcare] Audit Service</td>
<td>Security-oriented service to manage audit record</td>
<td>Trial Use Standard</td>
<td>Complete (Beta)</td>
<td>Commercially Available</td>
</tr>
<tr>
<td>[Healthcare and Community] Services Directory (ServD)</td>
<td>To find providers &amp; services in allocated areas, e.g., referrals.</td>
<td>Complete</td>
<td>Complete (Beta)</td>
<td>Under Development</td>
</tr>
<tr>
<td>hDATA Record Format Specification</td>
<td>A hierarchical format with metadata tagging for organizing / representing [clinical] data</td>
<td>Complete</td>
<td>N/A</td>
<td>Open Source &amp; Commercial</td>
</tr>
<tr>
<td>hDATA RESTful Transport Specification</td>
<td>REST binding for data retrieval using SOA (RLUS for REST)</td>
<td>Complete</td>
<td>Complete (Beta)</td>
<td>Open Source</td>
</tr>
</tbody>
</table>
## Current Activities

<table>
<thead>
<tr>
<th>Asset</th>
<th>Purpose</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care Coordination Service</td>
<td>Establish a standard to enable the easy flexible, <strong>controlled collaboration</strong> around a Shared Master Care Plan</td>
<td>Ballot Expected Sept 2013</td>
</tr>
<tr>
<td>Cross-Paradigm Interoperability Project</td>
<td>To develop an implementation guide illustrating how various HL7, IHE and OMG <strong>immunization-related artifacts</strong> can be deployed to satisfy immunization interoperability use cases.</td>
<td>Ballot Expected early 2013</td>
</tr>
<tr>
<td>Medication Statement Service Profile – Implementation Guide</td>
<td>Defines the content (precise data model and representation approach), semantics, behavioural model, and <strong>service functionality for management of a medication statement</strong>, supporting both REST and SOAP.</td>
<td>Finalizing DSTU Now, Publication in Jan 2013</td>
</tr>
<tr>
<td>SOA Services Ontology Project</td>
<td>Elaborating a high-level service taxonomy to promote the <strong>description and discovery of healthcare SOA services</strong>, and detailed taxonomy of one service, most likely eReferral</td>
<td>Informative Ballot expected mid-2013</td>
</tr>
</tbody>
</table>
Which services are being done next?

- We do not prioritize new work based on a roadmap.
  - Even if we pick priorities, that doesn’t assure that people will do the work
  - This approach is not business-driven
  - The committee is unfunded

- New activities to align conceptually
  - We strive for consistency in service granularity
  - We will adapt or adjust activities as needed for portfolio fit
We will start new work when...

- There is a single person **personally committed** to lead it
  - Why? *Without a leader with day-job support, the cycles simply aren’t sufficient to get the work done.*

- A core group of at least **3 organizations** will participate.
  - Why? *Without a core group of three there is not enough diversity to justify an international standard*

- There is a clear scope-of-work achievable in **12-18 months**
  - Why? *If work cannot be done in this timeframe, the scope is probably either unclear or too ambitious*

- There is an agreement to **work within the rules**
  - Why? *This doesn’t mean that everything we do is right. It does mean that if something doesn’t work, we need to fix it together.*
  - We take on new work “top down” aligned with the roadmap with “bottom-up” prioritization
Common Terminology Service II (CTS II)

- information and functional model for relationships and use of terminology
  - how data elements are constrained to ranges of possible codes
  - how selection lists are built and queried
  - how terminological information is validated
- interactions between terminology providers and consumers
  - submit requests for corrections and extensions
  - identification, distributions, integration of revisions to content into running systems.
- mapping between terminologies and data models
- queries for logic-based terminologies about subsumption and inferred relationships
Decision Support Service (DSS)

- uses patient data to draw conclusions regarding patients
- “guardian” of one or more modules of medical knowledge
- each DSS knowledge module is capable of utilizing coded patient data to arrive at machine-interpretable conclusions regarding the patient, examples
  - Medication ID, age, gender, weight, serum creatinine level -> Recommended maximum and minimum doses given patient's estimated renal function
  - age, gender, past health maintenance procedures -> list of health maintenance procedures due or almost due
- DSS semantic profiles for immunization forecasting
Retrieve Locate and Update Service (RLUS)

- expose healthcare assets and resources within an organization that are needed to meet business or medical needs
- interfaces to locate, retrieve, and update resources among and between healthcare organizations
- not intended to replace existing systems or implementations - transparent means of locating and accessing health data
  - regardless of underlying data structures, security concerns, or delivery mechanisms
- semantic profiles (e.g. HL7 message information models, CEN 13606 archetypes) define the payload
Privacy Access and Security Services (PASS) – Access Control

- Effort to bring consistency to access control (security) enforcement within a SOA architecture for health settings
- Service is policy-driven and context-aware
- Access decision service capability with extensions for the healthcare environment
- Service capabilities for secure collection of healthcare-specific access decision information
Privacy Access and Security Services (PASS) – Audit

- Service capability to provide for the generation of Healthcare Audit Event Records
- Provides for the secure submission of Audit Records for processing and storage
- Provides a service capability to support healthcare disclosure Audit Reporting
Healthcare and Community Services Directory (ServD)

- Intended to fill a void that exists when it comes to the discovery and scheduling of [healthcare] services
- Defines key functionality such as **Relate a Resource to a Location**, **Establish a Service Location**, and **Relate a Provider to a Provider Organization**.
- SOA service to assist in the management and discovery of health and human services functions within or across Enterprises
- Can be used to “discover a provider”, “find a provider in plan”, “find a service capability with capacity”, etc.
- Its usage is not limited to direct care functions (e.g., can support community-based needs, such as “meals on wheels”)
SOA and HL7 SAIF

- HL7 has produced a Services-Aware Interoperability Framework (SAIF) which embraces services, messages and documents
- Includes SOA-based behavioral framework and conformance framework for HL7 standards (including HL7 v2 and v3 messages, CDA documents and services)
- Utilizes SOA and Model-Driven Architecture principles for explicit expression of policy, governance and traceability
- Service standards rely on SOA WG and HSSP work
- Framework development in progress, will influence future development of standards within HL7
“Practical Guide for SOA in Healthcare”

- Targeted to help those interested in SOA to do SOA
- *Is one* approach for SOA-enabling healthcare organizations
- Brings together practical experience with recommended best-practices
- Is not (nor is it intended to be) an industry standard
- Is not (nor is it intended to be) officially sanctioned by HL7
- Three volumes to suit different audiences
  - Volume One to “Get Started”
  - Volume Two presents an Immunization Case Study
  - Volume Three ties the body of work to SAIF and HITSP

Available at [http://hssp.wikispaces.com/PracticalGuide](http://hssp.wikispaces.com/PracticalGuide)
For More Information....

Contact us!

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- vincem@mccaulleysoftware.com (co-chair)

Visit our project wiki....

- http://healthinterop.org
Summary

“How do you know that the [web-] services you’re building are not just the next generation of stovepipes?”

Janet Martino, LTC, USAF (Retired) to a panel of Healthcare IT Leaders