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?

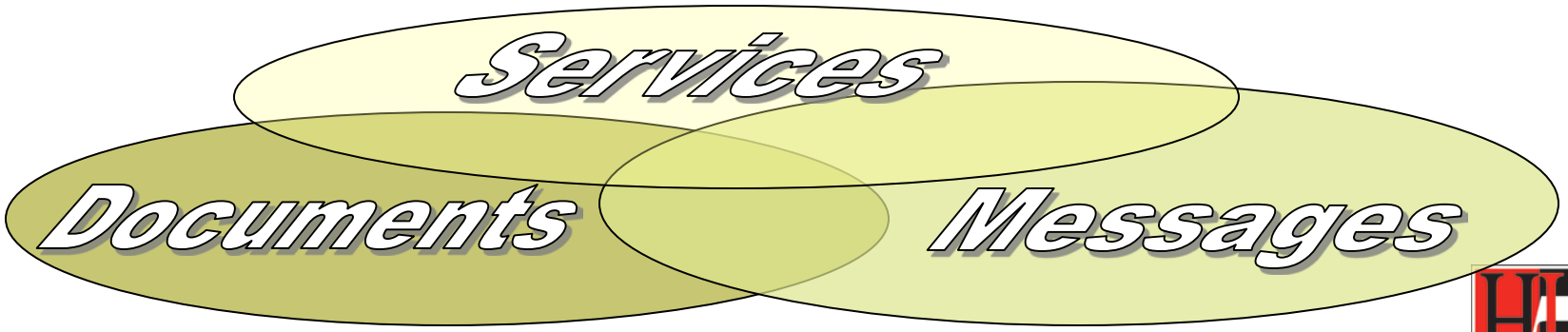
SOA ≠ Web Services

	SOA	Web Services
Is a technology platform?	**No**	**Yes**
Is a transport protocol?	**No**	**Yes**
Primary ownership is business-line owned?	**Yes**	**No**
Affects workflow and business processes?	**Yes**	**No**
Is an enabler for business and IT transformation?	**Yes**	**Yes**
Is an industry standard?	**No**	**Yes**

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

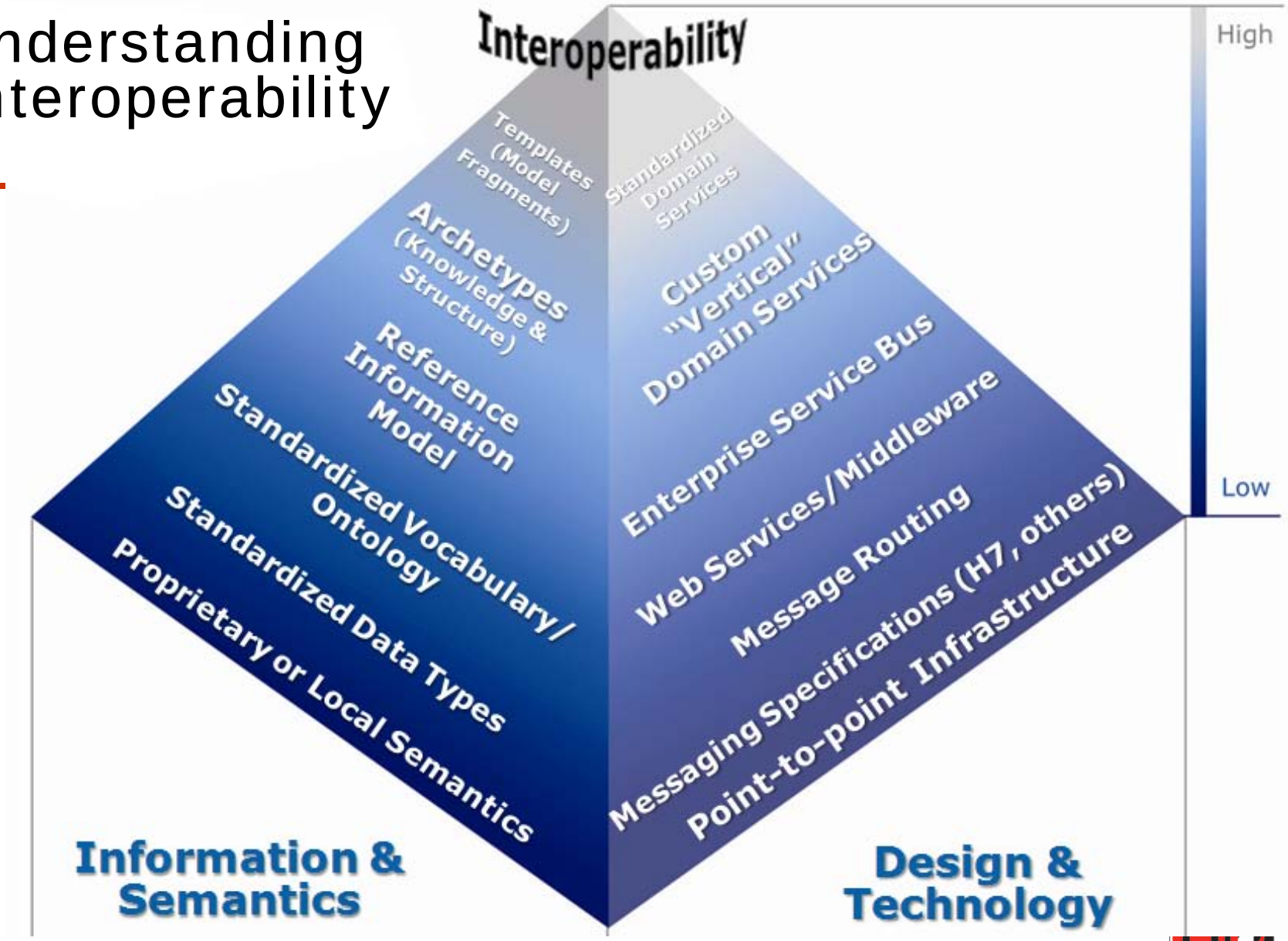


Why SOA Healthcare Standards?

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



Introducing HSSP

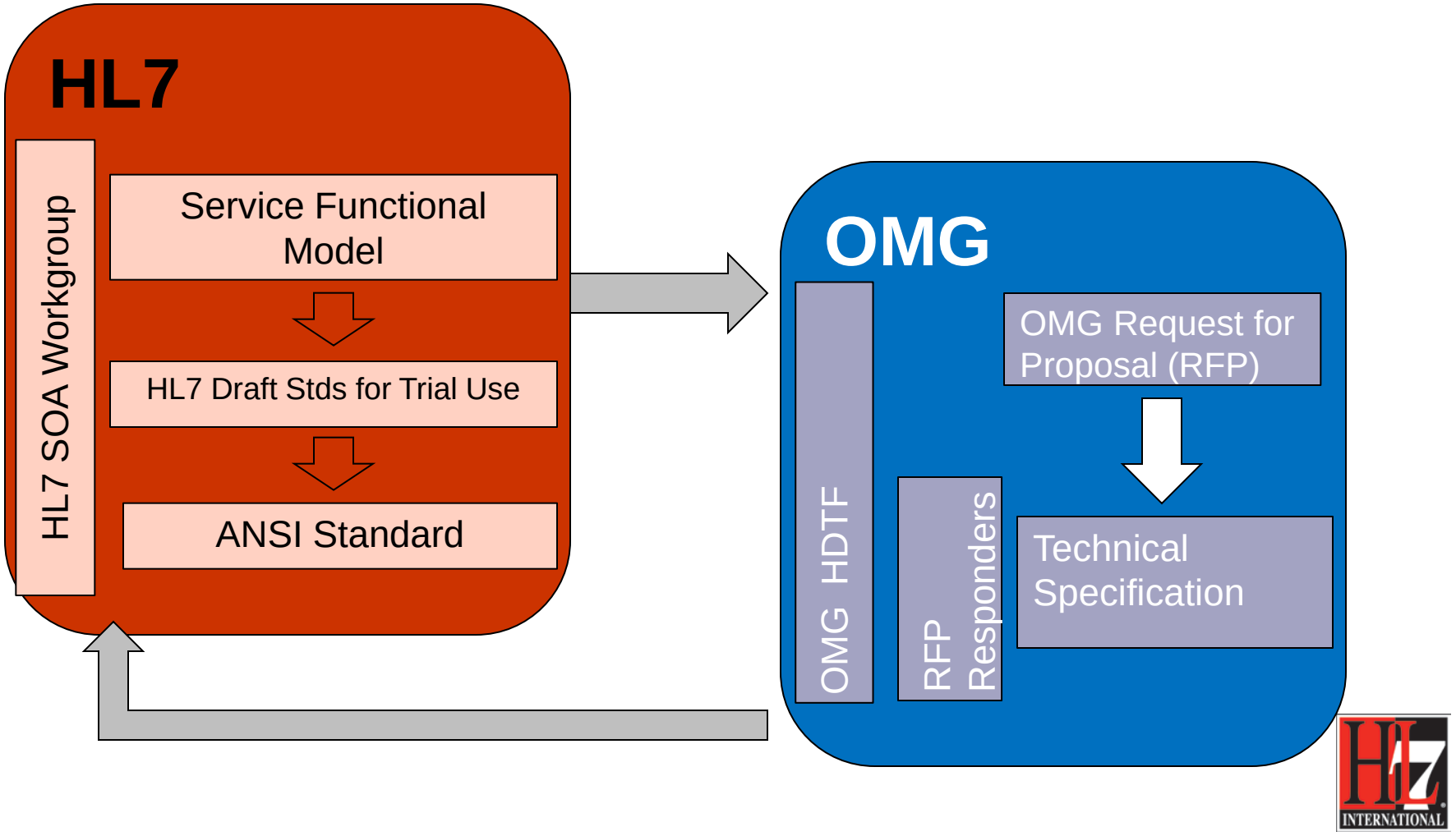
What is the Healthcare Service Specification Project?

- 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



Asset Inventory

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

Current Activities

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

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)

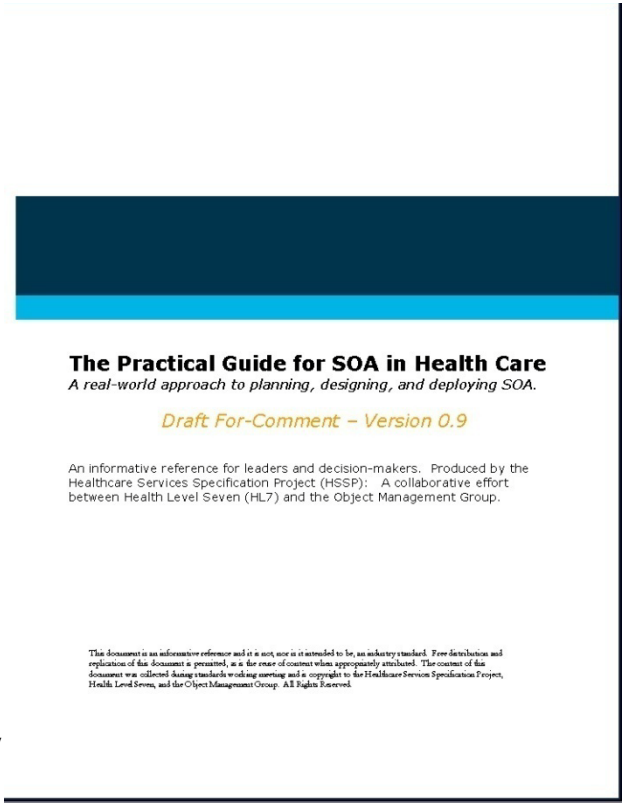
- Intended to fill a void that exists when it comes to the discovery and scheduling of [healthcare] services
- Defines key functionality such as ***Relate a Resource to a Location***, ***Establish a Service Location***, and ***Relate a Provider to a Provider Organization***.
- SOA service to assist in 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 <u>one</u>* 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

For More Information….

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  - beuchelt@mitre.org (co-chair)
  - djorgenson@inpriva.com (co-chair)
  - vincem@mccauleysoftware.com (co-chair)
- Visit our project wiki….
  - http://wiki.hl7.org (look for Service oriented architecture)
  - 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