The Role of Standards-Based Profiles in Establishing and Supporting Interoperability

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The great thing about standards – there are so many to choose from!
Standards: Necessary...Not Sufficient

Standards are

- Foundational - interoperability and communications
- Broad - varying interpretations and implementations
- Focused - may not consider relationships to other standards or domains
- Plentiful - often redundant or disjointed
- Partial – no single standard addresses full user tasks

Needed: a process for profiling multiple standards for coordinated implementation
Integrating the Healthcare Enterprise: A Framework for Interoperability

- A common framework for harmonizing and implementing multiple standards
  - Application-to-application
  - System-to-system
  - Setting-to-setting

- Enables seamless health information movement within and between enterprises, regions, nations

- Promotes unbiased selection and coordinated use of established healthcare and IT standards to address specific clinical needs
IHE: Connecting Standards to Care

Coordinate implementation of standards to meet clinical and administrative needs

- Clinicians and HIT professionals identify the key interoperability problems they face
- Providers and industry work together to develop and make available standards-based solutions
- Implementers are able to follow common guidelines in purchasing and integrating effective systems

IHE: A forum for agreeing on how to implement standards and processes for making it happen
Proven Standards Adoption Process

1. Identify available standards (e.g. HL7, DICOM, IETF, OASIS)
2. Document Use Case Requirements
3. Develop technical specifications
4. Testing at Connectathons
5. IHE Demonstrations
6. Products with IHE
7. Timely access to information
8. Simplified integration

IHE: Changing the Way Healthcare CONNECTS
IHE International Sponsors and Members

International and Domain Sponsors

- Healthcare Information Management Systems Society (HIMSS)
- Radiological Society of North America (RSNA)
- American Academy of Ophthalmology (AAO)
- American College of Physicians (ACP)
- American College of Clinical Engineering (ACCE)
- American College of Emergency Physicians (ACEP)
- American Society for Therapeutic Radiation Oncology (ASTRO)
- GMSIH (IT France), JAHIS (IT Japan), SFIL (laboratory)

IHE International membership

- New governance established in October 2007
- Broad multi-stakeholder membership: [www.ihe.net/governance](http://www.ihe.net/governance)
Participants include:

- Users - Clinicians, Staff, Administrators, CIOs, Governments
- Vendors of Information Systems and Equipment
- Consultants

Relationship with Standards Development Organizations (SDOs):

- HL7, DICOM, ISO, CDISC, ASTM, W3C, IEEE, IETF, and many others
- Approved via ISO/TC 215 allowing for IHE profiles to be published as ISO deliverables

National Adoption of Healthcare IT Standards

- US-HITSP, Canada-Infoway, many others worldwide
International Growth of IHE

- Local Deployment
- National Extensions
- Promotional & Live Demonstration Events
- Funding

Pragmatic global standards harmonization + best practices sharing
Growth in IHE Domains

- Over 200 vendors involved world-wide
- 8 Technical Frameworks
- 64 Integration Profiles
- Testing at “Connectathons” world-wide
- Demonstrations at major conferences world-wide
IHE Interoperability within the Enterprise

Enterprise IT Infrastructure

eMPI

User Auth

EMR - HIS

RIS

PACS

CVIS

ECG

Auto Mgr

LIS

Analyzer

Radiology

Cardiology

Laboratory

- Radiation Therapy
- Patient Monitoring
- Pathology
- Eye Care
IHE Profiles for extending the Enterprise

Accessing:
- Patient Charts
- Laboratory, Radiology results

Stark Relaxation
IHE Integration Profiles for Health Info Nets

What is available and has been added this cycle

Clinical and PHR Content
- Emergency Referrals
- PHR Extracts/Updates
- ECG Report Document
- Lab Results Document
- Scanned Documents
- Imaging Information
- Medical Summary
  (Meds, Allergies, Pbs)
  Format of the Document Content and associated coded vocabulary

Health Data Exchange
- Cross-Enterprise Document Sharing
  Registration, distribution and access across health enterprises of clinical documents forming a longitudinal record
- Cross-Enterprise Document Pt-Pt Reliable Interchange
- Cross-Enterprise Document Media Interchange
- Cross-Community Access

Security & Privacy
- Basic Patients Privacy Consents
  Establish Consents & Enable Access Control
- Cross-Enterprise User Attestation
  User Attributes for Access Control
- Document Digital Signature
  Attesting “true-copy and origin
- Audit Trail & Node Authentication
  Centralized privacy audit trail and node to node authentication to create a secured domain.
- Consistent Time
  Coordinate time across networked systems

Patient ID Mgmt
- Patient Demographics Query
- Patient Identifier Cross-referencing
  Map patient identifiers across independent identification domains

Other
- Request Form for Data Capture
  External form with custom import/export scripting
- Notification of Document Availability
  Notification of a remote provider/health enterprise

IHE Changing the Way Healthcare CONNECTS
Web Services provide a SOAP-based messaging infrastructure and transport mechanism
  ▪ One important piece of syntactic interoperability.

IHE Profiles combine syntactic (WS) and semantic (non-WS) interoperability specifications to deliver a service oriented healthcare interoperability.
  ▪ IHE uses a similar approach to WS-I in profiling web services specifications, with universally applicable guidelines presented as part of the IHE Technical Framework.
  ▪ Individual IHE profiles further refine the IHE Web Services guidelines in the context of each use case.
  ▪ As various use cases add new requirements to the use of web services, these universal IHE WS guidelines continue to evolve.
## Use of Advanced Web Services beyond SOAP, XML, MIME, Namespace, Schema, WSDL

<table>
<thead>
<tr>
<th>IHE Profiles</th>
<th>WS-Addressing</th>
<th>MTOM/XOP</th>
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A Service Oriented Architecture (SOA) is an architectural style for creating and using business processes packaged as services.

As a business practice, SOA improves organizational agility.

Web services are often used as the underlying technology of SOA implementations.

IHE's use of web services enables healthcare organizations to adopt SOA while using IHE profiles and transactions.
New IHE profiles using WS in 2008

- *Sharing of Terminology Value Sets (SVS)* profile provides a means through which healthcare facilities can receive a common, shared terminology managed in a centralized fashion.

- Add new web services functionality to enhance existing profiles helps solve new use cases:
  - Receipt of web service responses asynchronously for an *Asynchronous XDS-b*

- Addition of publish/subscribe capabilities to XDS in development as a white paper.

**IHE and Web Services:**

Future Directions

- The IHE process relies on standards developing organizations (SDOs) to produce standards which are fully vetted, and have broad base of support among implementers.

- As OASIS and the W3C approve new web services specifications which provide efficient support for specific healthcare use cases, IHE will continue to widen and deepen the use of web services in integration profiles.

- IHE also collaborates with the Healthcare Services Specification Project (HSSP). Several of the IHE profiles can be used as implementations of services specifications developed by the HL7 and OMG processes.
IHE and US Healthcare IT Standards Harmonization

The Certification Commission for Healthcare Information Technology (CCHIT)

The Health Information Security and Privacy Collaboration (HISPC)

American Health Information Community (AHIC)

Healthcare Information Technology Standards Panel (HITSP)

Nationwide Health Information Network Architecture Projects (NHIN)
### HITSP Interoperability Specifications and supporting IHE Profiles

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<thead>
<tr>
<th>Electronic Health Record</th>
<th>Emergency Responder</th>
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<td>Test Results IS-01</td>
<td>IS-04</td>
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#### Upcoming Use Cases Later in 2008-2009

- Patient Provider Secure Messenger
- Personalized Healthcare
- Public Health Case Reporting
- Immunization and Response Management
- Remote Monitoring
- Consultations and Transfers of Care
National and Regional Projects Using IHE Profiles

- Quebec, Ontario, Alberta, British Columbia (Canada Health Infoway)
- Denmark (Funen)
- Italy (Veneto)
- Spain (Aragon)
- THINC - New York
- NCHICA – N. Carolina
- Italy (Conto Corrente Salute)
- Netherland Amsterdam
- France DMP
- Austria
- CHINA-MoH Lab results sharing
- CHINA-Shanghai Imaging Info Sharing
- Malaysia
- JAPAN-Nagoya Imaging Info Sharing
- South Africa
- UK CfH (Radiology WF)
- VITL-Vermont
- Boston Medical Center - MA
- Philadelphia HIE
- CPHIC – Pennsylvania
- CareSpark – TN & VA
2008 HIMSS Interoperability Showcase

Leadership

Implementer

Supporter

Organizational Participants

Changing the Way Healthcare CONNECTS
Featured this year in the Showcase...

- 76 connected applications, 32 IHE profiles
- Secured Health Information Exchange with broad content
- Clinical Scenarios, focusing on clinician and patient access and information sharing across the continuum of care
- Population Health, Quality and Research
- Privacy and Security
- HITSP Interoperability Specifications
- Health information exchange with patient care devices
- Personal health record solutions
- Financial and administrative systems for billing and claims attachments (CAQH/CORE)
- Expanded distributed demonstration in an HIE format showing connectivity with vendor booths

**The 2008 Cast:**

<table>
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<tr>
<th>Category</th>
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<td>Vendors</td>
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*Changing the Way Healthcare CONNECTS*
Showcase Partners

- **HITSP**
  - Interoperability to support HITSP Use Cases

- **CAQH**
  - Interoperability between Provider & Health Plan

- **Clinical Research**
  - Bridging Healthcare Data to Clinical Research

- **Cable Industry**
  - Providing high-bandwidth support to the EHR
How to Participate in IHE

As a User or Vendor Committee Member

- Become an IHE member: Free at [www.ihe.net/governance](http://www.ihe.net/governance)
- Become a member of a Domain’s Planning or Technical Committees

As a User, Consultant or Vendor Interested Observer

- Become an IHE member: Free at [www.ihe.net/governance](http://www.ihe.net/governance)
- Provide Public Comments on Technical Framework Supplements
- Attend Demonstrations, Educational Events and Workshops
How to Use IHE

**As a Vendor Implementer**
- Implement IHE Integration Profiles
- Test systems through Connectathon process
- Publish an IHE Integration Statement for products

**As a User Implementer or Consultant**
- Use IHE Integration Profiles to develop interoperability strategy
- Use Connectathon Results and Integration Statements to evaluate vendors
- Demand IHE Integration Profile compliance in RFPs
Providers and Vendors
Working Together to Deliver
Interoperable Health Information Systems
in the Enterprise
and Across Care Settings

http://www.ihe.net