Improving Healthcare IT Systems through Interoperability

IHE can help manage “the medical devices mismatch”

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Presentation Overview

Overview: Given the brief time for the sessions, will be unable to cover in extensive detail, so please contact me as we would be delighted to provide additional information.

Primary goal for today’s session: That you are intrigued and wish to learn more

- Who is talking about global health interoperability?
- What is IHE? What does IHE Do or Produce? Who recognizes IHE?
- IHE and Medical Devices Overview
- IHE interoperability Success Stories
- IHE Patient Care Devices [PCD] Overview
- Next Steps
  - Join us – get involved with IHE
- Q & A
Why interoperability? What’s the value?

Does this look familiar?

It’s not just interfacing infusion pumps, for example. Many clinical systems must be integrated—from many vendors—using many technologies! Use of IHE-based products helps reduce costs and speed implementation.
Who is talking about interoperability?

WHO, UN and many others – connection to MDG

Global Meeting on Government Interoperability Frameworks 2010

Representatives of 26 developing countries agreed, through a declaration the urgency for governments, civil society and the private sector to work together to develop and implement government interoperability frameworks for accelerating progress in Millennium Development Goals.

- IHE can help
“Developing a global health indicator registry with standards for data, indicators, metadata, and references to analytic methods that builds upon work done in health and disease programs, promotes the implementation of the standards…”

**Developing and promoting interoperability standards for the health sector at both the level of individual and aggregate records.**

The eight agencies commit themselves to acting upon this goal immediately by: Working together and enhancing investments in developing a common standard for health information, including a common indicator and metadata registry and interoperable databases.

[www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000223](http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000223)
Isn’t interoperability largely a technology challenge?

No, it is more than just technology.

“...When implementing an e-Health system a systemic approach is necessary to account for all factors impacting on the success of the system.

...These impacting factors include policy and legal frameworks, workflows and processes and financial and human resources.

Technical interoperability is not always just a technical issue, it can also be a political one. If there is no interest in collaboration then there will be little support for interoperable structures.
Introducing Integrating the Healthcare Enterprise

**IHE**

- IHE is an organization with a process to help make the important goals of health IT interoperability happen in high and low resourced countries

- **IHE - Changing the Way Healthcare Connects**
IHE – a brief overview

- Global non-profit organization
- 400+ members from 30+ nations worldwide and still growing
- Over a decade of experience
- Led by IHE volunteers and sponsor organizations
- Over 100 IHE Profiles [IHE’s work product] published & in use worldwide
- IHE’s work is open source and freely available to all
Who are IHE Members?

Members lead IHE and represent a wide range of health and IT stakeholders including...

- Clinicians – physicians & nurses
- Executive clinical leaders such as CMIOs, CNOs
- Academic medicine faculty
- Non-profit membership associations such as HIMSS, European Association of Hospital Pharmacists, AAMI and many more
- Standards developers & SDO entities
  - HL7, ISO, IEEE, DICOM, etc
- Health professionals such as public health administrators & biomedical and clinical engineers and many others
- Consultants, product developers and vendors
What Does IHE Do or Produce, continued...

The official description...

- IHE creates paths to seamless movement of clinical patient data within & between enterprises, regions, nations
- IHE has created a common technical framework for harmonizing and implementing multiple health & IT standards
- Reduction of interfaces between health IT systems = reduced costs
Improving patient safety, ability to conduct clinical research and more

*From the official description to a story to help illustrate via a common use case...*

- Over 100,000 people per year estimated to die from preventable medical errors in just the U.S. – how many more worldwide?
About those recognized base standards
Who recognizes IHE?

Using accepted base standards such as...

Creates

Profiles

REPEATABLE

IHE
IHE Domains & Structure

1. Anatomic Pathology
2. Cardiology
3. Eye Care
4. IT Infrastructure
5. Laboratory
6. Mammography
7. Nursing – PCC subcommittee
8. Patient Care Coordination
9. **Patient Care Devices / Medical Devices**

10. Pharmacy
11. Quality, Research & Public Health
12. Radiology
13. Radiation Oncology

Future Domains may include:
- Dentistry [In process]
- Surgery [In process]
- …And others
The larger vision & goal

*Semantic interoperability*

**1st Level Goal:** Interoperability with two or more computer systems to exchange information

**Next Level Goal:** *Semantic interoperability* is the ability to **automatically interpret the information accurately** exchanged in order to produce useful results as defined by the end users of both systems.

**What’s Needed to reach this goal?** To achieve semantic interoperability, both sides must defer to a common information exchange reference model. The content of the information exchange requests are unambiguously defined: **what is sent is the same as what is understood.**

[www.ieee.org](http://www.ieee.org)
Why not just use standards?

Why is IHE Needed?

Standards are important and needed, but standards alone are not enough

- Sometimes they are too broad resulting in varying interpretations and implementations
- Sometimes there are too many & sometimes too few

- As a result, many times purchasers, end users, governments, agencies / ministries and product developers are forced to choose one standard over another and lose potential to reach an interoperable state
Benefits of medical device connectivity for hospitals & other connected entities

- With today’s often high staff-to-patient-ratio, staff must spend more time charting and less time on direct patient care

- Medical Devices able to transmit data directly to the EHR
  - Eliminates transcription errors
  - Increase staff productivity

- Example: One of IHE’s vendor members has a device interface library with 400+ different types of medical devices supported, including patient monitors, ventilators, infusion pumps, and anesthesia machines.

- This solution automatically converts the medical device data to HL7 or XML format and integrates it with any Electronic Medical Record, (EMR), Clinical Information System (CIS), or Alarm and Event Management system improving clinical documentation, enhancing workflow and saving thousands of nursing hours.
IHE Success Stories

Just showing two examples today due to time limitations, there are many more success stories available upon request.
Sample of IHE Implementations Worldwide

- Quebec, Ontario, Alberta, British Columbia Canada Health Infoway
- THINC- New York NCHICA – N. Carolina
- Italy (Conto Corrente Salute)
- Denmark (Funen)
- Italy (Veneto)
- Spain (Aragon)
- THINC- New York NCHICA – N. Carolina
- Australia
- VITL-Vermont
- Boston Medical Center - MA
- Philadelphia HIE
- CPHIC – Pennsylvania
- CareSpark – TN & VA
- CHINA-Shanghai Imaging Info Sharing
- South Africa
- Malaysia
- CHINA-MoH Lab results sharing
- JAPAN-Nagoya Imaging Info Sharing
- THINC- New York NCHICA – N. Carolina
- UK CfH (Radiology WF)
- France DMP
- Netherland Amsterdam
Go to Google Maps & enter
“Where in the World is XDS & CDA?”
InSite One: Largest managed HIE includes medical imaging with 650+ sites w/ability to share data through their enterprise archive using IHE actors and profiles

www.insiteone.com/why-dicom.php
TrakCare Supports Rapid Growth at Bangkok Dusit Medical Services

Bangkok Dusit Medical Services, Thailand

Bangkok Dusit Medical Services (BDMS) is the leading health service provider in Thailand with 18 hospital branches across the country. Its Bangkok Medical Center (BMC) is a four-hospital medical campus featuring numerous specialties, 650 doctors, the pervasive use of advanced technology, and a focus on patient care that draws clients from Thailand, Asia, and around the world. BDMS relies on InterSystems TrakCare™ to help it meet the highest standards for care and operational efficiency.

BDMS chose TrakCare because it includes a Web-based Electronic Patient Record (EPR) that provides a single view into patient information from across all departments. This unified information environment is

“With TrakCare, we have a unified system that has increased our efficiency and given our doctors more time to focus on patient care.”
IHE Success Stories: epSOS Project – Europe
Smart Open Services for European Patients

• **Who**: 30+ European entities from 12 EU-members

• **Goal**: To develop a practical eHealth framework and infrastructure that will enable secure access to patient health information, particularly with respect to a basic patient summary and e-prescription, between European healthcare systems.

• **epSOS Critical Principles include...**
  – Not to alter any Member State’s current health information system
  – Instead create a technical interface allowing different systems to work together

www.epsos.eu/epsos-home.html
The PCD Domain is concerned with *use cases* in which at least one actor is a *patient-centric point-of-care medical device*. 

PCD *coordinates* with other IHE clinical specialty based domains such as medical imaging and lab to ensure *consistency* of medical device integration solutions across all IHE technical frameworks.
IHE PCD Work Product

✓ **Current IHE PCD Profiles:**
  - Enterprise sharing of Patient Care Data (DEC)
  - Subscribe to Patient Data (SPD)
  - Rosetta Stone Terminology Project (RTM)
  - PCD Alarm Communication Management (ACM)
  - Point-of-care Infusion Verification (PIV)

✓ **IHE PCD Work in Process:**
  - Device Point-of-care Integration (DPI)
  - Waveform Communication Management (WCM)
  - Event Communication (EVT)
  - Medical Equipment Management (MEM)
  - Patient – Device Association (PDA)

✓ **Initial device classes...**
  Vital signs / physiological monitors, infusion pumps and **ventilators**
IHE PCD Work Product

✓ **IHE PCD Users Handbook**
  - How to assess PCD profile support
  - System verification & validation testing considerations

Please contact me and I can email link and/or document upon request

- lspellman@himss.org
IHE Technical Demonstrations

Held in locations worldwide for six years, including: Australia, Canada, China, Korea, France, Spain, US

US2010 - Atlanta
- 25K Sq Ft & 4K visitors
- 80 participants &
- 70+ systems

Upcoming Showcases
Oct 2010: Korea
May 2011: Budapest
August 2011: Australia
PCD area of an Interoperability Showcase
Suggested Next Steps

Join IHE and help make interoperability happen

How to Apply?

• IHE Membership is free
• Complete on-line application at www.ihe.net/apply
• Submit declaration page
• Applications reviewed by IHE International Board
• Reviewed monthly
• Join IHE Clinical or Operational Domains and sub-committees

Benefits of IHE Membership

• Leadership in HIT industry
• Direct work of IHE Committees
• Learn from industry’s top professionals
• Participation in IHE Domain
IHE Supports WHA resolution 60.29

WHA resolution WHA 60.29 of May 2007
"Health technologies" - in particular medical devices

Urges Member States: "to draw up national or regional guidelines for good manufacturing and regulatory practices, to establish surveillance systems and other measures to ensure the quality, safety and efficacy of medical devices and where appropriate participate in international harmonization"
Why choose IHE?

For End Users...

✓ Simplify tender & RFP processes

✓ Reduces cost
  ▪ Need fewer interfaces
  ▪ Open source

For End Users...

✓ Improve patient safety –

✓ Spend time innovating rather than supporting infrastructure work – again & again & ...

✓ Improve patient safety -
A Wealth of Resources, learn more & please join us!

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<thead>
<tr>
<th>Resource</th>
<th>Details</th>
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<tbody>
<tr>
<td>IHE Main Website</td>
<td><a href="http://www.ihe.net">www.ihe.net</a></td>
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<tr>
<td>IHE Europe</td>
<td><a href="http://www.ihe-europe.net">www.ihe-europe.net</a></td>
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<tr>
<td>Interoperability Showcase Information, videos, examples, and more</td>
<td><a href="http://www.interoperabilityshowcase@himss.org">www.interoperabilityshowcase@himss.org</a></td>
</tr>
<tr>
<td>Great resource for standards, interoperability, and IHE</td>
<td>primarily U.S focused, though not exclusively: Keith Boone: GE &amp; Co-Chair Patient Care Coordination Domain</td>
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<td><a href="http://motorcycleguy.blogspot.com/">http://motorcycleguy.blogspot.com/</a></td>
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Please feel free to contact me
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Questions & Discussion
Thank you!

Changing the Way Healthcare CONNECTS

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Holding Slides

- These are holding slides in case we have more time
IHE maximizes connections

- IHE works Application-to-Application
  - UNIX > Oracle

- IHE works System-to-System
  - Medical Device > EHR > PHR

- IHE works Setting-to-Setting
  - ER > Cardiology > ICU > Lab > EHR
Why interoperability? What’s the value?

Does this look familiar?

It’s not just interfacing infusion pumps, for example

Many clinical systems must be integrated – from many vendors – using many technologies!
IEEE defines interoperability as the ability of two or more systems or components to exchange information and to use the information that has been exchanged.

[www.ieee.org]
## IHE Domains & Structure

### IHE Development
- Develop IHE Profiles
- Interact w/SDOs and other related entities on development issues
- Test Tool Development
- Marketing
- And More

### IHE Deployment
- National & Regional deployment worldwide
- Encourage uptake of IHE Profiles
- Education and training
- Interact w/SDOs & other related entities for deployment issues
- Test events via IHE Connectathons
- Demonstrations and HIMSS Interoperability Showcases