Interoperability Standards enabling cross-border Patient Summary Exchange

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EU/US MoU Roadmap:
EHR interoperability: expected outcomes

- Development of use cases/user stories
- Perform Structure & Vocabulary Analysis
- Perform Healthcare patient and provider Mediated Exchange analysis
- Semantic and syntactic mapping of scenario related health data
- Pilots
- A global standard or IG for EHR summaries
Why Trillium Bridge?
A builder perspective...

What can we do to lower the cost of transatlantic business engagement in eHealth?

- Reduce barriers for transatlantic coordination, health care, trade
- Decrease standards development and implementation costs
- Accelerate convergence towards global standards
- Support right of citizens to their health data and safety

Well, perhaps we could try building..

...a Transatlantic Bridge for EHR summaries!
Trillium Bridge Project

**What:**
- Pragmatic Feasibility study on the exchange of Patient Summaries across the Atlantic

**How:**
- Comparing, analyzing, and mapping patient summaries starting with Meaningful Use 2 C-CDA/CCD and EU patient summaries (epSOS)

**When:**
- From: July 2013 to February 2015

**Who:**
- A stellar consortium comprising EU member state ministries, provider networks, industry, associations, SDOs
Trillium Bridge: transatlantic community of Knowledge and Action

Innovative Entrepreneurs
US Health Care Providers
European Standardization

epSOS National Bodies with Patient Access pilot
Objectives of Trillium Bridge

**Building the Transatlantic bridge for patient summaries**

- Use cases → gap analysis → identify barriers / easy wins → deployment
- Interoperability assets → Implementations → Validation
- Policy alignment, future standardization, and sustainability
- Feasibility study to set the tone and pace for interoperability in the global eHealth ecosystem.

**Attain the vision of EU-US eHealth MoU and roadmap!**
Trillium Bridge Use Cases

One Value proposition:
- When patient needs unplanned care overseas, a EHR summary fit for the purpose of safe and efficient health care is available.
- After the health care encounter, patient receives encounter report in a format and language that can be understood back home.

Two use cases:
- Provider mediated (citizen controlled, provider initiated)
- Patient mediated (citizen initiated, citizen controlled)

Blazing the transatlantic path – constraints and assumptions
- Translation of narrative unstructured content (not in scope)
- Incorporate patient summary elements in EHR or PHR (not in scope)
- Preconditions: citizen empowerment
  - EU Citizens have access to their EU Patient Summary (e.g. epSOS PAC, HECR)
  - US Citizens have access to their Clinical Summary in C-CDA/ CCD
EU patient summary

Patient summary is defined as the “minimum set of information needed to assure healthcare coordination and continuity of care”

Emergency or unplanned care refers to “the range of healthcare services available to people who need medical advice, diagnosis and/or treatment quickly and unexpectedly”
The patient feels sick and seeks healthcare in a country that is not his/her country of origin. As he/she frequently visits that country the health professional may have some clinical information about that patient in his/her own records. They will not normally have a language in common.
§ 170.205 Content exchange standards and implementation specifications for exchanging electronic health information.

170.205(a)(3) Consolidated CDA (C-CDA):

170.205(h) CDA Guide for Quality Reporting Document Architecture, Category I

170.205(i) CDA Guide for Reporting to Central Cancer Registries

170.205(k) CDA Guide for Quality Reporting Document Architecture, Category III (QRDA-III)
### § 170.205 Content exchange standards and implementation specifications for exchanging electronic health information.

<table>
<thead>
<tr>
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<tr>
<td>170.205(h)</td>
<td>CDA Guide for Quality Reporting Document Architecture, Category I (QRDA-I): Standardized representation of quality data for an individual patient. Data in a QRDA-I report can be consumed by a calculation engine to determine if the patient met the numerator or denominator criteria for a given quality measure.</td>
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<tr>
<td>170.205(i)</td>
<td>CDA Guide for Reporting to Central Cancer Registries: Standardized cancer registry reporting format.</td>
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<td>170.205(k)</td>
<td>CDA Guide for Quality Reporting Document Architecture, Category III (QRDA-III): Standardized representation of aggregate quality data (e.g. number of patients meeting the numerator criteria for a given quality measure).</td>
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Milestones to success

Selecting Grounds:
- Pilot Use Cases
- Business Architecture
- Gap Analysis

Building the Bridge:
- Aligning Structure & Terminology
- Trust Agreements
- Interoperability assets

Testing the Bridge:
- Testing Tools
- Data Sets
- Validation Reports

Policy Alignment:
- Organizational, Legal, Regulatory Interoperability
- Feasibility Analysis
- Cross-vendor integration
- Incentives
- Standardization
- Innovative Business models
- eIdentification,
- Security and privacy
- Education
- Clinical Research

We are here
Comparing EHR Summaries:
EU Patient Summary vs US Clinical Summaries

- Same base Standard (HL7 CDA)
- Different philosophy: capture vs continuity of care
- Different IGs: C-CDA/CCD (US realm) vs epSOS IG
- Different technical approach: Open vs Closed Template
## Gap Analysis: Clinical Comparison (Body)

<table>
<thead>
<tr>
<th>epSOS/EU Patient Summary Guideline</th>
<th>EU PS Guideline</th>
<th>epSOS PS Guideline</th>
<th>CCD</th>
<th>Optionality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section</strong></td>
<td>Optionality</td>
<td>Optionality</td>
<td>Section</td>
<td>Optionality</td>
</tr>
<tr>
<td>Allergy</td>
<td>R</td>
<td>R</td>
<td>Allergies</td>
<td>R</td>
</tr>
<tr>
<td>Medical Alert Information (other alerts not included in allergies)</td>
<td>R</td>
<td>R</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Vaccinations</td>
<td>O</td>
<td>O</td>
<td>Immunization</td>
<td>O</td>
</tr>
<tr>
<td>List of resolved, closed or inactive problems</td>
<td>O</td>
<td>O</td>
<td>Problem</td>
<td>R</td>
</tr>
<tr>
<td>Surgical Procedures prior to the past six months</td>
<td>R</td>
<td>O</td>
<td>Procedures</td>
<td>O (R only for inpatients)</td>
</tr>
<tr>
<td>List of current problems/ diagnoses</td>
<td>R</td>
<td>R</td>
<td>Problem</td>
<td>R</td>
</tr>
<tr>
<td>Medical Devices and implants</td>
<td>R</td>
<td>R</td>
<td>Medical Equipment</td>
<td>O</td>
</tr>
<tr>
<td>Major Surgical Procedures in the past six months</td>
<td>R</td>
<td>R</td>
<td>Procedures</td>
<td>O (R only for inpatients)</td>
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</tbody>
</table>
## Gap Analysis: Sample Sections & Terminologies

<table>
<thead>
<tr>
<th>Coded Section (C-CDA/CCD)</th>
<th>C-CDA Code System</th>
<th>epSOS Value Set Name</th>
<th>epSOS terminology</th>
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</thead>
<tbody>
<tr>
<td>Allergy/Adverse Event Type</td>
<td>SNOMED CT</td>
<td>epSOSAdverseEventType/epSOSReactionAllergy</td>
<td>SNOMED CT</td>
</tr>
<tr>
<td>Medication Clinical Drug Name Value Set</td>
<td>RxNORM</td>
<td>epSOSActiveIngredient</td>
<td>ATC</td>
</tr>
<tr>
<td>Vaccine Admin Value Set</td>
<td>CDC Vaccine Code (CVX)</td>
<td>epSOSVaccine</td>
<td>SNOMED CT</td>
</tr>
<tr>
<td>Problem</td>
<td>SNOMED CT</td>
<td>epSOSIllnessesandDisorders</td>
<td>ICD-10</td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>N/A</td>
<td>epSOSMEDicalDevices</td>
<td>SNOMED CT</td>
</tr>
<tr>
<td>Medication Route FDA</td>
<td>FDA RouteofAdministration</td>
<td>epSOSRouteofAdministration</td>
<td>EDQM</td>
</tr>
<tr>
<td>UnitsofMeasureCaseSensitive</td>
<td>UCUM</td>
<td>epSOSUnits</td>
<td>UCUM</td>
</tr>
<tr>
<td>Vital Sign</td>
<td>LOINC</td>
<td>epSOSBloodPressure</td>
<td>LOINC</td>
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</tbody>
</table>
Provider Mediated Case: Technical Architecture Overview

IHE XCA
IHE XCPD
IHE ATNA (epSOS)

Trillium Bridge Gateway (based on the epSOS Open NCP)

IHE XCA
IHE XCPD
IHE ATNA (eHealth Exchange)

Local Connector & eHealth Exchange Gateway

MU2 C-CDA/ CCD

EU Patient Summary epSOS pivot document (EN)

Transformer

CTS-2

Terminology Services
- EU epSOS master values (MVC/MTC)
- US core value sets (NLM)
Patient Mediated Use Case:

Technical Architecture Overview

Doctor Displays PS In local language prepares encounter report

Martha gets her CCD Via BlueButton

Get EU patient summary

Request transform..

Paolo has his EU Patient Summary epSOS pivot (EN)

Request transform..

Get clinical summary

Paolo has encounter report in CCDA/CCD

Request transform..

Terminology Services

- EU epSOS master values (MVC/MTC)
- US core value sets (NLM)
Trillium Bridge: achievements/work ahead

**Completed Gap analysis**

- In collaboration with S&I WG EHR Interoperability work stream
- Released Deliverable D2.2: Comparing Patient Summaries in the EU and US: Gap Analysis and Pilot Use Case Definition

**Identified interoperability Assets**

- Established the basis for a terminology service to offer interoperability assets
- Plan to provide prototype CTS-2 service

**Inform and support standardization efforts**

**Refine assets, work on the puzzle through validation**
Interoperability assets online

Standard Terminology Service

Our terminology service is still under construction...
Thank you for your understanding

Learn more

Check out Trillium Bridge Interoperability Assets:
http://extension.phast.fr/STS_UI
Expressing Medical Devices/Implants

EU Patient Summary/epSOS

HL7 C-CDA/CCD

Medical Device Coded Section

Medical Device Entry Content Module

Device Description

MedicalEquipment Section

NonMedical SupplyActivity

ProductInstance

Please check: www.trilliumbridge.eu

Deliverables:
D3.1: Clinical model and terminology mappings:
methodological approach, led by Ana Estelrich, PHAST
& Harold Solbrig, Mayo
Transforming EHR summaries EU ↔ US

<table>
<thead>
<tr>
<th>Template ID</th>
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<tr>
<td>Author</td>
<td>Structured Documents Working Group</td>
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**XPath EU patient Summary/epSOS**
/ClinicalDocument[templateId/@root='1.3.6.1.4.1.12559.11.10.1.3.1.1.3']/component/structuredBody/component/section[templateId/@root='1.3.6.1.4.1.12559.11.10.1.3.1.2.4']/entry/supply[templateId/@root='1.3.6.1.4.1.12559.11.10.1.3.1.3.5']/participant[@typeCode='DEV']/participantRole/playingDevice/code

**XPath: HL7 CCDA/CCD**
/ClinicalDocument[templateId/@root="2.16.840.1.113883.10.20.22.1.2"]/component/structuredBody/component/section[templateId/@root="2.16.840.1.113883.10.20.22.2.23"]/entry/supply[templateId/@root="2.16.840.1.113883.10.20.22.4.50"]/participant[@typeCode="PRD"]/participantRole[templateId/@root="2.16.840.1.113883.10.20.22.4.37"]/playingDevice/code

Check out Trillium Bridge Interoperability Assets: [https://github.com/kevinpeterson/trillium-bridge-transformer](https://github.com/kevinpeterson/trillium-bridge-transformer)
Trillium Bridge Deliverables

Please check: [www.trilliumbridge.eu](http://www.trilliumbridge.eu) under deliverables
EU/US MoU Roadmap: expected outcomes & Trillum Bridge

- Development of use cases/user stories
- Perform Vocabulary Analysis
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- Perform Healthcare provider Mediated Exchange analysis and validation
- Semantic and syntactic mapping of scenario related health data
- Validation and Pilots
- A global standard or IG for patient summaries
Parting Thoughts...

- **eHealth standards are the safety net that strengthens the fabric of the global eHealth infrastructure.**
  - Interoperability at affordable cost
  - Built once used anytime and anywhere
  - Working across cultures and borders

- **Health IT is enabling safe informed health care**
  - Key to new market opportunities
  - Milestone in the path to a healthier world
  - Culture of collaboration, creativity, and understanding for the eHealth ecosystem.

**Deploy or Die!**
Joi Ito, Head MIT Media Lab