eHealth week
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RIGA, LATVIA

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TRILLIUM BRIDGE AND BEYOND:
STATE OF PLAY AND FUTURE PROSPECTS

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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 June2015

- Who:
  - A stellar consortium comprising EU member state ministries, provider networks, industry, associations, SDOs

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

Achievements of Trillium Bridge

We are here

Policy Convergence:

- Feasibility Analysis
- Cross-vendor integration
- Incentives
- Standardization
- Innovative Business models
- eIdentification,
- Security and privacy
- Education
- Clinical Research

Testing the Bridge:

- Testing Tools
- Data Sets
- Validation Reports

Building the Bridge:

- Aligning Structure & Terminology
- Trust Agreements
- Interoperability assets

Selecting Grounds:

- Pilot Use Cases
- Business Architecture
- Gap Analysis

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HL7 INTERNATIONAL

Under the Hood

TBXform

Transformer Gateway

Transformer Components

CCD

CCD

Structure Transformation

Language Translation

bing

Code Mapping

EPSOS

EPSOS

CTS-2

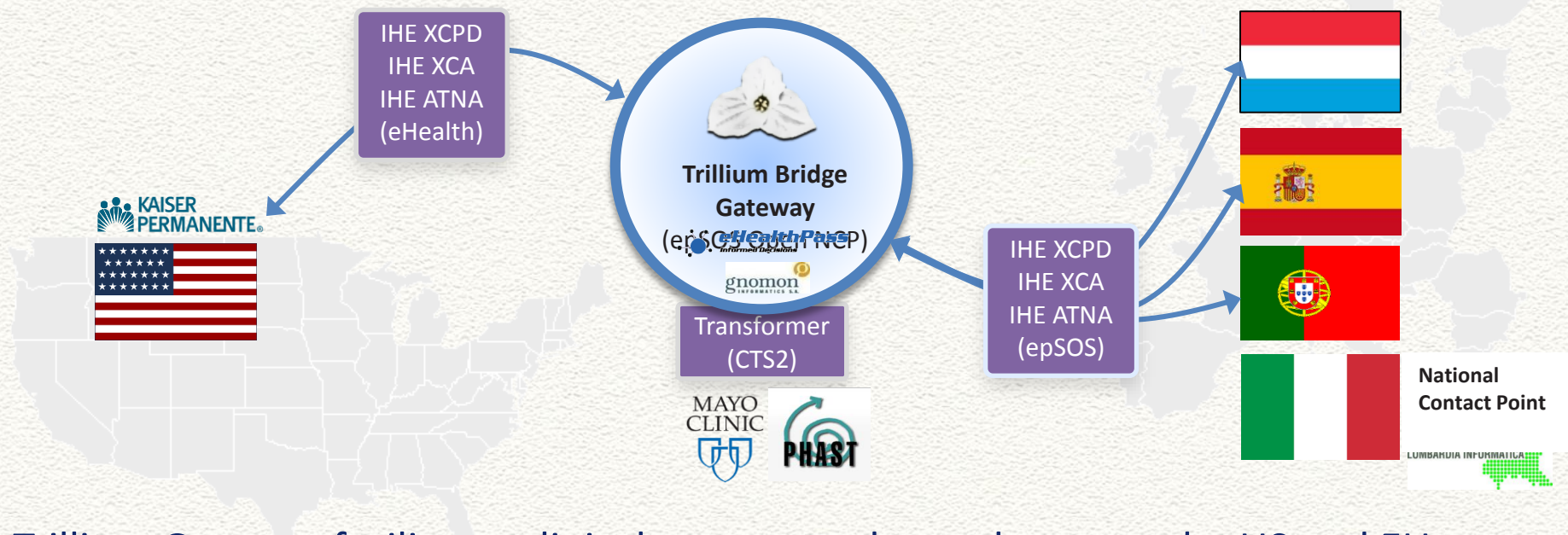# Open Source Software

MAYO CLINIC

PHAST

Statistics: coverage of value sets

epSOS Value Set	epSOS Code System	concepts with corresponence/ concepts present/ (% covered)	CCD Value Set	CCD Code System	concepts with corresponence/ concepts present/ (% covered)
epSOSActiveIngredient	ATC	606/5592 (6%)	Medication Drug Class	NDF-RT	1365/10699 (13%)
epSOSActiveIngredient	ATC	2836/5592 (51%)	Medication Brand Name	RxNorm	3329/13885 (24%)
epSOSActiveIngredient	ATC	2836/5592 (51%)	Medication Clinical Drug	RxNorm	9642/31214 (31%)
epSOSAllergenNoDrugs	SNOMED CT	79/112 (71%)	Ingredient Name	UNII	5315/63996 (8%)*
epSOSRoutesofAdministration	EDQM Standard Terms	55/73 (75%)	Medication Route FDA	NCI Thesaurus	57/118 (48%)
epSOSDoseForm	EDQM Standard Terms	28/457 (6%)	Medication Product Form	NCI Thesaurus	99/153 (65%)
epSOSIllnessesandDisorders	ICD-10	1775/9525 (19%) IHTSDO maps	Problem	SNOMED CT	7204/16443 (44%) IHTSDO maps
epSOSIllnessesandDisorders	ICD-10	1147/9525 (12%) NLM maps	Problem	SNOMED CT	6914/16443 (42%) NLM maps
epSOSVaccine	SNOMED CT	27/31 (87%)	Vaccine Administered	CVX	87/163 (53%)

Trillium Provider Mediated Exchange

Trillium Gateway facilitates clinical content exchange between the US and EU
- Remediate differences between IHE exchange specification implementation (epSOS and eHealth)
- Clinical content transformer service
- EU Continuity of Care Document to US Consolidated CDA patient summary
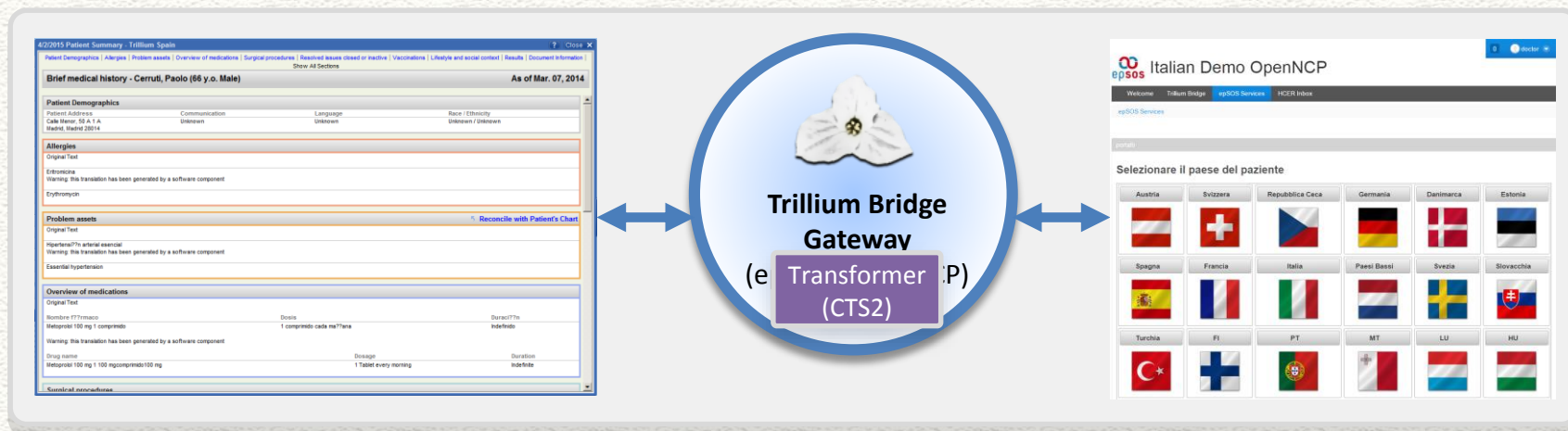
Trillium Exchange Demonstration

Proof of Concept Implementation Complete

Working bidirectional exchange between Kaiser Permanente, Spain, Portugal and Luxembourg

- Kaiser Permanente Exchange Platform

- Trillium Gateway and Transform Services

- Reference epSOS nodes representing the EU Countries

Trillium Exchange Lessons Learned

Team worked through differences in how the specifications (IHE XCPD and XCA) were implemented in order to achieve successful exchange across the Atlantic

Examples of most significant issues with specification alignment

- **Certificates**: Self signed for purposes of demonstration

- **SAML:** Significant differences in the requirements for eHeaelth versus epSOS implementation

- **Patient Discovery:** Demographics versus identifier based search

- **Document Query:** Difference in Class Code for Document Type used

- **Document Retrieve:** Country specific identifier is used to retrieve for epSOS

Future Prospects in Spain

- **Trillium Bridge fits eHealth Strategy:**
  – Testing and validating requirements
  – Automated generation for all citizens
  – All-bilingual approach - Multilingual terminologies
  – Stimulus for standards adoption
  – Solving practical legal issues
  – Complete semantic units approach fostering innovation
- **Moving forward**
  – Agreement levels: EU-USA, bilateral, patient led
  – "Convincing" industry about business added value of PS will require proof of feasibility and large-scale adoption
  – Population coverage measuring will be essential
  – Trillium Bridge documents may guide and teach

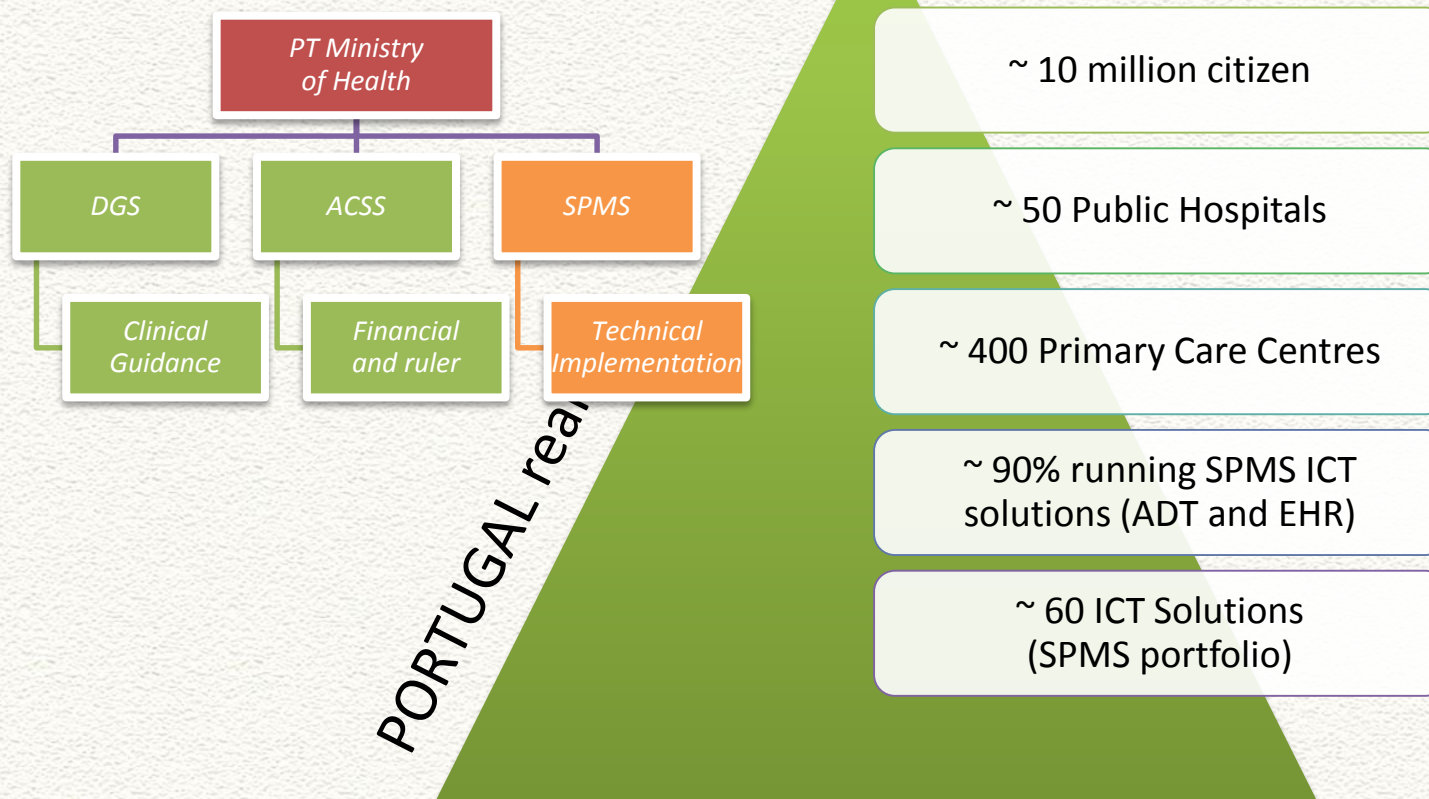# Portugal (about 3,5/9M Patient Summaries ready for exchange)

PT Ministry of Health

- DGS
  - Clinical Guidance
- ACSS
  - Financial and ruler
- SPMS
  - Technical Implementation

PORTUGAL ready

- ~ 10 million citizen
- ~ 50 Public Hospitals
- ~ 400 Primary Care Centres
- ~ 90% running SPMS ICT solutions (ADT and EHR)
- ~ 60 ICT Solutions (SPMS portfolio)

2014: American tourism in Portugal 227M€, (47.8M€, +26.7% from 2013): 156100 persons in 6 months, ~3548000 hotel nights (21,8%)

Luxemburg…

- **Trillium Bridge fit with the eHealth strategy of Luxemburg?**
  - By definition the eHealth Strategy of Luxembourg is cross border enabled
  - 45% of residents are expatriates
  - Luxembourg hosts many EU institutions
- **How do Patient Summaries and Trillium Bridge work in Luxemburg?**
  - Patient Summaries are part of the national strategy
  - The size of Luxembourg make it a perfect reference implementation and Large scale pilot
  - Trillium provides guidance on solving legal/organizational issues
- **What are the prospects you see for the future?**
  - Patient mobility will increase
  - Patient engagement is part of EU and US strategies
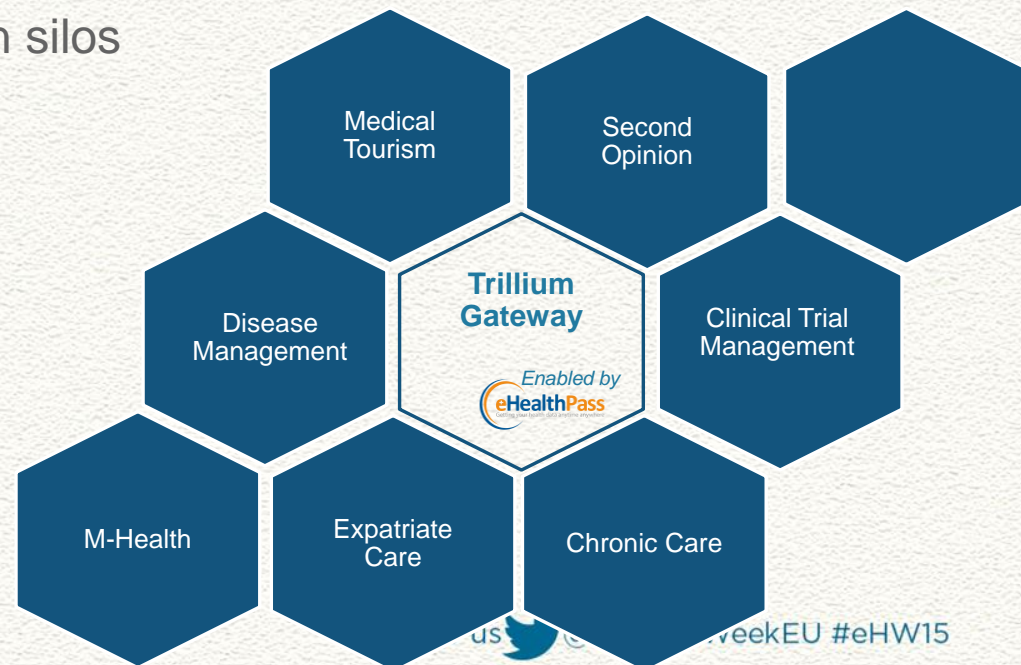 - Patient role in his care both planned or unplanned

- ca. 550.000 Inhabitants
- Foreign nationals (45%)
- ca. 155.000 Commuters (FR/BE/GE)
- Three languages Luxembourgish French German

Global vision for citizens on the move

- Accommodate **new business models**
  - Create an interoperable "healthcare e-passport" service
  - Establish a **global encounter report** format compliant to standard based patient summaries
  - **Patient outsourcing**
  - Patient **mobility** –
    - break the m-health information silos
  - Focus on **prevention**

  and information flow

- Technology is not a barrier

  (i.e. Trillium Bridge)

What's next?

Medical Tourism

Second Opinion

Disease Management

Trillium Gateway

Enabled by
eHealthPass

Clinical Trial Management

M-Health

Expatriate Care

Chronic Care

us #eekEU #eHW15

Interoperability?
We make it available.

eHealthPass
Getting your health data anytime anywhere

gnomon
INFORMATICS S.A.

Trillium Bridge: achievements

- **Gap analysis**
  - Compared patient summary specifications in EU/US
  - Shared clinical elements: problems, medications, allergies
- **Interoperability Assets**
  - Established a terminology prototype CTS-2 service
  - Developed Transformer of Patient summaries
- **Validation activities: 4 EU countries/ Kaiser Permanente**
  - EU/US Marketplace; HIMSS 2015; IHE Europe Connectathon 2015
- **Feasibility study:**
  - Reflected upon standards, cross-vendor integration, incentives, clinical research, security and privacy, innovative business models, education

Recommendation:
develop an international patient summary standard for people to communicate their <u>allergies</u>, <u>medications</u>, and <u>problems</u> anytime and anywhere as needed.

Joint Initiative Council -
San Francisco declaration

The JIC will contribute to better global patient health outcomes by providing strategic leadership in the specification of sets of implementable standards for health information sharing.

- **Future Standardization**
  - Cooperate International Patient Summary (PS) standard
  - Offer Terminologies & value sets at least for problems, medications, allergies, etc. in a frame similar to U.S. VSA
  - Address PS for planned care and secondary use.
- **cross-Vendor integration**
  - Export PS as part of societal responsibility
  - Offer PS for at least problems, medication, allergies
  - Support Trustworthy transatlantic exchange and use of PS.

Recommendations
on incentives, security & privacy

Incentives

– Incentives for keeping complete and up-to-date patient summaries (PS)

– Accreditation or training for health professionals on PS

– Staff appraisals or comparative reporting on quality PS

Privacy and Security

– Legal basis for safe and secure exchange of PS

– Clear security safeguards for EU/US exchange of PS

– International agreements for PS discovery

Recommendations for Innovation, education, research

Promote Innovation with Patient Summaries (PS)

– Showcase events with social value demonstrating PS, perhaps in Olympics

– Encourage trialability of Innovative business models for PS

– Promote patient engagement with PS and Personal Health Records

US and EC work on a joint Educational program with professional associations and patient advocacy groups

– develop guidance for health professionals on the creation, maintenance and use of high quality PS

– foster initiatives that motivate and engage patients with keeping PS

US and EU Joint Research program including items like

– advance the accurate risk analysis of patients based on PS

– demonstrate the value of sharing high-quality PS

Trillium Bridge transatlantic team

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Stephen Kay

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Elena Vaguero

Larry Garber

Vision of *e*Standards

eHealth Standards and Profiles in Action for Europe and Beyond

Think of a global eHealth ecosystem where:

- **people** (digital natives and immigrants)
  enjoy timely safe and informed health, anywhere around the globe

- interoperability assets fuel **creativity**, **entrepreneurship**, and **innovation**

where *e*Standards :

- **nurture** large-scale eHealth deployments to strengthen **Europe's voice** and **impact** locally on its citizens and globally on the world

- enable **co-creation** in interoperability where **trusted dialogs** on health, costs, and plans meet **great expectations.**

The How of *e*Standards

- Alignment of eHealth standards
  - accelerate knowledge-sharing, and promote wide adoption of standards.
- Evidence-based Roadmap
  - Convergence, iterative consolidation, broad acceptance of eStandards
- Quality Management System
  - interoperability testing & certification of eHealth systems.

- Coexistence of standards in large-scale eHealth deployment
- International interoperability action
  - EU/US MoU roadmap
  - Influence global standards
  - Boost competiveness
  - Fuel innovation
- Socio-economic aspects of interoperability
  - language for user/vendor co-making' in trust

*e*Standards and its siblings
nurturing large scale eHealth Deployment

Assess CT: the challenge of terminologies

- problems

OpenMedicine: the challenge of medication identification and substitution

- medications

eStandards: co-existence, change narrative, focus on tools

- Allergies

- **valueHealth:** sustainable business models