Trillium Bridge: Bridging Patient Summaries across the Atlantic

Trillium Bridge extends the European Patient Summaries and Meaningful Use II Transitions of Care in the United States to establish an interoperability bridge that will benefit EU and US citizens alike, advancing eHealth innovation and contributing to the triple win: quality care, health system sustainability and economic growth.

Objectives of the project
Trillium Bridge supports the Transatlantic eHealth/health IT Cooperation Memorandum of Understanding and Roadmap and the Digital Agenda for Europe in achieving the triple win for eHealth by establishing the foundations of an interoperability bridge to meaningfully exchange Electronic Health Records starting with patient summaries (PS) and benefit EU and US citizens alike. With a feasibility study based on a validation exercise in three European countries implementing epSOS and two US providers, Trillium Bridge will address questions pertinent to EU and US citizens, crossing the Atlantic, such as:

- What does it take for European citizens to access their European patient summary from epSOS and relay it to a US healthcare provider to be read, displayed, and possibly incorporated into their EHR system?
- Could US citizens visiting Europe provide their medical information to health care providers accepting European patient Summaries in an understandable and usable form, translated to their local language?

Trillium Bridge sets out to mobilize resources for an EU/US community of knowledge, identify gaps, and assemble interoperability assets to help bridge those gaps. This will foster synergies and collaborations catalysing a common understanding that will drive wide adoption of common global eHealth standards and specifications at a lower cost.

Project Description
Motivated by the transatlantic eHealth Cooperation Roadmap, Trillium Bridge aims to bridge patient summary specifications in the EU and the US to support interoperability for improved health and healthcare delivery, economic growth and innovation. The main elements of its workplan are:

- **Selecting the grounds:** Compare patient summaries for gap analysis & use case selection:
  - WP2 lead by Lombardia Informatica (EU) and Lantana (US)
  - Selects patient summary specifications and associated policies including eldentification, privacy & security to select pilot use cases and complete a gap analysis

- **Building the Bridge:** Assemble interoperability assets:
  - WP3 led by Phast (EU) and Mayo Clinic (US)
  - Assembles interoperability assets to align structure and terminology (semantic mapping services for value set published by the National Library of Medicine & epSOS, clinical document structures, testing and validation tools)

- **Testing the Bridge:** Develop testing tools, validate PS exchange:
  - WP4 led by IHE Europe (EU) and HL7 Foundation (EU)
  - Develops testing tools and validation reports from participating US providers (Atreus Health, Kaiser Permanente, SmartPHR) and epSOS sites (Italy, Portugal and Spain). Organizations that have submitted an expression of interest will be able to contribute to the validation.

- **Paving the Bridge:** Contribute to Policy Alignment, Standardization and Future Sustainability:
  - WP5 led by EuroRec (EU) and Lantana (US)
  - Contributes to policy alignment: cross-sector integration, incentives, standardization, innovative business models, education, clinical research, security & privacy

CASE STUDY: David, a 55 year old US citizen, was recently diagnosed with a clot in his left leg, causing swelling on that leg. He is prescribed the blood thinner Warfarin daily and is traveling to Europe. As he arrives in Lisbon, Portugal, he notices that his left leg swelling is worse. Concerned that he may have developed another clot, he visits the Hospital Particular De Lisboa. He explains to the triage nurse that he has an online Patient Health Record (PHR) and downloads a Consolidated CDA Continuity of Care Document (CCD) summary of his medical history, medications, allergies, immunizations, and recent lab and venous duplex results. The nurse uploads this CCD into the European Patient Summary format that can be imported into the hospital’s EHR. The hospital performs an INR blood test which comes back at a slightly sub-therapeutic level of 1.9, down from 2.2 when last done by his US physician. He also performs a venous duplex study on David’s left leg which reveals an improvement in the old clot described on his patient summary, and no new clots. The Portuguese physician reassures him that his Warfarin is working properly, suggests a slight increase in his Warfarin dose, a follow-up INR be performed in 1 week, and recommends that he stops eating salty peanuts on airplanes. The physician creates a summary record of David’s encounter in Portuguese, submits it through an online system that translates it into English, for David to enter it in his PHR.
Impacts & Expected Results

Trillium Bridge is expected to have significant impact on:

- Improved interoperability of eHealth Systems in US and Europe.
- Accelerated establishment of interoperability standards in eHealth and of secure, seamless communication of health related data.

The assembled interoperability assets, gap analysis, and feasibility study to be delivered at the end of the project, based on testing and validation by providers in Europe and the US, will serve as a springboard for projects to:

- Create opportunities for innovation and growth
- Lower costs/barriers for transatlantic business engagement
- Reduce implementation/configuration costs
- Decrease standards development costs
- Accelerate convergence towards global standards
- Support the fundamental right of citizens to their health information
- Take steps towards realizing the vision the Roadmap of the EU-US MoU on eHealth cooperation.

Trillium Bridge pushes the envelope for technical, semantic, organizational, and legal interoperability in the EU-US context. Trillium Bridge will mobilize the people and resources needed to address these questions and will identify, evaluate, and facilitate delivery of cloud-based terminology services and other interoperability assets that will allow both small EHR vendors and large providers to import, comprehend, and safely use patient summaries from either side of the Atlantic.

CASE STUDY 2: Paolo Cerruti is a 67-year-old retired businessman, who normally lives in the outskirts Bergamo, near Lake Como, in Lombardy. He is generally healthy, but has long-standing hypertension. His regular physician changed his medication two weeks ago because of poor blood pressure control on his previous medication. He is on holiday going through New England, US, travelling on his own to enjoy the autumn foliage, and is presently in Boston, MA. He is nearing the end of his holiday, and will be returning to Italy in three days’ time. Two days ago his day bag was stolen in a market square. The bag included his hypertension medication, and he has not been able to take his tablets for two days.

This morning he has woken up feeling dizzy and has blurred vision. The hotel is able to put him in urgent contact with a local general practitioner (GP). Having assessed him, the GP noted a raised blood pressure, but is uncertain about whether to attribute these symptoms to the raised blood pressure or a side effect of the new medication. Feeling otherwise healthy, Paolo had not thought to request a handwritten or printed medical summary from his Italian GP, but upon Paolo’s providing consent confirmation his online European Patient Summary for emergency access can be retrieved in the US. Now, the GP in Boston needs to know the medication, and the past few blood pressure readings to determine how exceptional the present reading is and manage Paolo appropriately.

Immediate access to the Trillium Bridge summary would be the perfect answer.

The GP is with a New England health system, part of the Trillium Bridge network. This means that the particular health system has signed mutual data-sharing agreements with other members of the network, including the Lombardy region where Paolo lives. Patient demographic and provider directory services are accessible through search functions, and are maintained by each participating member. The GP is able to enter demographic information about Paolo into a patient search facility, which relays his request to the Italian National Contact Point. Once the patient match is confirmed, Paolo is able to confirm and consent.

The GP requests the up-to-date patient summary from Lombardy. The credentials of the US GP are registered within the audit log at the Italian National Contact Point, which also timestamps the request of the summary. The summary document is relayed between the Italian Contact Point and the US, and in the process most of the clinical terminology and medication codes are translated into those which would be recognized in the US health record system. An audit log within the health record system also records the receipt of that summary. The GP find that the blood pressure he has recorded on Paolo is only a little higher than his recent readings, but notes that visual disturbances are a recognized side effect of this medication. No specific treatment is indicated, and Paolo is reassured that side effects will gradually subside, and his GP can prescribe a suitable antihypertensive medication upon his return to Lake Como.

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- Ministério da Saúde (Portugal)
- Ministerio de Sanidad, Servicios Sociales e Igualdad (Spain)
- Stichting Nederlands Normalisatie – Instituut the Netherlands (Netherlands)
- Prosocial Applications (United States)
- Mayo Clinic (United States)
- Lantana Consulting Group, LLC (United States)
- Kaiser Foundation Hospitals (United States)
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