WP8B – Use Case 2

Sharing health and medical data among healthcare organizations

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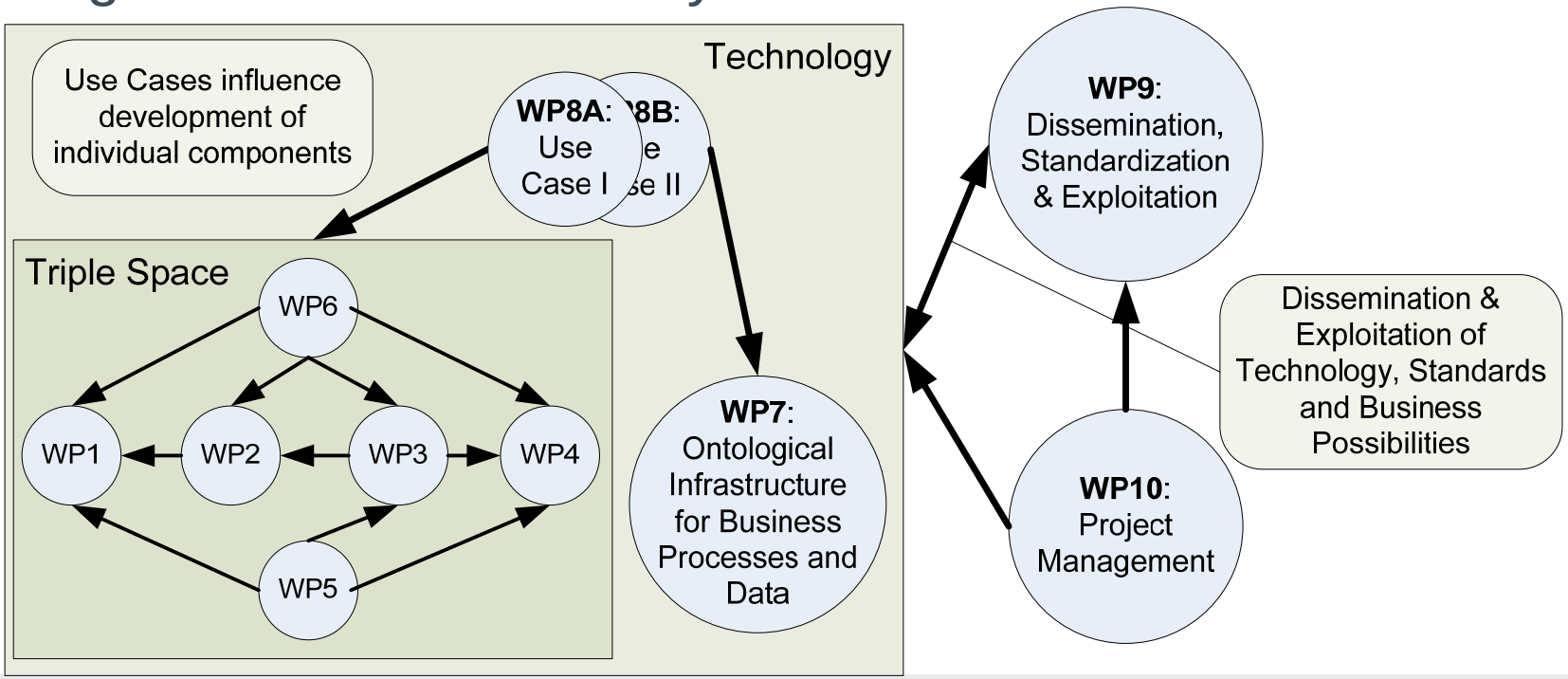
WP8B eHealth Use Case

- This WP will test TripCom infrastructure for an application that is focused in exchanging patient records among healthcare organizations or among different units within the same organization
- This WP takes the results from WP1-5 through the integration of the results by WP6



WP8B Leaders and efforts

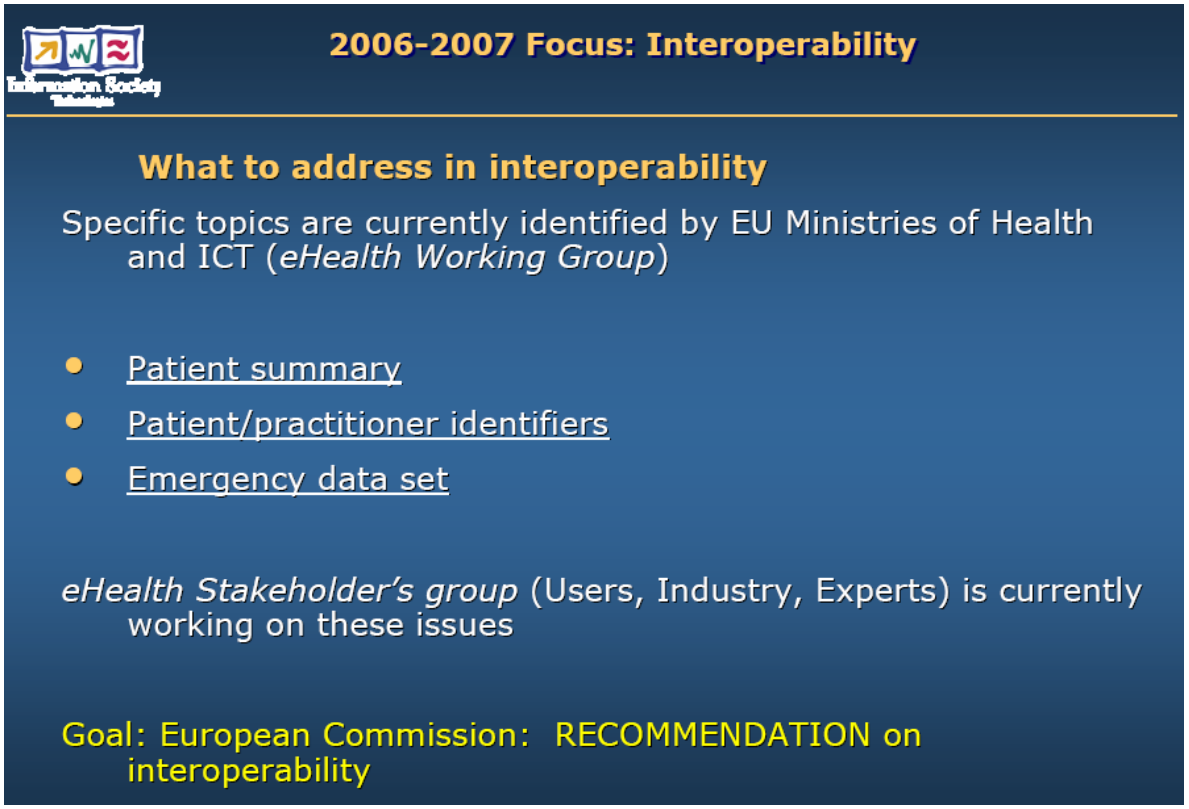
- WP Leader
  - CEFRIEL - 12 person-months - Dario Cerizza
- WP Partners:
  - LFUI – 6 person-months – Reto Krummenacher
  - NUIG – 2 person-months – Doug Foxvog
  - TUW – 4 person-months – Martin Murth
  - FUB – 2 person-months – Elena Paslaru Simperl
  - ONTO – 3 person-months – Vassil Momtchev
  - TID – 8 person-months – Sara Carro
- 37 person-months in total

The problem

- The **eHealth**
  - is a scenario in which **the integration problem** is amplified by
    - the **intensive use of knowledge**,
    - the need of accurately handling citizens' **privacy**, and
    - ***live or death implications***.
  - has been **seeking for *interoperability*** since late '90s,
  - is under deployment in many country
    - **UK**: NHS Care Record Spine
      - http://www.connectingforhealth.nhs.uk/
    - **Nederland**: NICTIZ – AORTA
      - http://www.nictiz.nl/
    - **Canada**: EHRS
      - http://www.infoway-inforoute.ca

The problem

- **Securely sharing health data** among healthcare organizations **remains an open challenge**.



Ilias Iakovidis (Deputy Head of Unit – ICT for Health, DG INFOSO, EC) *"European Commission activities in e-Health: The achievements and future prospects."* Med-e-Tel Luxembourg, April 5, 2006

Short history of standard achievements

1987 **HL7 v1.x** – it never got adopted

1995 **HL7 v2.x** – large adoption especially in USA

Attempt for **specifying** the format of **each** of the **message** that can be exchanged among any pair of systems…

1999 **CEN/TC 251** - the first to introduce, with CEN ENV 13606 / EHRcom, an **information model** and a methodological approach for deriving concrete interoperable messages

2002 **GEHR/openEHR** – proposal of the **archetype** concept and of a two-level methodology

2004 **HL7 v.3** – definition of an Information Model (**RIM**) that is the ultimate source from which all HL7 v3 protocol specification standards draw their information related content.

Attempt for **specifying** an **information model and deriving** all **messages** and protocol **specification** from such information model and formal terminologies (e.g. LOINC, SNOMED, etc.)

The need of semantic interoperability

- The proposals for **standard**izing an application protocol for the health care sector are all **similar** in concept and capabilities
- They try to **address the interoperability** problem **by**
  - **introducing** a **shared conceptual model** (i.e., an ontology),
  - **deriving message structure from such conceptual model** so that semantics is encoded in the definition of each element of data including its relationship with other elements,
  - **defining the information**, which can be carried by each message, **using** standard **medical terminologies** (e.g., LOINC, SNOMED, INN, ICD, etc.)
  - **binding** the resulting messages **to** "*the technology of the day*", meaning EDI in the '90, XML and **Web Services** today, who-knows-what tomorrow

Existing Approaches

- **Message-based communication**
  - has proven efficient and effective for certain activities in this area (i.e., hospital **administration**), but
  - has shown some problems to effectively and seamlessly collecting and integrating data from electronic health records

- **When addressing the problem of collecting and integrating data** from electronic health records, at least two are the **possible solutions**:
  - Building **centralized databases** that would
    - contain all the medical records on every patient
    - incorporate all of the different access rules and policies regarding different users and different levels of access
  - **Exchanging messages only when needed**
    - In this way no central repository is required and the ownership of the data seems respected

Limitation of the centralized approach

- The *cost* of building the infrastructure and collecting the data is enormous,
- the centralized repository approach creates *competitive and security issues* about who controls and has access to the information on a specific patient,
- the *difficulty in maintaining up-to-date* a repository originating from a large number of independently evolving systems, and
- last but not least a message once sent (especially in an asynchronous scenario) gives the owner a *sense of disengagement instead of* strengthening the sense of *ownership*

Limitation of the message-based approach

- Each recipient must *know in advance where to look for information*,
- each recipient must *know in advance the terminology* (e.g., SNOMED, LOINC) *to use* when asking for a specific record content,
- each recipient ends up maintaining *a specific interface for each system* it has to interact with, and
- *mining* (for disease prevention, early diagnosis, pharmaceutical research, enhancement of patient safety) *becomes almost impossible* due to the large amount of messages to be exchanged

Advantages of Triple Space approach

- **It is a realistic solution for the data ownership problem** because healthcare organizations will not loose their control over resources and they will be able to share information only with those that are authorized
- **It provides a simple way to guarantee consistency** because health data won't be neither transmitted or copied but simple used
- **It supplies a straight forward way to deal with integrity** because data won't be transmitted and it should be impossible for anybody, but the owner, to modify the data
- **It is a cost-effective solution** because additional storage resources (and related management cost) are drastically reduced

WP8B Tasks

- T8B.1: M1-M6
  - eHealth **Requirements Analysis** and State of the Art
- T8B.2: M7-M12
  - **Determination of indicators** for performance, security, quality and impact analysis
- T8B.3: M16-M22
  - **Prototype** of a TripCom application towards the eHealth scenario
- T8B.4: M23-M24
  - **Feedback** report to architecture work package
- T8B.5: M23-M36
  - Development of a **"Best Practice Guide"** for the development eHealth solutions
- T8B.6: M23-M36
  - **Evaluation** and application of the Prototype in Use Case Scenarios
- T8B.7: M31-M36
  - **Prototype** implementation **refinement**

WP8B Deliverables

- D8B.1: Leaded by CEFRIEL – Delivery Date: M12
  - State of the art and **requirements analysis** for sharing health data in the Triple Space
  - Estimated person-months: 12
- D8B.2: Leaded by CEFRIEL – Delivery Date: M30
  - **Prototype** of TripCom application for sharing health data among healthcare organizations
  - Estimated person-months: 19
- D8B.3: Leaded by TUW – Delivery Date: M36
  - **Assessment** of the developed solution with regards to the detected indicators
  - Estimated person-months: 6