

# Enabling the European Patient Summary Through Triplespaces

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## TRIPLE SPACE COMMUNICATION

This is the official Website of the Specific Targeted Research Project TripCom. TripCom is to be funded by the European Commission under the 6th Framework Programme, priority 2 Information Society Technologies (IST) under the project number IST-4-027324-STP.

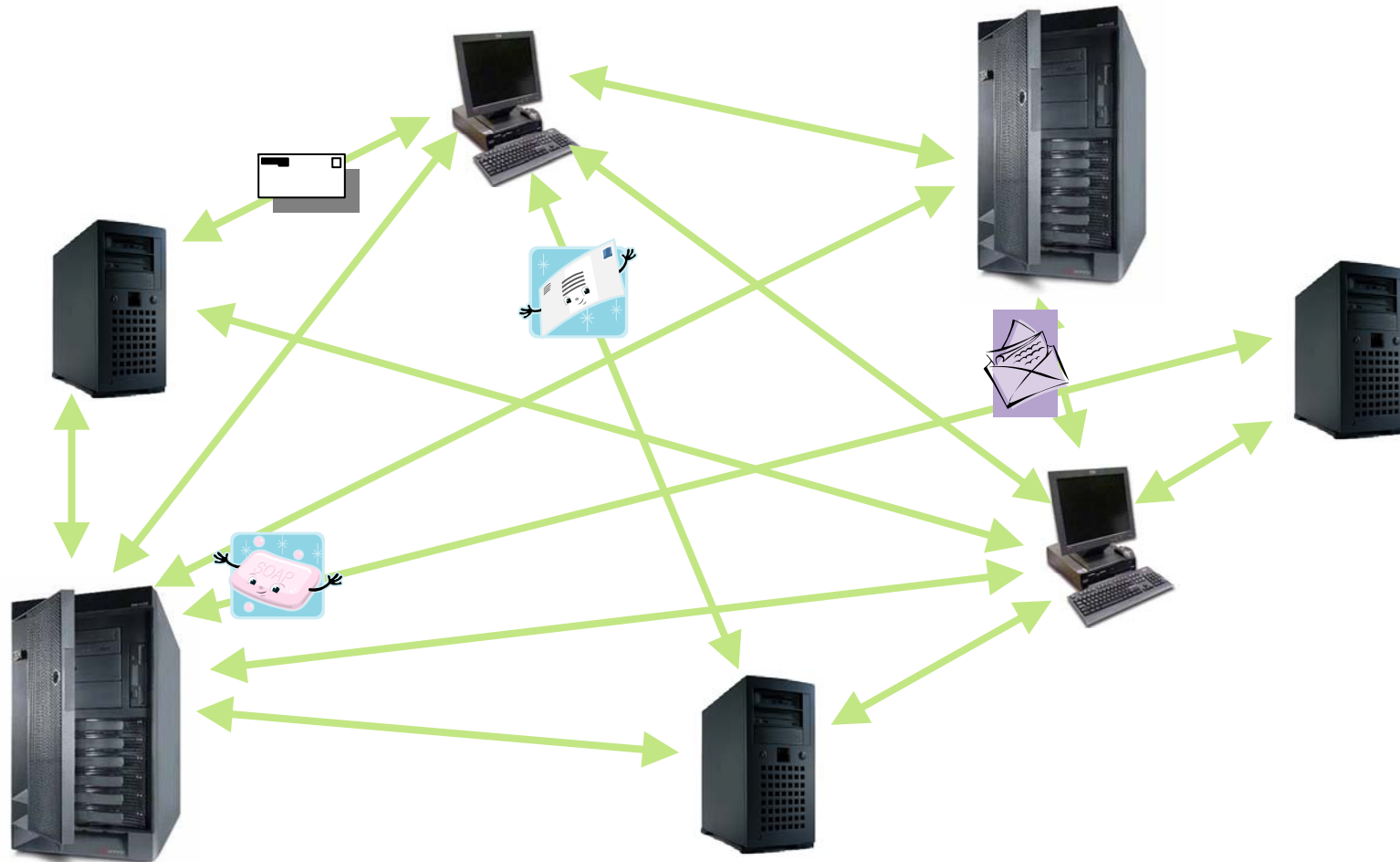
<http://www.tripcom.org>



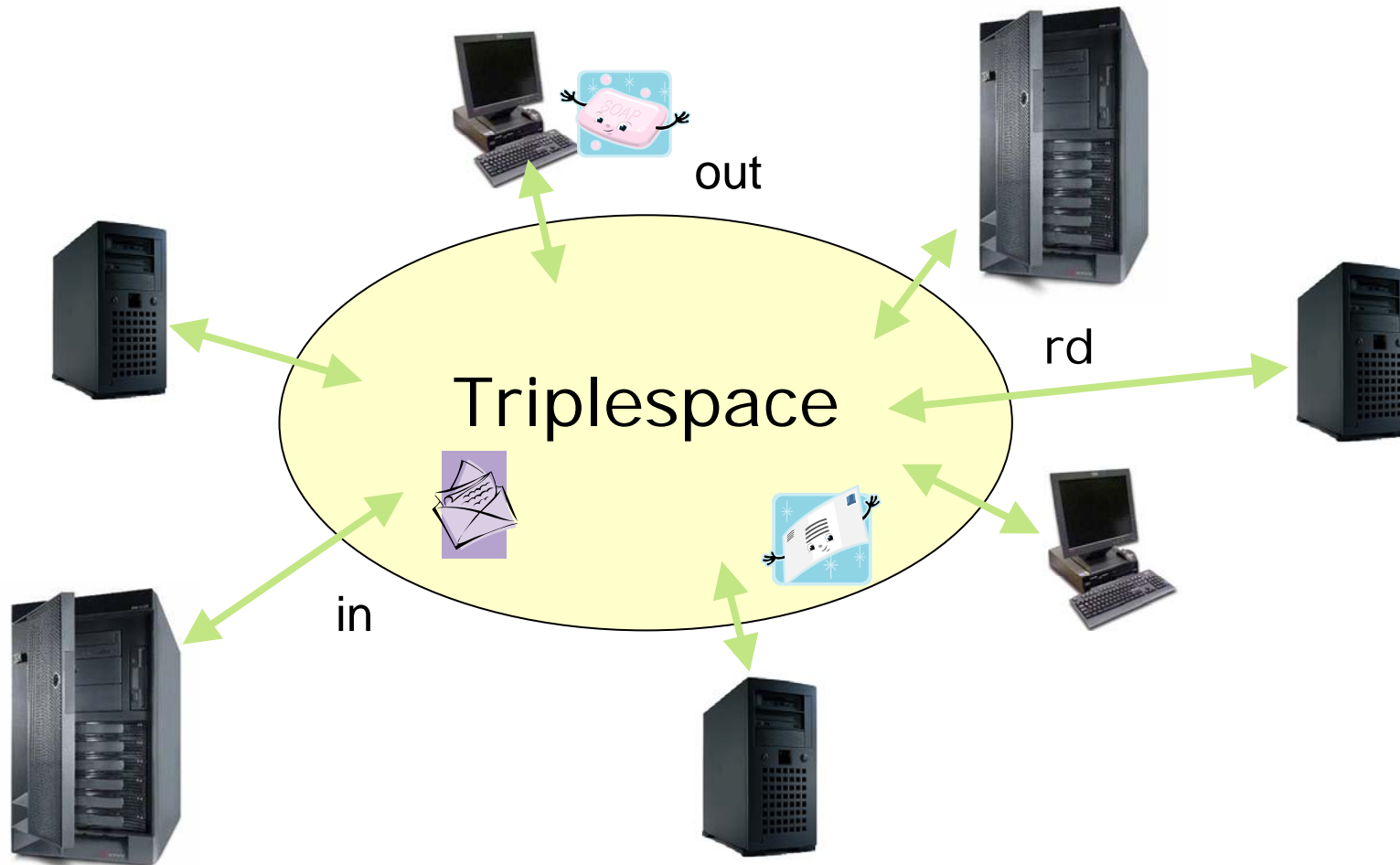
- Introduction / Context:
  - Triplespace computing (TSC)
- Motivation & Challenges
- eHealth scenario of TripCom
  - The European Patient Summary (EPS)
  - Why Triplespaces for the EPS
- Technical Aspects of EPS/TSC
- Long Term Vision & Prospects

# Introduction

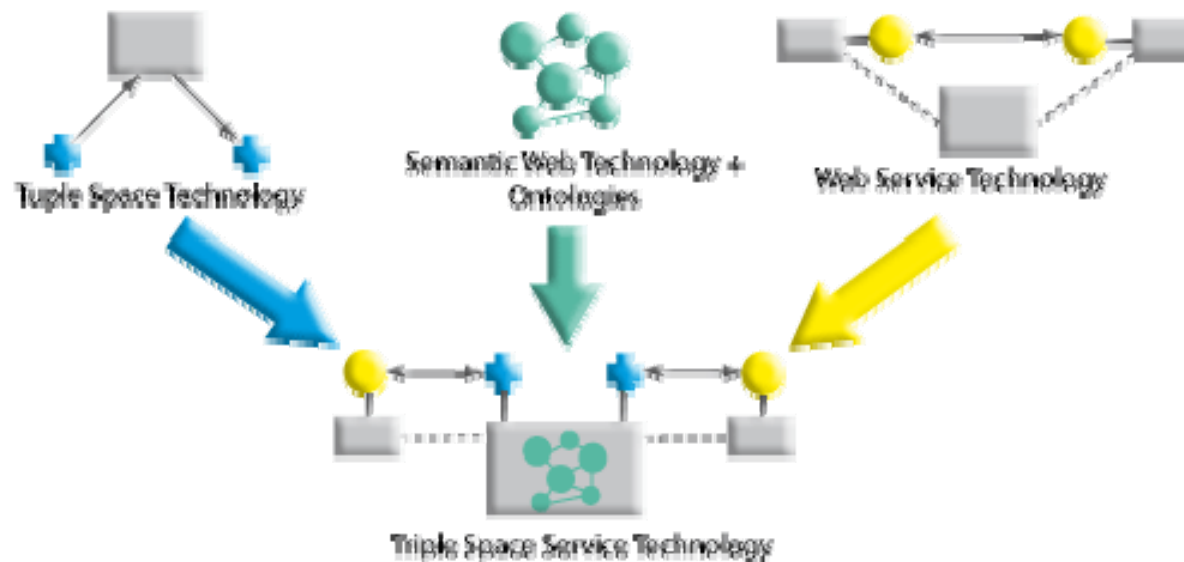
# Message Based Communication




# Space Based Communication



**Triplespaces provide a communication paradigm for *anonymous* and *asynchronous* information exchange that ensures the *persistency* and *unique identification* of the communicated *semantic, semi-structured* data.**



# Motivation & Challenges



### 2006-2007 Focus: Interoperability

#### What to address in interoperability

Specific topics are currently identified by EU Ministries of Health and ICT (*eHealth Working Group*)

- Patient summary
- Patient/practitioner identifiers
- Emergency data set

*eHealth Stakeholder's group* (Users, Industry, Experts) is currently working on these issues

**Goal: European Commission: RECOMMENDATION on interoperability**

- a **concise clinical document** of crucial citizen health data
- an enabling factor for an **European infrastructure for accessing and sharing** citizens' health data across Europe

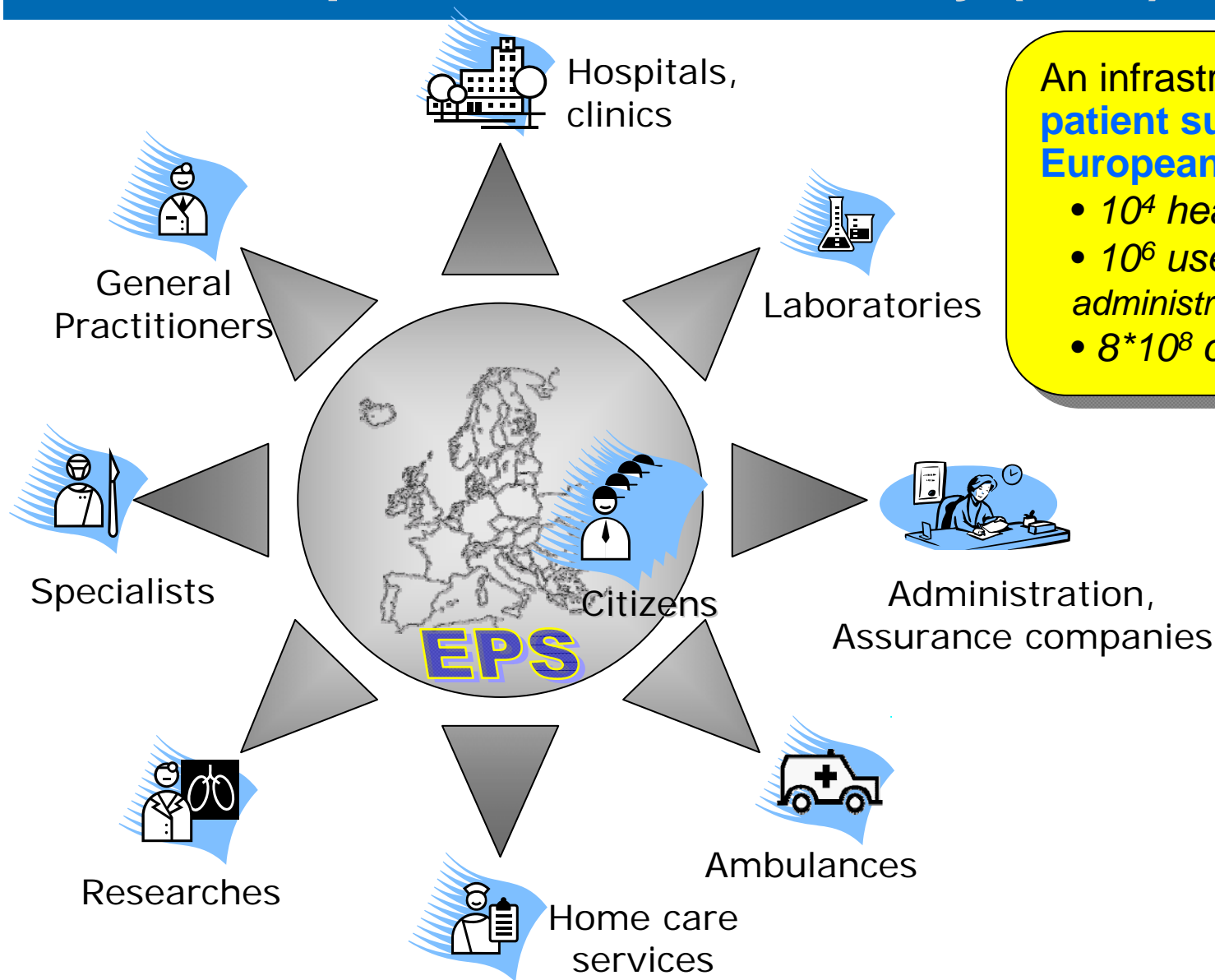
**Ilias Iakovidis** (Deputy Head of Unit – ICT for Health, DG INFOSO, EC)  
"European Commission activities in eHealth: The achievements and future prospects." Med-e-Tel Luxembourg, April 5, 2006

- Integration problem in eHealth **is more complicated than** in other sectors because:
  - **Complex Domain**
    - Need to deal with the **intensive use of knowledge**
      - Reference Information Model (RIM) in HL7 v3, Archetypes of OpenEHR
      - Medical terminologies: SNOMED, LOINC, ICD, UMLS, ...
  - **Need to Coordinate** multidisciplinary actors accessing patient data
    - asynchronously
    - from different locations
    - through different applications
  - **Privacy Issues** for the treatment of citizen data
    - Need to deal with security aspects and data ownership

# The TripCom eHealth Scenario

# The eHealth Scenario in TripCom

## The European Patient Summary (EPS)



An infrastructure for a **patient summary** at **European level**

- $10^4$  health authorities
- $10^6$  users (clinicians and administrative staff)
- $8 \cdot 10^8$  citizen summaries

### ■ **A Multilateral Solution**

- **Virtual common** infrastructure distributed among healthcare authorities
- To enable sharing citizens' data **anytime** and **anywhere**
- To **coordinate** actors in accessing data

### ■ **Data Ownership**

- To allow health authorities to **maintain the control** over the data produced by treating patients

### ■ **The Principle of Subsidiarity**

- Flexibility to overcome the **heterogeneity of data and applications** among existing eHealth standards and applications

### ■ **Multilingualism**

- To capture information in a language-neutral manner by using structured eHealth data and terminologies

### ■ **Privacy**

- To assure that only **authorized** caregivers access citizens' data

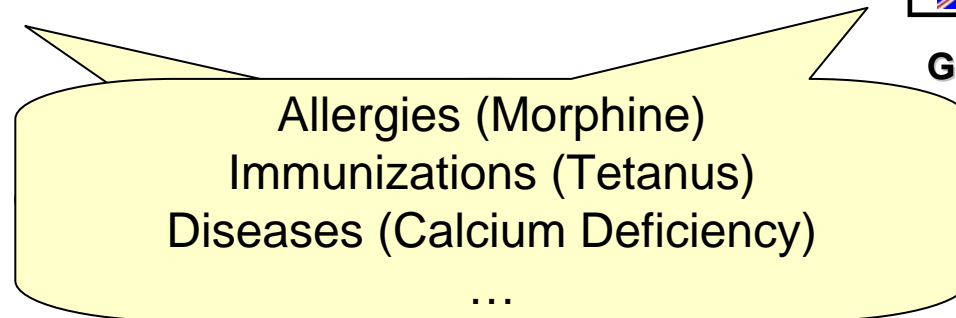
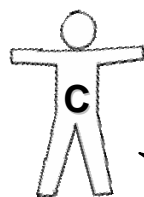
- **Decentralized and Distributed Shared Space**
  - Each healthcare party provides a node of the shared space
  
- **Persistent Publication of Information in the Space**
  - Healthcare parties persistently publish patient summaries in their own node, enforcing data ownership
  - Other parties connected to the infrastructure can retrieve the published data
    - Decoupled in **time**, **location** and **reference**
  
- **Coordination Support**
  - Enables multiple external applications to asynchronously and concurrently access the information, and
  - Allows one party to trigger actions on other nodes

- **Simple API**
  - Triple Space exposes a simple and consistent API for all clients, regardless of their home application
- **Semantic Interoperability**
  - Interactions decoupled in **schema** to cope with heterogeneity among data, protocols and processes of eHealth standards and eHealth systems
- **Security** and **Trust** Mechanisms
  - Define local and global policies for accessing and sharing citizens' data

# The Emergency Use Case Initialization of the Summary in UK



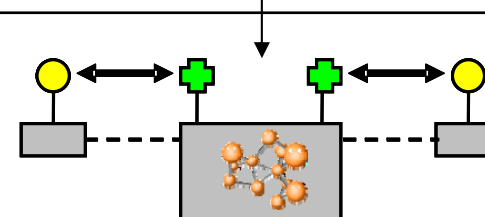
An English citizen asks his General Practitioner to **initialize** his **summary** in the EPS



The GP publishes the citizen's clinical information into the EPS through the **electronic Health Record**

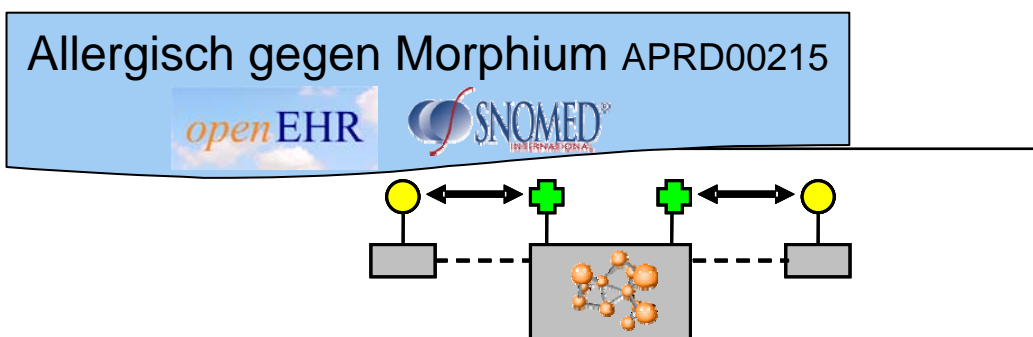
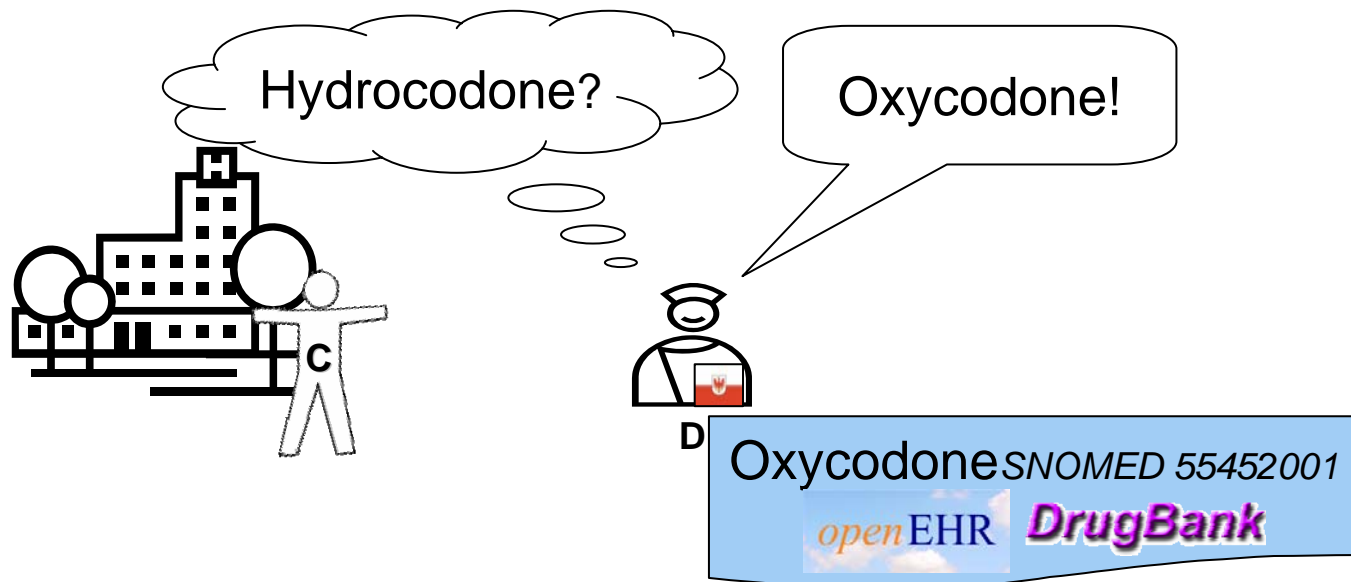
Allergy to Morphine *UMLS C0026459*  
Immunization to Tetanus *Medline Plus 615*  
Calcium Deficiency *UMLS C0020598*

cen health informatics IC 251 ICD NATIONAL LIBRARY OF MEDICINE MedlinePlus



C = Citizen  
GP = General Practitioner

# Visit to Dentist on Holidays



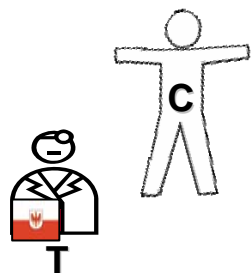
## Medical benefits

- Language understanding
- Privacy compliance
- Avoidance of administering a wrong drug

## TS capabilities

- **Decoupling** interaction in Time, Location, Reference and Schema
- Data and Application **interoperability**
- **Security**

# Examination / Expert Coordination



Untersuchung *Christian*



*Christian*

## Medical benefits

- Awareness of current clinical situation
- Support for interactions

## TS capabilities

- **Asynchronous messaging** to coordinate concurrent and heterogeneous applications

Morphinalergie CAS 57-27-2  
 Kalziummangel ICD E58  
 Oxycodone CAS 76-42-6  
 Untersuchung NULL



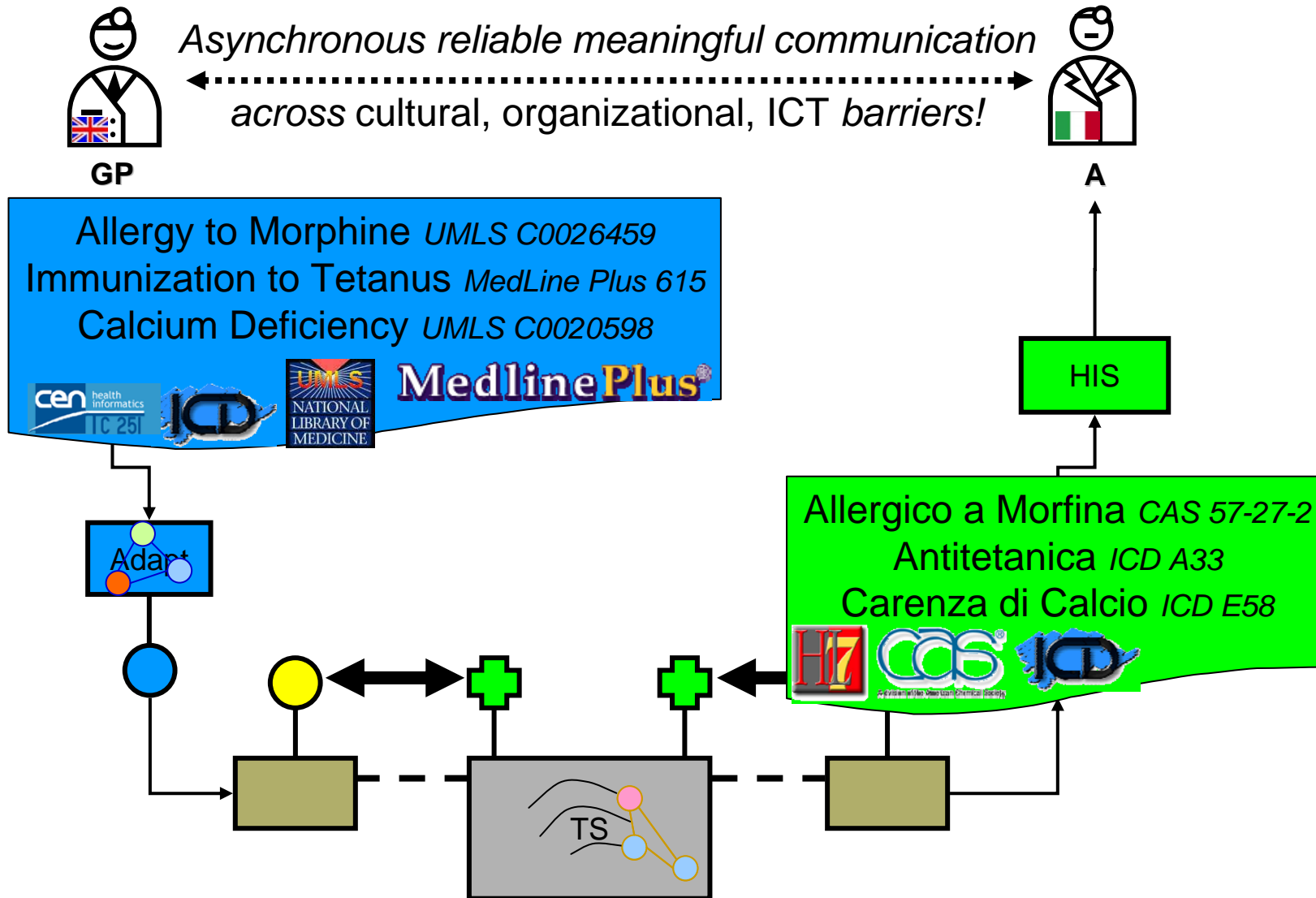
Allergico a Morfina CAS 57-27-2  
 Carezza di Calcio ICD E58  
 Oxycodone CAS 76-42-6



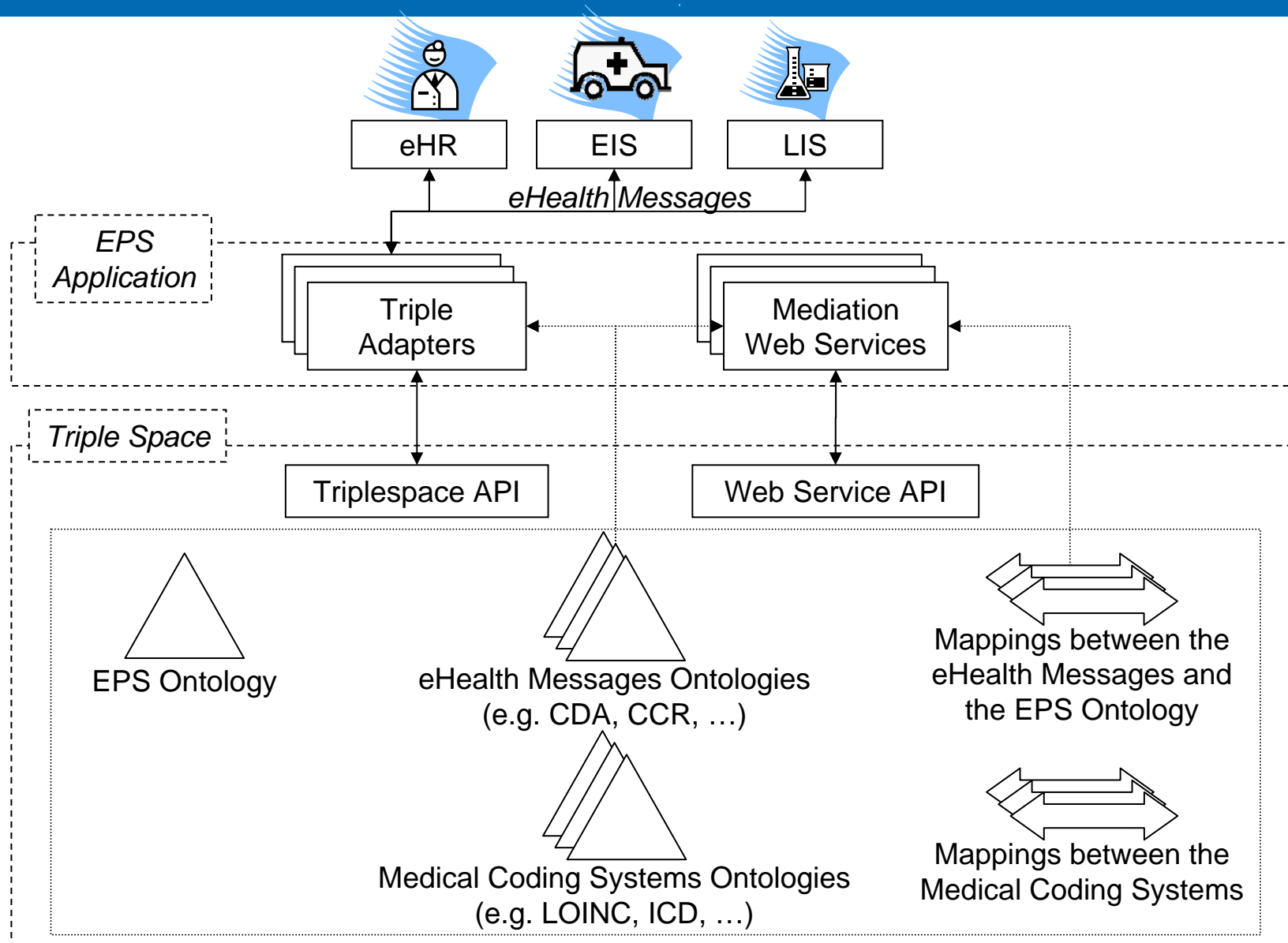
Esame *Christian*

# Some Technical Aspects

# Semantic Interoperability



# The Technical Picture



# Long Term Vision

# Vision & Prospect

- The EPS is a **first step towards a network of complementary healthcare centres**
- The European Patient Summary over TripCom enables
  - **asynchronous, reliable and meaningful communication**
  - **interoperability and coordination** of multiple heterogeneous actors
  - **privacy** with respect to the treatment of data
- If suitable as middleware for the EPS scenario, TripCom is expected to provide the grounds for novel technologies for various other challenges in eHealth...

# Thank you.

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