

eHealth Use Case



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- eHealth ongoing challenges

- The eHealth Scenario in TripCom
 - The European Patient Summary (EPS)
 - Why Triple Space for the EPS
 - The Emergency Use Case

- The Envisioned Design of the EPS over the TS
 - The General Picture

- EPS over TripCom: Long Term Vision

- 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



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

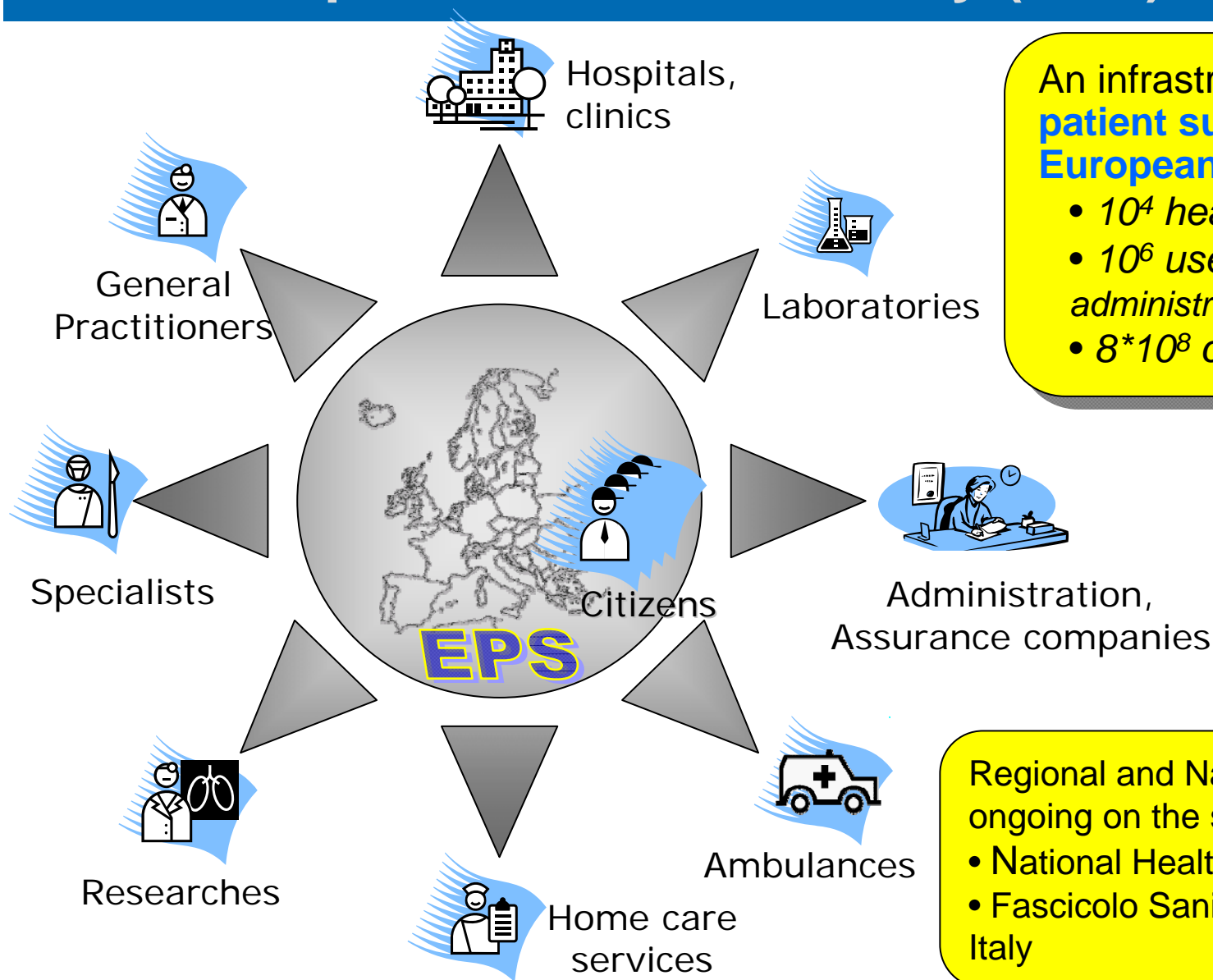
Goal: European Commission: RECOMMENDATION on interoperability

- 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

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

Regional and National projects are ongoing on the same topic:

- National Health System in UK
- Fascicolo Sanitario Elettronico in Italy

■ 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

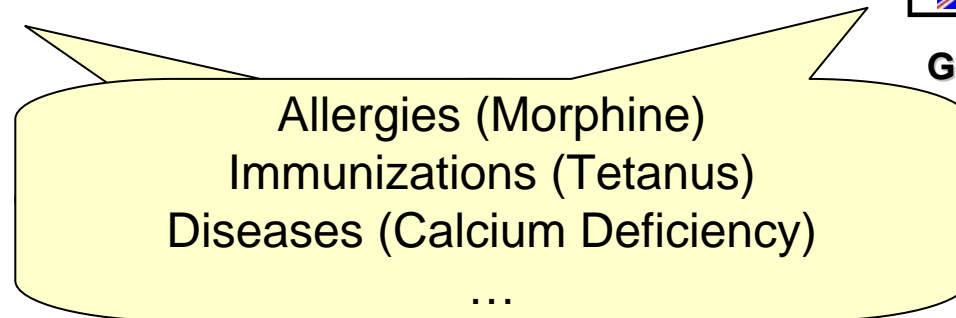
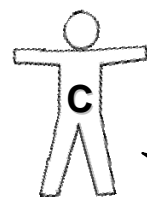
- **Decentralized and Distributed Shared Space**
 - Each healthcare party provides a node of the shared space
- **Persistent Publication of Information in the Space**
 - Healthcare parties persistently publish patient summaries in their own node, enforcing data ownership
 - Other parties connected to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

- **Simple API**
 - Triple Space exposes a simple and consistent API for all clients, regardless of their heterogeneity
- **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

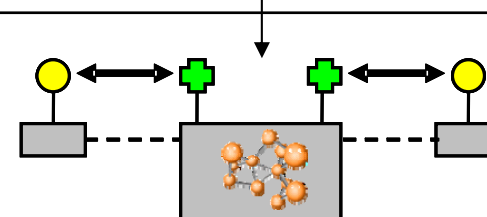


An English citizen asks his General Practitioner to **initialize** his **summary** in the EPS



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

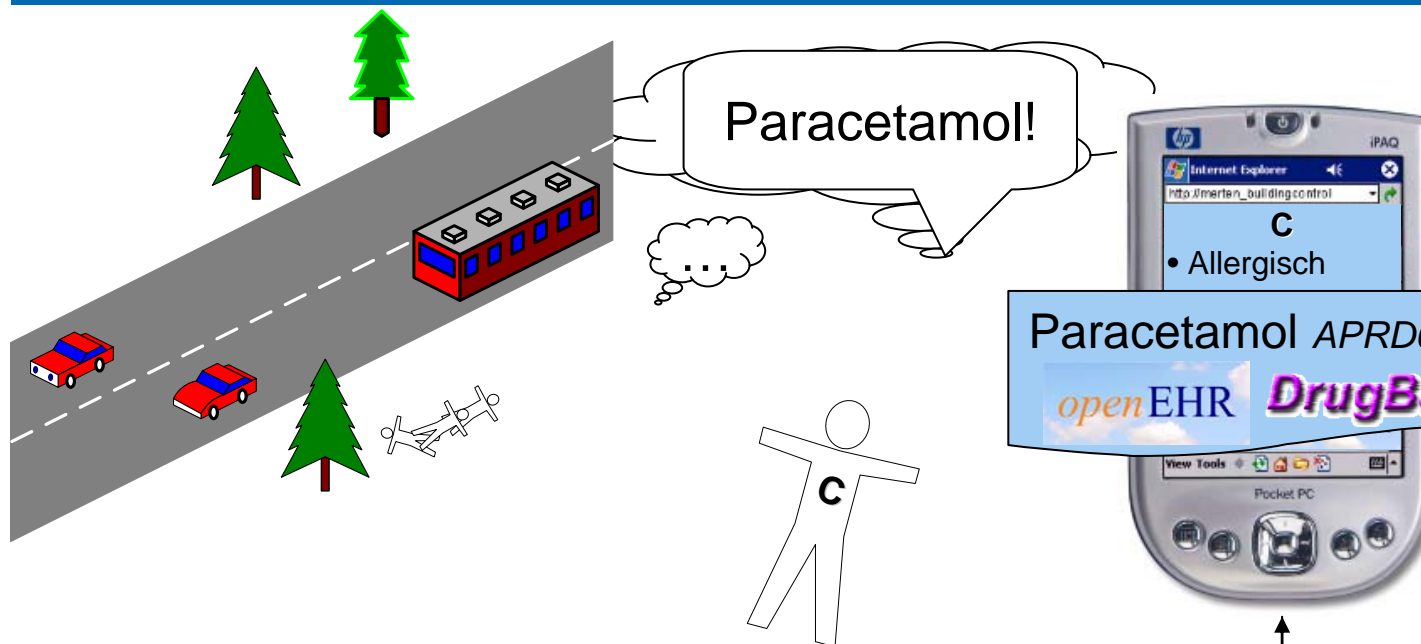
Allergy to Morphine *UMLS C0026459*
Immunization to Tetanus *Medline Plus 615*
Calcium Deficiency *UMLS C0020598*



C = Citizen
GP = General Practitioner

The Emergency Use Case

The Incident in South-Tyrol



Medical benefits

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

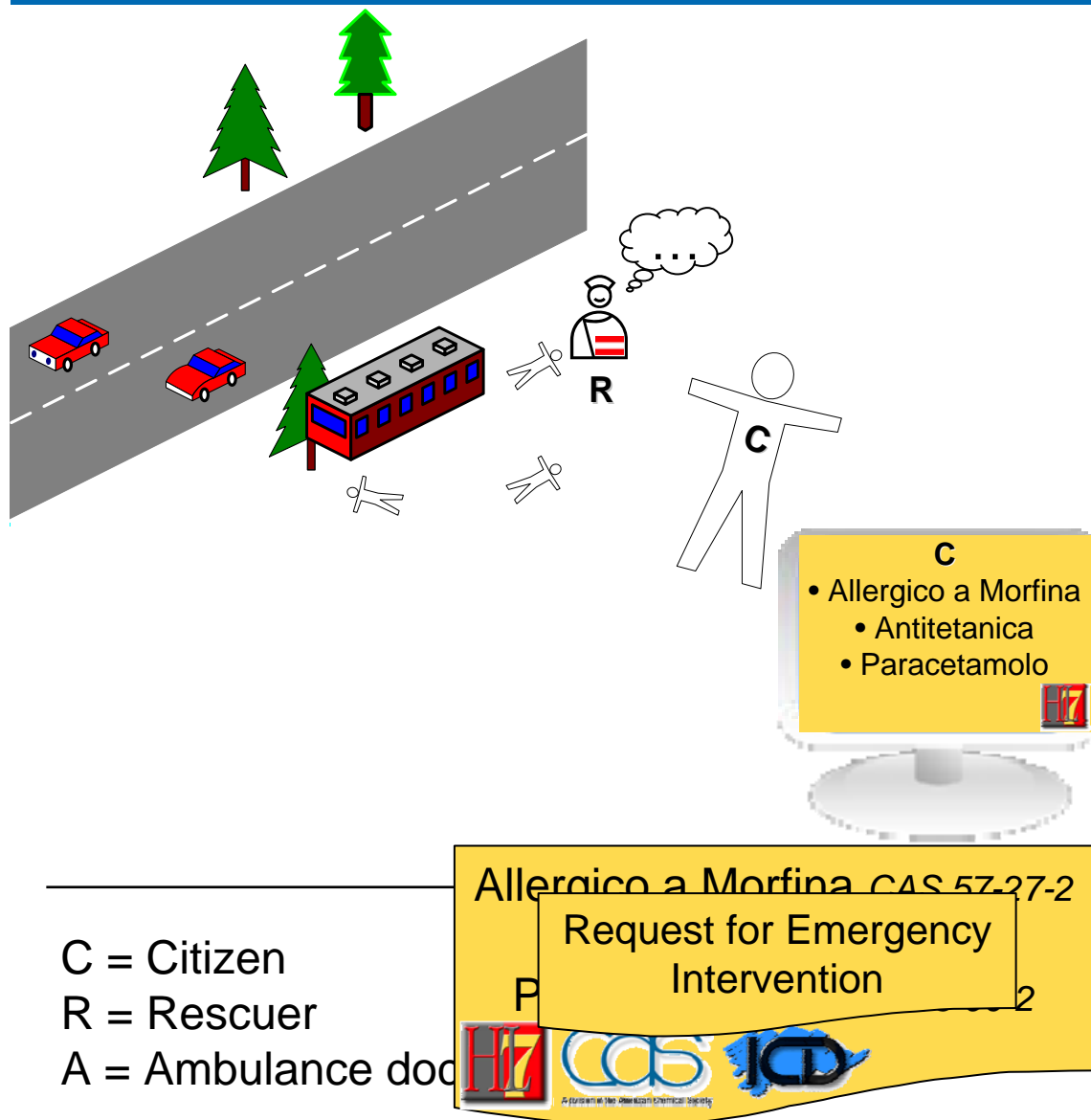
TS capabilities

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

C = Citizen
R = Rescuer

Allergisch gegen Morphinum APRD00215

The Emergency Use Case Ambulances Coordination



C = Citizen
R = Rescuer
A = Ambulance doc

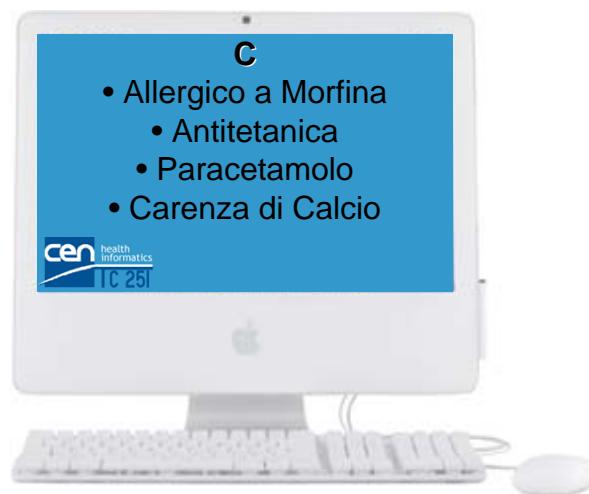
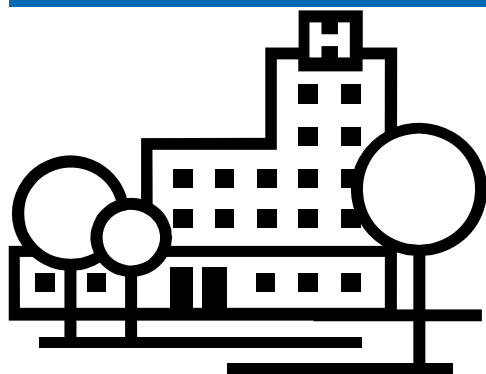
Medical benefits

- Awareness of current clinical situation
- Support for interactions

TS capabilities

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

The Emergency Use Case Hospitals Coordination



Medical benefits

- Awareness of patient clinical situation
- Foresee acceptance for a more efficient treatment

TS capabilities

- **Publish and Subscribe** mechanisms to coordinate concurrent and heterogeneous applications

Allergico a Morfina CAS 57-27-2
 Antitetanica ICD Y58.4
 Paracetamolo CAS 103-90-2
 Carenza di Calcio ICD E58

C = Citizen
 A = Ambulance doctor
 E = Emergency doctor

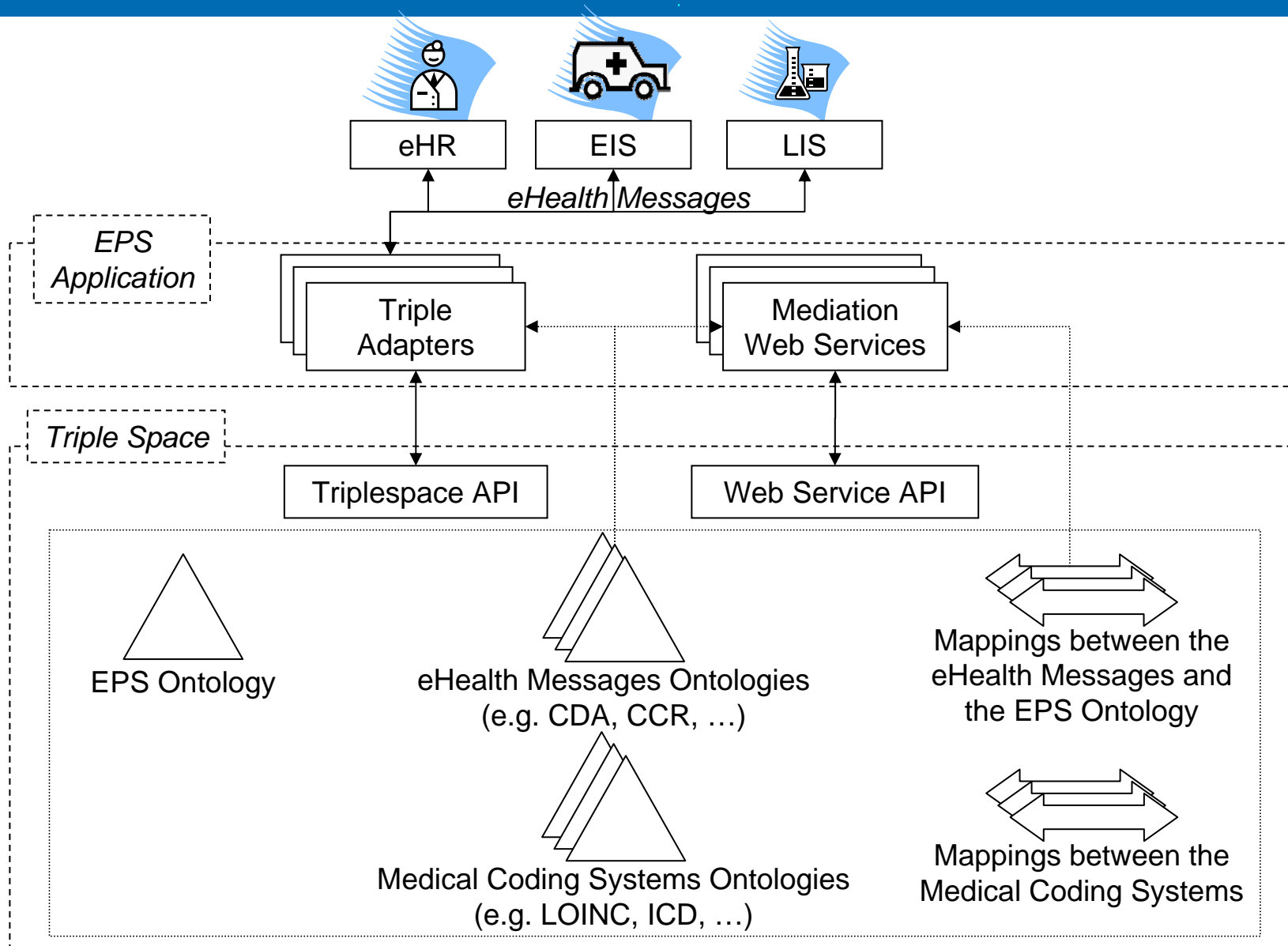


- The proposals for **eHealth standards similarly address interoperability** by:
 - Defining a **shared conceptual model** (e.g. HL7 RIM)
 - **Deriving message structure** from this conceptual model
 - Coding the information carried by messages **using medical terminologies** (e.g. SNOMED or ICD)
 - **Binding** the resulting messages *to “the technology of the day”* meaning EDI in the '90s, XML and Web Services today
- This is very similar to the Semantic Web approach in which **interoperability** is achieved by
 - **Modelling the domain knowledge** at conceptual level
 - **Interconnect applications** using the modelled concepts



The Envisioned Design of the EPS over the TS

The General Picture



EPS over TripCom: Long Term Vision

- The European Patient Summary is a **first step towards a network of complementary healthcare centres**
- The European Patient Summary over TripCom enables
 - **asynchronous**
 - **reliable**
 - **meaningful communication**
- among heterogeneous eHealth applications