Needs for semantic interoperability in Europe, research and implementation challenges

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Step 1 (past activities)
(Regional) Health Information Networks
Connecting providers: Messaging, EHR, online services
EHR & (Regional) Health Information Networks
18 years of EC activities

Research

Stand alone systems (EHR, messaging)

Pilots

Larger pilots with online services (e.g. eReferrals)

Wide Deployment

DEPLOYMENT PROGRAMS


EU eHealth Action plan (COMM 2004)

RESEARCH PROGRAMS

Large scale validation, EU wide services interoperability, mobility.
Step 2 (current activities)
Connecting individuals with providers/Health Information Networks - Facilitate individual’s “response ability”

- Health Centre
- Hospital
- Emergency
- Pharmacy
- Mobile PC
- Home

Secure Networks
Mobile, Wireless & Broadband
Region 1
Region 2
Region 3
Mobility
Step 3 (future)
Towards full picture of individual’s health status
(endogenous and exogenous determinants)

Biosensors

Environmental Data

Phenomic data

Genomic data

Integrated Health Records
Interoperability

- Concept with vast scope and many facets
- Many research groups working for decades
- Many international efforts with US, CA, and AUS
- Major technical aspects are common with other areas

But

- Semantic interoperability has to be realised by domain experts
- Progress will need further research

- EC supports research on semantic issues, works with Member States and experts, issues recommendations
- Political will exists, it is time for concrete actions and widespread stakeholders’ engagement
"Interoperability of electronic health record systems" is the ability

- of two or more EHR systems
- to exchange both
  - computer interpretable data and
  - human interpretable meaning,
  i.e. *information and knowledge*

Interoperability of EHR systems should
- make *access easier and more secure*, and
- enhance the *quality and patient safety*

"cross-border" = "trans-national"
Semantic interoperability is “concerned with ensuring that the precise meaning of exchanged information is understandable by any other application that was not initially developed for this purpose.”

Source: (IDABC 2004:16) European Interoperability Framework for Pan European eGovernment Services
Aim and Scope

- **Aim:** provide a set of guidelines for developing and deploying interoperable EHR systems

- **Scope:** EHR systems, incl. patient summaries, emergency data sets and medication records facilitating ePrescription solutions
Realising and sustaining interoperability

- Undertaking actions at five levels:
  - (1) overall political
  - (2) organisational
  - (3) technical
  - (4) semantic levels
  - (5) monitoring, evaluation and awareness rising

- Full compliance with national and EU legal instruments
Political level actions

• *Commit* to regional, national and cross-border interoperability & engage in active cooperation

• Reserve adequate resources & *invest long-run*

• Explore risks, barriers & *incentives* to overcome them

• Strong stakeholder involvement, adequate governance, management, PPPs, public procurement

• Embed eHealth initiatives in other *regional policy programmes*

• Step-by-step approach drawing on priorities & expertise
Organisational level

- Create an organisational framework based on a 5 years roadmap
  - Agree on a *European governance process* to establish *guidelines* for developing, implementing and sustaining cross-border interoperability
  - Consider policies and incentives to *increase demand for procuring* eHealth services
  - Explore the factors slowing down the *standardisation process*
  - Devise measures to speed up these processes
Technical level

- Survey existing technical standards and infrastructures that may underpin the implementation of systems supporting cross-border healthcare
- Explore the use of standardised information models and standards based profiles
- Learn from real-life experiences (LSP-SOS)
- Commit to the development of any necessary additional standard at a global level
Semantic level

- A mechanism to involve national research centres, relevant industries and stakeholders in the development of health semantics
- Consider international terminologies and classifications
- Widespread availability of tools for incorporating the semantic content into practical applications
- Agree on standards for semantic interoperability to represent the relevant health information for particular use cases
- Demonstrate the benefits or shortcomings of current and future systems through sound evaluation and assessment
Further key issues

• Protection of personal data
  ▪ A comprehensive legal framework for the processing of personal data
  ▪ Compliance with data protection obligations
  ▪ Privacy Enhancing Technologies (PETs)

• Certification of EHR systems
  ▪ a mutually recognisable conformance testing process

• Monitoring and evaluation
  ▪ EU monitoring observatory
  ▪ Measurement and assessment exercises

• Education and awareness raising
Workshops with Member States since early 2006

- 1st WS: ‘Health Terminologies: From product to process’
- 2nd WS: ‘From ideas to reality’
- The next step should be: ‘From reality to action’

This goal to be addressed by S.O.S., large scale pilot of 12 MSs and industry, supported by EC, with focus on patient summary and medication
Setting the scene:
Brussels WS, March 8, 2006

- Terminology is the heart of the record
- Most complex domain of eHealth
- Takes long time to understand
- Needs **corporate knowledge** (expertise) that continues

**Semantic IOp THE Issue for Europe to act**

- This is the start of a long process
- Primary scope ‘patient summary’
Working together with Member States, i2010 Subgroup on eHealth

- Two main domains to look at:
  - National approaches, solutions: Opportunities for synergies
  - Challenges in pan-European patient data exchange

- Actors & levels of expertise and responsibility to consider
  - policy makers: how to organise the whole process, EU to facilitate exchange of experience & coordinate joint activities
  - content and meaning: health professionals to discuss and decide
  - which classification/terminology (subsets) to use: expert centres to agree upon
**Interoperability model:**
**4 action levels**

| Health policy: **cooperation** | • Vision & *strategies*
| | • Processes & measures, incentives
| | • Socio-economic (sustainable), legal *framework*
| | • Accreditation and certification
| Health service providers (Organisational level): **collaboration** | • Organisational structures and culture
| | • Intra & inter-jurisdictional service processes
| | • Change management, behavioural change
| | • Systems thinking, business process re-engineering
| Semantic **interoperation** | • Terminologies, classifications
| | • Translation
| | • Data
| | • Structures
| Technical / functional **interoperation** | • Technical standards
| | • Hardware and software connectivity
| | • Security
| | • User interfaces
“Achieving interoperability is hard – achieving computable semantic interoperability is very hard”

Source: Charlie Mead, BAH, 2007

“Interoperability is a continual state of readiness – Integration is a slice through an interoperability time line”

Source: NEHTA, IOp Framework, 2006

“Systems integration is an ongoing problem because the workflow may change every day.”

Miguel Cabrer, CIO, Son Llàtzer Hospital, Palma de Mallorca

“Whatever you plan today, your endpoints will differ”

Jeffrey D. Miller, VP, Hewlett Packard
Objectives of the workshop

• To initiate a partnership for joint efforts to enable and support semantic interoperability of EHR systems in Europe
• This must involve all actors:
  ▪ policy decision makers,
  ▪ professional bodies,
  ▪ health IT systems suppliers,
  ▪ health terminology and tool designers and developers,
  ▪ technical architects,
  ▪ healthcare providers,
  ▪ Standards Development Organisations (SDOs),
  ▪ patients and other stakeholders
Specific focus

- How EHR systems need to be developed to enable
  - the *optimum and effective utilisation of terminologies*, such as SNOMED CT
  - alongside standardised data structure specifications such as archetypes and templates
- Practical implementation challenges
Additional focus

• Needs for further research
  ▪ to implement the EC Recommendation on cross-border interoperability of EHR systems
  ▪ support S.O.S. large scale pilot on patient summary and ePrescription
  ▪ in the context of CIP (Competitiveness and Innovation Programme) ICT Policy Support Programme
  ▪ Framework Programme FP7/FP8