Large scale eHealth deployment in Europe: insights from concurrent use of standards

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Introduction

• Selecting the appropriate set of standards for achieving interoperability is a major challenge for all eHealth deployment projects:
  – No single standard would cover all needs of a project
  – A multitude of overlapping and, partly, competing standards for
    • document formats,
    • terminology,
    • communication protocols
    • etc.
  – International consensus unlikely to be achieved anytime soon

• Projects need to address the coexistence between competing or overlapping standards
  – How do they do this?
  – What can we learn from their experience?
Introduction

• The eStandards project has published a collection of 19 “case studies” covering concepts and solutions
  – in the research domain
  – in large-scale eHealth deployment

• eStandards Deliverable 4.1: Solutions for a Coexistence of eHealth Standards, January 2016.
  – 240 pages
  – Online: http://bit.ly/1YCusmA

• The document also summarizes the most important lessons learned and recommendations from the experience described in the case studies.
The Case Studies

• We asked each project:
  – What is the project about? (Overview)
  – What is your approach to interoperability (e.g. standards and profiles used), by layer?
  – Where does concurrent use of standards play a role in the project, and how did you address this?
  – What is the governance structure for continuous maintenance of specifications developed by the project?
  – What are the main lessons learned from your project (successes, pitfalls and remedies)?
  – Has your project published resources that could be useful for future projects?
## Coverage of Interoperability Layers, by Case Study

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### Legal and Regulatory
- Policy

### Care Process
- (x) = Present
- X = Absent

### Information

### Applications

### IT Infrastructure
Results: Competing and Overlapping Standards

• In the „real-world“ eHealth deployment projects, we found little use of competing / overlapping standards other than terminology mapping:
  - International Classification for Primary Care (ICPC) and ICD-10 (DK)
  - ICD-10 and SNOMED-CT (NL)
  - National and regional EHR terminology (IT)
  - ICD-10 Procedure Coding System (PCS) and SNOMED-CT procedures (ES)
Results: Competing and Overlapping Standards

• epSOS developed an elaborated concept for converting between
  – a document in the sending country’s format and language,
  – a document in the receiving country’s format and language,
  – based on a “pivot document”, an intermediate format for which a mapping from and to each national format has to be defined.

• Document types: patient summary, ePrescription / eDispensation, patient consent
Results: Competing and Overlapping Standards

• In R&D projects, we found several elaborated algorithms for converting between different equivalent representations of messages or clinical documents.

• These can be classified into 3 approaches that complement each other:
  – Gateway based
  – Semantic mediation based
  – Model driven

• No “magic bullet”, all approaches have strengths and weaknesses.
Lessons Learned: Clinical Modelling and Templates

• Be pragmatic with regard to content formats.
  – A simple free-text PDF is still much better than nothing!

• The clinical information model should come first.
  – Derive EHR content format or message specifications from there.

• Mock-up applications are useful in clinical information model development.
  – For validation by end-users and revealing specification inconsistencies

• Non-interoperability is possible even within a single EHR standard.
  – Different templates/archetypes can be used for one clinical concept.

• Use Multi-Coding.
  – If one concept can be represented through codes from multiple coding systems, provide as many equivalent codes as possible. This greatly increases the chance of success of a terminology mapping.
Lessons Learned: eHealth Network Architecture

• **Think big, start small.**
  – It is better to start with a small system and grow over time, than to aim for the perfect solution immediately.

• **Develop your architecture layer by layer.**
  – Separate between the layers of interoperability, create the architecture within each layer, and across layers.

• **Decouple components by defining clear interfaces.**
  – Makes it easier to separate responsibility for, and development of the system components.

• **IT Security is hard.**
  – Cannot be successfully retro-fitted into an existing IT architecture.
  – Never try to “roll your own”!

• **Ensure that multiple end user applications can be built** for accessing and visualizing information
  – There are different user needs and preferences.
Summary and Conclusion

- No „magic bullet“ to address coexistence of overlapping/competing standards found
  - (but nobody really expected this)
- Three fundamental approaches: gateways, model driven and semantic mediation
- Terminology mapping (and Security) remain “hard” problems
- Lots of experience and tools available that others can learn from!
- Next step in eStandards: Condense the experiences and recommendation into a practical “cookbook”
  - to be published in October 2016.
Thank you for your attention

www.estandards-project.eu