Tools for interoperability: making standards digital?

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Abstract

This workshop revisits tools for standards-based interoperability aiming to update participants on recent developments in Health Level 7 (HL7) and stimulate discussion with the audience on advances in tools for the creation and deployment of standards and reusable interoperability assets challenging the traditional notion of standards in print. Best practices using tools for HL7 Clinical Document Architecture (CDA) like Art Decor and Model Driven Health Tools, the Functional EHR model, and Fast Healthcare Interoperability Resources (FHIR) address the interplay of tools for standards and profiles with interoperability assets through general descriptions and concrete examples.

Keywords. Interoperability tools, Clinical Document Architecture, HL7, FHIR

Introduction of the topic

Traditional standards were text-based and their consistent implementation for plug-n-play interoperability has been an illusive goal. Large-scale deployment of eHealth demands consistent implementation of standards at a lower cost. Interoperability tools and common interoperability assets make us imagine a digital future for standards.

1. Aim of the discussion

This 90 minute workshop aims to educate participants in recent developments in HL7 Standards and associated tools initiating a discussion on the future of standards and their use to accelerate large-scale deployment of integrated interoperable eHealth services at lower cost.

2. Contribution from each speaker

2.1. Towards eStandards, Catherine Chronaki, HL7 Foundation, Brussels

Catherine Chronaki will chair the workshop introducing its main theme and objectives at the backdrop of eStandards, a project funded by the European Commission to create a roadmap of standardization to support large scale deployment in Europe.

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2.2. How tools can help on developing functional profiles: the Italian Experience of the Fascicolo Sanitario Elettronico (FSE), Giorgio Cangioli, Italy

The realization of Regional interoperable EHR systems is part of the plan for the Italian Digital Agenda. In order to mitigate the risk of deploying systems with functional incompatibilities and fragile unreliable components, a Functional Profile for the FSE based on HL7 ISO 10781 EHR-S Functional Model Release 2 (EHR-S FM R2) [1], was defined and published as an HL7 Italy standard. A tool for modeling the functional profiles in UML - developed by Results 4 Care B.V. as part of the tooling strategy of HL7 Int. - was used. The presentation will show how the tool helps users ensure consistency with the EHR-S FM R2 standard. The aim of the discussion is to show how tools contribute to the consistent expression of system functionality, enabling comparison of profiles and reuse of artifacts.

2.3. Model Driven Health Tools, Dr. Amnon Shabo (Shvo), Israel

The Genetic Testing Report (GTR) Implementation Guide of CDA was one of the first end-to-end examples created using Model Driven Health Tools (MDHT) [2]. GTR addresses a constantly growing number of genetic testing types yielding new result formats less familiar to the receiving party. The challenge is to define a universal implementation guide (template) that accommodates common data requirements of genetic testing reports, which can be further refined to GTR specializations for research and healthcare as well as to specific genomic technologies or regional/realm requirements. The MDHT tool supports this type of specialization ensuring that each sub-template of GTR will be consistent with its parent template. To this end, MDHT supports the definition of abstract templates. Additionally, an abstract entry-level template, i.e. clinical genomic statement, was created to represent discrete data elements. The clinical genomic statement template is further refined to create specialized clinical genomic statement types for describing specific genotype-phenotype associations. Finally, refinement is also done by binding to different terminologies, both static binding, as well as dynamic binding, such as linking to external genomic ontologies.

2.4. Art-Decor, Dr Kai Heitmann, MD, Germany

Kai Heitmann will present recent developments on the Art Decor tools [3], which facilitate cooperative development, implementation and testing of clinical documents in the HL7 CDA format. In particular, Dr. Heitmann will focus on the use of Art-Decor to deploy discharge summaries in different healthcare settings around Europe. Dr. Kai Heitmann, MD is an independent consultant for healthcare IT and is involved in education, specification and implementation projects mainly throughout Europe. He is member/contributor of several standardization organizations such as HL7 and ISO and author of several standards.

2.5. Public Health Crisis: Putting it all together, Dr Jörg Caumanns, Germany

Jörg Caumanns will present an electronic system for infectious disease reporting and management commissioned by the German Ministry of Health, which employs HL7 FHIR [4] and HL7 Common Terminology Services 2 (CTS2) [5] services. The requirements on dynamic adaptability/extensibility of messages and associated case reports demanded highly flexible standards allowing run-time system reconfiguring. In
achieving this objective a set of modular FHIR Resources were used, so that resource definitions may be added or extended at runtime using FHIR Profiling. Changes to FHIR profiles are processed on-the-fly along with rendering of web forms for questionnaires. All terminologies and value sets used within the FHIR resources are managed through a HL7 CTS2 server. A CDA to FHIR converter allows hospitals to provide reports also as CDA R2 documents. A running prototype of the system has been implemented in 2014 and the Robert Koch-Institute performed an outbreak simulation which demonstrated that especially the FHIR- and CTS2-dependant features for dynamic adaptation of message contents and message scheduling were valuable for public health agencies.

2.6. HL7 Standards looking into the future, Prof. Charles Jaffe, MD, PhD

Since the advent of the Fresh Look Task Force in 2011, Health Level 7 has placed increasing emphasis on the needs of the implementation community. Fresh Look envisioned a new approach to interoperability that leveraged some of the best elements of Version 2, Version 3, and CDA, while supporting modern web technologies and advances in clinical information modeling. Both FHIR and CIMI (Clinical Information Modeling Initiative) [6] emerged from those efforts. The US Department of Health and Human Services (HHS) released the JASON Report [7], which promoted open APIs as the future of interoperability. The JASON Task Force subsequently leveraged this concept in a significant departure from traditional approaches to interoperability, which resonated with the HL7 FHIR initiative already underway. The Argonaut Project [8], comprised of leading private sector organizations and healthcare systems, has given promise to the evolution of FHIR as a global interoperability platform. Concurrent efforts now support the development of critical, freely available developments in conformance testing, which also promise to streamline and accelerate product development. Coupled with initiatives in vocabulary binding and an ever increasing community of stakeholders, HL7 promises to put us on an accelerated trajectory of truly interoperable systems.

3. Expected results

This workshop will update the participants on recent developments related to HL7 standards and associated tools that can help them develop standards-based integrated eHealth solutions at a lower cost, fit for the purpose of large scale deployment in Europe.

References
[8] Argonaut Project, [http://tinyurl.com/ml5x18p] [last access Dec 19, 2014]