



HL7 EUROPE NEWS



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NEWSLETTER

04



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by Catherine Chronaki



The Trillium Bridge Project: the first six months

Imagine having your core health data – health problems, medications, allergies, treatment plan, recent surgical procedures, etc. – in a *digital health passport* that can be safely read, understood and perhaps also updated by physicians in any country you happen to be, across the global eHealth ecosystem.

The 2010 EU/US Memorandum of Understanding on eHealth/Health IT cooperation sets

...the development of internationally recognized and utilized interoperability standards and interoperability specifications for electronic health record systems that meet high standards for security and privacy protection...

as one of its objectives and sets along with its Roadmap the policy context of the Trillium Bridge project.

The “Trillium Bridge: Bridging patient summaries across the Atlantic” project is co-funded by the European Commission to investigate the feasibility of exchanging Electronic Health Records (EHR) across the Atlantic, starting with the EU Patient Summary (PS) Guideline (ep-SOS) and Meaningful Use II. The project started in July 2013 and will run for 20 months led by the HL7 Foundation.

Trillium Bridge has adopted a four part strategy (shown in Figure 1) to establish and sustain an interoperability bridge across the Atlantic. Its findings intend to inform international standardization efforts, promote high standards of quality and safety in cross-border care, and contribute to health system sustainability and economic growth:

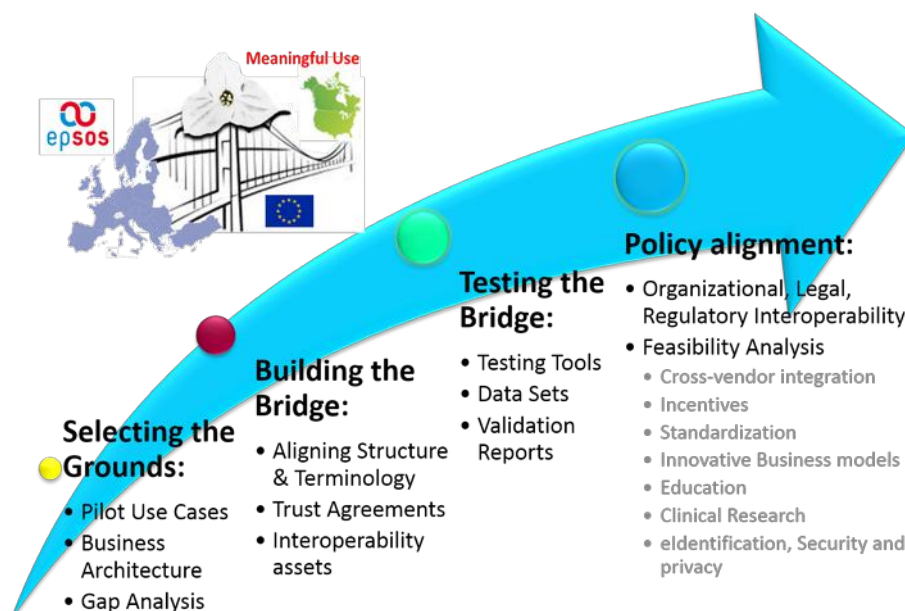


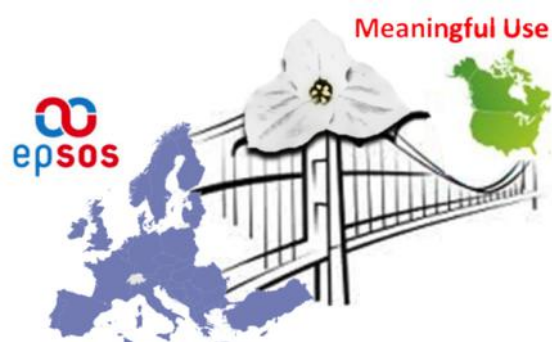
Figure 1: Trillium Bridge four part strategy

- **Selecting the grounds** led by M. Melgara, LiSPA; L. Alschuler (Lantana): Mobilize people and resources creating a community of knowledge to select and analyze key use cases and to carry out gap analysis i.e. compare PS specifications and associated policies including eIdentification, authorisation, privacy & security.
- **Building the Bridge** led by A. Esterlich (PHAST); H. Solbrig (Mayo): Assemble interoperability assets to align structure and terminology i.e. clinical document structures and semantic mappings for value sets published by the National Library of Medicine & epSOS.
- **Testing the Bridge** led by K. Bouquard (IHE Europe), C. Chronaki (HL7 Foundation): Develop testing tools strategy and validate exchange of patient summaries between the EU (Italy, Portugal, Spain) and the US (Kaiser Permanente, Atrius Health, Prosocial). Key organizations in EU Members states and the US has submitted expressions of interest including European affiliates, HL7 Spain, HL7 Italy, HL7 Germany, HL7 Austria, HL7 Greece, and HL7 Finland, etc.
- **Policy Alignment** led by D. Kalra (Eurorec), L. Alschuler (Lantana): Contribute to Policy Alignment, Standardization and Future Sustainability by informing development of PS IGs and template libraries in liaison with Standards Development Organizations (SDOs) to reduce the cost of standards and by delivering policy briefs in seven areas identified for policy alignment: cross-vendor integration, incentives, standardization, innovative business models, education, clinical research, security & privacy.

The first six months of Trillium Bridge concentrated on “Selecting the Grounds” i.e. mobilizing the community, collecting user stories, patient summary samples, and specifications, conducting gap analysis, analyzing use cases and the developing the logical business architecture.

Thorough analysis of the CCDA/CCD implementation guide (US Realm) and the EU PS (epSOS) implementation guide in collaboration with the ONC S&I EHR Interoperability WS, revealed that although the underlying standard was the same

(HL7 CDA) the design philosophy was different. The EU PS (epSOS) takes a snapshot approach of the EHR suitable for unplanned care settings, while CCDA/CCD drives continuity of care. As a result, CCDA/CCD includes sections such as encounters and social history, which are not present in the EU PS (epSOS). The coded clinical equivalent section present both in CCDA/CCD and EU PS (epSOS) are: medications, allergies, immunizations (vaccinations), problems, medical devices and implants. Several elements are richer in content in CCDA/CCD: social history observation, results, vital signs, procedures, plan of care, and functional status. Differences in the underlying terminologies associated with specific elements were also identified. The full analysis is included in the upcoming report “Comparing Patient Summaries in the EU and



US: Gap Analysis and Pilot Use Case Definition”, soon to be available at the Trillium Bridge website.

The comparison of the patient summary specifications in the EU and the US i.e. CCDA/CCD and EU PS (epSOS) will no doubt inform development of future template developments and implementation guides. It will also inform ongoing discussions on how patient summaries are expressed in CDA around the world. An HL7 Project Scope Statement on the gap analysis is under consideration in HL7 with the intent to bring it as a Working Item to the Joint Initiative Council.

Recent developments in Trillium Bridge were presented at HIMSS 2014 on February 25. The presentation slides are available at the HL7 portal and the Trillium Bridge website. The next stop for Trillium Bridge will be in Athens, Greece, in May 12-14 for the eHealth Forum. Join us at the European Commission exhibition booth to meet Martha and Paolo as they take their patient summaries across the Atlantic crossing the Trillium Bridge.

Catherine Chronaki, Secretary General, HL7 foundation

Links

Trillium Bridge
www.trilliumbridge.eu

eHealth Forum: Presidency Event on eHealth: Athens 12-14, 2014
www.ehealth2014.org

ONC S&I EHR Interoperability WS
<http://wiki.siframework.org/EU-US+eHealth+Cooperation+Initiative>

by Nicole Denjoy



eHealth Stakeholder Group Perspectives and Recommendations on Interoperability

The European Commission has outlined, amongst its eHealth Action Plan 2012 – 2020 operational objectives, the priority of achieving wider interoperability of eHealth services by the end of 2015.

A key enabler has been identified in the eHealth Interoperability Framework published by the European Commission .

The eHealth stakeholder group has been established with the goal of providing comprehensive stakeholder input to the European Commission and the eHealth Governance Initiative in order to accelerate scalable implementation in the member states at national/regional level.

In order to achieve this, the group has chosen a methodology aimed at understanding the overall landscape.

The goals of this report are to:

- Provide a comprehensive stakeholder input to the European Commission and to the eHealth Network through the eHealth Governance Initiative on Interoperability with key recommendations in order to accelerate scalable implementation at country level.
- Provide key references and preferred vocabulary used in the field of interoperability.

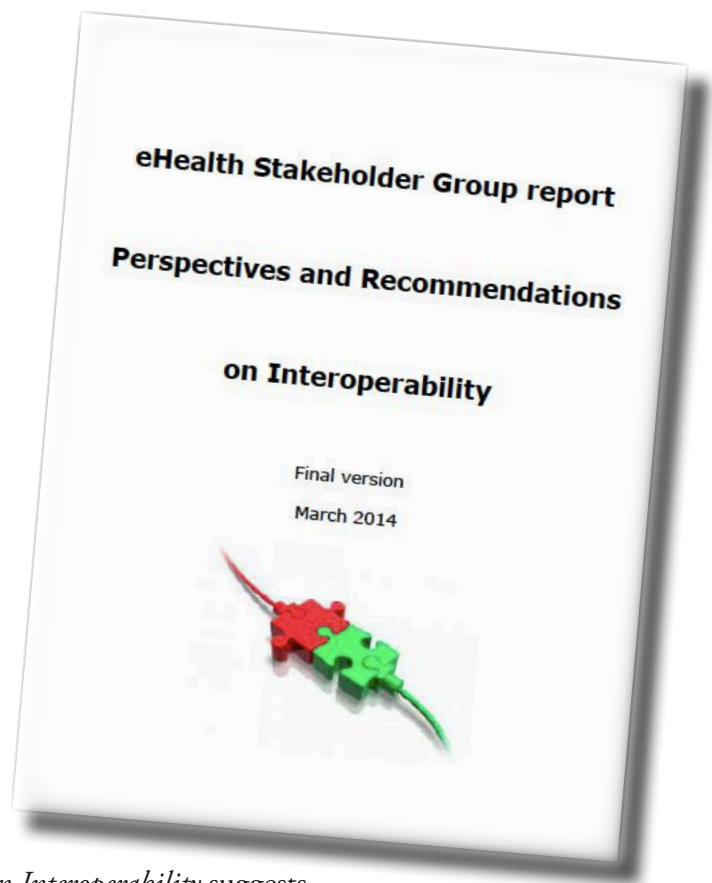
This report will focus on semantic and technical interoperability, as organisational and legal interoperability remain under the EU Member States responsibility.

The report takes into account the constant progress accomplished in the past decade, with the support of the European Commission, Member States and stakeholders.

As interoperability is a complex issue which needs a structured, incremental and cohesive approach, the *eHealth Stakeholder Group on Interoperability* suggests the following six recommendations:

- **Focus on priority use cases** which have been widely adopted and for which mature specifications exist.
- **Clarify privacy and data protection requirements** and establish general principle for organisational requirements for each of the use cases.
- **Foster the use of international standards and market focused profiles** to deliver ready to implement specifications that result in successful interoperability
- **4. Educate local level on eHealth interoperability** to transfer the knowledge gathered at European level to the national, regional and local level, for a better use and adoption of interoperable solutions.
- **5. Address semantic interoperability incrementally** (step by step) by selecting a small number of widely needed terminologies for a start.
- **6. Investigate the particular interoperability requirements of Mobile health, big data, and online social networks** to ensure the vast amount of data originating from mobile health solutions and Apps can be leveraged for better health care.

Nicole Denjoy, Secretary General COCIR



by Lasse van de Sand
and Sylvia Thun



IHE, HL7 & GS1: Interoperability between supply chain standards

Project „eCG“

The improvement of technical interoperability between different eS-standards in the German health care system is one of the main goals of the project “Standards zur Unterstützung von eCommerce im Gesundheitswesen” (eCG). The project started in August 2012 and is funded by the “Bundesministerium für Wirtschaft und Energie” (BMWi) within the support programme “Mittelstand Digital”. The project consortium consists of the „Hochschule Niederrhein“ (HSNR) the „Bundesverband der Medizintechnologie“ (BVMed e.V.) the „Zentrum für Informations- und Medizintechnik der Universitätsklinik Heidelberg“ (ZIM) and the „Integrating the Health Care Enterprise“ in Germany (IHE Deutschland e.V.). This article is focused on the role of the IHE Deutschland e.V. in the context of the aspired interoperability between GS1 and HL7 standards and messages and associated terminologies.



What is IHE?

Integrating the Healthcare Enterprise (IHE) is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. The initiative was founded in 1997 by the Healthcare Information and Management Systems Society (HIMSS) and the Radiological Society of North America (RSNA). Today the IHE is an international organization with established national deployment committees in 17 countries across the globe (Integrating the Healthcare Enterprise, 2014). In general IHE promotes the harmonized use of already established standards. Within this context IHE develops and publishes comprehensive technical guidelines which can be used for development and implementation of IHE compatible systems within the health care sector. For example such guidelines already exist for the domains of cardiology, radiology and pharmacy. Within the project eCG it is planned to develop a specific guideline for the domain “eSupply in Healthcare”.

What is GS1?

GS1 is an international non-profit organization with members in over 100 countries around the world. GS1 focuses on the development and implementation of supply chain related standards. The self-imposed

vision of GS1 is “a world where things and related information move efficiently and securely for the benefit of businesses and improvement of people’s lives, everyday, everywhere” (GS1, 2014). Especially GS1 identification (for example: GTIN, GLN) and transaction (GS1 XML CIN) standards are widely-used within the German health care system. The main focus of these standards is to enable an efficient electronic communication between commercial partners. So within the healthcare system the GS1 standards are mostly used for the communication between clinical institutions and manufactures (GS1 Switzerland, 2012). Within the complex internal supply chain of clinical institutions (for example: hospitals) other standards are predestinated to fulfill the specific needs of the involved departments and systems (for example HL7). Nevertheless it is important to integrate the product information from the GS1 standard system into these internal supply chain standards. This integration is one of the main preconditions to avoid media discontinuity and interface problems.

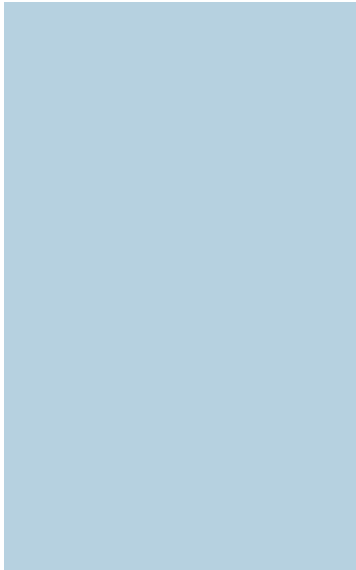
GS1 & HL7 & IHE

In the year 2007 HL7 and GS1 declared their purpose of a cooperation to develop global standards to improve patient care within a “Memorandum of Understanding” (GS1 Global office and HL7, 2007). At GS1’s semi-annual Healthcare Conference in October 2013 the two organizations renewed their Memorandum of Understanding (MOU) to work together to reduce medical errors and to increase the effectiveness of the healthcare supply chain (GS1 Global office and HL7, 2013). For example it is requested to integrate GS1 identification standards and attributes into HL7 messages to make them available within clinical information systems.

Following this approach it would be possible to use information from the procurement process for internal clinical processes. For example the HL7 „Dispense Report“ offers the possibility to use GS1 Codes within the relevant message types. Within the HL7 segment RXG field 4 it is allowed to identify the sender by the use of a GLN and the dispensed medication by the use of a GTIN (GS1 Switzerland, 2012). So while GS1 standards are still focused on the external part of the supply chain, the consequent use of these standards within HL7 messages makes it possible to convert internal clinical messages into the GS1 transaction standard (GS1 XML CIN) and use the contained information along the whole supply chain.

Within the planned IHE guideline for “eSupply in Healthcare” the interaction of HL7 and GS1 standards with terminologies like eCl@ss, PPN (Pharmacy Product Number) and Snomed CT will be defined in specific integration profiles. So this guideline will once provide a concrete technical courtesy to improve the interoperability between HL7 and GS1 standards along the supply chain in German health care system.

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GS1 Global office and HL7, 2013. HL7 Supports GS1 as World's Best Supply Chain Healthcare Standard. [Online], available at: http://www.gs1.org/docs/media_centre/gsl_pr_141013_HL7.pdf [Last accessed 15 Februar 2014].

GS1 Switzerland, 2012. GS1 Leitfaden für das Supply Chain Management im Gesundheitswesen. Schweiz: GS1 Switzerland. GS1, 2014. GS1 Vision & Mission. [Online], available at: <http://www.gs1.org/about/visionmission> [Last accessed 18 Februar 2014].

Integrating the Healthcare Enterprise, 2014. IHE International. [Online] Available at: <http://www.ihe.net/> [Last accessed 20 Februar 2014]

by Marco Demarmels



GS1 and HL7: Logistics in Healthcare

GS1 has published an implementation guide for Hospital Supply Chain Management. Even though it is meant for the Swiss market it may be useful for other countries, too. HL7 Switzerland has checked and confirmed the statements in the document that deal with HL7 messages used in ePrescribing. GS1 made the effort to translate the guide to German, English, French and Italian.



What does GS1 have to do with HL7, and which parts of logistics and healthcare are concerned? HL7 international along with over 50 stakeholders in healthcare has signed an endorsement paper [MOU13] that supports the adoption of the GS1 System of Standards for Healthcare as the global standard best suited for the healthcare supply chain. The reason for this massive support of GS1 was a McKinsey Report published in Oct. 2012 „Strength in Unity: The promise of global standards in healthcare“ [MCK12].



Figure 1: The healthcare supply chain and a possible separation of concerns between HL7 and GS1 (red line). Source: [GS1IG]

The GS1 System of Standards is widely used in Swiss healthcare: e.g. the GTIN number is used to identify trade items such as medication packages (along with a local code system) and the GLN number serves for the identification of health professionals and health institutions, practices and hospitals. The GTIN number shall be passed on all along the supply chain into the clinical workflows up to the points of usage of the goods, in particular of the administration of medication to a patient. This identifier must not be lost when crossing the boundaries of supply chain and clinical application.

GS1 Switzerland has published a guide for the implementation of the GS1 system in healthcare [GS1IG]. The findings in this guide can easily be transferred to settings in other countries. Therefore, a freely downloadable English translation has been provided. The document contains proposals on where to use GS1 XML messages and HL7 messages along the supply chain (separation of concerns). The Swiss HL7 Affiliate Organisation (www.hl7.ch) has confirmed the correctness of the HL7-related statements in the document.

There are currently discussions among members of the IHE Pharmacy Technical Committee and other healthcare experts about the aforementioned separation of concerns in hospital medication logistics between the in-house supply chain and the ePrescribing workflow: Even though HL7 supports order management, a draft of an upcoming „IHE Hospital Medication Logistics“ profile examines the use of GS1 XML Messages on the in-house supply side, instead of HL7 order messages.

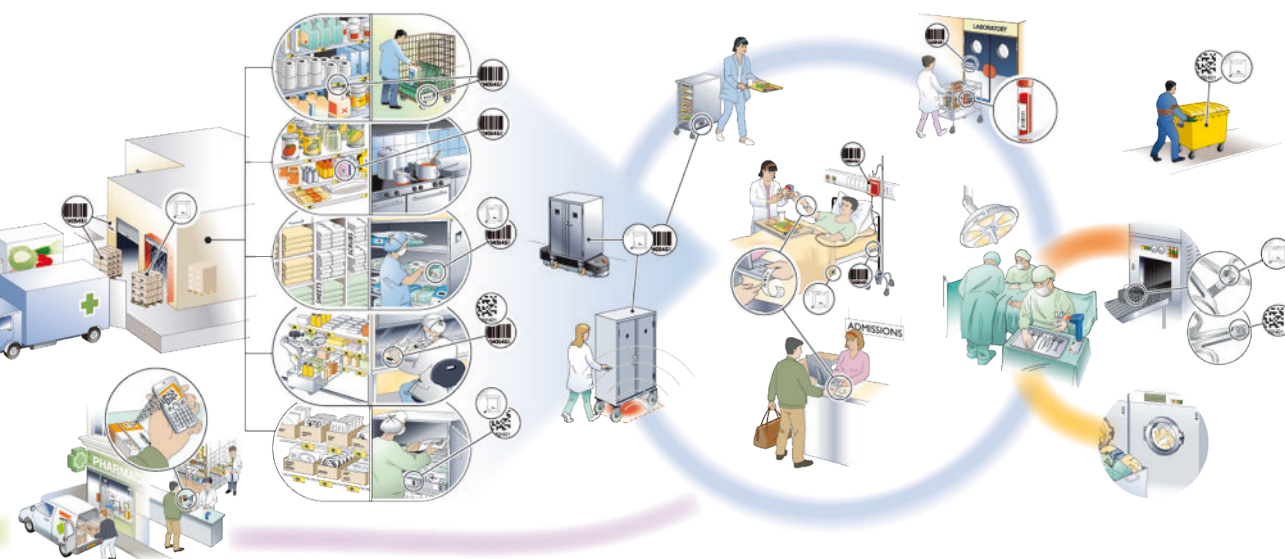
Marco Demarmels, Chair HL7 Switzerland

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[GS1IG] “Supply Chain Management in the Swiss Healthcare Sector” – Guideline for the implementation of the GS1 System – <http://goo.gl/8AIs3F>

[MCK12] McKinsey & Company: „Strength in in unity: The promise of global standards in healthcare” – <http://www.gs1.org/healthcare/mckinsey>

[MOU13] Statement of Understanding (HL7 & GS1) – <http://goo.gl/pS5JeN>



by Stefano Lotti and
Cristina Galeazzi



Nationwide EHR design in the real world as an Ultra-Large-Scale system

The realization of a nationwide EHR service is a challenge and the scale play a central role. Billions lines of code, thousand caregivers, millions of assisted people are involved...

– Doug Fridsma, Health IT as an Ultra Large-Scale System, HealthIT Buzz [1]

We have the necessity of a comprehensive and understandable framework to guide the subsequent technical specification. Can be obvious that the patient and the caregiver are at the center of the system. However, as a logical consequence of the statement, they are not simply user that interact externally with the system: they are part of the system. So, building interoperability among the different software systems and people involved that realize the eHealth as an Ultra-Large-Scale system [2], cannot be made at ‘implementable’ technical level in a meaningful way.

Neither the coordination of this effort can be realized with a traditional “use case by use case” approach. A technical specification that resolves single use case is not really significant in a complex system with a scale great enough to require continuous changes and an unprecedented level of cooperation. A pile of bricks is just a pile of bricks and isn’t a meaningful design.

In this scenario Functional Models play a key role. A functional model, even if complex, is understandable by people with low technical background. Another key point is that a functional model is constructed from a human perspective. As a consequence, in a functional model, consciously or not, the humans are part of the system, not simple ‘users’ that interact with the systems.

At the end of the day a functional model is, within a complex system, a necessary tool that can support the creation of an agreement among the different parts involved in the system (humans and computers). The goals, in the real world, are:

- to compare different existing systems with a common reference,
- understand what systems and people do, and
- where and how interoperability, among systems/people, is useful,
- know how the system will evolve over time in a cohesive and coordinated manner.

The challenge is surely high but this is the real challenge. We should consider that In Italy the landscape is a regionalized national healthcare system. Each Region developed its different healthcare system, some

Region developed its EHR system independently. Now for a recent government act all the Regions must establish a regional and interoperable EHR system from 2015. So the effort now must be coordinated among regions where EHR exists and region where it must be implemented from scratch. Someone can consider this as an disadvantage and yet it can be viewed as an opportunity to take in real consideration the healthcare system as an effective Ultra-Large-Scale system and avoid some common errors in designing the system in a top-down manner.

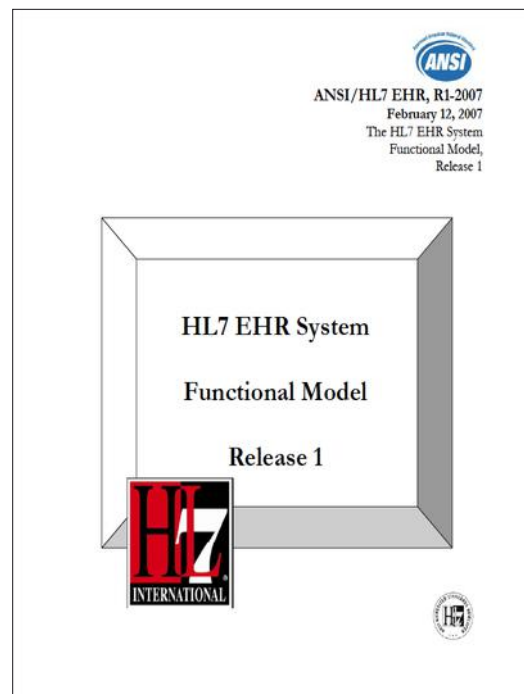
One year ago a bunch of regions met each other with the objective of defining a common functional model for EHR system and its Meaningful Use. Work started by defining business scenario documents in different areas (patient summary, regional interoperability, privacy and consent, terminology, care provision), but it suddenly became evident that profiling a whole functional model from business scenario perspective would have brought to a time-consuming activity leading to a partial functional model. Decision was then taken to start profiling from HL7 EHR-S Functional Model, working both on mapping business scenario defined on single functions and analyzing single functions and conformance criteria with specific meetings.

First 1-2 months were spent on translation of the model and on a first rough selection of applicable functions/criteria on the basis of the legal and regulatory Italian environment. A first preliminary mapping with regional business scenario, and analysis on trust infrastructure, were also done. In a second phase, specific groups of regions (task force) were convened to analyze specific functions/criteria grouped in thematic areas: Patient summary and Related Systems, ePrescription, Trans-regional processes, Demographics, Care provision, Record Infrastructure.

In this second phase, with an average of 2-3 meeting per area and an average of 7 participants among regions, regional IT in-house and other institutions, the analysis was completed. Last 2 weeks of work were spent to grant internal coherence to the functional profile (review of implementation priorities and updating of functions description) and its consistency with applicable regulations.

At the very end, in less than a year, with the participation of 14 regional administrations and other National institutions, the group arrived to the definition of a functional profile compliant with HL7 EHR-S FM.

Now the Profile will be published as HL7 Italy White Paper and the formal standardization process will be started. Concurrently the realized Functional Profile is under consideration by the national leadership, in the pathway of



the Italian EHR programme, as a meaningful working basis for planning and implementation.

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INVITALIA - Government agency for inward investment promotion and
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*Cristina Galeazzi, HL7 Italy
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[2] Linda Northrop et al: Ultra-Large-Scale Systems. The Software Challenge of the Future, Software Engineering Institute – Carnegie Mellon, 2006, http://www.sei.cmu.edu/library/assets/ULS_Book20062.pdf

by Carina Seerainer et. al.



A CTS 2 conformant Terminology Server for the National e-Health Infrastructure in Austria

The medical language is characterized by a variety of special terms, abbreviations and codes, organized in systems like nomenclatures and classifications. When it comes to establishing a nationwide electronic health record entailing the interconnection of various systems and partners, such as ELGA (Electronic Health Record) in Austria, efficient administration, maintenance and publishing of terminologies becomes a crucial factor. This is where a terminology server offers valuable assistance by providing its users terminologies like controlled vocabularies or classifications to ensure semantic interoperability in a defined field of application.

Collaboration between Austria and Germany

After a market research and evaluation of standards-compliant solutions, it was decided to set up the national Austrian terminology server by enhancing the results of a R&D project in cooperation with Germany.

The server based on the Common Terminology Services 2 (CTS2) standard was initially developed by the University of Applied Sciences Dortmund and funded by the German ministry of health. Due to its standards compliance, this open source solution served as the starting position for the Austrian project. Further development, adaptation and customization were carried out by the University of Applied Sciences Technikum Wien, in close collaboration with Dortmund. Development

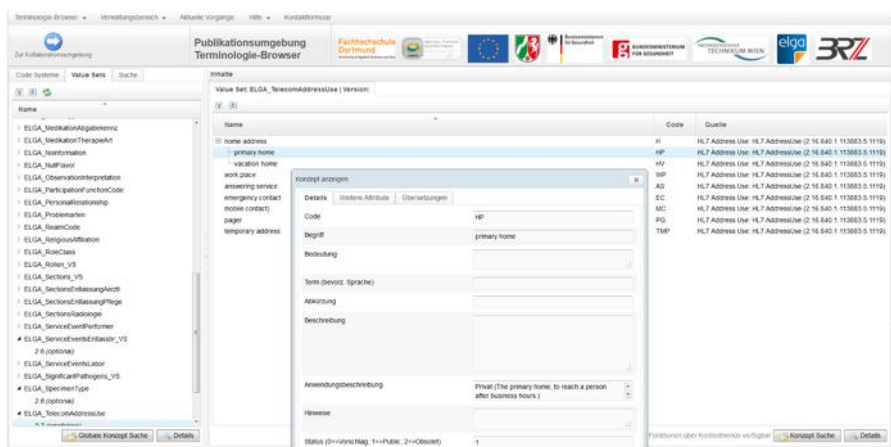


Figure 1: Terminology Server User Interface

and operation were accompanied by the ELGA GmbH and funded by the Austrian ministry of health.

Features of the CTS2 terminology server

The terminology server covers a greater part of the CTS2 services and provides web services as well as a web-based graphical user interface. Both interfaces enable users to search license-free code lists and value sets and export them in various standards-based formats including among others IHE Sharing Value Sets (SVS) and Classification Markup Language (ClAML). Additionally, a collaboration framework facilitates the joint development of new and adoption of existing terminologies by registered and entitled users. The web-application supports these collaborative processes with role-based features for the suggestion, discussion and publication of new concepts as well as corresponding configurable workflow elements.

Current status

Since January 2014 the terminology server has been in productive use in Austria. Beyond others, the publicly accessible publication environment provides all terminologies relevant for the implementation of HL7 CDA R2 documents for ELGA (planned to go live in 10/2014). It is therefore established as a part of the national eHealth infrastructure in Austria.

The terminology server represents a very successful cooperation between Austria and Germany in terms of building up a common open-source solution for the administration of controlled medical vocabularies.

Carina Seerainer (ELGA GmbH)

Robert Mütznier (University of Applied Sciences Dortmund)

Philipp Urbauer (University of Applied Sciences Technikum Wien)

Peter Haas (University of Applied Sciences Dortmund)

Alexander Mense (University of Applied Sciences Technikum Wien)

Stefan Sabutsch (ELGA GmbH)

Links

Publication environment of the Austrian terminology server:

<https://termpub.gesundheit.gv.at/TermBrowser/index.zul>

Further information (in German)

<https://www.gesundheit.gv.at/Portal.Node/ghp/public/content/gesundheitsystem-terminologieserver.html>

by Vitaly Rodionov et. al.



Experience to exchange electronic medical records based on CDA in Moscow

A pilot project had been completed in 2013 in Moscow with goal to establish electronic exchange of health information between the 5 largest municipal hospitals (City Hospital No 7, 12, 31, 57 and the Institute of Children's Emergency Surgery and Traumatology) and SIMI using CDA R2 standard.

Introduction

In order to improve the quality and accessibility of public health agencies' services in Moscow Unified Medical Information-Analytical System (UMIAS) is being developed [1]. One of the most important components of UMIAS is System for Integration of Medical Information (SIMI) that is supposed to cover all Moscow's medical facilities. A pilot project had been completed in 2013 with goal to establish electronic exchange of health information between the 5 largest municipal hospitals (City Hospital No 7, 12, 31, 57 and the Institute of Children's Emergency Surgery and Traumatology) and SIMI using CDA R2 standard.

Scope

Each of the hospitals has its own hospital information system from different providers. Those systems have been functioning successfully for many years. They provide maintenance of electronic medical records, including assistance for creation of discharge summaries and statistical cards of discharged patient.

Discharge summary has been used as a standardized electronic medical document to transmit clinical data of the patient's hospitalization to SIMI. Statistical card of discharged patient (standard form 066/u-02) is designed to transmit the information necessary to create federal statistical reporting forms. Card is filled during the patient's stay in hospital and is closed after discharge from the hospital. This document includes passport data of the patient, the id of obligatory medical insurance policy, social status, category of privileges, diagnosis at admission and discharge, interval from onset to arrival to the hospital, patient's movement within the hospital, performed surgery, the outcome of hospitalization and many others data.

Web-service has been built to enable the exchange of documents. Hospital information systems were transmitting discharge summaries and statistical cards of discharged patient to SIMI storage through this web-service. Discharge summaries were also being transmitted from SIMI storage to hospitals' medical information system on their request.

Additional standardized electronic medical document "appointment for hospitalization" was created based on the HL7 CDA R2 standard. Appointment for hospitalization was being created in one of the Mos-

cow clinics and transferred through Web-service to the program module “Hospitalization Queue” of Asclepius hospital information system deployed in the City Clinical Hospital No 57. Appointment for hospitalization (standard form number 057/U-04) consists of structured information about hospital to which the patient is sent to, his passport details, insurance policy number, indications for hospitalization and ICD-10 code of health problem.

Implementation Guides

Specialists of the HL7 Russia actively participated in this pilot project and prepared CDA R2 Implementation Guides for each of the three documents listed above. CDA R2 level 2 Implementation Guide was created for “Discharge summary” document. Local XML Schema was created that includes restrictions on the content of the header and body of the Clinical Document in accordance with this Implementation Guide. Some optional fields were made mandatory. Additional restrictions were presented as Schematron rules to fully comply with this Implementation Guide.

The structure of the generated document is based on Appendix N2 to the order N 405 from the Moscow Department of Health by 28.06.1996, and this structure should be used in all health care facilities of hospital settings. Base on this document a set of standardized sections and subsections of the electronic version of discharge summary were developed as presented in Table 1. All these sections must be present in the discharge summary.

LOINC	Section name	Subsection name	Required
46241-6	Hospital admission Dx		R
11535-2	Hospital discharge Dx		R
10154-3	Chief complaint		R
29762-2	Social history		R
52536-0	Admission Information		R
10184-0	Hospital discharge physical findings		R
30954-2	Relevant diagnostic tests &or laboratory data		R
18723-7		Hematology studies	R
18729-4		Urinalysis studies	R
11383-7	Patient problem outcome		R
42345-9	Discharge functional status		R
8653-8	Discharge instructions		R

Table 1: Set of sections and subsections of the body of a standardized electronic medical document “discharge summary”.

Development

Implementation of the discharge summary document in accordance with the CDA Implementation Guide required several months of hard work. Creation of XML-version of the document and its validation in accordance with provided XML Schema were the part of development effort. Thanks to the implementation guide, this work was done without significant difficulties in a timely manner.

Another big part of the effort was aimed at changing the existing database structures of three of the five hospital information systems. Discharge summary document was not sufficiently structured in these information systems. In particular, it was impossible to extract information for the complaints, social history, admission and discharge physical findings and Patient problem outcome sections, as these were stored unstructured in 1-2 text fields of electronic medical record.

Conclusion

Pilot project was completed with all developers coped with the task. Possibility for exchange of important clinical information through SIMI UMIAS was demonstrated between hospital information systems from different manufacturers. Future plans are to provide detail information in the discharge summary in accordance with the requirements of Level 3 CDA.

*Vitaly Rodionov, Julia Shtevnina, Sergey Shvyrev, Tatyana Zarubina
HL7 Russia, Russian National Research Medical University named after
N.I.Pirogov, Moscow, Russia*

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[1] Unified Medical Information-Analytical System: <http://emias.info/>

by Catherine Chronaki



European Patient Summary Guidelines

On November 19, 2013, the eHealth Network (eHN) established under article 14 of the European Union (EU) Directive 2011/24/EU on patient's rights to cross-border care adopted the guidelines on minimum/non-exhaustive patient summary dataset prepared by the eHealth Governance Initiative with participation of the HL7 Foundation. Paola Testori, Director General for DG Health & Consumers of the European Commission, greeted the event as a landmark agreement: "we really begin to see a concrete outcome on collaboration in eHealth for the benefit of patients, after years of discussion".

The Patient Summary (PS) guidelines support continuity of care and patient safety across-borders focusing on emergency or unplanned care and provide a common data baseline for patient summaries within the 27 Member States of the European Union. In that spirit, the Trillium Bridge project (www.trilliumbridge.eu) motivated by the EU/US Mem-

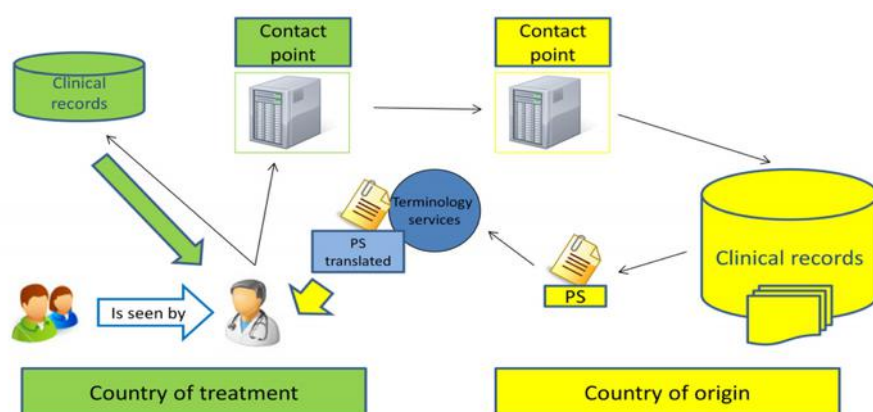


Figure 1: The patient feels sick and seeks healthcare in a country that is not his/her country of origin. As he/she frequently visits that country the health professional may have some clinical information about that patient in his/her own record. They will not normally have a language in common.

orandum of Understanding and roadmap, carries out a feasibility study for the EU/US electronic exchange of patient summaries comparing specifications recognized by the EU patient summary guideline and the US Meaningful Use Stage II regulation.

Two use cases provide the backdrop for the PS guidelines. The first one assumes that the patient receives unplanned healthcare in the country of treatment for the first time. The attending physician requests the patient's PS from a recognized contact point. The contact point relays the request to the contact point in the patient's country of origin and the attending physician receives the patient's PS in the language and terminologies of the country of treatment. The second use case shown in the figure below, assumes that the patient has previously received care in the country of treatment. As a result, the attending physician receives in addition to any clinical records available locally, the patient's translated and transcoded PS from the country of treatment.

The PS dataset is the *minimum set of information needed to assure health-care coordination and continuity of care* in emergency or unplanned healthcare situations supported by *the range of healthcare services available to people who need medical advice, diagnosis and/or treatment quickly and unexpectedly*. The PS guidelines refer to the basic and extended PS dataset that includes administrative data such as provider and insurance as well as clinical information such as problems, medication, allergies, immunization, and therapeutic plan. The basic PS dataset i.e. the essential clinical information must always be available, while the extended data set i.e. the recommended clinical information should be completed wherever possible.

Although the guidelines serve as non-binding recommendation to the EU MS, they provide for the first time the technical, semantic and organizational framework for cross-border care noting the underlying implications and responsibilities. They specify that MS have shared responsibility for the infrastructure services supporting the exchange of patient summaries such as terminology, translation, security, eIdentification, and authorization. Thus, MS need to work together to analyze, understand, and jointly address the relevant interoperability aspects.

The epSOS Large scale pilot (www.epsos.eu) that designed, built, and evaluated a service infrastructure to demonstrate cross-border interoperability between electronic health record systems in the MS (2008-2014), provided the background and practical experience for the PS guide-

lines. With the support of the epSOS industry team, widely-adopted standards and integration profiles such as HL7 CDA, IHE XCA, IHE XCPD, and well known terminology systems such as ATC, Snomed-CT, and ICD10 established the foundations for technical and semantic interoperability for cross-border healthcare in the EU.

Beyond the well-studied aspects of interoperability, epSOS alongside with the eHealth Governance Initiative and the Calliope thematic network have been pivotal in recognizing and addressing the need for cultural interoperability in the European eHealth ecosystem. Were they successful? In a way “YES”, these projects led to the development of the PS Guideline and its adoption by the eHealth network.

Still several challenges remain before PS are widely deployed and European citizens can safely enjoy continuity of care across the EU. Standard Development Organizations are particularly challenged to review and revise their processes towards being more agile, collaborative and responsive to the needs of the global eHealth ecosystem. eSENS and other EU co-funded projects including those under Horizon 2020 PHC-35 need to take the next steps towards:

- (a) reception, adoption and further development of PS guidelines by healthcare professional societies, the eHealth industry, and other eHealth stakeholders,
- (b) governance of terminologies and specifications at the European level, and
- (c) alignment of standardization efforts and eHealth policy at the International, European, MS level.

In retrospect, the European PS guideline adopted last November is an important milestone in our quest for eHealth interoperability. It presents a concrete opportunity for HL7 International and other Standard Development Organizations to work together and lower the costs of standards development, adoption, and implementation stimulating wider stakeholder engagement and open innovation!

Catherine Chronaki, Secretary General, HL7 foundation

Links

EU Directive 2011/24/EU on patients' rights to cross-border care
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:088:0045:0065:en:PDF>

epSOS www.epSOS.eu

Guidelines on minimum/non-exhaustive patient summary dataset
http://ec.europa.eu/health/ehealth/docs/guidelines_patient_summary_en.pdf

eHealth Governance Initiative www.ehgi.eu

Trillium Bridge www.trilliumbridge.eu

European HL7 User Groups

by René Spronk



As an organization, both HL7 International as well as the HL7 Affiliates serve two largely disjunct audiences:

- standards developers – those involved in the creation of HL7 standards or implementation guides;
- standards users – those that “use” HL7 standards, in the widest sense of the word, inclusive of software developers as well as clinical stakeholders.

Many of the activities of HL7 International have been aimed at the standards developer community, as exemplified by the structure and aims of its Working Group Meetings (WGMs). It’s not the “creation of standards” which should be the essence of the organization, but the “adoption of standards”. This realization, which has also been expressed as one of the strategic goals of the organization, has recently led to the creation of a taskforce (<http://bit.ly/1nQ66fB>) to examine the concept of formal ‘HL7 User groups’. Such ‘HL7 User groups’ would be solely focused on users of the HL7 standards. The scope of such a user group could be limited to a subject area (e.g. HL7 use in clinical genomics) and/or geographic area (e.g. Europe) and/or audience (e.g. Clinicians or Software Developers).

In fact there already are at least two examples of de-facto HL7 User Groups: the HL7 Affiliates, and the International Application Implementation and Design (AID) working group.

- HL7 Affiliates are both involved in the creation of standards (e.g. translation of HL7 standards, the localization thereof in the form of implementation guides), as well as in the sharing of project and implementation experiences (i.e. using the standard). New affiliates are probably more focused on the localization effort, whereas the activities of mature affiliates are probably more akin to that of a country-specific HL7 User Group.
- The AID working group (formerly known as RIMBAA) is focused on the sharing of best practices within the software developer community. It regularly organizes 1 or 2-day meetings (two of those in Europe in 2014, see <http://bit.ly/OdCv5i> for the agenda of the next meeting on June 3rd) with the explicit aim to allow that particular group of standards users to share their experiences. Ultimately the aim of AID is to ease the use/implementation of HL7 standards within software implementations.

Activities that cater to standards users are likely different from the ones that cater to standards developers – and yet as affiliates we continue to blend the two. Mostly the annual conferences organized by individual HL7 Affiliates attempt to appeal to both audiences, with mixed levels of success. After all, why organize two meetings (one for users, the other for developers) when it’s hard enough to organize one financially viable



meeting? This is also a mindset issue: thinking of an affiliate as a ‘user group’ should have an impact as to what it does.

Is there a need for European HL7 User Groups? The European meetings of AID show that there is a certain level of willingness of the attendees to invest in travelling to centralized meetings – as long as the users see a clear benefit in such meetings. The IHIC meeting (International HL7 Interoperability Conference) serves the user community – participation has dwindled over the past few years, it could however be revitalized – and its scope enhanced. HL7 has also embarked to organize ‘connectathons’ for FHIR (see following article in this newsletter), an activity aimed at FHIR ‘users’.

The ‘user group’ taskforce of HL7 International has suggested a pilot based on a new HL7 User Group related to Immunization Registries. The de-facto user groups (e.g. the Affiliates, AID) could be designated as such at a later point in time, once the formal structure of HL7 User groups has been agreed upon. In the meantime, it doesn’t hurt for all of us to think how we could engage the HL7 user community in Europe.

René Spronk, Ringholm BV, the Netherlands

by Ewout Kramer



International FHIR Developer Days in Amsterdam



On November 24 to 26 the “International FHIR Developer Days” will be held in Amsterdam, the Netherlands. FHIR, HL7’s latest standard geared towards mHealth and cloud applications, has just been published as a DSTU (draft) standard, and has already gained a lot of interest in the software development community.

HL7 International organizes FHIR connectathons/hackathons during its Working Group Meetings (WGMs) – a place where those new to the standard, or those that already have prior experiences, can test and develop their FHIR implementations. A connectathon consists of multiple tracks, e.g. one for those that are new to the standard, and another one that’s related to advanced concepts such as security, profiling and FHIR documents.

Such connectathons are a chance to learn, a chance to actually get to play with the specification. It’s an opportunity to do so in an environment where others are doing the same thing and where you’ve got the experts who can answer your questions, so you can get moving a lot faster than you would if you were trying to work on your own. Connectathons are also about building a community of peers – sharing pitfalls and best practices, enabling connections with other implementers that one can use after the connectathon itself.

The International HL7 FHIR Developers Days 2014

The International HL7 FHIR Developers Days 2014 will be held on November 24th – 26th in Amsterdam. During Education Day, the three fathers of FHIR, **Lloyd McKenzie, Grahame Grieve and Ewout Kramer** will talk about ‘Design Principles’, ‘Developers Philosophy of FHIR’ and ‘Building your server’. During Hackathon and Connectathon Day they will be available all day to answer your questions about design, resources, implementation and REST, JSON. There is also the possibility to follow the HL7 FHIR Hands on-training course facilitated by **René Spronk**.

Registration
Please preregister by sending the application form down below.

Preliminary program

Monday 24th November Education Day
Lloyd McKenzie on ‘Design Principles’
Grahame Grieve on ‘Developers Philosophy of FHIR’
Ewout Kramer on ‘Building your server’

Tuesday 25th November Hackathon Day
Interactive sessions, with Lloyd McKenzie, Grahame Grieve and Ewout Kramer available to answer your questions.

Wednesday 26th November Connectathon Day
Interactive sessions, with Lloyd McKenzie, Grahame Grieve and Ewout Kramer available to answer your questions.

The Developers Days are for decision makers, architects, designers and developers.

The International FHIR Developer Days enhances the connectathon concept because they will be a blend of education and a connectathon – and not just a connectathon. The meeting will kick off with a full days’ worth of education, and it is the intent to intersperse the connectathon with brief educational updates (of a highly interactive nature) related to common issues that the participants are facing.

The three founding fathers of FHIR, Lloyd McKenzie (Canada), Grahame Grieve (Australia) and Ewout Kramer (the Netherlands) will be present, both to present tutorials on the first day, as well as to assist with any issues (e.g. design, resources, implementation and REST, JSON) encountered by the connectathon participants. Additional education will be provided by René Spronk (the Netherlands), e.g. a “FHIR for managers” tutorial.

Although primarily aimed at software developers there will be specific sessions for those that are not writing actual code: for audiences such as software architects and managers there will be sessions on the final day, e.g. on how one should position FHIR, how one can use it, and what the ramifications are in terms of other standards.

Normally the FHIR connectathons are held in the US, these FHIR Developer Days are a unique opportunity to join such an event in Europe. For those that are “Fhired up” about FHIR, see <http://fhir.furore.com/devdays/> for registration and a detailed agenda.

Ewout Kramer, consultant technology and architecture at Furore in the Netherlands and member of the FHIR core team

by Kai U. Heitmann et. al.



ART-DECOR: a tool bridging the chasm between clinicians and health IT

Sometimes it is a long way from an idea or a requirement to exchange clinical information electronically, determining contents and processes, creating a specification by means of standards up to the actual implementation in software applications and exchange of data in production. It starts with a complete and consistent documentation along with an optimized collaboration process and consensus of the experts involved. A new tool, called ART-DECOR, is now used in many European projects and supports consistent and comprehensive documentation, specification, implementation and testing of communication solutions. This short article gives a first impression about the background, opportunities and objectives of this new tooling environment.

Collaboration challenges for the experts

It is usually a collaboration of experts who start with ideas or requirements and jointly develop a proper specification, achieve implementation and eventually the exchange of clinical information between applications. Experts come from the area of the request itself, e.g. physicians, nurses, medical staff as well as from areas of requirements analysis, modeling, standardization (such as HL7 and IHE), software architects, interface specialists and – often forgotten – terminologists. They all take care of a common understanding of cross-domain semantics.

Previously, there was hardly any comprehensive or only scattered support by tools of a technical nature that allowed all of these groups of experts – in short: users, architects/modelers, terminologists and software engineers – to contribute their respective knowledge to the definition and implementation process and to get what they need in order to fulfill their tasks while things evolve.

ART-DECOR

A new tool, called ART-DECOR, is now used in many European projects and allows supports creating consistent and comprehensive documentation. The tool offers support for specification, implementation and testing of, for example, CDA-based specifications.

ART-DECOR stands for **A**dvanced **R**equirement **T**ooling using **D**ata **E**lements, **C**odes, **O**IDs and **R**ules and has the main objective to support all experts in the development process. DECOR is a methodology to model and document the information requirements of clinical users. This model is then used to link various “artifacts” like terminologies and templates together and generate documentation (implementa-

tion guides), XML and test tools, etc. Supported by consistent version management the iterative improvement of all artifacts created during the working process is fostered.

DECOR is used to hold (among other things) data sets with a hierarchical list of concepts, data types, value sets, codes, identification schemes, business rules and templates. The underlying data format is XML. Generation of HTML and PDF documentation and XML materials is accomplished by transformation with stylesheets and other methods.

DECOR consists of two parts: the methodology, a framework supporting modeling of artifacts (including documentation) and transformation scripts such as XML stylesheets, beyond other tools such as XML schemas, schematrons, etc.

ART is the user interface of DECOR to create and adapt DECOR files and artifacts. ART is based on the XML database eXist [existdb] and uses XQuery [xquery] and Orbeon XForms [xforms, orbeon].



Who benefits from ART-DECOR?

The target groups arise from the experts of the different areas already mentioned, in particular, ART-DECOR supports:

- regional and national networks, as well as large healthcare providers to document internal / external requirements in terms of data sets and data flows consistently with the objective to exchange information
- standard experts, modelers, architects and terminologists who put together their contributions based on target standards and procedures, supplementing the requirement specifications
- healthcare software providers who are looking for a simplified implementation of standard specifications and optimum support for implementations.

In quite a couple of European projects ART-DECOR is already being used (see “Projects using ART-DECOR” in table 1), experts with different skills from the health professional side, terminologists, architects, designers and programmers take care of their data sets, data types, value sets, identifier schemes, codes, and business rules by means of (HL7v3/CDA) templates.

An example?

Probably it is worth to illustrate the features of ART-DECOR a bit and where it offers support from concept to implementation and testing.

A demonstration use-case: Suppose there are electrocardiogram findings to be exchanged electronically. Assume the following very simplified situation:

Example Use Case

Patient: John Doedidoe, male, *19.2.1962
Performing physician: Dr. Kai U. Heitmann, MD
EKG-Results (summary)

- Normal sinus rhythm
- Ischemic ST-T changes in anterior leads
- Poor R Progression in right precordial leads

ART-DECOR supports the following steps:

- Create and manage a data set, documentation of the structure and semantics from the perspective of health care providers
- Define the actors involved (e.g. performing physician), interactions and the exchange situations (scenarios)
- Setting of concepts and terminology guidelines (for example, sets of values, codes) and identifications from the perspective of terminologists
- Define the structure and semantics, add business rules, identifier schemes, codes and link everything to e.g. HL7 templates from the perspective of standardization experts, modelers and interface specialists
- Version and change management
- Generation of ISO Schematron [isosch], documentation, etc.
- Test the communication in terms of content, correct display, etc.

In addition, information about the project are documented.

Table 1: Some of the larger governance groups/projects using ART-DECOR along with the HL7 domain used

ELGA (AT): National infrastructure Austria – CDA
RIVM (NL): National screening programme on bowel cancer – CDA
QiN and KfH (DE): Dialysis treatment data exchange – Care Provision
Nictiz (NL): Multiple projects

- Perinatology – CDA and Care Provision
- Laboratory results for pharmacists – Orders
- Care Transfer Data – CDA
- GP Acute Care – Care Provision
- Youth Health Care – Care Provision, Immunization
- GP Locum – Primary Care
- Medication data – Prescriptions and dispense

HL7 Norway (NO): National document definitions – CDA

- Anesthesia Record, EKG report, Operation Note, Spirometry Report

HL7 Germany (DE) / Interoperability Forum: National document definitions – CDA

- Discharge Letter
- Infectious Disease Reporting
- Diagnoses, Oncology Reports, Pathology Reports etc.

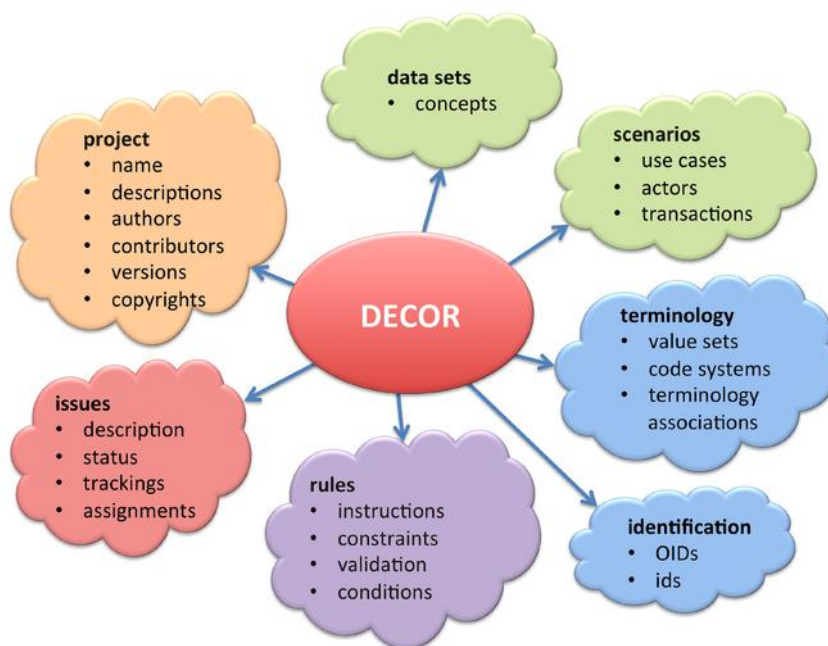


Figure 1: The ART-DECOR tool is project oriented and supports the definition and management of clinical concepts and scenarios, allows the definition of structure and semantics in terms of rules (templates, profiles), identification schemes and terminologies (codes); it provides a forum for project-based problems, questions, and suggestions for changes

Data sets, scenarios and terminologies

In this article, data set, scenarios and terminologies are not in the focus so a extensive description is missing here. If you like you can visit the demo of the EKG example use case at the ART-DECOR sandbox at <http://art-decor.org> [adsbekg] and have a closer look on how this is achieved in the tool. Also refer to figure 1 for an overview.

HL7 v3 templates

The more generic a model or specification for the exchange of information is, the more you have to cover the „missing“ path to semantic interoperability with other „companions“. Joy and sorrow of the HL7’s Clinical Document Architecture (CDA) is that on the one hand it does not have a highly specialized domain-specific model, making it relatively easy to understand it and basically generic to implement. On the other hand: in order to make communication partner actually understand each other, the peculiarities of the specific application in question must also be determined and taken into account. This “gap” to true semantic interoperability needs to be filled.

These additional restrictions and definitions are documented in HL7 v3 templates. Templates are predefined structures describing structure and semantics of mostly clinical content (functional model) and specify what the associated XML instance looks like (technical model). They act as a „pattern“ of existing HL7 models (for example, the CDA model). Ideally, they are designed as a reusable semantic blocks that are used over and over again where they fit. Examples are definitions for the “patient”, the “authors of a document”, a structure of a “diagnosis” or a “lab result”, etc.

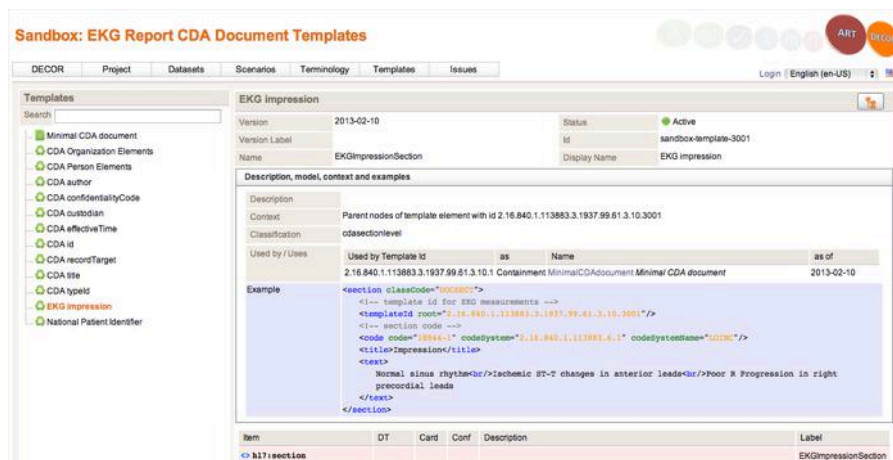
It pursues three main objectives: Templates are an aid for

- the creation of (parts of) messages and documents
- the validation of messages and documents
- processing (parts of) messages and documents .

Figure 2: Template list (left) and detailed information with examples and cross-relation (template meta data, on the right) of a section-level template for the EKG results

The Clinical Document Architecture knows at least four types of templates. These are related to

- CDA documents, such as a discharge letter, a lab report, etc.
- CDA header parts such as patient, author, description of the documented service etc.
- Sections on CDA (Level 2), for example, vital signs, last medication
- Entries on CDA, to represent Level 3 structures, for example, a discharge diagnosis, a medication activity etc.



The specification of the structure and semantics as HL7 Templates, along with identifiers, codes happens in ART- DECOR from the perspective of and for the standardization experts, modelers and interface specialists. The XML instances are described as accurate as possible with their elements and attributes, structure, cardinality, conformance, data types, identification schemes required to be used and value sets with set of values, or units and accuracy of measurements. Following the above three objectives, this results in an exact statement on how to build a conforming XML instance (“... which item goes where and must be populated how?”), but also a way to validate created instances (“...did I use the correct code?”) or to process the received data.

The focus of templates in ART- DECOR is certainly on HL7 CDA templates which are very often used in modern specifications. However, any arbitrary XML instance can be described and validated in this way.

RESTful Services and Repositories

Many of the artifacts like value sets and templates can also be achieved by calling RESTful services. The format of the Templates follows the

Figure 3 : Rendering of a CDA section-level template in ART-DECOR in detail (the so-called template design): the tabular form offers concise information on how the corresponding XML fragment has to be built up

Item	DT	Card	Conf	Description	Label
h17:section					EKGImpressionSection
↳ @classCode		0..1	F	DOCSECT	EKGImpressionSection
↳ h17:templateId	II	1..1			EKGImpressionSection
↳ @root		1..1	F	2.16.840.1.113883.3.1937.99.61.3.10.3001	EKGImpressionSection
↳ h17:code	CD	1..1	M		EKGImpressionSection
			CONF	@code = 18844-1 @codeSystem = 2.16.840.1.113883.6.1	
↳ h17:title	ST	1..1	M		EKGImpressionSection
↳ h17:text	SD.TEXT	1..1	M		EKGImpressionSection

HL7 Templates Standard: Specification and Use of Reusable Information Constraint Templates, Release-1 [templatesdstu1]. ART-DECOR is in fact a reference implementation of the exchange format described in the Templates DSTU.

At present, the experience collected in a number of projects is examined to what extent it may be re-used at a higher level. Why should the ECG findings in Norway, for example, expressed in CDA be technically different from one in Germany? Are the definitions therefore also usable in for example Germany?

The thoughts around re-usability led into the implementation of so-called Building Block repositories (BBR) that ART-DECOR offers. At European level, the BBRs are now already populated with HL7 value sets and they include CDA models as generic templates. Additional projects covers BBRs drawn from the epSOS project, CCD 1.0 or C-CDA Release 1.1 (C-CDA R2 in preparation). BBRs are directly available and usable in any ART-DECOR project, which means that a project simply references BBR components (rather than copy them) or refine existing definitions and uses them in their context at a fingertip.

What does ART-DECOR cost?

ART-DECOR is 100% free. It acts as the basis for the collection of data descriptions, scenarios, terminology and templates in some larger projects and has tools for change and version management. It supports various forms of publication and eases the creation and validation of examples and test scenarios. In the meantime, some software companies uses ART-DECOR definitions also as a basis for their code generators or to build (reference) user interfaces, for conversions of data formats and more.

Gained in practice, for use in practice

ART-DECOR is used in European countries in various projects in practice, including in support of the national infrastructure ELGA in Austria, the Dutch Nictiz (National Healthcare Standards Institute) and the RIVM (National Institute of Public Health and the Environment in the Netherlands). The development was and is driven by practice and experience and what is really needed in the field so far, not by too much theoretical constructs that may happen but were never seen. Thanks to

A summary in four bullet points: ART-DECOR...

- ...is an open-source tool and a methodology for various multidisciplinary stakeholders of healthcare information exchange
 - ...supports comprehensive collaboration of team members within and between governance groups
 - ...allows separation of concerns and different views on one single documentation for different domain experts
 - ...supports creation and maintenance of HL7 templates (DSTU), value sets, data sets and more
-

Features of ART-DECOR for HL7 / CDA Templates

- Template Viewer based on the Templates DSTU R1 exchange format (balloted), documentation of templates in ART, as HTML or PDF
 - Two Template editors for HL7v3 / CDA Templates
 - Terminology Browser for various terminologies
 - Value Set Editor
 - Building Block Repositories with various “standard” templates and value sets, e.g. C-CDA R 1.1, epSOS, IHE
 - ISO schematron generator, works with open and closed templates
 - RESTful services to get various artefacts
 - FHIR profile editor under investigation
-

a modern development environment of the tool itself innovations for all ART-DECOR projects can be made available with a very small time delay.

Summary

With ART-DECOR a free collaborative tool is available, which is now used in European projects for a consistent and comprehensive documentation, as an aid in specification, implementation and testing of communication solutions.

More information can be found on the website of the ART-DECOR expert team under art-decor.org. There you can also look at the ECG findings sample.

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Maarten Ligtvoet, M.Sc., Nictiz

Marc de Graauw, M.

...all part of the ART-DECOR Expert Team

References

[orbeon] Orbeon XForms framework, www.orbeon.com

[xforms] XForms Wikibook, <http://en.wikibooks.org/wiki/XForms>

[xquery] XQuery Wikibook, <http://en.wikibooks.org/wiki/XQuery>

[existdb] eXist XML database, <http://www.exist-db.org/>

[isosch] ISO Schematron, ISO/IEC 19757-3, iso.org

[adsbekg] A demo example at the ART-DECOR website can be found at <http://art-decor.org/art-decor/decor-project--sandbox->

[templatesdstu1] HL7 Templates Standard: Specification and Use of Re-usable Information Constraint Templates, Release 1, Balloted for DSTU

Calendar of Events



Working Group Meeting	Phoenix, AZ, USA	4 to 9 May
eHealth Forum 2014 The Premier European Forum on eHealth	Athens, Greece	12 to 14 May
ISO TC 215	Karuizawa, Japan	19 to 24 May
eHealth Summit Austria	Vienna, Austria	22 to 23 May
pHealth 2014 Conference	Vienna, Austria	11 to 13 June
MIE (Medical Informatics Europe)	Istanbul, Turkey	31 August to 3 September
28th Annual Plenary & Working Group Meeting	Chicago, IL, USA	14 to 19 September
Annual Meeting and National Interoperability Conference HL7 Germany and IHE Germany	Göttingen, Germany	22 to 24 October

HL7 Training schedule / Developer Days

The International HL7 FHIR Developers Days 2014	Amsterdam, the Netherlands	24 November
August 14th Fundamentals Course Registration for this course will open on June 10th	on your computer @everywhere	14 August to 27 November

HL7 Affiliates in Europe

see also <http://www.hl7.org/Special/committees/international/leadership.cfm>

HL7 Austria http://www.hl7.at Chair: Stefan Sabutsch	HL7 Germany http://www.hl7.de Chair: Christof Gessner	HL7 Russia Chair: Tatyana Zarubina MD PhD
HL7 Bosnia and Herzegovina Chair: Samir Dedović	HL7 Greece http://www.hl7.org.gr Chair: Alexander Berler	HL7 Spain http://www.hl7spain.org Chair: Francisco Perez
HL7 Croatia http://www.hl7.hr Chair: Miroslav Končar	HL7 Italy http://www.hl7italia.it Chair: Stefano Lotti	HL7 Sweden Chair: Gustav Alvfeldt
HL7 Czech Republic http://www.hl7.cz Chair: Libor Seidl	HL7 The Netherlands http://www.hl7.nl Chair: Robert Stegwee MSc, PhD	HL7 Switzerland http://www.hl7.ch Chair: Marco A. Demarmels MD, MBA
HL7 Finland http://www.hl7.fi Chair: Juha Mykkanen PhD	HL7 Norway http://www.hl7.no Chair: Line Andreassen Saele	HL7 Turkey Ergin Soysal MD, PhD
HL7 France Chair: Nicolas Canu	HL7 Romania http://www.hl7romania.ro Chair: Florica Moldoveanu	HL7 UK http://hl7.org.uk Chair: Philip Scott



About HL7 International

Founded in 1987, Health Level Seven International (www.HL7.org) is the global authority for healthcare Information interoperability and standards with affiliates established in more than 30 countries. HL7 is a non-profit, ANSI accredited standards development organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services. HL7's more than 2,300 members represent approximately 500 corporate members, which include more than 90 percent of the information systems vendors serving healthcare. HL7 collaborates with other standards developers and provider, payer, philanthropic and government agencies at the highest levels to ensure the development of comprehensive and reliable standards and successful interoperability efforts.

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