



HL7 EUROPE NEWS



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NEWSLETTER

03



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Freely licensed standards from HL7 International

In August 2012, HL7 International announced its decision to make its standards freely available. This momentous decision has been broadly welcomed by the global health informatics community. Without doubt, the decision will consolidate HL7's position as the most widely deployed health interoperability standards in the world. However some questions and uncertainties remain.

Benefits

Purpose

The free licensing of HL7 standards is scheduled to be implemented from April 2013. The stated aim of the decision was “to maximize benefits to our members, the healthcare community, and all those who have contributed to make HL7 standards so successful.” The decision is arguably consistent with at least the second part of the HL7 International vision statement: “To create the best and most widely used standards in healthcare”. Whether HL7 will deliver the “best” standards will depend if we take the judgement of the market (vendor and consumer adoption), government programmes (national/regional adoption) or the view of other stakeholders (such as clinical assurance of utility and fitness for purpose, for which there is at present no credible international authority). It will also depend upon HL7 International's continuing organizational viability.

Removing barriers to adoption

The requirement to become a paying member of HL7 International or one of its affiliates to obtain legal access to the HL7 standards was sometimes raised as an objection by certain stakeholders. There is no question that the ‘liberation’ of HL7 intellectual property will remove this perceived barrier. For countries that have adopted a national “Open Standards” policy for publicly funded projects, this is more than a perception issue – HL7 standards were otherwise at risk of exclusion from adoption in national programmes on this aspect alone.

Reputation

The decision to open up HL7 content to non-members has been widely welcomed as the ‘right thing to do’ and has helped to soften the image of HL7 into something altogether more warm and cuddly than the previous Scrooge-like impression that some people perceived.



Uncertainties and risks

Scope

At the time of writing, the revised HL7 International bylaws are out for ballot along with the text of the new IP policy (provided to members for information, not approval). The new policy refers to “Specified Materials” and describes what members and non-members can do with this subset of the HL7 product family that the Board has decided to include in the free licensed content. The current problem is that there is still some uncertainty about the precise scope of “Specified Materials” – in particular about what constitutes “computable artefacts” and whether or not they will be freely licensed. The potential implementation of HL7 content into open source solutions seems forbidden by the current wording (which only permits organizational members to distribute products to “customers”), but there is likely to be further debate on this question.

Financial viability

Potentially the most serious risk is whether HL7 International will remain financially viable after it gives away its “crown jewels”. The challenge is to retain existing members (not so much the committed minority who actively participate but the fairly disconnected majority who primarily just want the IP but maybe have some comfort level from ‘being in the club’) and to attract new members. This is what the Board-appointed Membership Task Force wrestled with for several months in re-framing membership benefit packages as recommendations to the Board. Time will tell if the benefits are sufficiently attractive to avoid the requirement for significant cost-cutting and organizational re-configuration.

The same question arises for affiliate viability. Various countries have taken initiatives to extend or re-articulate the HL7 affiliate value proposition and the International Council has formed a task force to share ideas and good practice between fellow affiliates. This is also a topic for the planned meeting of European affiliate chairs during eHealth Week in Dublin in May 2013.

Conclusions

HL7 is a vibrant community of intellectual activity and volunteer effort that continues to lead innovation in global health interoperability standards. The emerging FHIR standards offer exciting possibilities and are rapidly developing with enthusiastic support and interest.

Hopefully HL7 will emerge from the dramatic change of IP policy with the strength and capacity to continue and expand its role for many decades to come.

Dr Philip Scott

Chair, HL7 UK

Co-chair, HL7 International Council



Joint Initiative Council – Past and Present

The Joint Initiative Council, or JIC, was set up under the *Joint Initiative Charter for SDO Global Health Informatics Standardization* (JI charter). The JI charter was executed on 29 August 2007 and expresses a strong, positive will among leading health informatics standards development organisations (SDOs) to collaborate, coordinate and cooperate in delivering a globally applicable, relevant and implementable set of health informatics standards. In particular, it seeks to address and resolve concerns about issues of gaps, overlaps, and counterproductive efforts in health informatics standardization.

The JIC was formed to provide strategic leadership of activities undertaken under the JI charter, which was originally executed by three organisations, ISO/TC 215, CEN/TC 251 and HL7 international. Membership of the JIC is open to other global SDOs working in the area of health informatics that agree to participate under the terms of the JI charter. Subsequently, CDISC, IHTSDO, GS1 and, most recently, IHE became members of the JIC – bringing the total membership to seven SDOs.

The JI charter also established a “joint working group” or “JWG”, to provide a forum to promote discussion and input from experts from the participating SDOs. Its role includes developing processes for joint work and making recommendations to JIC on current and proposed joint projects.

The JIC and JWG do not develop or publish standards directly; rather, they facilitate collaboration among the JIC members to identify common interests and progress them as joint work. A work item that is accepted onto the work program of a JIC member may be submitted to the JIC and approved as a joint project, if it is relevant to more than one JIC member. Participation in joint projects is voluntary but the JIC also provides a forum in which potentially competing standardization activities may be questioned.

One of the JIC members is selected as lead SDO for each approved JIC project and provides an agreed project leader and facilities for joint ballot reconciliation. Other participating SDOs provide co-leaders and a customised plan is developed for simultaneous balloting and producing a joint publication that meets the rules of all participating SDOs.

Joint projects completed through JIC have included the IDMP and ICSR standards for medicinal product reporting and pharmacovigilance, the ISO/HL7 EHR system functional model, Release 1.1 (EHR-S FM R1.1) and ISO 21090 harmonized data types. The JIC also monitored progression of some ISO/HL7 standards to separate joint publication under the HL7-ISO pilot agreement.



HL7 has contributed strongly to JIC activities. Potential advantages of progressing HL7 standards as joint work items in collaboration with other JIC members include immediate adoption of the outputs as International and European standards as they become ANSI normative HL7 standards.

JIC presently has seven joint projects which include Release 2 of the EHR S FM, the CDISC BRIDG model for communication of biomedical research data and ContSys. To facilitate harmonisation, JIC members have also agreed to register their standards, terms and definitions in the Standards Knowledge Management Tool (SKMT).

While the ISO/TC215 health informatics committee is an equal member of the JIC, the JIC also has a special relationship with TC 215 in that TC 215 provides the JIC secretariat, the JWG is constituted as TC 215 advisory group, and one of the JI charter's goals is for all joint standards to be published through ISO.

It is now some eight years since the first discussions on forming the joint initiative and over five years since JIC activities commenced. With a wider range of interests and stakeholders, the JIC is conducting a strategic review of its charter and activities, which includes:

- Understanding the needs of our respective customers and identifying common ground between SDOs to ensure that our work remains relevant and appropriate into our second decade
- Updating the JI charter and the roles of the JIC and JWG to reflect current needs of member SDOs and other stakeholders
- Improving communication and more effectively representing our joint interests
- Developing a focus on more effective implementation and use of global eHealth standards
- Looking to collaborate with WHO, ITU and other global organisations in addressing the eHealth needs of low and medium income countries (LMICs)
- Continuing to work with ISO Central Secretariat to facilitate development, publication and maintenance of joint health Informatics standards.

Achieving the goals of the JI charter is challenging. Most JIC members are part of established standards bodies and we have a legacy of some 25 years of health Informatics standards work, much of which widely adopted. Nevertheless, we are committed to making a difference and, on behalf of JIC members, I seek your support and goodwill of helping us to do so.

Richard Dixon Hughes

Chair, Joint Initiative Council,

Joint Initiative for SDO Global Health Informatics Standardization

Link

<http://www.jointinitiativecouncil.org/>



ELGA



The course is set for Austria's national health record system

ELGA will represent the future nationwide platform for data sharing of the Austrian health care system. After long and controversial debates the Austrian National Council finally adopted the law on ELGA in November 2012. The ELGA Act which came into force on 1st of January 2013 paves the way and sets the milestones for the implementation of the electronic health record ELGA. Accordingly, first functions of ELGA shall be available from 2015.

The main goals of ELGA are improved collaboration in Austria's health system, optimised therapy as well as a patient centered approach and more patient empowerment. The functions of ELGA will facilitate the referral, hospitalisation and discharge processes and – above all – enable doctors to have relevant medical data ready when treating a patient – in the primary and the secondary care sectors alike. The technical network of ELGA will enable the people working in private practices, hospitals, nursing homes and health centres to act as reliable and committed sources and consumers of health data and thus improve their communication. Their common benefit will lie in easier workflows and enhanced, better structured information. The time and energy saved from the often burdensome document management can be directed towards the patient's needs.

ELGA aims to provide relevant and important data like lists of prescribed and dispensed medication or discharge summaries or specialist's reports, e.g. pathology, radiology or laboratory reports. Doctors and nurses shall be able to fully use their curative potential without being distracted by the absence or inaccessibility of relevant facts.

The core requirements for ELGA are based upon the highest data security and interoperability standards within the established domestic and European electronic healthcare communities. The ELGA IT Architecture stipulates a geographically distributed system based on both centralized (shared) and decentralized patterns and components. The core building blocks are composed of numerous ELGA XCA Affinity Domains. Sensitive data are typically stored at their origins within these Affinity Domains without the need of establishing any centralized data store. However, the autonomous domains consume shared services which operate on centrally maintained high quality master data, like the Centralized Master Patient Index (C-MPI) and the Centralized Healthcare Provider Index (C-HPD). These services provide reliable sources of commonly used information about the participants which are mainly used for security reasons, notably in the Access Control System.

Granting access to a patient's health records requires the fulfilment of a set of technical, organizational and regulatory rules within the so called Authorization and Logging System. The parameters needed for interaction with this system are delivered from the C-MPI and the C-HPD.

Citizens will be able to access their personal ELGA documents, applications as well as to the safeguarding functions for the patient's rights via an internet portal. In order to access his or her electronic health record, the citizen can either use the personal Citizen Card, a secure smart card for e-government applications, or a transaction code on the mobile phone.

The citizen can authorise doctors and nurses to access his or her health data in ELGA and define the expiry date of the authorisation. This feature of the ELGA portal enhances patient autonomy and the enforcement of patient's rights.

Usability and accessibility are key issues of the successful implementation of the ELGA portal. In order to reach broad acceptance for the portal, the principal stakeholders and especially citizens and patient groups have been integrated in the making of the ELGA portal from the very start.

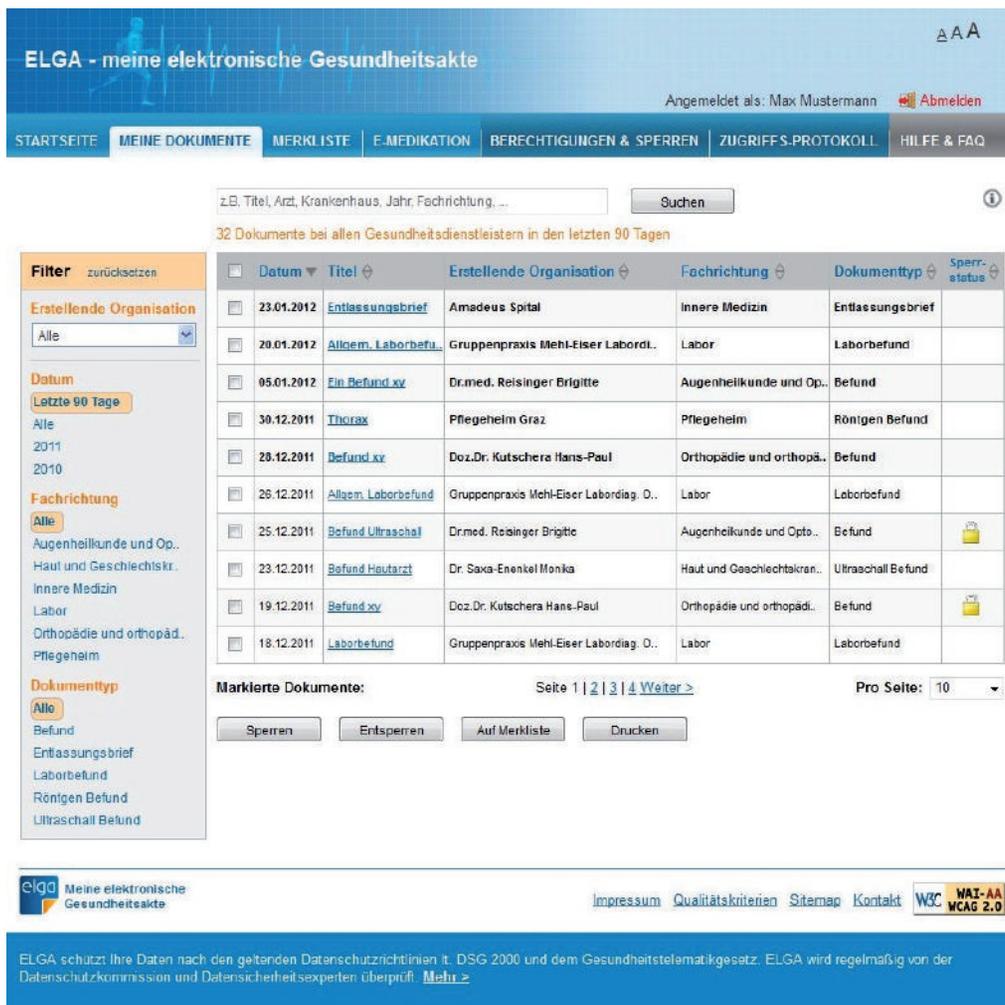


Figure 1: A major step towards patient autonomy: This screenshot shows a draft overview of personal health documents in the ELGA portal

HL7 Clinical Document Architecture (CDA) in ELGA

The information contained in the ELGA documents shall not only be read by authorized health service providers. It shall also be usable in their IT systems (so called „semantic interoperability“). Therefore, the Clinical Document Architecture (CDA), Release 2 was stipulated as the relevant document standard.

The XML-based CDA format carries the human readable information; in addition machine-readable data can be embedded in order to support semantic interoperability. Thus, CDA documents can not only be displayed on the PC screen and printed as usual, but single data from the document can also be imported into the recipient's IT system to be used for clinical decision support, calculations or statistics. Information on specific conditions, e.g. on allergies and on medication doses can be automatically integrated in the particular documentation of a health service provider.

ELGA provides access to the most frequently produced and exchanged classes of documents, i.e. the “Physician’s Discharge Summary” and the “Nursing Discharge Summary“, the “Laboratory Report, the „Diagnostic Imaging Report“, and the “Pathology Report“. Other Documents will be defined in the near future. The HL7 CDA Implementation Guides were elaborated on a consensual basis together with the main stakeholders of the Austrian health system, amongst them representatives of the Austrian Chamber of Doctors, nurses and physicians from both the primary and secondary care sector, the social security, hospital providers as well as the software industry, medical data exchange platforms and academics. At the end of the harmonisation process, the Implementation Guides were successfully balanced by HL7 Austria and are now national realm-specific HL7 standards. In total, approximately 200 persons were involved.

Conclusion

Due to the federal organisation of the healthcare system in Austria, ELGA is designed as a distributed system with central components for patient and healthcare provider identification and authorisation management. After its successful roll out, ELGA can provide the basic IT infrastructure for further applications such as an electronic certificate of vaccination, or registries for implants or patient’s provisions. Enlarged collaboration e.g. with telemedicine will also be possible. The principal challenge lies in organisational and procedural questions: ELGA might trigger new forms of nationwide collaboration and communication and has thus the potential to contribute to a fundamental modernisation of the Austrian healthcare system.

Stefan Sabutsch, ELGA GmbH

Further reading

S. Herbek, H. A. Eisl, M. Hurch, A. Schator, St.Sabutsch, G. Rauchegger, A. Kollmann, Th. Philippi, Pr. Dragon, E. Seitz, St. Repas. ELGA: The Electronic Health Record in Austria: a strong network between health care and patients. In Eur Surg 44(3): 129-204 (2012)

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CDA Validation Methods

by René Spronk



Introduction

The implementation of the CDA standard and the validation of CDA-conforming XML instances is based on two types of specifications:

1. The CDA class model, a refinement of the HL7 Reference Information Model (RIM). The class model is expressed in MIF (Model Interchange Format), HL7's meta model format.
2. Context-specific constraints (Templates) of the generic CDA model, as defined in a CDA implementation guide for specific document type and one specific context. At this point in time Templates are mostly defined in textual form. A single CDA implementation guide may define hundreds of templates.

A HL7 MIF definition of the CDA class model is provided with the HL7 v3 standard. The CDA MIF file can be transformed into less "rich" expressions such as UML and XML schema. Parts of the requirements as expressed by the MIF are lost during the transformation process.

CDA implementation using XML techniques

The standard requires that all CDA instances validate against a published CDA XML schema. This is the main reason why a lot of CDA implementations are based on the CDA XML schema. The wide availability of XML tools is a definite advantage; there are disadvantages as well. The XML schema language is not rich enough by far to express all of the requirements as present in the original CDA class model. A CDA document instance that validates against the XML schema is not guaranteed to be a valid CDA instance - to be a valid CDA instance one has to create XML that conforms to the requirements that are expressed in the CDA class model.

Class generators are commonly used next to other well known XML techniques such as XPath and DOM/SAX. JAXB is an example of a class generator: a tool which transforms XML schema to corresponding Java classes.

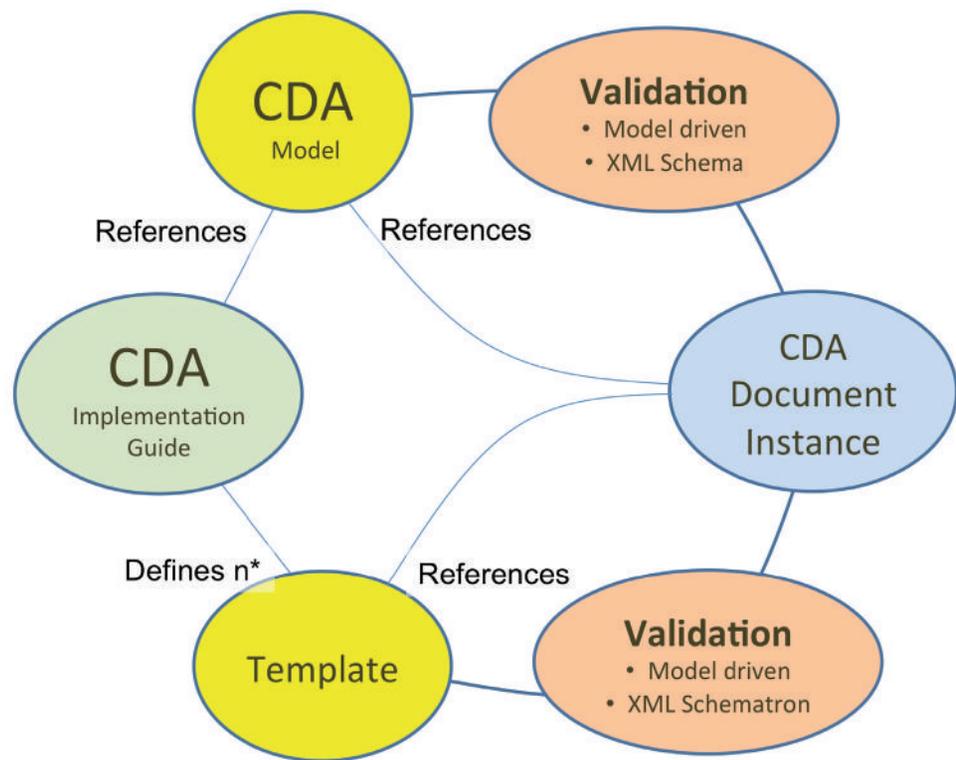
There is currently one freely available toolkit that has the capability to generate schema and schematron files for CDA templates:

ART-DECOR (www.art-decor.org), a HL7 version 3 (not just CDA) tool for (amongst other things) defining and managing constraints on HL7 v3 models, and has the capability to generate schema/schematron to validate such constraints.



Model driven CDA implementation

In order to fulfill all requirements as expressed by the CDA class model the starting point for all CDA implementations would have to be the CDA MIF. MIF however has the disadvantage that it is a HL7 specific format which is only supported by a limited number of tools. Because of the fact that CDA essentially is an information model without any behavioral aspects associated with it one has the option of creating a very solid mapping from CDA MIF to UML, which in turn allows for the use of UML based tools.



The CDA MIF (or the UML equivalent thereof) can be used by class generators to create a set of classes (in e.g. Java or C#). There are a couple of freely available class generators which one could consider when implementing CDA:

- 1. MDHT (<http://www.cdtools.org>), a CDA specific class generator. This tool generates Java classes based on a UML representation of the CDA class model and on an OCL representation of applicable templates.
- 2. MARC-HI Everest (<http://everest.marc-hi.ca>), a HL7 version 3 (not just CDA) MIF-based class generator, which doesn't support the notion of Templates.

Summary

When it comes to CDA there are two types of specification: the CDA model itself, and any applicable Templates. This article describes two approaches for implementation and validation of CDA documents: model driven code generation, and an approach using XML Techniques.

Model driven code generation is the preferred implementation option given that it allows for full validation of the CDA model and Templates. The use of XML techniques, whilst not allowing for full validation, is acceptable in projects where full compliance is not that important – sometimes 90% compliance is simply good enough.

In real-world projects the definition, management and validation of a multitude of CDA Templates tends to be one of the major issues. The MDHT tool is currently the best tool available to support model driven code generation and therefore CDA validation.

René Spronk, Ringholm BV, the Netherlands

This article is an abridged version of an HL7 whitepaper that can be found at <http://j.mp/gDwZKm>.

Antilope

Antilope is a Thematic Network and the objective is to develop documentation and educational materials in order to promote the dissemination, adoption, take up and testing of existing and recognized profiles and standards selected as part of the eHealth European Interoperability Framework (eEIF).

This will be achieved through the initial production of high quality documentation to be used in multi-stakeholder, multi-country workshops where experts, opinion leaders and decision makers will be confronted with that material and will be encouraged to implement the Antilope actions in order to deploy eHealth interoperability. Issues and barriers will be recorded and solutions proposed.

Four workpackages are defined to provide guidelines, recommendations and frameworks based on a set of use cases, related profiles and standards, Interoperability Quality Management System, testing guidelines and Certification process. The scalability of the results from the preparation phase to the EIP on Active and Healthy Ageing is also considered. All the deliverables will be presented for validation and promotion by organizing workshops across Europe covering a region of countries based on proximity.

The consortium includes the required expertise by mixing a core group in charge of the production of the documentation, the expert partners bringing the specific expertise and the supportive validation partners in charge of the organization of the workshops for the dissemination of the Antilope recommendations among all stakeholders in their geographical area.

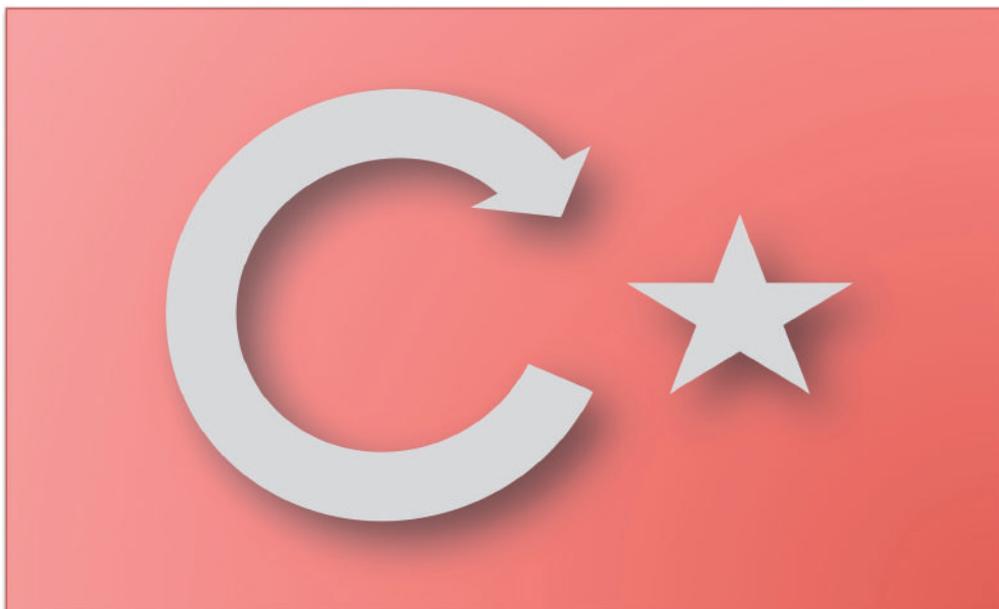
These beneficiaries represent standards (development) bodies, national or regional health authorities, competence centers and other directly relevant organizations and will allow the Thematic Network to build wide support across the EU for the approach and products of Antilope.

The project is a two years project starting in February 2013 where more than 20 partners are directly involved to the deliverables including educational materials and organization of the workshops.

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Turkish Health-Net: Reloaded

In 2005, the Turkish Ministry of Health started the Family Medicine Information System (FMIS) with the aim of nationwide interoperable health information system in primary care. This earlier information system was collecting information from primary care to monitor public health indicators, and, was planned to transform into an electronic health record system in time. Later in 2007, initial version of the Health-Net was introduced as a separate information highway, that was aiming to acquire health information produced in the secondary and tertiary healthcare providers. Both of these systems adopted HL7 V3 as the communication standard of choice for information exchange. Although these two systems was serving for a part the national health information, these had worked almost completely independent as two different incompatible systems.

Turkish Ministry of Health has launched Health-Net version 2.0 with several improvements on August 2012. This CDA R2 based new version finally merges these two systems to cover all the providers from three levels of the national healthcare system. This is an important further step to nationally integrated health information system and electronic health records. The system also closes the gap between primary care and secondary/tertiary care by allowing and controlling bidirectional information flow and giving the opportunity to track and manage referrals among each other.

Health-Net 2 relies on a newer version of *National Healthcare Data Dictionary* (version 2). This dictionary describes the properties of individual data elements that are grouped to form many *Minimal Healthcare Datasets* (MHDS), each capturing some information in different scenarios during healthcare processes such as immunization records, prescription or observations, as well as special disease specific conditions for follow up of long term chronic diseases. Information communication relies on CDA R2 based packages (i.e. documents) that was created by one or combinations of several MHDSs (i.e. document components). All providers are expected to transmit patient data to centralized servers located in the Ministry of Health.

In Health-Net 2, overall information flow is categorized into seven different packages:

Demographics package

This package intends the maintenance of patient demographics. Privileged providers may update patient's demographics on any information change. Basic demographic information is provided by an integration to national Identity Sharing System. The Identity Sharing System is an online service for sharing the information which is stored on the database of the Central Population Management System maintained by the Ministry of Interior General Directorate of Population and Citizenship Affairs. This integration helps to improve the consistency of demographic information.

Encounter package

This package aims to be used by the providers to capture any information produced during a patient encounter. It may be consisted of several MHDSs. E.g. admission information, physical examination findings, laboratory request, laboratory results, tobacco use and obstetrics examination.

Laboratory investigations results

This transmission package is mainly used by laboratories to transmit laboratory results to Health Net.

Citizen Registration

Privileged providers may register a person if s/he has not been registered to the system before. A common use of this service is the registration of a newborn to the system for the first time by the family doctor.

Inpatient package

All the information produced during the hospitalization such as physical findings, laboratory results and procedures should pass to Health Net forming an inpatient package consisted of corresponding MHDSs.

Notification of death package

Healthcare providers should send this package containing the details related to death of the patient.

Human Immunodeficiency Virus (HIV) infection package

This package is specifically used for the follow up of HIV patients. Package may contain many MHDS such as admission information, prescription, requests and results of laboratory tests and encounter records.

Information Semantics

National Healthcare Data Dictionary is supported by several coding and classification systems like gender codes, blood group codes, International Classification of Disease 10th version or national procedural codes (SUT Codes). These coding systems are maintained on a terminology server so called Healthcare Coding Reference Server (HCRS). Health-Net 2 relies on HCRS version 3. The LOINC codes will soon join the HCRS. But, still there is a room for further growth, especially for the terminologies on clinical information such as SNOMED CT.

Ergin Soysal, MD, PhD

HL7 Turkey, Chair

Hacettepe University, Informatics Institute, Vice Dean

Dept. of Health Informatics, Chair

SemanticHealthNet

by Charlie McCay



The SemanticHealthNet project is a high profile FP7 funded project that is well placed to inform and influence European policy on how healthcare information specifications are developed and maintained.

It is looking at how healthcare and biomedical information can be usefully and safely shared across and within Europe in ways that increase the health and wealth of the region.



The project is treating this as a challenge that requires collaboration at the organisational level as well as the technical level. The project is not looking to establish a new organisation, nor is it looking to invent new technologies or approaches to interoperability and sharing data. Instead it is working with the Standards Development Organisations and other stakeholders to see how specifications for information models, terminologies and ontologies can be managed and used in a coherent way, and how those organisations that are moving the state of the art forwards can collaborate within a Virtual Organisation. HL7 is recognised to be a key player in this collaboration.

HL7 has a great deal to offer to Europe in this space:

- Established Fundamental Standards such as CDA, Clinical Statements and the HL7 V2 messaging
- Numerous European National Initiatives that promote HL7 CDA documents, V3 Information Models, HSSP services, and V2 messaging specifications for widescale use
- Many of the European FP7 funded projects are using HL7 specifications as a basis for exchanging information, including epSOS patient Summaries and
- Vibrant network of affiliate organisations across Europe with significant membership.

- Huge supplier investment building on existing product support for HL7 standards, and driven by Meaningful Use requirements for CDA and HL7 V2 messages in the US as well as European National Initiatives.
- Future-looking standards developments, including FHIR and SAIF.

The cost of accessing HL7 standards was the major issue when this project began eighteen months ago. The decision to make HL7 specifications freely available for use has radically changed that, and means that HL7 engagement in the project can move on to looking at how to simplify the use of those specifications.

The Consolidated CDA project in the US provides a pattern for how a toolkit of CDA section and entry level templates can support defining what information is needed for a particular exchange, and make it easier for suppliers to implement new clinical exchanges. Within SemanticHealthNet we will be looking at how the epSOS Patient Summary CDA profile, and the Consolidated CDA profiles can be constrained/extended to meet the Heart Failure usecase.

This approach of constraining existing CDA Implementation guides for different clinical use cases avoids replicating all of the implementation guidance and avoids redefining the information that is common across many different clinical scenarios.

The epSOS Semantic Services definitions define the Patient Summary content by further constraining the CDA header and templates for sections and entries that are defined in the IHE Patient Care Coordination specifications. Within SemanticHealthNet we will take this epSOS patient summary definition and define just the additional constraints and entries that are required to support our exemplar usecase. The intent is to take the underlying Patient Summary definition for granted, and to just define the information requirements that are specific to Heart Failure.

As well as providing a way forwards grounded in the way that epSOS has used CDA, this approach will be informed by the work that is being done on Detailed Clinical Models in the HL7 Patient Care Committee and the xParadigm project.

What we aim to do in the SemanticHealthNet project is to illustrate how these workstreams can inform collaborative activities in Europe, by pointing to the artefacts that need to be governed, and the way that HL7 decision making processes can form part of the European virtual organisation's decision making processes.

Charles McCay

Project's HL7 technical contributions

Acknowledgements

This work is made possible by FP7 Grant Agreement 288408 for the SemanticHealthNet project.

References

Further details available at

<http://wiki.hl7.org/index.php?title=SemanticHealthNet>

<http://www.semantichhealthnet.eu/>



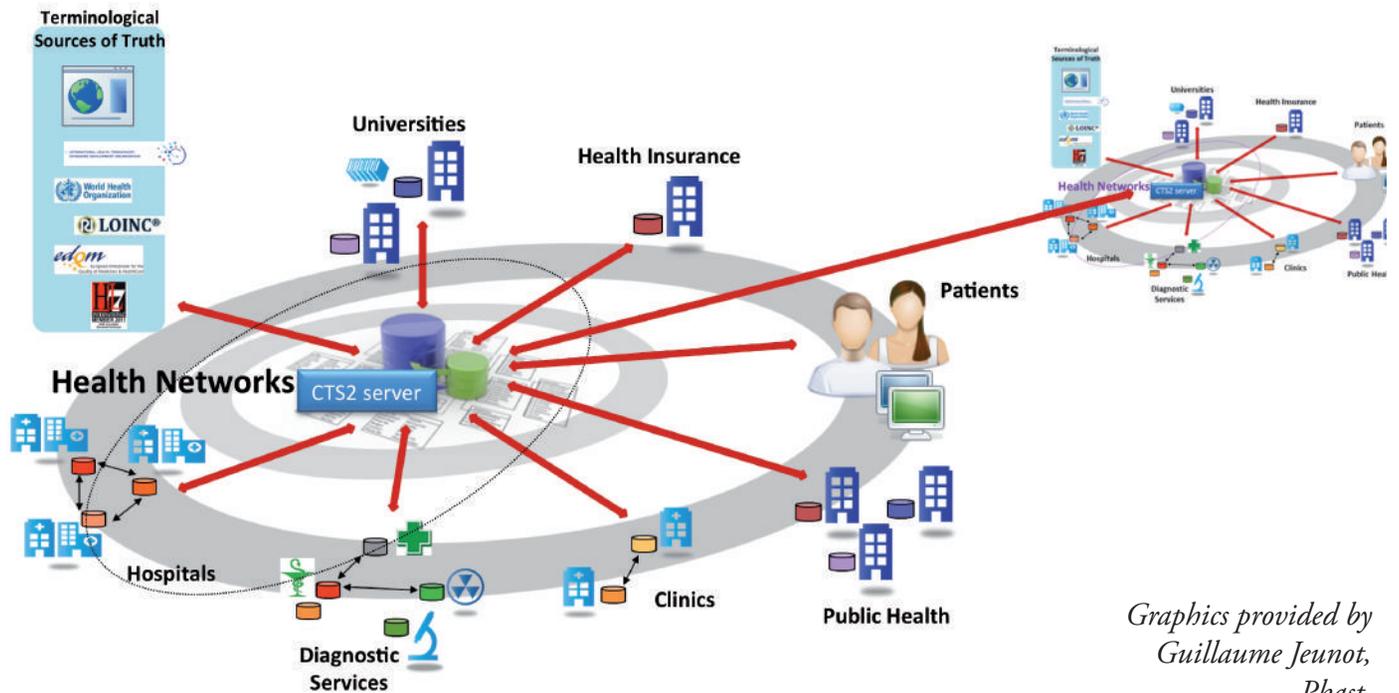
A Key Component to Shared Semantics and Data Interoperability

Common Terminology Services

The HL7 Common Terminology Services Release 2 (CTS2) Service Functional Model (SFM) Normative (N) standard describes a common, modular expected set of behaviors of a terminology server when using and managing terminologies in a deployment environment. CTS2N covers several aspects of browsing, authoring and managing terminologies, grouping its operation in functional profiles. A draft version of this standard was published by HL7 in 2009 for trial use (Draft Standard for Trial Use or DSTU), which will be balloted by HL7 as a normative (official) standard as part of the joint effort between the HL7 Vocabulary and SOA Working Groups in May of 2013.

The CTS2-based services contribute to interoperability both within and between healthcare networks, ensuring access to a uniform, transversal vocabulary equally understood by patients, healthcare professionals and the systems exchanging primary care information. When accessed by an end-application, these web services enhance the ease of capturing information and prevent errors. Healthcare professionals are provided with pick-lists (drop-down menus) containing the terms they need to use for coding patient information at the point of care. This is achieved through the CTS2 functionality of binding terminology to a particular usage context. The pick-lists contain terms recommended by clinical guidelines or national implementation guides, and they can be used to assist the healthcare professional in clinical decision support. These groups of terms used within a special context, or value sets, are carefully selected from official terminologies as deemed most appropriate by representatives of professional associations working together with Subject Matter Experts from national agencies or Standard Development Organizations. To support their work, CTS2 not only provides Authoring Binding and Authoring Value Set functional profiles, but it also provides the terminological sources of truth with the necessary functionalities to create concepts and terminologies (code systems).

In order for these authoritative value sets to be consistently applied across healthcare networks, the system administrators or a designated person can then be notified to import them or change their status or even export them according to the workflow in place, ensuring that the end-users work with the latest version of the available terminology. The administrator can also facilitate the transition from a local, in-house terminology to an official one by the use of the CTS2 Authoring Association profile used for mapping. The mapping functionalities are especially important in cases in which two terminologies with different life cycles are associated – such as LOINC for laboratory results associated with billing terminologies used in the respective Member State or jurisdictional domains. The correct use of CTS2 can assure the use of the latest version of the terminology in official use, which is crucial, especially when dealing with health insurance reimbursement. CTS2 is also very important in a multi-lingual environment where terminologies need to be translated in the Member State language.



Graphics provided by
Guillaume Jeunot,
Phast.

There are but a few of the basic functionalities that a CTS2-based server can provide contributing effectively to easy capture, storage, linking of clinical records for continuity of care in different settings, review and comprehension of the clinical data by all participants, and especially the patient. CTS2 also greatly improves the secondary use of data by public health agencies, research and quality monitoring agencies, enforcing a common coded terminology needed for correct data aggregation.

Both primary and secondary seamless communication of health related data need a secure shared semantic space and CTS2 is one of the core components assuring interoperability standards in eHealth. Shared semantics are essential to harmonizing fragmented healthcare networks across Member States, one of the ICT themes of the Seventh Framework Programme (FP7) Specific Programme of the European Commission.

The need for a common terminology service in the pan-European space has been made obvious as illustrated by the epSOS project, and it is encouraging to know that there are several CTS2 implementations in Europe, out of which two¹ served as direct input for CTS2N: namely the terminology server of the

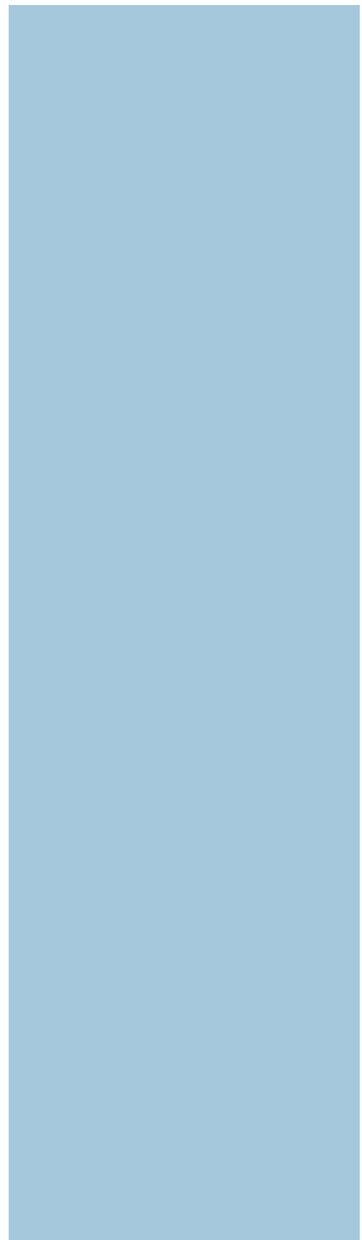
- University of Applied Science, Dortmund, Germany (<http://www.wiki.mi.fh-dortmund.de/cts2/index.php?title=Hauptseite>), and the
- Standard Terminology Server (STS) of Phast, France (<http://wiki.phast.fr>).

Implementations exist as well across the Atlantic, for example that of the

- Mayo Clinic (<http://informatics.mayo.edu/cts2>).

Interoperability between the Mayo Clinic BioPortal server and Phast's STS has been achieved based on the CTS2 standard.

The 2009 CTS2 DSTU has served as well as basis for the technical specifications published by the Object Management Group (OMG) within the Healthcare Services Specifications Project (HSSP)² known as the Platform Independent Model (PIM). The CTS2 Normative version submitted for HL7 May 2013 ballot includes the lessons learned from these real-life implementations as well as from the development of the PIM, and provides implementers with modular functional



conformance profiles while also providing links to the corresponding PIM services.

Help us improve the standard and spread the word!

Ana Estelrich, HL7 CTS2 project leader

Nicolas Canu, HL7 France president

Footnotes

1 Other CTS2 implementations we came across throughout the project are the Integrated Terminology Server (ITS) of Indizen (<http://www.itserver.es/ITServer>) in Spain, and the DiTAM (Distributed Terminology Assets Management) infrastructure of Codices (<http://www.codices.com/>) in Italy.

2 The Healthcare Services Specification Project (HSSP) [<http://hssp.wikispaces.com>] is a joint endeavor between Health Level Seven (HL7) [<http://www.hl7.org>] and the Object Management Group (OMG) [<http://www.omg.org>].

by **Ewout Kramer** and
Robert Stegwee



Meet FHIR, the “digital native” of the HL7 family

Since Health Level Seven as an organization has been around for over 25 years, it should not come as a surprise that new standards within the HL7 family of standards for healthcare interoperability keep popping up.

The first major version to get real uptake, particularly in hospitals, has been the version 2.1 standard to connect ancillary systems to the core hospital information system. Still, version 2.x is being used for similar purposes, like exchanging the results of lab-tests between a lab and a care organization. Development of version 3 started over 15 years ago, much more aimed at rigorous modeling of health information, to make sure the meaning of the data being transferred would be well understood by (computerized) receivers of the information.

The most successful member within version 3 globally has been the Clinical Document Architecture, which provided a basis for flexible exchange of information, not putting too much of a burden on the recipients' systems. A web browser with a CDA style sheet was often sufficient.

More rigorous and hence taxing approaches have been taken with version 3 messaging in the national infrastructures of e.g. England and the Netherlands, where patient summaries and medication information are now shared nationally, based on fully detailed information models.

In the fall of 2011, HL7 International raised the question: “What would a good specification look like, if HL7 were to start from scratch?” This question triggered the birth of a new HL7 family member, truly a “digital native” as most young kids are today, as it is well rooted in the current knowledge of the information technology landscape which consists of all types of devices and services interacting with each other in ad-hoc and unplanned ways. The HL7 community was more or less on fire with enthusiasm and debate when they first learned about Grahame

Grieve's ideas on resources for health, which is probably why they named the baby Fast Healthcare Interoperability Resources, or FHIR pronounced as "fire".

Over the last year and a half, FHIR has shown its potential to the world, through a first FHIR connectathon at the September HL7 International working group meeting of 2012 in Baltimore and yet another planned for October 2013 in Australia. FHIR is not a static paper specification but an actual set of working principles and products that can be used in (app) development and tested against each other. Also, it is a truly international development, with a core editorial team coming from Australia (Grahame Grieve), Canada (Lloyd McKenzie) and the Netherlands (Ewout Kramer). All other important people and organizations contributing to this initial boost of enthusiasm around FHIR can be found at <http://hl7.org/implement/standards/fhir/#credits>. You may also be excited to know that the first translation into Japanese is available as well! The developments within FHIR are going at internet speed, which is necessary to keep up with the thousands of yet unconnected medical apps that are striving to make the world a healthier place to be in. So for the latest news, please look to

■ <http://hl7.org/implement/standards/fhir>

and read on for an introduction into the background of this new and exciting member of the HL7 family.

Several notions and insights have inspired the development of FHIR. Not in the least the notion of a one-stop-shop where any software developer can go and pick up the bits and pieces necessary to develop a simple yet effective health information interface, preferably over the weekend. These bits and pieces according to FHIR are called 'resources'. Examples of resources are a patient, a lab test, an appointment, even an order or a procedure is a resource to be communicated.

For this purpose, a resource is a self-contained, well-defined and fully documented piece of information, which may be linked to other resources but is not contained within other resources. To make HL7 travel at internet speed, FHIR is grounded in and makes use of well-known software standards such as REST, Json and Atom, which are lightweight web technologies that are available to anyone. To make the resources easy to use, they are limited in their core definition, to contain at least those data elements that are essential for basic communication. As these requirements may be different in specific countries or specific situations, resources have a well-defined way to tailor the core definitions to fit these specific needs. This may lead to (national) variations of resources, but these are in line with the international variations in medical practice and care organization. Having a common core component should make reuse, reconciliation and implementation easier than the current HL7 version 3 route through high-level RIM-based modeling.

FHIR builds upon the clinical knowledge (and wisdom) embedded in 25 years of healthcare interoperability standards development within HL7 International. The discussions that we have had on how to (internationally) represent patient data will be leveraged in constructing the FHIR resources. Just as FHIR builds upon existing web technologies, it will reach out to the working groups within HL7 International to help build resources that are sound and valid from a clinical and health informatics perspective. The key challenge will be to make the tough choices to keep both the models and the interface specification simple, while still supporting the most common real life scenarios. Keeping complexity low promotes ease of implementation, market acceptance and, ultimately, market penetration. This also means FHIR avoids adding direct support for less common use cases, which otherwise tend to fill most of a specification's content. Remember: people need to be able to understand this "over the weekend" and hence the

FHIR standard serves a different community than the version 2 and version 3 standards, at least initially.

Until now, FHIR has developed a set of technical and architectural specifications that have been tested at connectathons in Baltimore (2012) and Phoenix (2013) and balloted as a draft specification. Early implementations are the basis for the connectathon, and a number of organizations were very helpful in participating and making available the necessary infrastructure components. Currently most of the effort is focused on defining the actual content of the resources, which need to be agreed upon and balloted, starting with resources like patient, medication prescription and administration, diagnostic reporting, and visits and hospitalization. In addition, the team is already looking into the implications of FHIR on the maintenance organization and support services that need to be set up around the new standard, including education and training. Even though FHIR is taking its baby steps, remember what development at internet speed means: within a few years FHIR may see millions of users, as the use of mobile devices and web technologies for patient use of health information will need to become interoperable with everyday healthcare technologies.

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

Robert Stegwee, chair of HL7 Netherlands and consultant with Capgemini Consulting for Health Information Technology and Strategy

by Robert Stegwee



HL7 Netherlands intensifies its cooperation with IHE

The Ministry of Health, Welfare and Sports, as well as other key policy makers in health care in the Netherlands, have expressed a renewed focus on the application of standards for information exchange in health care. At the national level, the Minister recently gave a clear description of her expectations through the establishment of a new national Health Care Institute, which will have an authoritative role in quality standards for care and care information, and through the recognition of the National Implementation Agenda for eHealth, for which standardization is an important precondition to success. At the same time, numerous tangible developments, in the form of projects at local, regional and national levels, seek to establish the practical implementation, cooperation and further development of standards for information exchange.

Standards are essential for reliable, consistent and secure information exchange. Standards also enable the quick and cost-effective development and deployment of applications for information exchange, because they offer complete products to health care providers, health professionals and patients that allow interoperability to be established.



Information exchange is a key responsibility of patients and health professionals. Standards are built around their basic needs and obligations to exchange information amongst each other and with other agencies in health care. Health professionals and patients are supported by health care providers and other organizations that make available the health information infrastructure and its related EHR and PHR applications. The HIT suppliers involved make sure the standards are realized in their underlying technology and applications. This perspective on standards applies to both the top-down approach of national projects, as well as for projects that are developed bottom-up by local, regional and domain specific groups.

The renewed policy focus on the application of standards for the exchange of information, both from the Ministry and from the other stakeholders, is seen as an important milestone and underscores our vision that a clear and equal cooperation at all levels is required to achieve the necessary standards for health information exchange and their application in day to day health care practice.

HL7 and IHE in the Netherlands are two organizations that concentrate on the realization of standardized information exchange in health care, with respectively 20 and 10 years of experience in health care in the Netherlands. HL7 focuses on the development of universal, generic and international standards that cover all areas and processes, while IHE is mainly concerned with defining and implementing specific application profiles that are based on international standards. The members of HL7 and IHE consist primarily of the health professionals, health care providers and HIT vendors that are necessary for this exchange of information to take place in practice. In addition, umbrella organizations, knowledge institutions and service and consultancy providers are member of our organizations. For many years, they have made their time and expertise available on a voluntary basis in an open national and international cooperation to achieve workable standards for health care. This applies both to the more than 400 members of HL7 and IHE combined in the Netherlands, as well as the thousands of members we both have internationally in over 35 countries.

After a period of four years of board level cooperation, during which an active alignment has been achieved between HL7 and IHE in the Netherlands, it is time for a next step. The combined boards have decided, given the overlap in our membership and the shared mission and goals of our organizations, to work together as much as possible starting 2013. This is expected to lead to significant strengthening of our cooperation in the development and support of standards and profiles. It will have an impact in the support of our members and in our collaboration with other stakeholders in health care in the Netherlands.

In our decision to intensify the cooperation, we are supported by many of our members and stakeholders, in particular by the association OIZ, which brings together the vendors and service providers of Health IT. In our discussions with the umbrella organizations of patients (NPCF), medical professionals (KNMG) and health insurance companies (ZN) on this extensive form of cooperation, our intent was received with much appreciation. Given both our roles as formal Dutch representatives (“affiliates”) of the international HL7 and IHE organizations, the legal and formal design of IHE and HL7 in the Netherlands will remain unchanged. We will both continue to fulfill our international roles as well as possible with the aim of international standards meeting the requirements and needs of the Dutch health care. The collaboration of our organizations within the Netherlands will focus on harmonization of standards, profiles, training, knowledge, user platforms, and other services, as well as representation of our members and participation in standards activities at a national level.

The results of our decision to strengthen the cooperation will become visible during the course of 2013. In addition, we are in the process of also strengthening our joint relationships with the national institute for health IT (Nictiz) and other standards organizations, such as the national standards body NEN, to further coordinate and harmonize our roles and positions at a national level. The aim is to establish, from a health policy perspective, a single source of clear and unambiguous direction for the future national collaboration on standardization of information exchange in health care, based on the day to day needs and priorities of patients and health professionals in delivering health care.

Robert Stegwee, chair HL7 Netherlands

Based upon a joint press statement of the boards of HL7 Netherlands and IHE Netherlands

by Jeremy Thorp



epSOS and Sustainability

Any European citizen is free to live, work and travel anywhere in Europe. So what happens if someone falls ill? Under the European Directive on the application of patients' rights in cross-border healthcare [1], there are rights to healthcare supported by operating principles "to ensure patients' trust in cross-border healthcare ...necessary for achieving patient mobility as well as a high level of health protection".

These rights for the mobility of patients and healthcare workers have highlighted the need to share health records across national boundaries. In most cases it is hard enough to exchange patient data from one hospital to another, or even from one doctor to another. How can you safely exchange patient information across borders, in different languages, across multiple systems and domains?

This is the challenge set by the European Commission when it issued a call for proposals for a large-scale pilot to provide concrete cross-border services that ensure safe, secure, and efficient medical treatment for citizens when travelling across Europe. Two specific areas were identified: a shared patient summary for EU citizens and an e-prescription service (including e-dispensing). The epSOS project started in 2008 with 12 member states and 29 beneficiaries, including an industry consortium of more than 30 partners. The project completed its specification stage in 2009 and moved into design and development with testing in 2011 and piloting in 2012. During that time, the project expanded to 23 Participating Nations and to include new use cases including patient access.

One of the underlying principles has been to ensure that epSOS does not force changes on local systems in each country. The project has had to create messages for patient summaries, e-prescriptions and e-dispensing. This has required a wide range of technical and semantic standards, based on a CDA model carried by HL7 messages operated within amended IHE profiles and tested in a Connectathon-like setting. The semantic challenge has been complex, especially given the many languages across Europe, and includes mapping concepts from scheme to scheme and specific translation issues. Alongside this, project teams have also been addressing legal and organisational interoperability (with supporting agreements).

In 2012, with encouragement from the European Commission, the project began to develop a reference implementation of the technical infrastructure that connects the national eHealth system of a Participating Nation to the epSOS network. This is available under the open source GPLv3 and Apache Software License v2 [the software artefacts are available through the EC Joinup repository].

epSOS has created a foundation for the safe and secure cross-border exchange of patient information for all Member States. The biggest achievement has undoubtedly been the successful working together of so many countries and industry partners to achieve a joint objective – namely working pilots that are able to exchange patient information safely and securely. The combined efforts of the countries, industry partners and multiple country beneficiaries show how much can be achieved where there is a will to succeed.

As the project formally completes at the end of 2013, attention has been focussed on sustainability, conscious that specific activity (particularly in pilot sites) needs to be consolidated into long-term action.

The European Commission had already announced proposals for a joint action approach to e-health governance, including the commission and member states and a thematic network to support the joint action. The aim is to ensure the e-health initiatives make a contribution to health outcomes and efficiency in delivering services, to ensure patients and health staff have more influence on the e-health agenda alongside the health IT industry, and to work toward an efficient and safe system of transferring patient data across EU borders to support cross border care.

Through the European Commission there is already dialogue with the US Government, and epSOS has already been asked to submit its patient summary for consideration by the eHealth Network who are responsible in the Directive for recommending the patient dataset to be used as the basis for cross-border information exchange of patient data across Europe.

epSOS has created a foundation, and each Member State is committed to the implementation of their own eHealth roadmap. Together these provide an exciting opportunity for improving the quality of care, and empowering patients in a mobile and dynamic Europe.

epSOS has achieved all its major goals, with the likelihood that more countries will begin piloting in 2013. The real value of epSOS, however, will be shown in what happens after the pilot phase is complete. epSOS has laid the foundations for cross-border exchange of information – not just for Europe, but for the whole world.

Jeremy Thorp

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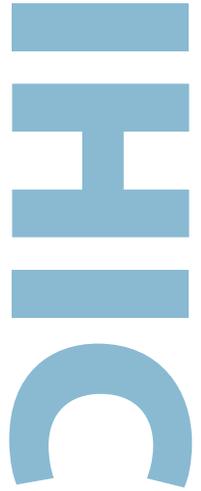
Tel: PA Angela Walters (+44) 113 397 3486

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13th International HL7 Interoperability Conference in Vienna, Austria



The 13th International HL7 Interoperability Conference (IHIC) was held from 27-28 September 2012 in Vienna, hosted by the affiliate HL7 Austria. As the international scientific forum of the HL7 community, the IHIC allows scientists and implementers to present and discuss concepts, models and implementations for innovative interoperable e-Health solutions. The conference also aims to close the gap between science, research and real world. Held since 2000, the annual IHIC is now a key event of scientific research in the area of HL7 and interoperability in healthcare.

In spite of the short time available for preparations, the Austrian program committee with HL7 Austria chair Stefan Sabutsch, Alexander Mense and Peter Seifter, completed by HL7 Germany chair Kai Heitmann, Bernd Blobel and Catherine Chronaki from HL7 Greece, organized a dense program of inspiring presentations from experts around the world.

The session topics of the conference comprised various concepts and frameworks for smart interoperability infrastructure services, models for intelligent use of Electronic Health Records (EHR) and joint HL7 and IHE implementations at regional and national level. A broad range of new concepts and solutions was presented: from approaches to increase patient empowerment by the intelligent use of EHR, to reports about success and challenges in national approaches, e.g. in Australia, Canada, Columbia and Korea, to the use of HL7 in telemonitoring solutions and in surveillance systems, standards based testing approaches and new ontological approaches to further interoperability.

The quality of submissions to the conference was very high. Despite the strict review process performed, all accepted peer-reviewed contributions of the 13th IHIC were published in cooperation with the editorial board of the European Journal of Biomedical Informatics (EJBI) in the EJBI volume 8 (2012), issues 3 and 4. This EJBI special topic volume “Standards and Solutions for eHealth Interoperability” provides solutions for interoperability of European health information systems. It addresses standards, specifications and their implementation in local, regional as well as international eHealth solutions, thereby representing different institutions, regions and countries around the world.

One highlight of the conference was the bestowal of the Joachim W. Dudeck Award by the HL7 International Council for the best conference paper of a young author. This award has been launched in 2011 in memory and honor of the outstanding German physician, scientist, lecturer and standards developer Joachim W. Dudeck. He was the founder and long term Chair of HL7 Germany, the first Affiliate Director at the HL7 Board of Directors and author or contributor of many specifications around HL7 and XML in health informatics. Sponsored by

HL7 Germany, the Dudeck Award distinguishes outstanding achievements in developing and/or implementing HL7-based interoperability solutions as well as in promoting the use of HL7 and its harmonization with other specifications. On the occasion of the 13th IHIC, the award was bestowed upon Edgar De La Cruz, a student at the University of Cauca, Colombia, who presented a national reference architecture for the exchange of CDA documents in Colombia.

The 13th IHIC was topped off by the well-known session „Show me your CDA“. Presentations of new development strategies for CDA documents, implementations of Severe Adverse Event reports or CPET results and demonstrations of powerful tools for CDA implementation allowed participants to gain an in-depth view on new CDA developments all over the world. Active discussions offered the backdrop for a successful conference, supporting the strengthening of networking and the creation of synergies among the thriving HL7 community.

Especially the international HL7 community took great interest in the event. Besides affiliate chairs of Australia, Czech Republic, Switzerland, Germany, Italy, Great Britain and of the host country Austria, several representatives of the HL7 International, CEO Charles Jaffee and CTO John Quinn, Director at large Jamie Ferguson, Catherine Chronaki, Philip Scott and Michael van Campen, as well as ISO TC 215 Secretary Lisa Spellman were welcomed.



Above: Kai U. Heitmann presenting the Joachim W. Dudeck award

left: Great interest and discussion at the conference

bottom: closing "remarks" of the conference at the Heurigen, a typical Austrian get-together



With over 80 participants of more than 20 HL7 affiliates around the world the IHIC 2012 followed the success of previous IHIC venues. We thank all the participants of last year's IHIC and are looking forward to seeing each other again at the 14th International HL7 Interoperability Conference from 28-30 October 2013 in Sydney!

Barbara Franz, University of Applied Sciences Upper Austria





Spirometry Tests Standardization and its Implementation in Catalonia

Since the appearance of electronic medical devices, many have been the formats that have represented output data from those devices. Each of them was independent and manufacturer's own, from this way, obtained information was offered a low interoperability, so its integration with hospital information systems is difficult.

Due to apparition of CDA R2 model, emerged of HL7's version 3, standards can be defined to cover the difference between different data formats extracted from devices, and at the same time, to structure the information in the proper way.

In this article, it's detailed the methodology used to normalize the spirometry test, since its proposal until its approval, and finally, it specifies the first standard implementation experiences in centres and hospitals in Catalonia.

Respiratory diseases, specially the COPD, lung cancer and tuberculosis, are the main causes of mortality that will continue to increase during next decades. Spirometer is the medical device mandated to measure the pulmonary volume and capacity, identifying possible alterations. Commonly, all devices have a proprietary output data format, and this is a setback for the integration on different environments, being that when store data on a shared repository, they aren't interoperable due that they not share the same format and, mostly, they doesn't contain structured data.

Driven by "Oficina d'Estàndards i Interoperabilitat de TICSalut" and "Pla de Digitalització d'Imatge Mèdica de Catalunya", there has been created a standard based on HL7 version 3, CDA R2. The goal is normalize a complete data set, including both received data from spirometers and those that come from the test citation, provided by electronic clinical history from hospital or medical center.

Consequently, is achieved to obtain a spirometry report that contains, not only the information related with the spirometry test, but also all the data from the test request, patient identification and spirometer. This set of data from different sources, requires applying a CDA R2 structure, oriented to ease the integration between medical device and the HIS, and a higher interoperability among hospital information systems.

The data model [1] has been realized by a multidisciplinary scientific team, formed by pulmonologists, health-tech experts and spirometer manufacturers, thus providing different perspectives about this model, and enriches it with the knowledge of the different team profiles.

There are two versions of this data model, the first more detailed, clearly oriented to a subsequent execution of a data mining system, and the second, more basic and taking into account that not all the centers or hospitals can provide the information demanded on the detailed version.

After the data model generation, there are generated a set of normative and technological artifacts, to facilitate the standard implantation:

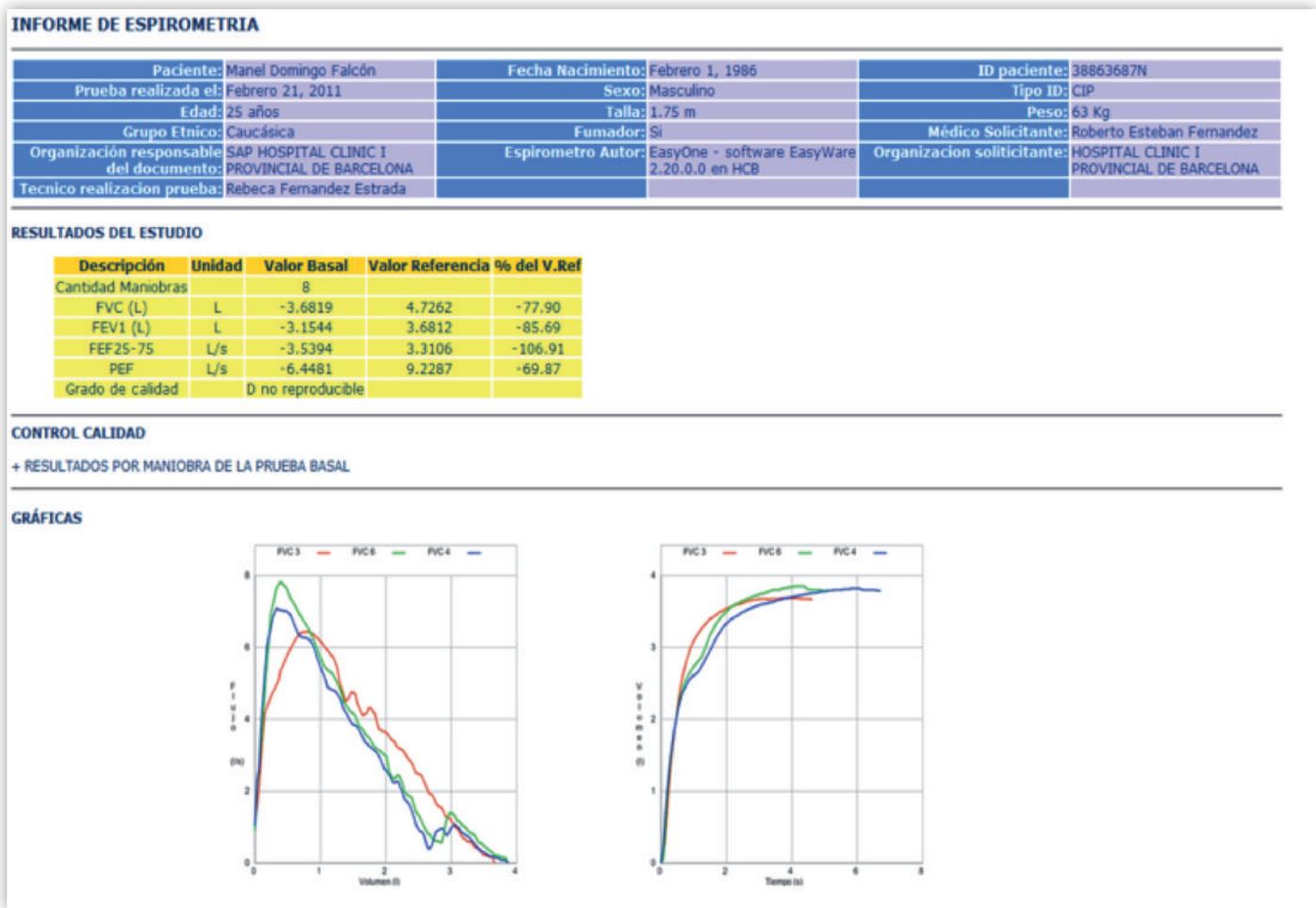
- CDA R2 Spirometry implementation guide [2]: Contains the norms to follow to implement CDA R2 correctly, with mandatoriness of each field, as well as its content. There have been realized two versions also from this guide, referred to both versions of data model.
- CDA R2 XML formatted templates: A set of CDA R2 spirometry templates, ready to be used in any implementation. There exist templates for both versions, basic and detailed.
- XSL Style sheet: File needed to visualize spirometry CDA R2, which follows a standard style sheet for CDA-HL7 presentation (see figure 1).

Using spirometry CDA R2, allows that the resulting reports can be shared through different hospital HIS, and execute data mining services, that are very important for medical research processes. Also it's important to note that the doctor can view the spirometry digitally, from his workstation, and watch the tests history for each patient.

The first implantation of the CDA R2 spirometry standard has been done through an open-source integration framework called EI2Med, based on Mirth Connect, in which many tools have been developed to ease generation and integration between CDA R2 spirometry standard and HIS.

The manufacturers and spirometry models that have been integrated at the moment with the integration framework EI2Med, and that they have cooperate on this first spirometry standard implementation, are: "EasyOne" from NDD and "DatosSpir Micro A" from Sibel.

Figure 1. Visualization of spirometry report CDA R2



Regarding the implementation of the standard in centers and hospitals in Catalonia, nowadays there are several public centers of ICS, such as Lleida and Sabadell, and also Calella hospital of the “Corporació de Salut del Maresme i la Selva” that are carrying out the relevant integration tasks to achieve the implementation of spirometry standard in their respective systems. The proofs and tests performed satisfactorily at these centres, being especially validated by experts in the field of respiratory medicine. Finally it should be remarked that all these implementations are supervised by the “Oficina d’Estàndards i Interoperabilitat de TicSalut del Departament de Salut de la Generalitat de Catalunya.

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²Oficina d’Estàndards i Interoperabilitat – Fundació TicSalut. Departament de Salut de la Generalitat de Catalunya, Espanya

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by Catherine Chronaki



eHealth
Governance
Initiative



eHealth
Governance
Initiative
eHGI

Advancing Semantic and Technical Interoperability in Europe

In the November 7, 2012 meeting of the eHealth network, the voluntary body of EU member state representatives formed under Article 14 of the Directive 2011/24/EU on cross-border care¹, the eHealth Governance Initiative (eHGI) submitted as a basis for discussion a paper on Semantic and Technical Interoperability. The discussion paper² was developed by eHGI “Interoperability Standardization and Markets” WG under the leadership of Dr. Falk Schubert (Fed Ministry of Health, DE) with participation of HL7, IHE, COCIR, as well as experts from Members states and national eHealth programs. Taking a pragmatic approach to semantic and technical interoperability, it contributes insights to the benefits and

challenges of interoperability and presents a set of recommendations that could shape coordinated European and national eHealth policy through concrete actions taken up by the eHealth network on a voluntary basis.

Interoperability in eHealth is defined as the ability of two or more eHealth systems to use and exchange both computer interpretable data and human understandable data and knowledge. Three aspects characterize interoperability:

- Legal (providing laws, policies, procedures and cooperation agreements needed to allow the seamless exchange of health information)
- Semantic interoperability (ensuring that the precise meaning of exchanged information is unambiguously interpretable by any other system, service or user) and
- Technical interoperability (enabling two or more information and communication technology applications, to accept data from each other and perform a given task in an appropriate and satisfactory manner).

Benefits & Challenges

Semantic and Technical interoperability in eHealth is a public good that benefits our society in a number of ways as for instance, in mobile and ubiquitous access to medical information, enhanced quality of care, improved cost efficiency, and informed choice of healthcare providers.

At the same time, linking the different actors, IT systems and institutions beyond culture, language, and jurisdiction, presents significant challenges which are further highlighted by the complexity of the health domain, the heterogeneous healthcare systems in Europe, locally developed or adapted coding systems characterized by a variety of classifications, ontologies and nomenclatures, non-systematic acceptance, adoption and use of existing standards and imbalance between costs allocated and benefits accrued from interoperability.

The practice of interoperability

In August 2012, eHGI launched a survey among its 26 European Member States and associated countries investigating the practice of interoperability in national health systems and eHealth programs. 22 out of 26 countries replied. With respect to National strategy on Electronic Health Records (EHRs), the majority (15 countries) have defined a national strategy for the introduction of EHRs and 11/15 require conformance to at least one international standard, while almost all countries (21 out of 22) allow a mix of structured information and free text into EHRs.

As far as coding systems referring to medical terminologies, classifications and thesauri, all 22 countries use coding systems and 21 also set coding rules. One third (8 out of 22 countries) have developed a national strategy for semantic interoperability, while half of them (11 countries) plan to develop one within the next three years. 11 countries noted the demand for the development of new coding systems, although most recipients emphasized the significance of selecting, qualifying, and implementing existing ones.

Coding systems used in many countries include: ICD-10 (15/22 countries), SNOMED-CT (9/22), LOINC (8/22), ICD-9-CM (8/22) and ATC (7/22). Although the actual number of standards in use is probably higher, 42 different standards were identified, but only about one quarter (11), were used by more than one country. The majority of countries (17/22) cooperate with other countries to validate their coding systems.

Recommendations to the eHealth Action

Taking steps towards technical and semantic interoperability requires coordinated policy actions at the European and national level. eHGI put forward a set of actionable recommendations to be adopted by the eHealth network on a voluntary basis and improve seamless care in Europe and globally. Several principles underline operationalizing these recommendations namely: adopting a stepwise incremental approach, building on research projects, initiatives and pilots, and sharing best practices. The actual recommendations are as follows:

- 1. Encourage greater cooperation between Member States
- 2. Encourage greater cooperation between national authorities and standardization bodies
- 3. Enable the recommendation of standards and (harmonised) profiles based on selected use cases
- 4. Use the purchasing power of the public section as an enabler for semantic and technical interoperability
- 5. Foster data portability for healthcare providers and patients
- 6. Link and harmonize coding systems
- 7. Facilitate access to existing standards and medical vocabularies
- 8. Stimulate usability engineering for structured and encoded data
- 9. Consider incentivisation of healthcare providers.

eHGI is currently formulated a set of actions for each of these recommendations to be presented to the eHealth Network in its May 2013 meeting in Dublin.

The role of the HL7 Foundation and European HL7 Affiliates

The HL7 Foundation established in Brussels in 2010 working with the 18 national European HL7 affiliates established in Germany, Austria, Finland, Sweden, Norway, the Netherlands, UK, Spain, France, Italy, Switzerland, Croatia, Czech Republic, Bosnia Herzegovina, Greece, Turkey, and Russia, the wider HL7 constituency and other eHealth stakeholders, will no doubt have a key role in the operationalization of these recommendations which aim to advance interoperability for seamless care and well-being in Europe and globally.

Catherine Chronaki, Secretary General, HL7 Foundation

Footnotes

1 DIRECTIVE 2011/24/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 on the application of patients' rights in cross-border healthcare: <http://bit.ly/flm06y>

2 eHGI Discussion Paper on Semantic and Technical Interoperability <http://bit.ly/132FeR5>

Meeting Announcement

OMG Technical Meeting Special Event

Summit On Evolving An Open E-Health Platform: Bringing Down Business, Policy, Information, And Technology Barriers

Worldwide, the importance that has surfaced and the attention now being paid to effective health information-sharing across geographies and cultures has never been higher, yet consistently these efforts are thwarted either by business barriers, incompatible policies, aged or inappropriate technology, or variances among the information being shared and how that information is represented. Despite the global attention to these matters, in no place are these concerns more prevalent than within the EU. With a fluid a population crossing country boundaries daily, and recent developments clearly granting EU citizens access to medical care and treatment regardless of where they are within Europe, an urgency has emerged to discover practical approaches that can overcome what have traditionally been barriers to these objectives.

In order to foster effective dialogue around this subject, OMG, a not-for-profit standards consortium operating in a dozen vertical markets (including health), will be hosting a Health Community Summit to provide a venue and format for exploring these challenges and coming to a shared vision about the key elements and building-blocks which will foster effective interchange and ultimately become an enabler for eHealth.

The summit will marry limited presentations and case studies with community dialogue en route to charting a course for e-Health that is practical and implementable. Case study highlights from Victoria Health (Australia), the Mayo Clinic (US), the National Health Service (UK), and others will form a backdrop to incent dialogue and community participation. The format of the workshop has been designed to be highly interactive, and delegates from all facets of the e-Health industry are welcomed. Focus-sessions will include topics ranging from information representation to architectural „services“ to business policies among several others.

The Program Includes:

- Featured keynote from prominent e-Health programs within Europe
- „Lightning Round“ vignette presentations from multiple regional and national initiatives to discover commonalities and provide a basis for discussion
- Focused discussion sessions on the business/policy environment, information (exchange) environment, and technical interoperability / interchange
- Case study highlights as examples of each of the above from outside or within Europe
- Poster sessions for deeper dialogue and discovery of key solution elements and relevant standards

Monday, June 17th,
09:00 - 17:00

Radisson Blu Hotel,
Berlin, Germany

Learning by Doing

HL7 Fundamentals Course

HL7 International, in collaboration with the HL7 International Council, is pleased to announce the scholarship program for the August 2013 edition of its highly successful global HL7 Fundamentals course (formerly known as HL7 ELC)

The HL7 Fundamentals course is an internet based, tutor monitored, HL7 managed, self-study course on health informatics and HL7 standards. The goal is to create a cost effective and affordable way to give opportunity for healthcare IT professionals, globally, to learn about HL7 standards so that they can use them in their implementations.

To encourage the global use and adoption of healthcare informatics by expanding knowledge about, access to and use of HL7 standards, especially in those countries and regions where there is minimal or no HL7 presence, the scholarship program has started on March 2010 English edition ELC course.

Preference will be given to applicants from countries without an HL7 Affiliate.

At the end of the course, participants should

- Know how to confront a project involving interoperability among disjointed healthcare information systems.
- Know how to read the most widely used HL7 standards.
- Understand the need for controlled vocabularies, master files, and entity registries.
- Read and Write V2.X messages.
- Read and Write V3 messages.
- Read and Write CDA® R2 documents.
- Know when to use each artifact (messages, documents).

Web-Based Training

- HL7 Certified Teachers helping you step-by-step.
- Reading material developed by our tutors.
- Bibliographic material.
- Discussion forums.
- Glossary.
- Integration activities stewarded by the teaching team.
- Self evaluation quizzes.
- Tutor evaluation for each module.

To sign up for any upcoming Fundamentals course, go to the HL7.org website and click on “Upcoming Fundamentals Course” in “Events”.

For additional information including prerequisites, key dates, and costs see the FAQ and Brochure or contact Sharon Chaplock at sharon@HL7.org.

If you experience difficulty registering for the course, please contact: eLearning@HL7.org.

Calendar of Events



Working Group Meeting	Atlanta, GA, USA	5 to 10 May
eHealth Week – HL7 Enabling Connected Care in Europe and Globally	Dublin, Ireland	13 to 15 May
HL7/IHE/ISO Pharmacy Out-Of-Cycle Meeting	The Hague, Netherlands	10 to 12 June
Summit On Evolving An Open E-Health Platform Bringing Down Business, Policy, Information, And Technology Barriers	Berlin, Germany	17 June
27th Annual Plenary & Working Group Meeting	Cambridge, MA, USA	22 to 27 September
Annual Conference HL7 Switzerland	Olten, Switzerland	17 October
Annual Meeting and National Interoperability Conference HL7 Germany and IHE Germany	Göttingen, Germany	23 to 25 October
International HL7 Interoperability Conference (IHIC) 2013	Sydney, Australia	28 to 30 October
National HL7 Standardisation Congress 2013	Utrecht, the Netherlands	6 December

HL7 Training schedule

HL7 UK - Summer School e-health applications and integration	Leeds, UK	9 to 10 July
August Fundamentals Course Registration for this course will open on June 11th	on your computer @everywhere	15 August to 28 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: Kai Heitmann MD	HL7 Romania Chair: Florica Moldoveanu
HL7 Bosnia and Herzegovina Chair: Samir Dedović	HL7 Greece Chair: Alexander Berler	HL7 Russia Chair: Tatyana Zarubina MD PhD
HL7 Croatia Chair: Miroslav Končar	HL7 Italy Chair: Stefano Lotti	HL7 Spain Chair: Carlos Gallego Perez
HL7 Czech Republic http://www.hl7.cz Chair: Libor Seidl	HL7 Luxembourg http://www.hl7.lu Chair: Stefan Benzschawel	HL7 Sweden Chair: Gustav Alvfeldt
HL7 Finland http://www.hl7.fi Chair: Juha Mykkanen PhD	HL7 The Netherlands http://www.hl7.nl Chair: Robert Stegwee MSc, PhD	HL7 Switzerland http://www.hl7.ch Chair: Beat Heggli
HL7 France Chair: Nicolas Canu	HL7 Norway Chair: Terje Halvorsen	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.

E-mail: HQ@HL7.org • Website: www.HL7.org

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