Open Platform Architecture
Based Upon SMART Apps Platform and the HL7 FHIR® (DSTU) Demonstrated at HIMSS14

By David Kreda, Translation Advisor, and Joshua Mandel MD, Lead Architect, SMART Platforms Project Harvard Medical School/Children's Hospital Boston
www.smartplatforms.org

During the HIMSS14 Annual Conference (February 23-27, 2014 in Orlando, Florida), several healthcare IT exhibitors presented an eye-opening example of the potential of HL7's newest standard, FHIR® (Fast Healthcare Interoperability Resources). The list of exhibitors included Cerner, Intermountain Healthcare, Hewlett Packard, and Harris Corporation. They presented the **SMART on FHIR Open Platform Architecture,** which combines FHIR and the open source, web-standards based technology stack created by the SMART Platforms Project, a research effort based at Harvard Medical School and Children's Hospital Boston that enables real-time integration of substitutable medical apps, or SMART apps, on EHR systems.

Three sophisticated EHR systems, including Cerner Millennium, HELP2 from Intermountain Healthcare, and VistA from the Veterans Health Administration, were each independently FHIR-enabled in less than six weeks. With vastly different internal architectures and technologies, they were nonetheless able to supply the data via FHIR API calls made by the suite of SMART Apps that were installed on their systems. Harris Corporation then demonstrated its services oriented architecture (SOA) service, which accepted same FHIR API queries from the SMART apps, federated queries to the same EHR systems holding the patient data, and synthesized a cross system, longitudinal patient record, which was returned to the requesting SMART app.
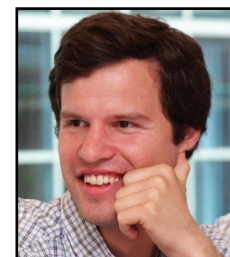
David Kreda

Josh Mandel, MD

Hewlett Packard, which engineered the SMART on FHIR implementation on top of VistA, described its implementation effort this way:
Proof of concepts using the [SMART] platform funded by the [ONC] have been developed demonstrating how light-weight applications can be rapidly developed, adopted and implemented using a predictable architecture, consistent API specifications and standards such as HL7's new interoperability standard called [FHIR]. In less than three weeks, HP integrated two SMART applications (Blood Pressure Centiles and Cardiac Risk) with VA VistA platform in HP's Advanced Federal Health Innovation Lab (AFHIL).

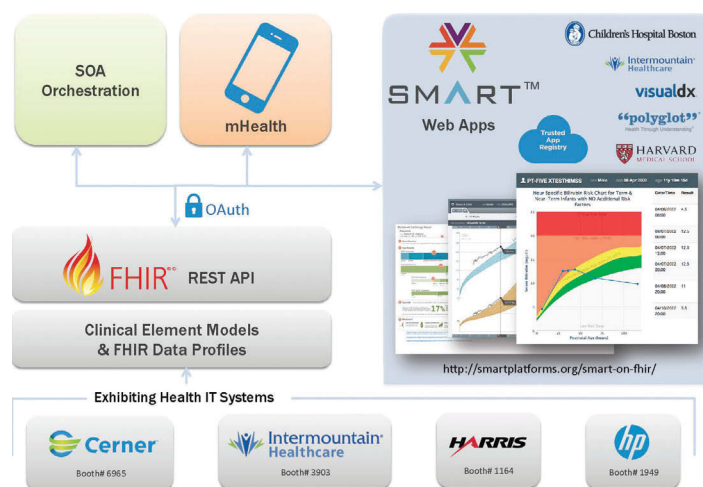Josh Mandel, Lead Architect of SMART and a key member of the FHIR Management Group (shown

The SMART on FHIR® Open Platform Architecture (HIMSS14 Handout)

Open Platform Architecture, continued from page 1

in the photograph to the right talking to Grahame Grieve, one of the originators of FHIR, at HIMSS14), recounted his experience in incorporating the FHIR API into SMART's technology model. "It was something we could do quite quickly, because FHIR and SMART are remarkably similar in how they focus on granular data access. FHIR has the advantage of a larger data vocabulary for many real-world needs and, of course, being a community adopted standard."

Josh Mandel and Grahame Grieve at HIMSS14

SMART on FHIR is EHR vendor-agnostic on the application side. All SMART apps presented at HIMSS14 were only coded once and make identical FHIR calls to all EHR platforms. Of course, vendors were free to expose any of the SMART apps in any manner they elected. In one example, the vendor screened patient context so that the SMART app would launch only if appropriate, showing how a tailored and uninterrupted clinical workflow environment can be implemented to incorporate third party apps.

The SMART apps shown at HIMSS14 on SMART on FHIR platforms included two apps developed by SMART (the SMART Pediatric Growth Chart App, winner of the 2014 Red Dot Design Award, and the SMART Blood Pressure Centiles App), one by Polyglot Systems, Inc. (the Meducation® App), one by Logical Images, Inc. (the VisualDx® diagnostic clinical decision support system), and one by Intermountain® Healthcare (the Bilirubin app). David Kreda, Translation Advisor for the SMART Project, observed that "these examples of data-aware external SMART apps running unchanged on EHR systems that adopt SMART on FHIR show how the right technologies can make a big contribution to clinical IT innovation."

For EHR vendors, FHIR's incrementally implementable API and SMART's developer-friendly technology holds the promise of materially increasing the value of their systems by making them open to the inclusion of apps and services developed by providers, researchers, and others.

The SMART Platforms team now believes that the accelerated adoption of HL7's FHIR standard can not only advance the SMART team's objective for promoting substitutable apps sooner, but also generate an even larger market place for vendor-neutral shared clinical data repositories, decision support systems, clinical knowledge bases, and more.

About SMART
SMART's Principal Investigators, Isaac Kohane, MD, PhD and Kenneth Mandl MD, MPH, proposed how an ecosystem approach would usher in an era of accelerated innovation that would increase the utility, quality, value, and flexibility of EHR systems (No Small Change for the Health Information Economy, NEJM 2009). In 2010, Harvard Medical School and Boston Children's Hospital received a $15 million award from the US Office of National Coordinator (ONC) to develop ways to promote the interoperability of clinical data stored in EHR systems by lowering barriers to absorbing medical apps into existing EHRs.

HL7 International and AEGIS.net, Inc. Partner to Launch HL7 Conformance Testing Program

By Andrea Ribick, HL7 Director of Communications

Andrea Ribick

HL7 and AEGIS.net (AEGIS) launched the new Conformance Testing Program for HL7 standards at HIMSS 2014. The HL7 Conformance Testing Program provides a platform for ongoing, iterative testing that helps healthcare IT developers get highly interoperable products to market quickly and cost-effectively. The testing program will make interoperability significantly more efficient for vendors and implementers by reducing interface development time and costs.

"We chose to partner with AEGIS because they're an industry leader in the testing of interoperability between Health Information Technology systems and HIEs," said Charles Jaffe, MD, PhD, CEO of HL7 International. "Going forward, HL7 anticipates using the AEGIS Developers Integration Lab to provide a testing platform for all new standards."

The Conformance Testing Program leverages the technology and architecture of the AEGIS Developers Integration Lab (DIL). The DIL is an Infrastructure as a Service (IaaS) and Testing as a Service (TaaS) open source testing solution for health information exchange gateway, interoperability, and compatibility testing.The DIL helps automate and execute test cases created by HL7, providing an easy-to-use system for ongoing, iterative, 24/7/365 conformance and interoperability tests against published HL7 specifications.

Mario Hyland, Senior Vice President of AEGIS said, "AEGIS is proud to partner with HL7 International to bring its members a unique benefit offering HL7-specific conformance testing for continuous interoperability through the AEGIS DIL. The DIL's automation and ease of use will help ensure that HL7 conformance testing truly adds value without creating inefficient layers of complexity."

The entire HL7 International community, including affiliates, benefits from this shared testing service, which can eventually be used to identify test cases that are sufficiently mature to comprise a certification program. Participating in this program takes the burden off of vendors to validate technical interoperability and offers vendors a major market differentiator. This effort also builds upon and accelerates consensus toward national standards, EHR certification criteria, and testing procedures for Stage 2 of Meaningful Use and beyond.

The program is currently in a pilot phase, during which supported standards are limited to Version 2 Immunization Registries. Participation will be free of charge until the HL7 Working Group Meeting in September 2014.

For more information on this program, please visit http://www.HL7.org/implement/conformance-Testing.cfm.

AEGIS

AEGIS DIL

Update from Headquarters

What's Hot? HIMSS, Conformance Testing and FHIR®

Mark McDougall

By Mark McDougall, Executive Director, HL7

January Working Group Meeting

Approximately 360 attendees participated in our January Working Group Meeting held in San Antonio, Texas, January 19-24, 2014. Over 45 HL7 work groups met in San Antonio and 26 of them conducted co-chair elections. Attendees also took advantage of 33 tutorials that week.

Meeting Sponsors

I am also pleased to recognize the following organizations that sponsored key components of our recent January Working Group Meeting in San Antonio:

- Hi3 Solutions
- Furore
- iNTERFACEWARE
- Gordon Point Informatics
- Beeler Consulting LLC

January 2014 WGM Sponsors with HL7 Vice Chair Don Mon, PhD

The additional sponsorship support provided by these organizations contributes considerably to HL7's meeting budget and is much appreciated.

HIMSS14

For 25 years, HL7 has exhibited each year at the annual conference of the Healthcare Information and Management Systems Society (HIMSS). This year's HIMSS convention convened in Orlando, Florida during the week of February 24, 2014 and reportedly attracted over 37,000 people.

HL7's Director of Communications, Andrea Ribick, once again was exceptional at developing a new booth for HL7 and organizing 29 thirty minute presentations on HL7 standards and relevant topics. Most of the presentations attracted crowds that filled the theater area and were standing room only.

FHIR®

HL7's Fast Healthcare Interoperability Resources (FHIR) was a very popular topic at this year's HIMSS convention. Grahame Grieve provided several presentations within the HL7 booth.

There was also an HL7 sponsored breakfast panel presentation on FHIR at the theater in the HIMSS Interoperability Showcase" that featured HL7 CEO, Charles Jaffe, MD, PhD, moderating a panel including Doug Fridsma, MD, PhD, Chief Scientific Officer at ONC; Grahame Grieve, Principle Developer of FHIR; John D. Halamka, MD, MS, CIO of Beth Israel; David McCallie, Jr., MD, CMO of Cerner;

Crowds at the HL7 HIMSS14 Exhibit.

and Wes Rishel, Vice President and Distinguished Analyst from Gartner. Well over 100 individuals attended this early morning session to hear the panel share insight on the opportunities that FHIR® offers those who are working on interoperability and standards leading to health information exchange. A video of this impressive panel presentation is available for free at the following URL: https://live.blueskybroadcast.com/bsb/client/CL_DEFAULT.asp?Client = 556675&PCAT = 8341&CAT = 8341.

This edition of the HL7 News also includes an article about the FHIR Connectathon that was held at the January Working Group Meeting and can be found on page 7. Additional information on the FHIR initiative can be found on the HL7 website at www.HL7.org/FHIR.

Conformance Testing Pilot

HL7 launched a new conformance testing program during the HIMSS convention that was met with enthusiasm by attendees. HL7 held a panel briefing about this new program at our booth during the lunch hour on Tuesday which drew standing room only crowds. Developed in partnership with AEGIS, this program helps healthcare IT developers speed time to market by providing a cost-effective platform for ongoing, iterative testing of conformance and interoperability with HL7 standards. More information on the new conformance testing pilot is provided on page 3 of this newsletter and can also be found at http://www.HL7.org/implement/conformanceTesting.cfm.

Invaluable Volunteers

I also wish to express our sincere thanks to the many individuals who volunteered to staff our booth and/or make presentations in our HL7 booth at the HIMSS convention, including:

Calvin Beebe
Frank Caniglia
Alison Chi
Jean Duteau
Woody Beeler, PhD
Hans Buitendijk
Catherine
  Chronaki
Grahame Grieve
Freida Hall
Gretchen Hudson
Mario Hyland
Chuck Jaffe,
  MD, PhD

Robert Jenders,
  MD
Ken McCaslin
Chris Millet
Don Mon, PhD
Melva Peters
John Quinn
Scott Robertson
Andy Stechishin
Howard
  Strasberg, MD
Sandy Stuart
Grant Wood

Board of Directors

Given that Bob Dolin resigned from his Board Chair position, HL7 convened a special election for the Board Chair. Stan Huff, MD, was elected in March and will serve as the Chair of the HL7 Board of Directors through December 2015.

I am also pleased to report that Ken McCaslin was recently elected to the position of Chair of the Technical Steering Committee, which is also a voting position on the HL7 Board of Directors. The complete list of members of the HL7 2014 Board of Directors is provided on page 34.

I would also like to acknowledge and thank outgoing Board members Bob Dolin, MD; Becky Kush, PhD; and Ed Tripp for their incredible service to the HL7 organization.

Ken McKaslin

Stan Huff, MD

Bob Dolin, MD

Becky Kush, PhD

Ed Tripp

Benefactors and Supporters

We are very appreciative of the organizations for their ongoing support of HL7 through their membership at the HL7 Benefactors and Gold member levels, who are listed on page 23. Their support of HL7 is very much needed and sincerely appreciated. We are pleased to recognize our benefactors in all of our HL7 newsletters, on the HL7 website, in all of our HL7 press releases, and at all of our HL7 working group meetings. A special thank you is extended to the list of firms that represent our 2014 HL7 Benefactors and Gold members.

HL7 Sponsored FHIR Breakfast Panel in the Interoperability Showcase at HIMSS14 in Orlando, FL.

What is a Draft Standard for Trial Use (DSTU)?

By Ken McCaslin, FHL7, HL7 Technical Steering Committee Chair; Director, Healthcare Standards, Quest Diagnostics

Ken McCaslin

A Draft Standard for Trial Use (DSTU) is exactly what it says, it is a standard in a draft form for the community to test and determine usefulness in the environment for which it is intended. When one says "standard" it is an implied assumption that it is in fact "A standard". The Merriam/Webster Dictionary defines standard as something that is considered acceptable or desirable. Many of these draft standards are desirable, but until the community has used them, it is unclear if the community can accept them as standards, hence the concept of draft. Once two or more organizations begin to use a standard and potentially share their experiences, only then can the desirability of a proposed standard be measured. There is no precise measure for desirability or acceptability; much of the measurement is based on usability and reliability of the standard for the intended purpose.

It is for this reason that draft standards typically have an expiration date of 12, 18 or 24 months from publication date[1]. The length of time is likely based on the complexity of the proposed draft standard and how long it will take participants to adopt, validate and begin to use it in production environments. As break/fix situations are encountered, the preparing authority, at their discretion, can release updates as interim releases or as errata to the original proposal. Because the evolving standard is in trial status, there is no requirement to maintain backward compatibility[2]. How formal this becomes depends on the community, but the goal is to gather enough knowledge during the trial use period to increase adoption across the entire community to formally make this a standard within the community. This starts the normative process where the community begins to resolve interoperability issues through the break/fix process. This then leads to the next step of a Normative standard. To get to this level, it requires a reiterative process through the Draft Standard for Trial Use (DSTU), either at the interim release, major releases, or both, depending on the complexity of the break/fix solutions. The community must be the group that makes these decisions because of their Subject Matter Expertise[3].

Therefore DSTUs are expected and anticipated to be evolving as the community tests, validates and adopts the standard. A well formed DSTU will have small incremental changes where more complex DSTUs could have multiple incremental changes that become minor releases followed by an extensive major release, but either path is acceptable as the target community works through the DSTU with their business partners.

Success of a DSTU should not be measured by getting it published; it should be measured by the engagement of the community.

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[1] GOM §13.02.06 : The length of the trial use period is at the discretion of the responsible Work Group. The DSTU may be extended one year by petition to the TSC (GOM §13.02.06.02.)
[2] GOM §13.02.07 and 13.02.08
[3] Refer to TSC Policy and Guidance to Work Groups on DSTU Updates vs. DSTU Ballots

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Update from Headquarters, *continued from page 5*

Organizational Member Firms

As listed on pages 23-25, HL7 is very pleased to report that there are 563 organizational member companies. We sincerely appreciate their ongoing support of HL7 via their organizational membership dues.

In Closing

Since 1991 I have had the sincere pleasure and honor as serving as HL7's Executive Director. Time really does fly by. This summer, Shelly and I will celebrate our 25th wedding anniversary. Our oldest son, Jack, is completing his second year studying mechanical engineering at Michigan State University. Our youngest son, Alex, is completing his senior year in high school. He was asked to produce a video that the high school would show all incoming 9th graders on "moving up day". Check out this video that Alex produced conveying his view on what high school is all about: www.youtube.com/watch?v = 8wfGlRQcqHg.

We are so incredibly proud of the young men that Jack and Alex are becoming. It is so difficult to fathom that we will be "empty nesters" in a few months. Where did the last two decades go? The years have flown by so quickly. Each day I try to remember to give thanks for my many blessings. May you and your loved ones also be blessed with good health, kind smiles, plenty of laughter and hugs.

FHIR® Connectathon #5

By Lloyd McKenzie, Member of the FHIR Governance Board

Lloyd McKenzie

On January 18 and 19, immediately prior to the San Antonio Working Group Meeting, HL7 held its 5th International FHIR Connectathon. This was the final connectathon prior to the publication of FHIR as a draft standard for trial use (DSTU) specification. This connectathon had over 30 attendees with 8 different servers and 15 client systems demonstrating a variety of interoperability scenarios around patient management, document creation and sharing, and audit logging. There was particular interest in the potential for conversion between FHIR documents and the Consolidated CDA®.

Connectathon participants arrived from four continents and represented diverse backgrounds including large healthcare organizations, small healthcare vendors, consultants and government. For some, it was their first connectathon and their interoperability solution for the simpler scenarios was built on site during the two days. For others, the connectathon was the culmination of months of preparation, often building on work done for prior connectathons. In all cases, the connectathon meant animated conversations, looking at code over other developers' shoulders, debugging and – in the end – interoperability. All interoperability scenarios were successfully implemented by multiple attendees.

The FHIR project team initiated the connectathon process at the September 2012 Working Group Meeting as part of an effort to ensure that the FHIR specification met the needs of implementers and that the technical approaches proposed in the standard met the needs of real-world implementation requirements. The process has proved extremely successful, with many enhancements being introduced to the standard to address issues that would not have been identified without the connectathon experience. Connectathons have also proven to be a boon to the development community, providing direct access to the authors of the standard and providing an opportunity to give the specification a trial run (and influence its evolution) before it starts appearing in RFPs and regulations. As one developer said of their experience, "It's simple to kind of get in there and play, and it helps to have multiple servers to just test things out against."

The connectathon experience has gone international as well, with the past year seeing connectathons held in Australia and the UK. There is also a combined 3-day education and connectathon FHIR Developer Days session scheduled for the Netherlands on November 22-24th of this year.

For those interested in viewing a bit of the connectathon experience, Rene Spronk (co-chair of the HL7 AID Work Group) kindly put together a couple of short videos from the January session. They can be found at http://vimeo.com/84564317 and http://vimeo.com/84592321.

For those who are interested in participating in or observing the 6th Connectathon at the May Working Group Meeting in Phoenix, registration is open now. The theme for this session will be Questionnaire, with the advanced scenarios focusing on some of the use-cases of the Office of the National Coordinator's "Structured Data Capture" initiative. Additional entry-level and experimental tracks will also be available. For full details, refer to the Connectathon wiki site.

More information about the FHIR specification itself can be found on the FHIR DSTU website.

[1] http://fhir.furore.com/devdays/
[2] http://wiki.HL7.org/index.php?title=FHIR_Connectathon_6
[3] http://HL7.org/fhir

FHIR Connectathon photos courtesy of Rene Spronk

EU/US Exchange of Patient Summaries:
the Trillium Bridge Project

By Catherine Chronaki, Secretary General, HL7 Foundation, HL7 European Office

Catherine Chronaki

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 in, 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 (epSOS) and Meaningful Use Stage 2. The project began in July 2013 and will run for 20 months and is 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:

- 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, authorization, privacy & security.
- Building the Bridge led by A. Estelrich (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 have submitted expressions of interest, including European affiliates such as 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, standard-
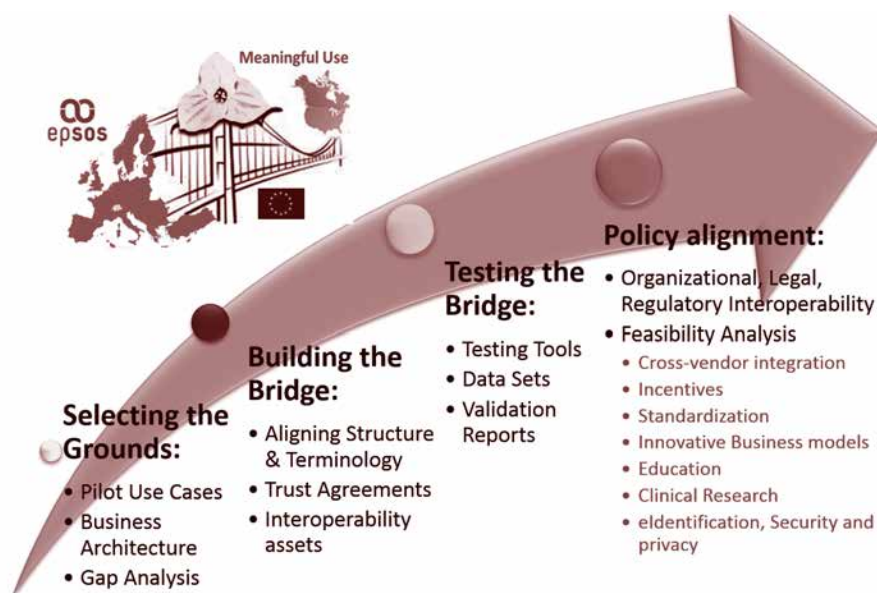

Figure 1: Trillium Bridge four part strategy to establish and sustain an interoperability bridge across the Atlantic.
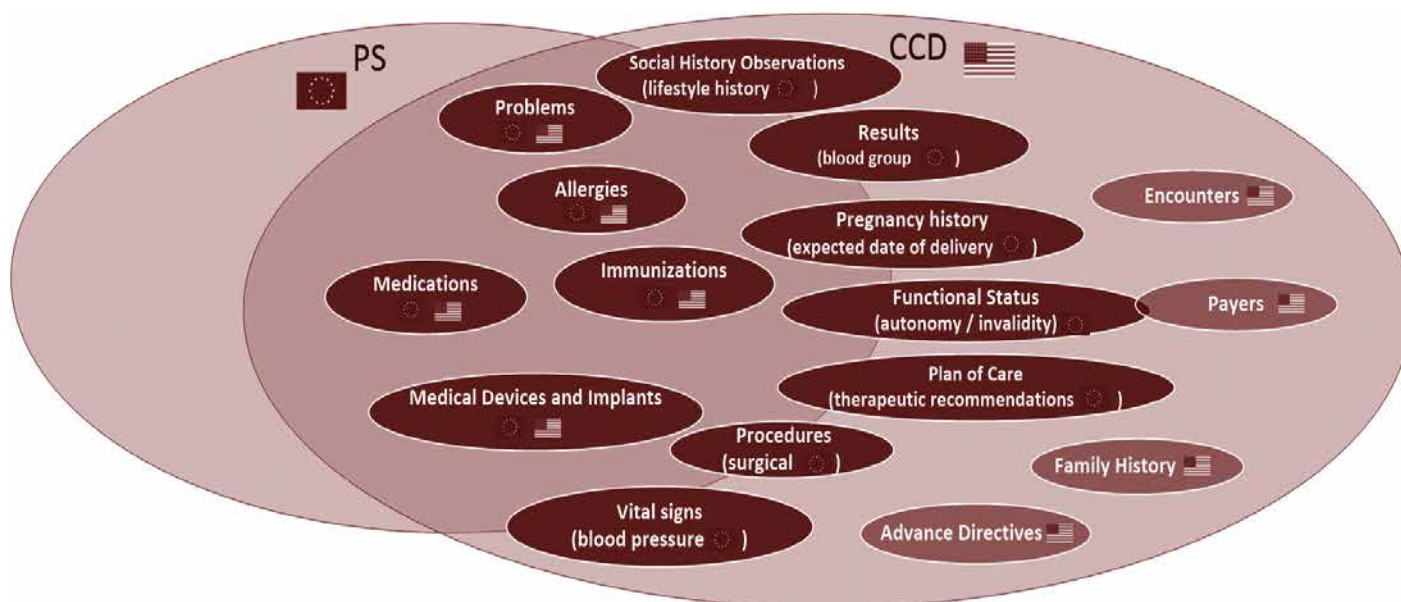
Figure 2: Graphical representation comparing the coded equivalent sections between the EU PS (epSOS) IG and the C-CDA/CCD US Realm IG

ization, innovative business models, education, clinical research, security and privacy.

The first six months of Trillium Bridge concentrated on "Selecting the Grounds". This translates to mobilizing the community; collecting user stories, patient summary samples, and specifications; conducting gap analysis; analyzing use cases; and developing the logical business architecture.

Thorough analysis of the Consolidated Clinical Document Architecture (C-CDA®/CCD®) Implementation Guide (IG) for the US Realm and the EU PS (epSOS) IG 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 C-CDA/CCD drives continuity of care. As a result, C-CDA/CCD includes sections such as encounters and family history, which are not present in the EU PS (epSOS). The coded clinical equivalent section present both in the C-CDA/CCD and EU PS (epSOS) are: medications, allergies, immunizations (vaccina-

tions), problems, medical devices and implants. Figure 2, contributed by Ana Estelrich presents this information graphically. Several elements are richer in content in the C-CDA/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.

Figure 2: Graphical representation comparing the coded equivalent sections between the EU PS (epSOS) IG and the C-CDA/CCD US Realm IG
The comparison of the patient summary specifications in the EU and the US 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 Trilium Bridge were presented at the HIMSS14 conference in Orlando, FL. The presentation slides are available on the HL7 website (www.HL7.org/HIMSS) and on the Trillium Bridge website (www.trilliumbridge.eu). The next stop for Trillium Bridge will be in Athens Greece, in May 12-14 for the eHealth Forum (www.ehealth2014.org). 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.

Links
Trillium Bridge:
www.trilliumbridge.org

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

European Patient Summary Guidelines

By Catherine Chronaki, Secretary General, HL7 Foundation, HL7 European Office

Catherine Chronaki

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 (MS) of the European Union. In that spirit, the Trillium Bridge project (www.trilliumbridge.eu), motivated by the EU/US Memorandum 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.
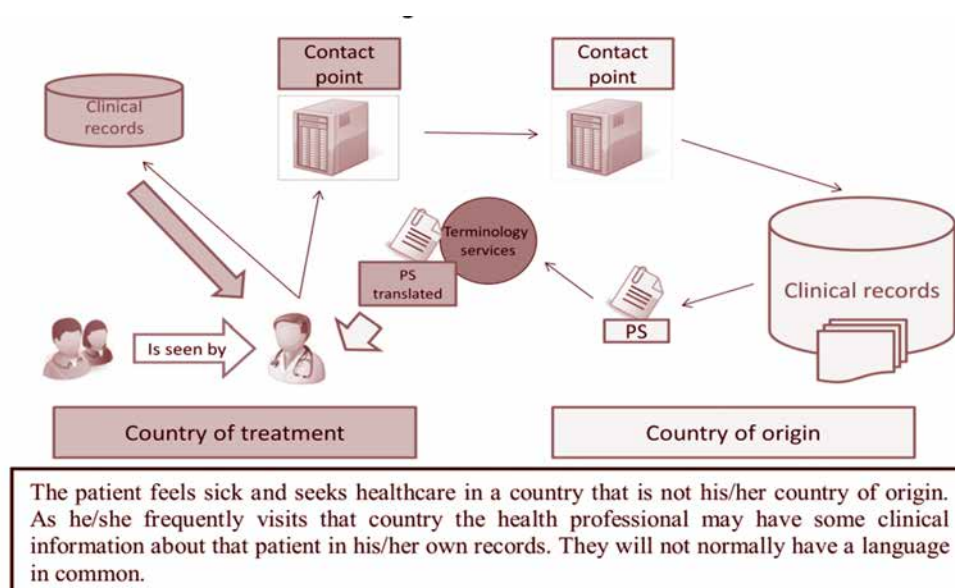
Two use cases provide the backdrop for the PS guidelines. The first one assumes that the patient receives unplanned healthcare in the country of treatment for the first time. The attending physician requests the patient's PS from a recognized contact point. The contact point relays the request to the 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 healthcare 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; and 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 a 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,

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 records. They will not normally have a language in common.

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 guidelines. With the support of the epSOS industry team, widely-adopted standards and integration profiles such as HL7 Clinical Document Architecture (CDA®), IHE XCA, IHE XCPD, as well as well-known terminology systems like 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, 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? Yes, in a way,

as these projects led to the development of the PS Guideline and its adoption by the eHealth network.

Several challenges still remain before the PS are widely deployed and European citizens can safely enjoy continuity of care across the EU. Standards Development Organizations (SDOs) are particularly challenged to review and revise their processes toward 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 toward:

(a) Reception, adoption and further development of PS guide lines 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 SDOs to work together to lower the costs of standards development, adoption, and implementation, stimulating wider stakeholder engagement and open innovation!

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

Upcoming INTERNATIONAL EVENTS

eHealth Forum: Presidency Event on eHealth
Athens, Greece
May 12-14, 2014
For more information, please visit:
http://www.ehealth2014.org

eHealth 2014 (Austria)
Vienna, Austria
May 22–23, 2014
For more information, please visit
http://www.ehealth2014.at

eHealth 2014 (Canada)
Vancouver, BC, Canada
June 1–4, 2014
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http://www.mie2014.org/

HL7 28th Annual Plenary & Working Group Meeting
Chicago, IL
September 14–19, 2014
For more information, please visit
http://www.HL7.org/events/work-groupmeetings.cfm

Why I Became a
Certified Professional

HL7 Director of Education Sharon Chaplock, PhD, Interviews Erin Holt, Surveillance Systems and Informatics Program Director, CEDEP, TN Dept of Health

Erin Holt

Sharon Chaplock, PhD

Erin relates her experience with taking the Version 2.7 Specialist Certification exam and the CDA® Certification exam, why the certifications are important, and how she successfully prepared for the exams. Read her story below.

Why did you become certified?
Having credentials is becoming more and more important in a competitive job market, and can also give you credibility for what you know. People are more likely to listen. My background is in Public Health Epidemiology. I found communication of data between systems and turning data into information, not only necessary to my day to day public health business, but also extremely interesting. Through my daily activities in implementing Electronic Laboratory Reporting and my participation in the HL7 Public Health Emergency Response Work Group, I began to appreciate the need for computable semantic interoperability so I decided, why not get certified? It was beneficial as I worked with older versions of Version 2 (V2) and as Public Health enters the world of Clinical Documents, to look at the bigger picture and better understand the standards and their development.

What materials did you use to study for the exam?
In Public Health, it's currently all about Version 2 specifically for immunization registry communications and communicating reportable lab results electronically. So in studying for the V2.7 exam I was able to draw from my experience in implementing V2 messaging when reading the Version 2.7 standard. This experience probably enabled me to better grasp the concepts and rules within the standard. In addition, I regularly take HL7 tutorials when attending working group meetings. Since my first working group meeting in January 2011, I have taken almost, if not all, of the Version 2 related tutorials, as well as Version 3 (V3) related tutorials. I was first introduced to the RIM at a CDC PHIN conference years ago, (2007 I believe) given by AbdulMalik Shakir, and I was hooked. The possibility of Public Health implementing CDA communications and my interest in the RIM really pushed me to take the CDA exam. As with the V2.7 exam, reviewing the standard and taking the tutorials was helpful. In both cases, the Study Guides and Practice Exams made available by HL7 definitely helped. It seems obvious, but I didn't know how much I didn't know until I took the practice tests, especially in regards to the other V2 messages.

What challenges did you have taking and studying for the exam?
I really didn't have any challenges. The standard document makes it clear. I studied up and had an orientation.

You need to be well prepared. It's well to note in the tutorial description that you can't just take the tutorial and expect to pass the exam. I took that seriously and it was true.

What advice would you give to those interested in taking the certification exam?
For Version 2 especially, nothing substitutes reading, highlighting and understanding the standard. It certainly helps if you are able to relate the material to something and that you can see it in action. I used the concepts that I struggled with in my daily implementations as topics, which initially gave me a focus for reading the standard. Then I filled in the gaps with the rest. It's also useful to know how the standard is organized to easily access the information that you are looking for. There's no better way to prepare than to read it (the standard). Suck it up and read it. In addition, specifically to CDA, what also really helped me was learning about the RIM and the relationship between it and CDA. I have always had an interest in modeling, so this made understanding CDA easier to grasp.

How has being certified benefited you?
I hope I have more credibility now, not only within my own organization, but with external partners as well. I've gained a more formal perspective of V3 and CDA, and a broader understanding of Version 2. With this knowledge, my solution development and strategies I hope are better. The biggest benefit is having a larger pool of knowledge to draw from when implementing interoperable interfaces as well as brainstorming ideas.

Any additional comments you'd like to provide?
Taking the exam as a computer based test (CBT) instead of paper was very efficient. What I liked most was getting my results right away. While I was apprehensive about clicking the wrong button, it didn't matter because I could review my answers at the end before submitting my exam.

Thank you, Erin

Do you want to be an HL7 certified professional, too? To find out more about the HL7 certification program and the resources we provide to help you get certified, please visit: http://www.HL7.org/implement/certification.cfm

What Is Your Definition of a Clinician?

Katherine Duteau

By Katherine Duteau, HL7 fan and member; Duteau Designs Inc.

The word "clinician" is a much argued over word. For instance, as I overheard in a discussion, "If you ask a group of doctors what the definition of clinician is, they will give many completely different answers." I collected a variety of opinions from different members of HL7 and I wish to share what I heard with you. Not surprisingly, many people said many different things. The question I asked people was "What is your definition of a clinician?"

There were a lot of diverse answers. Many people said it requires a lot of training to be a clinician, and you can't just have completed first aid training to be called a clinician. What most people said is that to be a clinician, you must have substantial training in the hands-on care of patients. You must work in healthcare, have training in medicine, be professional, and provide patient care at a clinic. The usual definition of a clinic, in this case, was a hospital, a pharmacy, or a health clinic.

I want to take some time to discuss some of the responses that I thought really answered the question.

"Someone who has the training and/or expertise to evaluate or improve upon the physical or mental heath of a person or animal." – This is very well said and I like how the respondent said person and animal. That means that a veterinarian is considered a clinician, which I believe to be true.

"A jurisdictional provider who provides healthcare services to a client. "– I like how this definition says that you have to be a jurisdictional provider, which means you must have a very good medical education, be qualified to provide healthcare, and have a client.

"Someone who works in a clinic and either has a medical background, or his or her main focus of work is healthcare related." – This is very precise. It states you have to work in a clinic, and you should have either a medical background or your main focus of work is healthcare related.

Along with the above definitions, a few people had some different opinions on what their definition of a clinician was. I will give you some examples of what they said and my analysis of it.

"It's a person who cares for a patient." – Although this statement is true, we would have to expand upon it because a doctor cares for a patient, but so does anyone else. The janitor who works at the hospital cares for the patient, but isn't a clinician. The reason he isn't is because, as stated above, you have to work at a clinic and have training in medicine.

"Somebody who gives clinical advice."– This is very a broad statement. That could really be anybody, so we need to be more specific. I could give you some clinical advice, but I do not consider myself a clinician.

"Anybody who has anything to do with medicine." – That could mean a parent who is giving his or her child medicine or even the patient himself. That would mean, for instance, that if you had first aid training you would be considered a clinician, which I do not think is true.

"A doctor." – That is true, but a clinician is more than just a doctor. I believe that a clinician is a nurse, a pharmacist, a veterinarian, or a person who works with patients.

"One who provides care to a patient." – This is true in a way, but do you also need to work in a clinic or have medical training? I believe that these points need to be addressed to be considered a clinician.

Another question I asked to some people was "What occupations are clinicians?" Most people agreed that doctors, nurses, pharmacists, veterinarians, and people who worked with patients are clinicians. They also agreed that a person who only has first aid training is not a clinician.

I want to thank the various people at the January Working Group Meeting in San Antonio who responded to my questions and took the time to share with me their view of what makes a clinician.

The Early History of HL7, Part 2:
Activities by the Academic Community

By Rene Spronk, Senior Consultant and Trainer, Ringholm; Co-Chair, HL7 Application Implementation and Design Work Group

Rene Spronk

HL7 was founded in 1987. There are two key activities that can be regarded as precursors of HL7. The first set of activities are those by the academic community leading up to the publication of the ASTM E1238 and E1294 standards, and the other is the development and early use of level 7 protocols by health informatics industry representatives like Don Simborg (which was the subject of part 1 of this series). These activities were closely intertwined, if only because of the fact that the number of interested parties in the field of healthcare informatics was relatively small at the time.

Academic Community: McDonald, Hammond et.al.

Clem McDonald (Medical Computer Science Research, Indiana University School of Medicine), Ed Hammond (Division of Medical Informatics, Duke University), and other academics first became interested in interface standards through their work with computer stored medical records. The medical record is an assemblage of information from various sources: the clinical lab, the radiology department, the consultant, the nurse, the current physician as well as sources other than the current point of care. Much of that data was electronic even in the mid to late 70's, but getting it into the computer stored medical record required either manual keying of the data, jerry rigged screen scraping, or capture of printer output.

Clem McDonald's first attempt to stir interest in developing standards for CDI (Clinical Data Interchange) was in the form of an editorial entitled "Grocers, Physicians, and Electronic Data Processing". It stated that the cost of hardware and software was low enough to allow for the use of a computer by most office-based physicians, but that the cost of data entry would become prohibitive unless the medical industry developed standards for CDI. The editorial called attention to the UPC code (the bar code on all grocery products) and applauded the "grocers"' foresight for developing the UPC standard in 1970 – when there was no immediate use for these codes since the computerized checkout counter was a decade into the future. McDonald argued that the medical profession should show similar foresight and develop CDI standards. The editorial concluded with "One might argue there are really too few computerized medical record systems to matter so what is the need. We'll let the grocers answer that one."

The editorial was rejected nine times in the 1981-1983 timeframe. The reviewers argued with Clem on many points, including those that were not actually made: e.g., that "clinical data is nothing like grocery stock", and that "standards would be of no use because physicians did not have computers in their office and never would". The paper was finally published in 1983. Ed Hammond stated the following about the general reaction back then related to standards development "That's blue collar work; there is no academic honor in doing it." – there was zero interest. McDonald subsequently wrote a paper that provided a starting point for a panel discussion at the Symposium on Computer Applications in Medical Care (SCAMC) meeting of 1983. It contained much of the same arguments as the editorial mentioned above, and stated the following about the actual method for the communication of clinical data (note the absence of LANs):

"At the present there are at least two potential media for communicating results between producers and requestors. The first is the telephone. Current modem technology with auto-dialers and auto-answer capabilities could easily support such communication. The second possibility is paper with bar codes. Wand readers and matrix printers that can print bar codes are inexpensive and reliable."

At the 1983 SCAMC meeting a group of clinicians, laboratorians and computer scientists started a discussion in AAMSI (one of the forbearers of AMIA) about how to interest the academic community in standards. Those interested gathered as a AAMSI task force to formulate a draft standard. Clem McDonald stated, on the scope of the work: "In order to speed closure, we limited the scope of the initial effort to the interchange of clinical laboratory results. We started with the clinical laboratory on the basis of a variant of Sutton's law - that's where the data is." While the group was sympathetic with the desire to encompass many more types of clinical data, they believed the chances of success in standards development were improved by starting with a narrow focus. Limiting the focus to clinical laboratory data defined a problem large enough to be important, but small enough to be solved with a few years' worth of effort. They went through three cycles of proposed standards and revisions, and contacted Health Care Financing Administration (HCFA), American Society for Testing and Materials (ASTM), and a number of commercial lab vendors seeking review of the proposed standard.

Example Laboratory result. In HL7 Version 2 terms, P became PID, B became OBR, and R turned in to OBX. Note the use of "" for the null value.

In the fall of 1984, the task force presented a draft standard to an open SCAMC meeting. The panel was moderated by McDonald. Panel members included Clement McDonald, Gio Wiederhold, Donald W. Simborg, Ed Hammond, Fredrick R. Jelovsek, and Ken Schneider. The participants' responses were a cacophony of disagreement and encouragement. Some argued that even the limited scope of the laboratory was impossibly large; others argued that unless the standard covered all medical communications, it was unworthy.

For example, Clem McDonald wanted to focus on clinical laboratory interfaces; and Don Simborg held a sincere belief that no single vendor could ever meet the needs of the various clinical departments and clinical specialists, and was primarily interested in creating standards for all of what would be required for an HIS composed of best of breed.

ASTM E31

In 1984 the American Society of Testing and Materials (ASTM) invited the taskforce to organize as a formal subcommittee (known as E31.11 Standards for the Exchange of Clinical Data) within their organization.

Clem McDonald:
"This was an important step because ASTM is one of the few qualified consensus standards forming groups and gave us the tools to develop a formal consensus, with proper procedures and policies. The standard (documented in just 16 pages) was accepted by ASTM and published as E1238-88 (Standard Specification for Transferring Clinical Laboratory Data Messages Between Independent Computer Systems) in 1988."

This was the first published balloted consensus standard for clinical data. The standard was published in 1988 and was implemented in 1989. ASTM E1394, a standard for instrument to lab system interfaces, was subsequently created in close time frame as a simplified version of ASTM E1238. This is still the predominant message standard used between instruments and lab systems.

The ASTM E1238 standard was ultimately merged with HL7 Version 2 shortly after the publication of HL7 Version 2.0. McDonald continues to be active in standardization to this day (e.g. LOINC, and within HL7).

This is the second part of a series of articles about the early history of HL7. This article is an abridged version of a creative commons article available at http://bit.ly/1e7KScz – you are referred to the full article for references. See http://bit.ly/O68VxR for a video interview with Clem McDonald. Please let us know should you have additional information about the early history of HL7.

UML Profile for MIF Static Models

Antonio Villegas

By Antonio Villegas and Antoni Olivé, Universitat Politècnica de Catalunya - BarcelonaTech

Antoni Olivé

This article summarizes our contribution to the 2012-2013 HL7 Tooling Challenge "Produce a UML Profile for MIF Static Models". The main goal of the profile is to enable the representation in UML of the MIF static models. This representation allows all members of the large software engineering community to understand those models without requiring additional training. Furthermore, the healthcare community can benefit from existing UML-based modeling tools and methodologies. Among others, there are tools that generate a significant part of the final code of a software system from its UML model.

In what follows, we first briefly describe the proposed profile, and then we illustrate its use by means of a small example in the transformation of MIF models into equivalent UML models.

The UML Profile for MIF

The UML Profile for MIF static models allows the representation of existing or new MIF models in UML. Figure 1 shows the three main components of the transformation. The input is a MIF model and the output is a semantically equivalent UML model. The input model can be represented in XML or in its equivalent graphical representation. The output model can be represented in the standard graphical notation defined by UML, or in its equivalent XMI. The central component is the proposed UML profile, which makes possible the above transformation. A profile is a standard mechanism that allows limited extension to UML without modifying the underlying metamodel of the language. A profile consists essentially of one or more stereotypes. A stereotype is a class whose instances extend the characteristics defined in a model element.

The profile consists of six parts, as indicated in Figure 1. The Foundational Area contains the stereotypes that represent the concepts in the HL7 Reference Information Model (RIM), including acts, roles, entities, and participations. The Message Communications Control Area contains the stereotypes that represent the technical infrastructure of HL7, including messaging and other components. The Special Constructs Area contains the stereotypes that provide ways to represent specific constructs from HL7, such as attributes, entry points, CMETs, and choices.

The profile uses the HL7 Version 3 Data Types Abstract Specification R2, which contains the data types referenced within the MIF static models; the HL7 RIM which contains the foundational classes of the HL7 standards; and the HL7 Vocabulary, which contains the HL7 Concept Domains, Code Systems, and HL7-defined Value Sets referenced within the MIF static models.

The Foundational Area of the profile comprises the stereotypes that represent the "normative" content of the HL7 RIM. Figure 2 shows a subset of those stereotypes. All of them are a subtype of the InfrastructureRoot stereotype, which is an extension of the UML metaclass Class. The color of the stereotype box is significant as it identifies the RIM class referenced by the stereotype. The Act related stereotypes are red, the Entity related stereotypes are green and the Role related stereotypes are yellow. These color guidelines are defined in the HL7 RIM.

Figure 3 shows an example of use of the profile. The example uses nine stereotypes defined in the Foundational Area (Patient, Organization, Entity, Role, Participation, Observation, Person, NonPersonLivingSubject and Place) and eight stereotypes defined in the Special Constructs Area (StaticModel, EntryPoint, Choice, CMET, Attribute, Scoper and Player). Note that a class can have several stereotypes. Class BirthPlace uses the stereotype «Role» to indicate that it is a (subtype of the) RIM Role. The class has two attributes that are stereotyped «Attribute» to
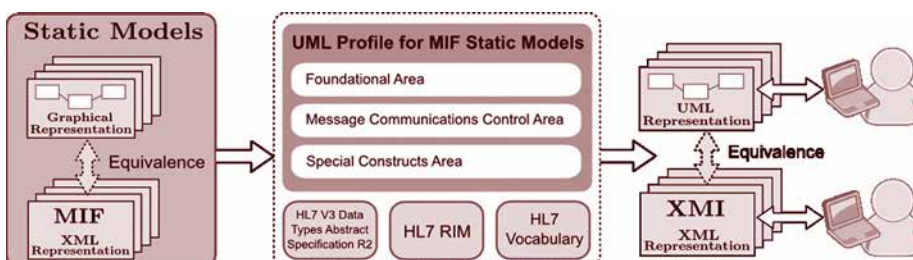

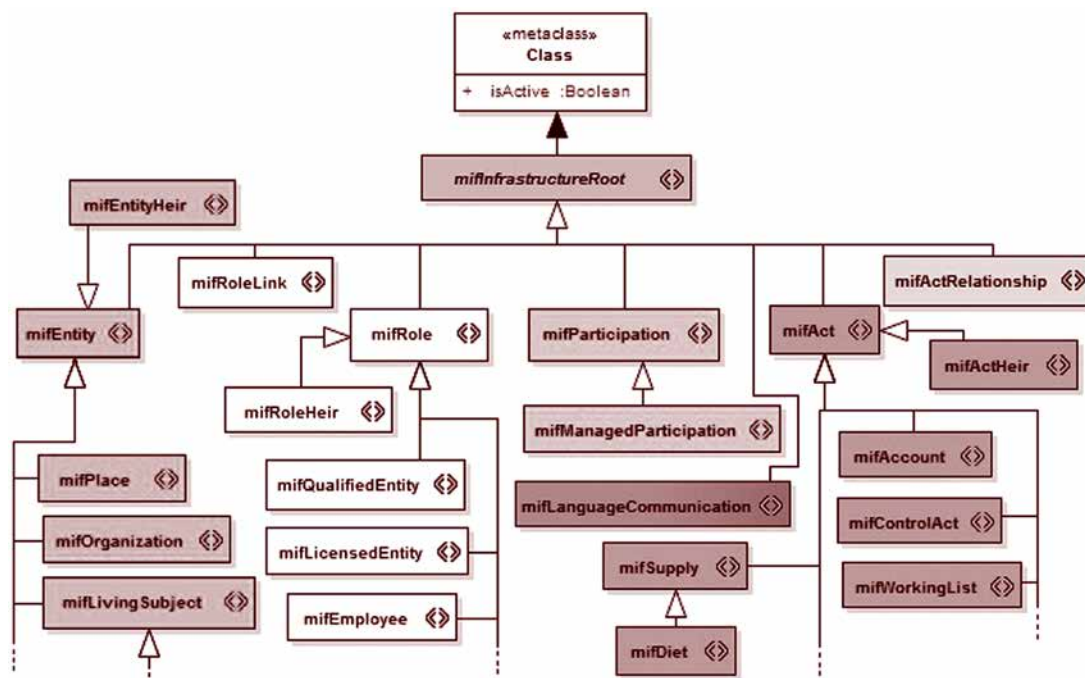*Figure 1: Components of the MIF-UML Specification*

Figure 2: Stereotypes of the Foundational Area (fragment)

of MIF attributes; for example, the attribute class-Code for Patient. A similar transformation is done for the classes Person, Non-PersonLivingSubject and BirthPlace in Figure 4.

A MIF Choice element is represented as a class. Figure 4 shows the Entity-ChoiceSubject choice. In UML we represent choices as generalization hierarchies of classes, as depicted in Figure 3. The Choice class is the top-level class in the UML generalization hierarchy. It contains the name indicated in the name attribute of the class node in the MIF representation, and it is defined as abstract. The Choice class must have two stereotypes. The first stereotype must be «Choice», which indicates that the class is a Choice. The second stereotype is indicated by the first derivation Supplier subnode of the MIF class, which represents the RIM class from which the Choice class hierarchy is derived. In the example

indicate that they are RIM attributes. The association between BirthPlace and E_PlaceInformational is stereotyped «Player» to indicate that it corresponds to the RIM association player – playedRole between Entity and Role.

From MIF to UML
Our specification includes guidelines for the transformation of MIF models into UML using our profile. In the following, we illustrate this transformation by means of its application to the example in Figure 4. The result of the transformation is shown in Figure 3.

Each static model has one Entry Point (Patient Nullify in the example in Figure 4), which is named, carries an ID and contains a brief description. Figure 3 shows the entry point as a UML class with the stereotype «Entry-Point» (which is part of the Special Constructs Area).

Graphically, classes in MIF and in UML are similarly represented as boxes con-

taining a name and several attributes. The class Patient of Figure 4 is transformed into a UML class with the stereotype «Patient». Similarly, class attributes in MIF are represented as UML attributes with the stereotype «Attribute» that defines properties for where to keep additional information
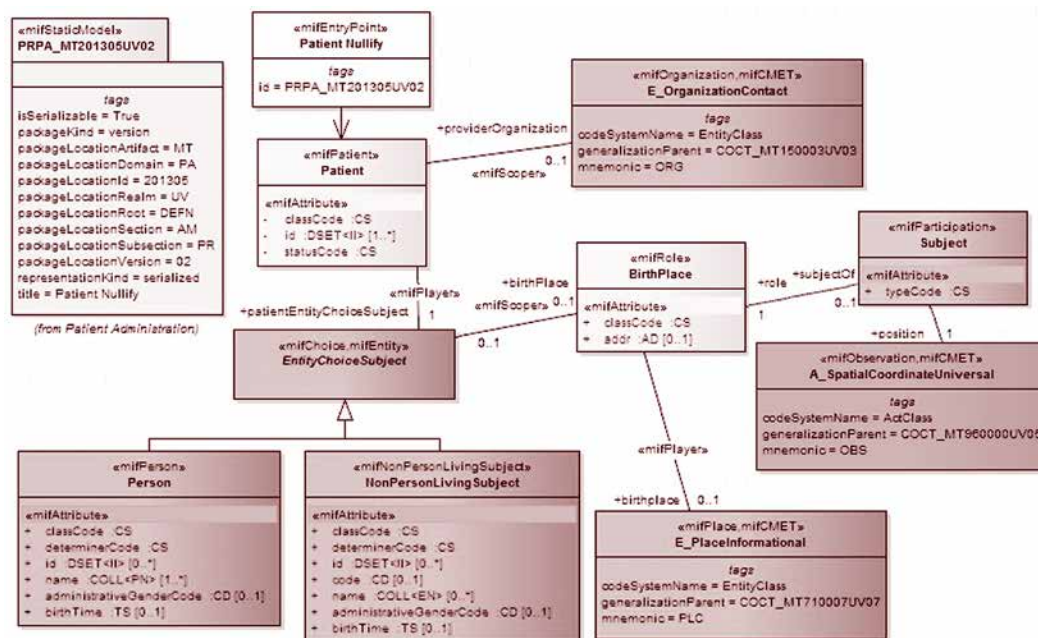

Figure 3: Example of use of the UML profile for MIF

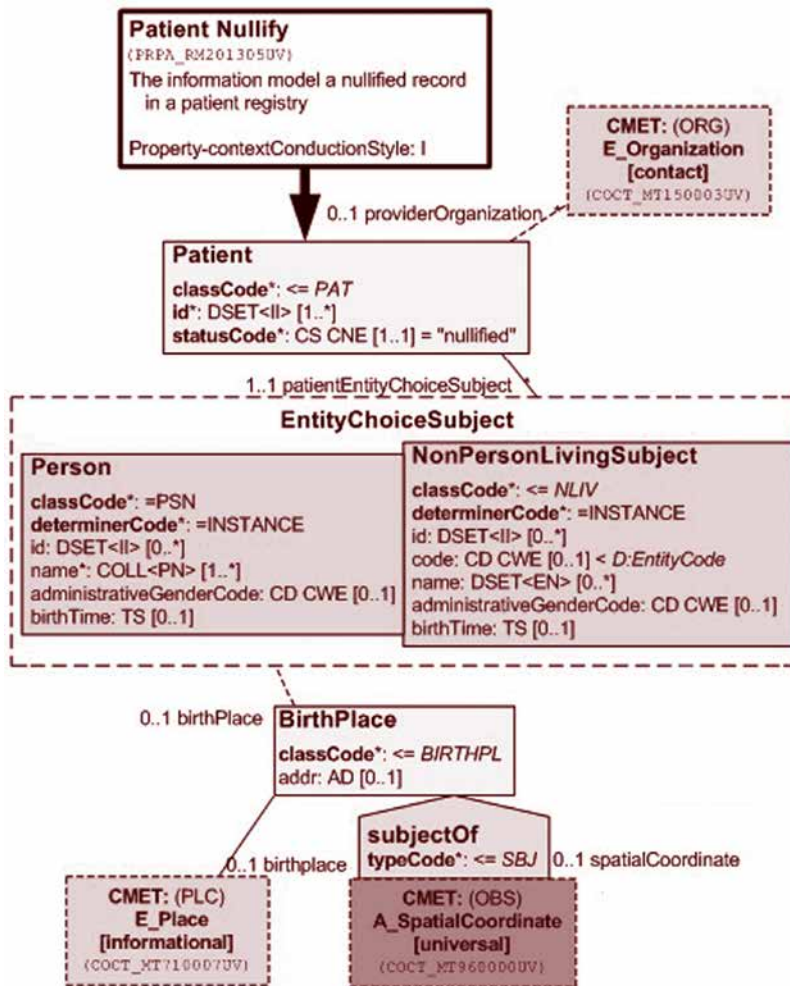# UML Profile for MIF Static Models *continued from page 17*

Figure 4: A MIF Example

shown in Figure 3, EntityChoiceSubject generalizes classes Person and NonPersonLivingSubject, and it is stereotyped as both «Choice» and «Entity».

CMETs are common references that are likely to be made by multiple models. When a CMET is referenced, or used in another diagram, it is shown with a special notation—a box with dashed edges. It contains the name of the CMET, its artifact identification code, its class code, and its level of attribution. We represent a CMET as a UML class with the stereotype «CMET». The class must contain another stereotype from the Foundational Area representing the kind of the main class referenced by the CMET.

Figure 4 shows three examples of CMETs: E_Organization, E_Place and A_SpecialCoordinate. Their UML represen-

tation, shown in Figure 3, consists of three classes, all with the stereotype «CMET», and with the additional stereotypes of «Organization», «Place» and «Observation».
In the MIFs (and in the RIM) all associations are binary, and – with only two exceptions – they can be directly represented in UML. In Figure 4 there are three normal associations: (1) between the act A_SpatialCoordinate and the participation Subject; (2) between that participation and the role BirthPlace; and (3) between the CMET and the role Patient. Figure 3 shows their UML representation as binary associations. The corresponding multiplicities are taken from the MIF model.

The MIF associations that require a special treatment are those linking roles and entities. The problem arises because there are two such associations in the RIM,; they are named playerRole – player, and scopedRole – scope. Each one has a special representation in the MIFs: a solid line for the first, and a dashed one for the second. There are two examples in Figure 4 corresponding to the roles Patient and BirthPlace. Our profile includes two stereotypes for representing those associations in UML: «player» and «scoper». The playerRole – player association between Patient and EntityChoiceSubject is stereotyped «player» in Figure 3. Similarly, the scopedRole – scope association between Patient and E_Organization is stereotyped «scoper» in Figure 3. The corresponding multiplicities are taken from the MIF model, as in the normal case. In this way, the profile allows for the capture of the complete semantics of MIF associations.

In our submission, we show the detailed transformation of several MIF models from Clinical Document Architecture, Clinical Statement, Patient Administration, Pharmacy and Scheduling. The profile specification has been developed with Sparx Enterprise Architect, although it can be easily imported and used with other modeling tools that support XMI.

Our submission includes a MIF-UML modeling guide that describes the steps required to construct valid MIF static models in UML using our profile. The guide is illustrated by means of examples using Enterprise Architect as a modeling tool.

Member Spotlight on Anita Walden
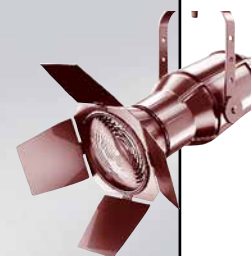
Anita Walden has been a member of HL7 since 2003. Her primary focus in HL7 has been to develop semantic standard data elements to be used at the point of care and reused throughout research, surveillance, and other health and medical entities. She believes that defining and using standard terms throughout the system will reduce recollection of data, increase data quality and hopefully, in the long term improve access to information. Anita has held many positions in HL7. She is a member of the Public Health Emergency Response Work Group and is a founding member and current co-chair of the Clinical Interoperability Council (CIC). She also serves as the publishing facilitator for the CIC. Anita was also the project manager for the Tuberculosis Data Standards DAM, the Schizophrenia DAM and the Major Depressive Disorder DAM. An interesting fact about Anita's involvement in HL7 is that since joining in 2003, she has attended every working group meeting, with the exception of the January 2014 meeting. She instead spent that week climbing Mount Kilimanjaro in Tanzania with Ed Hammond!

Anita has worked at Duke University for the past 15 years. She is currently a senior clinical research informaticist and project leader at the Duke Translational Medicine Institute. Throughout her career, she has worked for academic, pharmaceutical and clinical research organizations where she led projects and teams focused on data management activities for global clinical research and clinical research informatics initiatives. Anita has participated in a wide variety of informatics activities, including acting as a project manager and assisting in the development of methodology for creating therapeutic care data standards, including the Tuberculosis DAM project, one of two therapeutic area methodology projects funded by the National Institute of Health (NIH) and facilitated by Duke in partnership with standards organizations, HL7 and CDISC. She is also serving as the informatics project manager for the development of a 50,000 participant registry system to collect and manage self-reported, electronic medical record information from local providers and specimens that will be used to reclassify health and disease employing advanced scientific technologies working toward personal medicine.

Anita grew up in North Carolina and currently lives in the Chapel Hill-Durham area. In her spare time, she enjoys working in her yard, day hiking and skiing during the winter months. Every few years, she disconnects from phones, email and work to regenerate. For her, this means traveling to a developing country and living with local families, staying on farms, hostels or small guest houses. Anita says this grounds her and opens her eyes to the world outside of her everyday life. Most recently, she spent a month in East Africa. There, she visited Tanzania, where she hiked 8 days on the Lemosho route on Kilimanjaro; took a safari in the Ndutu region of the Ngorongoro Crater Conservation Area and the Serengeti to witness the Great Migration; traveled to Ethiopia to experience the beautiful highlands in and around Lalibela, once considered a second Jerusalem, to see ancient monasteries and churches carved out of rock; and spent time in Nairobi, Kenya, witnessing the balancing of modernization with traditional culture. To see photos from her trip, please visit: http://anitaw.smugmug.com/Hiking/Mount-Kilimanjaro-Trek/37110042_3ZLjRD#!i=3080613488&k=hbqXV3K.

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Life in the TSC and HL7 - What is Next

By Ken McCaslin, FHL7, HL7 Technical Steering Committee Chair; Director, Healthcare Standards, Quest Diagnostics

Ken McCaslin

This past January Working Group Meeting in San Antonio was different in so many ways from any previous meeting. I hope it was not obvious, but it was very intimidating for me as the new chair of the TSC. Both Charlie McCay and Austin Kreisler were exceptional TSC Chairs as they helped move HL7 forward. HL7 is now entering a unique time with a number of issues on many fronts. Improved healthcare interoperability could not be more important, as there are so many areas that have needs in a truly changing world. At a time when we need more hands, we struggle with not having enough bodies to get the work done. This is a time when we must be mentors and leaders to new people who will continue the work that has barely begun.

The big question is: How do we get started? We need to find better ways to attract others to join and help lift up HL7. One of my favorite managers once told me that if you are not training at least three or more people to succeed you, then you are stuck repeating your mistakes.

News from the PMO and Project Services Work Group

Dave Hamill

By Dave Hamill, Director, HL7 Project Management Office

Piloting Conformance Testing at HL7

Health Level Seven International (HL7) has partnered with AEGIS to offer a new HL7 Conformance Testing Program. In an effort to streamline implementation of interoperability standards, HL7 has leveraged the game-changing technology and architecture of the AEGIS Developers Integration Lab (DIL). The DIL helps automate and execute test cases created by HL7, providing an easy-to-use system for performing both conformance and interoperability tests against published HL7 specifications, standards and profiles, including templates and implementation guides.

The entire HL7 International community, including affiliates, benefits from this shared testing service, which can eventually be used to identify test cases that are sufficiently mature to comprise a certification program. Participating in this program takes the burden off of vendors to validate technical interoperability and offers vendors a major market differentiator.

The scope of the pilot project is to create test artifacts for Immunization. This past February, at the HIMSS14 Conference in Orlando, a 'proof of concept' was unveiled by demonstrating a subset of the immunization profiles. The pilot will conclude at HL7's Plenary Meeting in September.

A high-level overview of the process to set up and conduct practice testing in the Developers Integration Lab (DIL) is on the homepage of www.HL7.org.

HL7 Help Desk Expansion

HL7 has expanded its Help Desk pilot to include the following areas:
- HL7 Immunizations
- HL7 V2.X Orders and observations
- HL7 V2.X ADT
- HL7 V2.X Meaningful Use Stage 2 Implementation Guides
- FHIR®

The Help Desk is free to HL7 members and includes professional support staff to get the support you need to lower development costs by resolving implementation challenges. There are over 300 FAQs and Knowledge Base articles available.

Additionally, HL7's team of Help Desk Moderators is available to answer any question posed by members which aren't part of the database of FAQs and Knowledge Base articles.

HL7 members can access the Help Desk at https://healthlevelseven.desk.com.

Life in the TSC and HL7 *continued from previous page*

We have done extremely well during the last 26 + years, but that is only a start. We need to provide a good space for new people that may not even know about HL7. We have the ambassador program, but we all need to be ambassadors for HL7.

I do not pretend to have the answer, but I have learned that those who are "HL7 people" are some of the brightest. I would like you to consider what led you to HL7, what made you stay, and what keeps you coming back.

When you get a chance to reflect on this, please send me an email with an idea that you think might invite/encourage new people to join HL7. Please title it "Building a New HL7" and send it to me at Kenneth.H.McCaslin@ QuestDiagnostics.com. I will gather all the emails and consolidate them into a collective document that I will email prior to the September Work Group Meeting. Then, let's brainstorm together to determine the next steps.

Congratulations

To the following people who passed the HL7 Certification Exams

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Computer Based Testing

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Satheesh Nalliyappan
Lauren Vermette

January 2014
Sandeep Kovvur
Eric Bultman
Shanmugasundaram Jaganathan
Melanie Kourbage
Raghava Rachuru
Siva Karthik Devineni
Lester Arthur
Jing Li
Chukwuma Okeke

February 2014
Josh Reynolds
Michael Adams
Richard Overath
Dean Quarles
Patrick Malone

HL7 China

December 15, 2013
Qizu Deng
Yihui Fan
Yang Gao
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HL7® FHIR® Institute & Meaningful Use Standards Implementation Workshop

Gain real-world HL7 knowledge

TODAY

that you can apply

TOMORROW

What is the HL7 FHIR® Institute?

The HL7 FHIR® Institute provides resources and training for the next generation standards framework created by HL7: Fast Health Interoperability Resources or FHIR®. The FHIR® Institute focuses on making this new standard easier to understand and implement across the healthcare community. Training at the FHIR Institute includes both face-to-face and virtual events and is targeted at software developers, implementers and executives. Learn about FHIR straight from the source at FHIR® Institute programs delivered by expert FHIR standard developers.

What is an Implementation Workshop?

An HL7 Implementation Workshop is a three-day interactive hands-ons event focused on HL7-specific topics such as Version 2, Clinical Document Architecture (CDA®), Quality Health Reporting Document Architecture (QRDA), and Health Quality Measure Format (HQMF). It includes a combination of exercises and presentations to help attendees learn how to implement HL7 standards.

Why Should I Attend?

This is an invaluable educational opportunity for the healthcare IT community as it strives for greater interoperability among healthcare information systems. Our classes offer a wealth of information designed to benefit a wide range of HL7 users, from beginner to advanced.

Among the benefits of attending the HL7 Implementation Workshop are:

- **Efficiency**
  Concentrated format provides maximum training with minimal time investment

- **Learn Today, Apply Tomorrow**
  A focused curriculum featuring real-world HL7 knowledge that you can apply immediately

- **Quality Education**
  High-quality training in a "small classroom" setting promotes more one-on-one learning

- **Superior Instructors**
  You'll get HL7 training straight from the source: Our instructors. They are not only HL7 experts; they are the people who help produce the HL7 standards

- **Certification Testing**
  Become HL7 Certified: HL7 is the sole source for HL7 certification testing, now offering testing on Version 2.7, Clinical Document Architecture, and Version 3 RIM

- **Economical**
  A more economical alternative for companies who want the benefits of HL7's on-site training but have fewer employees to train

Upcoming Event

July 7 – 10, 2014
HL7 FHIR Institute & Meaningful Use Standards Implementation Workshop
Hyatt Regency Cambridge Cambridge, MA

Upcoming WORKING GROUP MEETINGS

September 14 – 19, 2014
**28th Annual Plenary
& Working Group Meeting**
Hilton Chicago Hotel, Chicago, IL

January 18 – 23, 2015
Working Group Meeting
Hyatt Regency on the Riverwalk
San Antonio, TX

May 10 – 15, 2015
Working Group Meeting
Hyatt Regency Paris –
Charles de Gaulle Hotel
Paris, France

September 18 – 23, 2016
**30th Annual Plenary &
Working Group Meeting**
Hyatt Regency Baltimore
Baltimore, MD

October 4 – 9, 2015
**29th Annual Plenary & Working
Group Meeting**
Sheraton Atlanta Hotel
Atlanta, GA