Optimizing Interoperability for the Internet of People

eHealth Week 2017 in Malta—Connected Health Data Meet the People: Diversity, Standards, and Trust

The Success of the Value-Based Care FHIR Summit

Plus...

Report on the eStandards Final Conference

Making C-CDA Documents More Relevant and Pertinent

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Affiliate Spotlight on HL7 UAE

In this Issue

Update from Headquarters Farewell and Welcome

By Mark McDougall,
HL7 Executive Director

A Successful WGM in Madrid

HL7 produced a productive meeting with 310 attendees at our May Working Group Meeting (WGM) in Madrid, Spain, May 6-12, 2017. Over 40 HL7 work groups convened meetings in Madrid, of which 17 conducted co-chair elections for 28 leadership positions. Attendees also took advantage of 17 tutorials, a FHIR connectathon, and certification testing. In addition, the HL7 affiliates sponsored a reception with poster boards on Sunday evening.

I would like to express sincere appreciation to several individuals who contributed to the success of the Madrid WGM, particularly:

- Paco Perez who provided tremendous support and guidance over the last two years.
- Diego Kaminker for his help translating materials into Spanish, suggesting music for our walk-in playlists, and his ongoing guidance.
- Contributions by many to help identify and recruit speakers for our plenary session, including: Paco, Philip Scott, Catherine Chronaki, Christof Gessner, and Alexander Berler.
- Kai Heitmann who donates his time to serve as HL7's photographer.
- Lillian Bigham who once again planned and produced an exceptionally well run HL7 WGM and kept the meeting expenses under budget.

Staff Changes at HL7 HQ

Melanie Hilliard

During her three years supporting HL7's marketing needs, Melanie proved to be an exceptionally talented marketing resource, excelling at both higher level strategic duties and the detailed tasks of promoting HL7 meetings and membership. Melanie was presented with an exciting opportunity that was too good to pass up: she will join Mandi Bishop's new company called Lifely Insights.

Sharon Chaplock, PhD

During the almost five years as HL7's Education Director, Sharon made considerable contributions to HL7. She developed and launched HL7's educational portal, significantly expanded HL7's webinar program and also expanded HL7's certification testing program via online testing services as well as at more than 400 in person testing centers around the globe. Sharon has moved on to a semi-retirement phase.

Lillian Bigham

Lillian joined our team as the HL7 Director of Meetings after we enticed Lillian to come out of retirement in January 2006 for just six months. Fortunately for us, those six months turned into 11½ years! The Madrid WGM was Lillian's final meeting prior to retiring at the end of May. She received well-deserved recognition and appreciation at the event, including a standing ovation at Monday night's co-chair dinner meeting that brought tears to her eyes. She is looking forward to spending more time golfing and with her family.

Retiring HL7 Director of Meetings Lillian Bigham addresses the crowd in Madrid, after being recognized for her service by HL7 CEO Charles Jaffe.

We will certainly miss Melanie, Sharon and Lillian and wish them well in their next chapter of life.

HL7 Welcomes New Staff
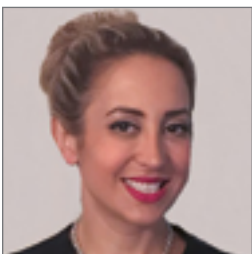
Maryam Mahjoub joins our team as the new HL7 Marketing Director. She brings with her 15 years of international marketing experience, working in Canada, UAE, Bahrain and the UK. A results driven business strategist, she has helped organizations like Canada Post, BMW and Faronics to grow their revenue and market-share. Her most recent position was with Interfaceware, an HL7 member and integration provider in the healthcare space. It was then she realized her passion for healthcare and attained her Masters in Healthcare Leadership from the University of Denver. Maryam relocated to Ann Arbor to join the HL7 team. In her spare time she enjoys volunteering with various non-profits, writing for healthcare publications and practicing martial arts.

Sadhana Alangar, PhD, joins our team as the new Director of Education. She brings over 25 years of experience as a leader within the field of education. She has significant cross-cultural experience having taught diverse students in India, Texas, Hawaii and Michigan. She is competent in institutional strategy development that aligns with organizational vision and mission. Sadhana is proficient in using lean six sigma tools to analyze and improve processes. She is also specialized in course development for both onsite and online programs. Her experience includes developing and teaching interactive courses in eLearning platform such as Moodle. Sadhana holds an undergraduate degree in Mathematics, a graduate degree in Econometrics and a PhD in Business Administration (Finance). She is a member of Toastmasters International and lives in Ann Arbor.

Please join us in welcoming Maryam and Sadhana to our staff!

Woody Beeler Passes Away

On the Sunday at the beginning of the Madrid WGM, we learned that George (Woody) Beeler, PhD, had passed away that day after a long battle with cancer. Most in the HL7 community knew Woody. For those who didn't, Woody was not only a former chair of the HL7 Board of Directors, but he was also actively involved in many areas of HL7, such as having significant roles in the development of:

Woody Beeler, long-time HL7 Member and Former Chair of the HL7 Board

- IT tools for creating HL7 standards
- HL7 Version 3 data model
- Message development framework (MDF)
- Reference information model (RIM)

Within hours, I received emails from Lloyd McKenzie and Dave Shaver suggesting that we create a scholarship in Woody's name. Details on the scholarship and guidance for making donations can be found here: http://www.hl7.org/about/beeler_scholarship.cfm.

I would also like to thank Dave Shaver for his suggestion that we create a video of stories to share with Woody's family, and Renee Spronk for his willingness to handle the recording duties. Woody's family was very appreciative of receiving the link to over 20 video recordings from people around the world who knew Woody.

31st Annual Plenary Meeting in San Diego

We are pleased to report that the theme for our upcoming plenary meeting will be "Improving Patient Safety with Interoperability." More program details are available on our website. Please join us for the 31st plenary meeting that will occur on Monday, September 11th at the Hyatt Regency La Jolla at Aventine in San Diego, California.

Benefactors and Gold Members

We are pleased to recognize HL7's 2017 benefactors and gold members who are listed on page 36. 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, and at all of our HL7 WGMs.

Organizational Member Firms

HL7 is proud to recognize our organizational member firms listed on pages 36-39. We appreciate their ongoing support of HL7 via their organizational membership dues.

In closing, I am pleased to send best wishes to you and your loved ones for good health and plenty of laughter!

Meeting Sponsors

I am pleased to recognize the organizations that sponsored key components of our May Working Group Meeting in Madrid:

Gold Sponsor: ORION HEALTH | *Silver Sponsor:* InterSystems
Sponsors: Hi3 • iINTERFACEWARE

A warm thank you is also extended to nine HL7 affiliates who sponsored the Sunday evening reception and poster board session. The additional sponsorship support provided by the organizations listed above contributed significantly to HL7's meeting budget and is much appreciated.

- HL7 Argentina
- HL7 Austria
- HL7 Canada
- HL7 France
- HL7 Germany
- HL7 Italy
- HL7 Netherlands
- HL7 Norway
- HL7 Switzerland

Letter from the Chair:

Reflections on the Madrid Meeting and Looking Forward

It is hard to believe that just a little while ago, we were meeting in Madrid—a lovely city with a rich and varied history that was palpable. We had the opportunity to enjoy fabulous cuisine and wine. Thanks to the guidance from HL7 Spain Chair Paco, the HL7 staff adjusted the meeting hours, delaying the daily meeting start and end hours in order to better accommodate how Spain works. Being there for the national holiday and celebration of St. Ysidro showcased how vibrant the people and city of Madrid are.

By Pat Van Dyke, RN, Board Chair, HL7 International

One of my favorite things about meetings outside the US is getting a more intimate perspective of the country or region in which we are meeting—in this case from the plenary speakers of Spain, the United Kingdom and France. The presentations showcased the desire to take care of varied populations all within the same country. They addressed the challenge of identifying populations and population needs between regions and within regions as well as the desire and effort to provide optimum healthcare across jurisdictions and discovering it is not necessarily easy to do. These presentations also highlighted how countries are striving to find consistent approaches and processes for working on healthcare issues, while still having time and resources to recognize and find solutions to variances. Finally, since we are not widgets, I was reminded of the importance of listening and the recognition that each person is an individual with his/her own needs.
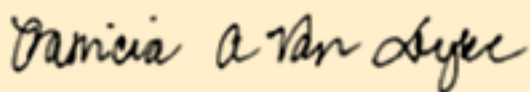
Collaboration

These meetings confirm that we are the same in many ways and on many levels. The work of standards affords us the opportunity to create a common good which can be measured and shared, and at the same time, still allows us to vary our work on the edges in order to meet a specific need of a country, region, population or individual. The practice of respecting and listening to each other is so important. Our work takes time, patience and passion. Working together has its challenges, but will lead to success. The meeting in Madrid reminds me again that we need to continue to come together as an organization comprised of countries and individuals to find ways to be aware of, share, and re-use the work that is being done around the world.

Thank You

Thanks to all of you for your encouragement while working with me over the past two years. You are the organization. It is the belief that you have in the work that you do—both on a professional and personal basis—that makes the organization excellent. We have our bumps; however, if we remember that we may have differences, but are striving for the same result and if we actively listen to each other, we have the ability to work effectively.

I wish you a very successful September meeting and remainder of the year. Enjoy! 2017 will be over before we know it!

Pat Van Dyke, RN
Board Chair, HL7 International, 2016-2017

Member Spotlight on Melissa Mendivil

Career Background

Melissa Mendivil began her journey with HL7 in the mid 1990s as an interface analyst at Sunquest Laboratory Information Systems. A biology major in college and then employed in the pharmaceutical research industry, she had no previous experience with IT. She joined the company as she was able to "speak lab" to clients and translate that into HL7 specifications for their programmers. Before too long, she found herself as a programmer analyst, implementing new HL7 interfaces for suites of the product. (She asks, "Does it show my age if I can recall working with Version 2.1? ☺")

Melissa has held different positions in her career, but all have centered around clinical data, and in particular the HL7 standards. She currently works as a technical product manager for the Optum Data Exchange product, which is a comprehensive clinical interoperability engine and data repository.

Becoming an HL7 Member

It was through Optum, who is an HL7 Benefactor, that Melissa became involved with the HL7 organization. Optum has established a very successful HL7 Community of Practice and it was through her involvement with this group that she began attending the Education Work Group meetings every two weeks. Melissa recalls that she was warmly accepted and encouraged to participate further.

An Education Co-Chair

In May of 2016, she was elected co-chair of the Education Work Group and she states that it has been an honor and pleasure to work side-by-side with HL7 staff and volunteers to see a number of strategic initiatives come to fruition. She says that although she is a relative newcomer to the working group meetings and the HL7 organization, she feels that she has found a home in this community.

Hobbies and Home Life

Melissa lives in Charlotte, NC with her husband. She has two daughters in college; coincidentally are both are studying in health related fields. In her spare time – (which product managers have notoriously little of!) – she enjoys revisiting her past life in research chemistry by experimenting with farm to table recipes, and exploring second hand shops for hidden furniture treasures to rehab as she practices for her retirement career as a future HGTV star. ☺ ■

Collaborative Tools for HL7 Work Groups

If I Had a Hammer…

By Wayne Kubick, CTO, HL7 International

The business of HL7 is consensus-based standards. Consensus is achieved by working together, so one of my priorities as CTO is to make it easier to collaborate.

Historically, HL7 has relied primarily on working group meetings, telephone conferences, email and a document Wiki. In many cases Tracker is used, and perhaps Google Docs. Recently, we've been adding web conferencing for screen-sharing. But mostly, work groups talk, record what they say somewhere, and produce documents. And we still rely extensively on phone conversations and email attachments more than anything else.

When we talk about tooling at HL7, we often focus on the tools needed to publish our standards, which are incredibly important (and have their own individual challenges). But before we have something to publish, work groups need to interact repeatedly, so there's an entire range of collaboration tooling that we want to explore to use our time together most wisely.

While we've gotten a great deal of mileage out of MediaWiki and Tracker, both tools lack the advanced features that can help us improve our collaborations. We also must realistically work within our limited budget. Additionally, we want to use tools that will meet our needs through configuration rather than relying too heavily on customized programming to help us feel that we can support what we have. Fortunately, HL7 has been granted a no-cost community license by Atlassian Inc. to use their suite of collaboration tools, which we expect to be rolling out to the HL7 community in the coming months.

Many of you have experience with the Atlassian Suite – their Confluence Wiki is used by other standards organizations such as SNOMED, CDISC and the JIC. Additionally, JIRA is used by many major organizations such as Oracle, eBay, Cisco and even ONC. I also understand that HL7 Australia has been using these tools for years with great success.

Unlike MediaWiki, Confluence provides an intuitive WYSIWYG interface. It not only can store documents and publish them in multiple formats (including Word and PDF), but can also provide a platform for collaborative authoring and editing. You can easily comment and "Like" just as you do with social media. The EST Work Group is already using it for meeting agendas and minutes, and it will notify you when you have action items. In addition, Project Services is setting up an online PSS form, which should make it easier to streamline the creation, review and approval of this and other process documents.

JIRA can provide the same issue tracking as Tracker, but also includes workflow and advanced tools to plan, track and release products as well as built-in support for Agile development processes. Among other things, the FHIR team is currently evaluating it as a platform for managing future ballots.

Both products are fully integrated with single sign-on and with a Chat tool (HipChat) that we'll also be evaluating for use by the entire HL7 community.

Of course, we have a long history of using our current tools, so it's not possible to flip a switch overnight. Therefore, we plan to continue to use MediaWiki and Tracker to some degree while we begin to explore all that the Atlassian tools can offer.

We believe there will be many advantages to this powerful, widely used, integrated stack of tools that can be customized and extended through a rich marketplace of 1000's of add-on products that can extend it in multiple ways. I can't begin to imagine all of the suggestions the creative HL7 community will undoubtedly identify themselves, and I'm looking forward to hearing your ideas as we move forward.

So, stay tuned for more details as we begin to make this exciting new collaboration platform available. Think of it as a joint adventure into tomorrow. ◼

Available Online:

For more information on about the Atlassian suite, please visit:

https://www.atlassian.com/software

By Karen Van Hentenryck, HL7 Associate Executive Director

Efficiencies Streamline WG Activities

New Decision Making Practices in September

Those of you who attend the working group meetings (WGMs) or have had any opportunity to hear our CTO Wayne Kubick speak, know that he supports a concept called essentialism defined as "the disciplined pursuit of less". As a proponent of essentialism, Wayne has been working to identify and simplify many of the long-established but inefficient processes within HL7. One of the processes identified as needing simplification was the organization's Decision Making Practices (DMPs).

In the past, the Process Improvement Committee (PIC) distributed a single set of default DMPs every couple of years that each work group (WG) could customize for their particular purposes. Each WG was required to adopt a set of DMPs (either the default or their customized set) that were then posted to their page on the HL7 website. As a relative newcomer to HL7, Wayne quickly realized how inefficient this process was as it required participants to download and review the DMPs for each WG they were participating in, and the differences were not easily identifiable. He therefore proposed that we have a single set of DMPs and a finite set of sections within those DMPs that can be customized by any given WG. Rather than loading an entire set of DMPs to each WG's webpage, it would more efficient to simply post the customized portions of the DMPs to a WG's webpage. This allows participants to quickly see the changes to the default DMPs that have been adopted by any given work group.

PIC agreed that this was a more efficient method of developing and posting DMPs and will be releasing a new set of DMPs in September 2017 along with a modifications template for WGs to document their modifications to the default set.

PIC has identified the following sections of the DMPs as customizable:

- Section 2 on Open Meetings as some groups such as the Leadership Development and Nomination Committee and the Policy Advisory Committee have closed membership, closed listservs, and may have some closed meetings.

- Section 5 on quorum as smaller WGs or closed membership groups may have different quorum requirements than most of the large WGs.

- Section 7 on electronic voting, to allow WGs to specify minimum length of discussion period, voting period and to identify appropriate quorum for their electronic votes, which again can vary significantly based on the size of the WG or committee.

- Section 8 on proxy voting. While the default is to not allow proxy voting, PIC understands that some groups may wish to allow this going forward.

The DMP Modification Template will be used to document a WG's changes to customizable sections identified above. The Modification Template will not be a free form document. Instead, it will provide language for closed meetings, assuming your WG has a closed membership and language for proxy voting, should your WG decide to allow proxy voting, etc.

As noted above, PIC will be releasing the updated set of DMPs at the September 2017 meeting and WGs will have until January 2018 to adopt and document changes to the customizable sections of the DMP via the DMP Modification Template. While PIC will collect the modifications, the authority to approve or deny modifications proposed by any WG lies with the Technical Steering Committee. ◼

Voting Moves to Cloud-Based App
Electronic Co-Chair Elections Coming Soon

By Karen Van Hentenryck, HL7 Associate Executive Director

As many of you know, co-chair elections have been conducted at the working group meetings (WGM) for many years using the old fashioned method of paper ballots. Staff routinely spent several hours during the WGM determining whether voters were subscribed to the appropriate work group (WG) listserv, and were in the membership database and thus eligible to vote. It also took time to physically count the paper ballots. The whole process was extremely time consuming and just plain inefficient.

While we've looked for ways in the past to conduct WG co-chair elections online, we've been unsuccessful at being able to quickly and easily determine the list of eligible voters (subscribed to the listserv and a current HL7 voting member) for any given WG and allow only those eligible voters to participate in a ballot on the HL7 website.

All of that is about to change. We've found a new online app called Election Runner (www.electionrunner.com) that will allow us to conduct co-chair elections online. A cloud based application, Election Runner enables us to run multiple elections simultaneously (this was a drawback with Poll Everywhere, another application that we've used for the FHIR Application Roundtable), and customize election details by work group.

Specifically, Election Runner allows us to:

- Set start and end dates/times for each WG co-chair election
- Customize the number of nominees that can be selected for any given WG co-chair election (e.g., vote for two or vote for three)
- Send reminders to those who haven't voted
- Automatically tally the results

The CTO and Executive Committee have approved conducting a pilot with Election Runner with three to four WGs at the September 2017 meeting. Assuming the pilot goes well, Election Runner will be used for all co-chair elections beginning January 2018.

This will require a change to our current co-chair election process as outlined in the GOM, specifically to eliminate the absentee ballot. With Election Runner, there is no need for absentee ballots. Any member subscribed by the Wednesday prior to WGM to the listserv of the WG holding co-chair elections will be eligible to vote. All co-chair elections will be conducted 9 am – 5 pm local time during the WGM.

Members will need to be subscribed to the appropriate listservs using an email address that matches the email address in the HL7 membership record.

If your WG is interested in participating in the Election Runner pilot in September, please contact me (Karenvan@HL7.org) and our CTO, Wayne Kubick (wkubick@HL7.org). We look forward to a successful Event Runner pilot in September and a complete rollout for all co-chair elections in January. ◼

Easy Download of SNOMED CT Codes

Tools for Members: The Vocabulary Standards Portal

By Karen Van Hentenryck, HL7 Associate Executive Director

HL7 and SNOMED International have had a working agreement for many years. The agreement is fairly structured and outlines joint work to be completed by a collaborative effort of both organizations.

One such work item completed in 2016 was the Vocabulary Standards Portal. The portal enables HL7 standards developers to download the latest versions of SNOMED CT. As users of SNOMED CT codes are no doubt aware, anyone can search for SNOMED codes on the SNOMED website. The advantage of HL7's Vocabulary Standards Portal is the ability to download the codes, thereby making it very easy to populate your value sets.

The Vocabulary Standards Portal is available to members and non-members alike who are working on HL7 International standards. To access the portal, individuals must have a username and password for the HL7 website. When the user is logged on to the HL7 website and navigates to the portal to access SNOMED CT codes, he/she will be asked to identify the HL7 International standard being developed (for which they are downloading SNOMED CT codes) and the associated HL7 work group. Once those questions are answered, the user is taken to a screen and presented with several choices of SNOMED CT code versions available for download. Each month, HQ provides SNOMED with the names of individuals who downloaded codes from the Vocabulary Standards Portal along with the name of the standard and work group entered by the user.

As noted above, the Standards Vocabulary Portal is available to all developers working on HL7 International standards. The "working on HL7 International standards" modifier is important. Use of SNOMED codes is controlled in each country by Affiliate Licenses. SNOMED created a specific

Developer's License for use of the portal. Standards developers can download SNOMED CT codes from the portal for free as long as they follow the terms of the Developer's License, regardless of whether or not their country has an Affiliate License.

To use the codes to develop country-specific implementation guides or to implement the codes in any given country requires an affiliate license. The US has an Affiliate License through the National Library of Medicine. While some of our affiliates are covered under Affiliate Licenses through their own country, many of our affiliate countries do not have such a license. While these individuals may download and use the codes to create HL7 International standards, they are prohibited from downloading the codes to create country/realm-specific guides and/or to implement standards that contain the codes in their country. Countries who wish to obtain an Affiliate License should contact SNOMED directly at info@ihtsdo.org.

To date, the Vocabulary Standards Portal has seen very limited use. The general sense for the lack of use is either that most people are unaware of this tool or don't know where to find it. We built the Vocabulary Standards Portal to assist our developers and encourage all of them to access the portal as needed to populate the value sets associated with HL7 International standards under development. The hope is that the work we did with SNOMED to create the Vocabulary Standards Portal can be duplicated with other vocabularies. ■

Available Online:

To access the Vocabulary Standards Portal, please visit:

http://www.hl7.org/portal/index.cfm

HL7 Standards Approved by ANSI, January – June 2017

APPROVED

Name	Designation	Date
1. HL7 Version 3 Standard: Representation of the Health Quality Measures Format (eMeasure), Release 1	ANSI/HL7 V3 HQMF, R1-2017	15-Jun-17
2. HL7 EHR-System Pharmacist/Pharmacy Provider Functional Profile, Release 1 - US Realm	ANSI/HL7 EHRRXPROVFP, R1-2012 (R2017)	12-Jun-17
3. HL7 Version V3 GELLO Implementation Guide: Clinical Decision Support, Model Definition Language for GELLO, Release 1	ANSI/HL7 V3 GELLO IG CDS MDL, R1-2017	17-Apr-17
4. HL7 Version 3 Standard: Medication; Knowledge-Based Query, Release 1	ANSI/HL7 V3 ME DKBQ, R1-2012 (R2017)	3-Apr-17
5. HL7 CDA® R2 Implementation Guide: Privacy Consent Directives, Release 1	ANSI/HL7 CDAR2 IG CONSENTDIR, R1-2017	12-Jan-17
6. HL7 Version 3 Standard: Privacy, Access and Security Services (PASS) Access Control, Release 1	ANSI/HL7 V3 PASSAC, R1-2017	9-Jan-17
7. HL7 Version 3 Domain Analysis Model: Diet and Nutrition Orders, Release 2	ANSI/HL7 V3 DAM DIETORD, R2-2017	6-Jan-17
8. HL7 CDA® R2 Implementation Guide: Personal Healthcare Monitoring Reports, Release 1	ANSI/HL7 CDAR2 PHMRPTS, R1-2017	3-Jan-17

News from the HL7 Project Management Office

ONC Grant Project: Enhancing C-CDA Implementation and FHIR

By Dave Hamill,
Director, HL7 Project
Management Office

Late in 2015, The Office of the National Coordinator for Health IT (ONC) awarded HL7 a grant to enhance and improve C-CDA implementation and support the FHIR infrastructure. In 2016 and 2017, the collaborative agreement continued as additional grant funds were awarded to focus primarily on FHIR development. The grant covers twelve components listed below with the first seven complete.

1. Discovery of C-CDA content inconsistencies via surveys and in-person Implementation-a-thons

2. Extension and/or modification of template samples to address inconsistencies identified by item 1 above

3. Creation of an updated C-CDA R2.1 Companion Guide informed by items 1 and 2 above

4. A C-CDA rendering prize challenge

5. A C-CDA scoring methodology

6. Enhance/upgrade the platform where C-CDA sample templates reside

7. Define FHIR Repository processes

8. Updates to the HL7 Help Desk section specific to C-CDA to address items 1-3 above

9. Harmonize/standardize FHIR terminology and information models

10. Create a FHIR Profile Registry/ Repository Prototype

11. Modify/enhance C-CDA value sets

12. Develop a FHIR tools and profile Roadmap

Progress This Quarter

Calvin Beebe led the effort to produce HL7's first ever virtual C-CDA Implementation-A-Thon (IAT). The event focused on two tracks – Transition of Care, with topics presented by Calvin, Ben Flessner and Brett Marquard; and Care Plan, conducted by Lisa Nelson. Dave Degandi provided the Skype for Business functionality to facilitate simultaneous tracks.

This pilot effort was deemed a success and future virtual IATs are being discussed; however, the group did state that face-to-face IATs offer better opportunities to collaborate amongst each other and conduct sidebar discussions, neither of which can be done virtually. The conclusion was that a 'best of both worlds' would be ideal – HL7 should host both virtual and face-to-face IATs going forward. HL7 is working with the ONC to make that happen.

Work continued to harmonize/ standardize FHIR terminology and information models at HL7's Clinical Information Interoperability Council (CIIC) Meeting jointly hosted by HSPC (Healthcare Services Platform Consortium). The CIIC is undertaking a proof of concept project to demonstrate the value of creating, adopting and implementing a process to standardize data elements and harmonize clinical models to create FHIR profiles for specific use cases. Use of FHIR profiles created via this process will result in highly interoperable applications that can pull data from virtually any EHR. The three deliverables from this project will be:

1. Documentation of the agreed on and repeatable process for standardizing data elements and creating the related CIMI models and FHIR profiles for a particular use case

2. Development of the DAMs, CIMI models and FHIR profiles for one or more selected SMART on FHIR applications currently under development

3. Development and publication of a related FHIR implementation guide

Lantana Consulting Group was awarded the project to modify and enhance C-CDA value sets. This project includes the following deliverables:

• Reviewing and performing 'quality assurance' against current C-CDA value set definitions in VSAC (Value Set Authority Center) (completed in July)

• Defining requirements and processes for ongoing maintenance of C-CDA value sets; implementing those requirements and piloting the processes for C-CDA value sets so as to establish a new baseline collection of up-to-date CCDA value sets (in process)

• Continuing the work above to develop value set updates and present those changes as issues for discussion or errata to the Structured Documents Work Group (SDWG) on an ongoing basis. Collaborate with the SDWG on the resolution of these changes by hosting a wiki consensus review (in process)

As the end of the second year of collaboration with the ONC

drew near, HL7 re-evaluated each of the unfinished components and assessed what is needed to further refine and expand FHIR functionality and implementation readiness to advance development of the FHIR specification, to provide support to the FHIR community consistent with the FHIR product roadmap, and to continue to improve C-CDA. Based on this analysis, all but the C-CDA Help Desk updates will move forward. Furthermore, we identified the following as work that could be done if additional grant funds are provided for 2018:

1. Support implementation of the FHIR registry system and processes

2. Improve business processes and tools for the FHIR community

3. Improve tools for the FHIR community

4. Enhance C-CDA product support by:

   a. Improving processing and publication of C-CDA errata updates

   b. Developing new C-CDA samples and implementing improved QA processes on new and existing samples

   c. Designing and developing a proof-of-concept retooling of the C-CDA publishing environment within the FHIR publication system to speed the release process, improve consistency between templates and reduce errors.

HL7 appreciates ONC's continued support of C-CDA and FHIR for 2017 and beyond. ▪

HL7 Welcomes New Members

Gold

• Advocate Healthcare Laboratories
• Altarum Institute
• Aurora Health Care
• Blue Cross Blue Shield Association
• CITRIOM LLC

Organizational

• AxialHealthcare
• Blue Cross Blue Shield of Kansas City
• eSpoc
• Health and Welfare Information Systems Centre
• HealthNow New York Inc.
• Healytics, Inc
• KaMMCO
• Medical Research Analytics & Informatics Alliance
• NaviHealth
• Nebraska Dept of Health and Human Services
• Psmi Consulting, Inc.
• Radiology Consultants of Iowa, PLC
• RDnote
• Sentry Data Systems
• UC Davis School of Medicine
• UCB
• Utah Department of Health
• XchangeWorx

Benefactor

• Staywell

HL7 WGM and FHIR Connectathon

Exploring *Sync for Genes* Pilots in Precision Medicine

Precision medicine enables individualized medical treatment based on clinical genomic information. Lower costs of genomic sequencing have made genomic testing in clinical care more accessible. As such, increased accessibility demands have increased efficiency in data sharing and usability to capture all the potential gains from this technology.

To fulfill the potential of precision medicine, genomic data needs to flow between regulators and users, linking clinicians/patients, NGS sequencing laboratories, and electronic health record systems (EHRs) (See Figure 1 on page 15). These data stakeholders are connected by a standardized infrastructure, HL7's Fast Healthcare Interoperability Resources (FHIR®) standard, creating a "Ring of FHIR" that expedites data sharing.

FHIR is an interoperability standard that facilitates electronic data sharing. In Figure 1, FHIR Genomics, the genomic portion of FHIR, enables genomic data to become more readily available in a consistent format.

At the HL7 International FHIR Connectathon and Working Group Meeting in Madrid, several HL7 members explored precision medicine applications

By Gil Alterovitz, PhD, Co-Chair, HL7 Clinical Genomics Work Group, Harvard Medical School/Boston Children's Hospital

Lydia Guo, Wellesley College

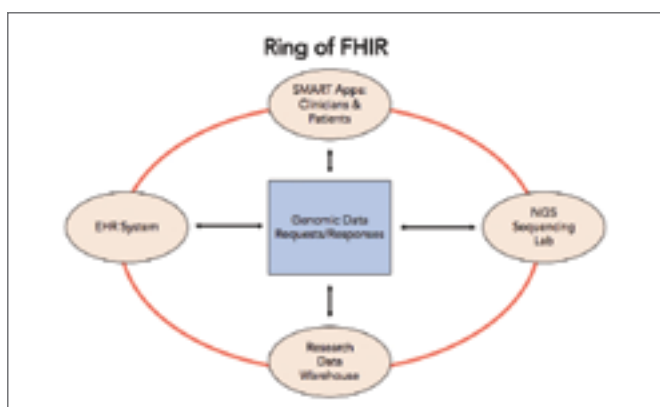Bob Milius, PhD, Co-Chair, HL7 Clinical Genomics Work Group, National Marrow Donor Program/Be The Match

Figure 1. *The "Ring of FHIR" shows the locations and flow of genomic information facilitated by FHIR.*
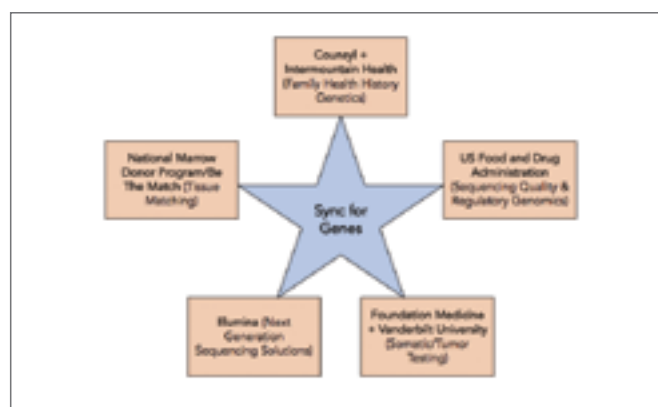

Figure 2. *Sync for Genes involves five use cases across pilot sites.*

of FHIR Genomics across use cases piloted by the *Sync for Genes* program. These members include: Gil Alterovitz, PhD; Martin Maiers; Bob Milius, PhD; Joel Schneider, PhD; and Grant Wood.

 Sync for Genes, launched by the US government this past year, aims to integrate clinical genomics into the point-of-care (POC) and accelerate standardization of sharing patients' genomic data. Through the Office of the National Coordinator for Health IT (ONC), the project is also partnering with the NIH's Precision Medicine Initiative, *All of Us*. *Sync for Genes* is creating a foundation of widespread genomic data use to support the *All of Us* program.

At the core of *Sync for Genes* lies FHIR Genomics, the technology that is enabling a universal standard for clinical genomic data sharing among laboratories, providers, and other stakeholders. Utilizing FHIR Genomics, *Sync for Genes* can help incorporate genomic data for care and/ or translational research. This

will enable the combination of genotypic data with phenotypic EHR data such as medication, imaging, and family history.

To aid developers and analysts, in February 2017, HL7 published the *HL7 Domain Analysis Model: Clinical Sequencing* (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=446). The Domain Analysis Model (DAM) is a guidebook on precision medicine use cases with a special focus on clinical sequencing, elucidating genomic use case scenarios, stakeholders, data flow diagrams, and challenges/lessons learned.

With such knowledge, stakeholders can better understand precision medicine and effectively incorporate genomic data into the POC workflows by implementing FHIR.

Drawing from DAM's enumerated use cases, *Sync for Genes* has facilitated pilot testing, getting feedback from various facets of genomic use cases including: family health history genetics, sequencing quality and regulatory

genomics, somatic/tumor testing, Next Generation Sequencing (NGS) solutions, and tissue matching (See Figure 2).

The pilots include organizations represented by personnel associated with the HL7 Clinical Genomics Work Group: Counsyl with Intermountain Healthcare (Grant Wood), National Marrow Donor Program/Be The Match (Bob Milius, Martin Maiers, Joel Schneider), and Foundation Medicine with Vanderbilt University Medical Center (Dr. Jeremy Warner). Other piloting organizations include Illumina and the FDA. Pilot testing between labs, providers, health IT developers, health coordinators, and other stakeholders provides diverse perspectives. In addition, at the Madrid Connectathon, the *Sync for Genes* use cases were examined and tested and feedback was presented at the HL7 Working Group Meeting. Finally, it was also voted to be incorporated into FHIR's current build. ◼

eHealth Week 2017 in Malta

Connected Health Data Meet the People: Diversity, Standards, and Trust
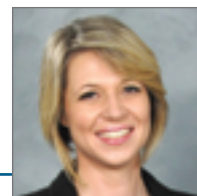
By Eva Turk, PhD, MBA, Senior Researcher, DNV GL

This was my first eHealth Week (www.ehealthweek.org). But surely not the last one! This year's conference was part of the Maltese EU Presidency and I had the opportunity to escape the mid-May snow in Oslo and travel south to Malta. Located in the midst of St. Juliens, the Intercontinental hotel was the venue for knowledge sharing and opportunity thinking.

In the title, I am referring to the HL7 and EFMI session in the Maltese eHealthweek2017. But to be honest, this title is very much true for the entire conference where the European Commission, the Maltese Ministry of Health and HIMSS Europe found a great balance of exciting content and networking possibilities.

Met the panel, from left: Morten Bruun-Rasmussen, Doug Fridsma, Eva Turk, Catherine Chronaki, Anne Moen, John Mantas

Connected Health Data, Meet the People: Diversity, Standards, and Trust

Using health data in a connected world requires a personal digital health compass calibrated to individual personalities and needs, such as a learning health system. The key question was what will take the learning health systems to the next level?

Internet of People is opening up new opportunities for delivering healthcare across our lifespan (at the session we heard about the Appetitus app for elderly in Norway), in the developing world (have a look at the GO Explorer) and in developed countries (Danish scaling up of integrated home monitoring services for people with COPD - Maturing a Telemedicine Infrastructure (MaTIS)). Yet, there are risks and barriers that hamper its adoption in healthcare.

What we see is that that trust is one of the main barriers that must be overcome for the Internet of People to thrive. Digital literacy requires focus on tools that are usable for the purpose, personal integrity, easy access to data as well as trust in data and people. Health professionals need proactive recognition approaches in terms of opportunities to become certified professionals and choose accredited biomedical and health informatics programs.

When thinking of a dynamic learning healthcare system, we need a constant flow of interaction between various types of activities:

- Co-creation between all relevant stakeholders—to make it real using standards

- A supportive and appropriate governance system—to make it scale toward large-scale deployment

- The flexibility to adapt and align as needs and requirements change—to make it stay in a sustainable way

- Secure data analytics and data management platforms offer an opportunity to unlock, qualify, combine and prepare data for analytics and benchmarking

Digital health standards are essential in all these activities to nurture a growing culture of interoperability. These can facilitate productive connections between relevant stakeholders, including domain experts and data scientists, mindful of the differences in perspective of health systems, citizens, workforce, and market. At the end of the day, the backbone of the Learning Health System is a System of Health Learners.

To become a health learner means being able to connect the dots and seeing the bigger picture. It demands involvement from all. To live what we preach on stakeholder engagement, we invited the audience to participate in our Kahoot survey together with the panel. This brought a new dynamic into the room, created better engagement, and confirmed some of the speakers' highlights.

As for myself, I believe that connecting trusted health data and the people is a crucial step toward achieving sustainable development goals and contributing to a healthier society. ■

The Learning Health System is a System of Health Learners.

Moving Forward Towards Interoperability

The Success of the Value-Based Care FHIR Summit

The healthcare industry shares a common goal to create true interoperable exchange across healthcare systems to enable better patient care and improved outcomes. While we have made considerable progress toward that goal in recent years, we are still some distance away from the finish line.

In April, progress was made by the HL7 Payer User Group at the HL7 Value-Based Care FHIR Summit and Mini-Connectathon, held at the Microsoft Technology Center in downtown Chicago. The event was co-hosted by Microsoft, the AHIP Innovation Lab and Blue Cross Blue Shield Association.

The summit was designed to help participants understand and experience how FHIR helps patients and consumers to have real-time access to actionable healthcare data while allowing health plans and providers to improve workflow, care coordination, care quality and quality reporting. The event brought together the payer, provider and vendor communities to:

- Demonstrate that technical interoperability is possible, practical and fast
- Discuss and test applicable use cases of mutual strategic value
- Identify, assess and document optimal priorities to make actionable improvements in HL7 standards to enhance effective information exchange

Attendees at this event included representatives from the following stakeholder groups: clinicians from several larger health systems and a specialty medical group; EHR and population health vendors; large, small and medium payers, including Humana, UnitedHealth and Health Care Services Corporation; technology vendors who support consumers, providers and payers, including Microsoft, Optum and Edifecs; and health information exchange (HIE) organizations.

The summit featured two separate tracks: 1) a mini-Connectathon and 2) FHIR for Managers. These offerings ensured that small, focused groups from multiple stakeholders could get hands-on exposure using relevant use cases. Participants explored FHIR resources, shared business challenges and offered critical feedback into the standards development process.
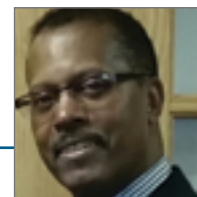
By Lenel James, Business Lead, Health Information Exchange & Innovation, National Programs Division of Blue Cross Blue Shield Association; Member of HL7 Payer User Group, HL7 Attachments Work Group; Planning Committee Member of the HL7 Payer Summits
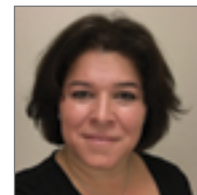
and Jocelyn Keegan, Senior Consultant, Payer and Provider Workflow; Member, HL7 Attachments and Pharmacy Work Groups; Active FHIR Supporters

HL7 FHIR Mini Connectathon

This track allowed coders and product managers to get hands-on experience with access to teams already in development and workflows and applications that partners, competitors and customers have underway. For example, the Attachment Track scenarios included the exchange of a request and response for clinical documentation using FHIR Resources to support a claim or prior authorization. Although this was the first experience with FHIR for half of the participants, they were all able to craft the request and response, and use Postman for the exchange with a FHIR server. In fact, one participant created their own FHIR server which other participants posted content to as well. Another created a RESTful application to receive requests and respond with an attachment automatically.

Participants in the Financial Track contributed to the development of the FHIR Financial Resources through a review of the resource scopes and content where they confirmed that the resources covered the business and content requirements. They then successfully exchanged eligibility and claim resources with test 'Payer Servers' to further explore the resource contents and supported exchange patterns.

HL7 FHIR for Managers

This track enabled leadership to see first-hand outputs of January's 2017 HL7 Payer Summit, including a demonstration of the ClinFHIR to for physicians business operations analysts, and an overview of the value-based care use cases for FHIR from the March HL7 Partners In Interoperability session. It also featured demonstrations of emerging FHIR-based apps, including the "best-in-show" winner on real-time charting from HL7's March FHIR Applications Roundtable. See inset for other applications demonstrated.

Value-based care stakeholder organizations face the ever-increasing need to share targeted, patient and organizational level data with each other for patient care and reporting purposes under HEDIS and MACRA. FHIR continues to prove itself as a low barrier way forward. It is important that that payer,

As shared by several of the participants—

"The HL7 FHIR for Managers sessions offered an exceptional opportunity to observe the activity from capable leaders in the clinical data world specializing in interoperability."

"The importance of data and analytics in value-based care was front and center. There were on-point presentations from vendors who are working to combine claims and clinical data. There were demonstrations of how this virtual reservoir of information can be used to assist providers in making clinical decisions."

"We engaged in meaningful discussion regarding barriers to interoperability and suggestions on how those barriers can be resolved: partnership, discoverability, security, data stewardship among others."

"Attendance provides an avenue for payers to participate in defining solutions to these challenges."

FHIR Apps Presented

- FHIR Computable Care Plan, Leidos
- FHIR Bridge for Quality Measures and Care Coordination, Edifecs
- Processing C-CDA® Using Big Data Infrastructure and Generating FHIR Alerts, CitiusTech
- Natural Language Interface for Real-Time Charting & Clinical Decision Support, Applicadia

April Connectathon Tracks

- Attachments and C-CDA on FHIR – Rick Geimer, Lantana
- Care Plan – Dave Carlson, VHA Standards & Interoperability
- Clinical Reasoning (quality measure data)– Bryn Rhodes
- Financial – Paul Knapp, Co-Chair, HL7 Financial Management Work Group
- Patient (for first-time attendees) – Howard Edidin

Tracks

The following tracks were part of this FHIR Mini-Connectathon. Each item links to the track description, with the coordinators name and email on the linked page.

- Attachments
- C-CDA on FHIR
- Care Plan
- Clinical Reasoning Track
- Financial Track
- Patient Track

The Success of the Value-Based Care FHIR Summit (Continued)

Pilot Opportunity – 30 Day Med Rec

Proposed by Shahid Shah, Jocelyn Keegan and Molly Hegarty, MS, RD

Over the last 6 months Partners in Interoperability business stakeholders have identified 30 Day Medication Reconciliation as a target workflow to test a real world challenge for the emerging FHIR resources.

Payers and provider groups will increasingly need to ensure that medication lists are checked to report quality ratings, risk contracts and to continue to improve patient safety and outcomes. Leveraging FHIR enables a larger audience of participants to share critical data more quickly and consistently.

Business Case Opportunity
The savings for payer implemented medication reconciliation program

$1.3K per member

50% Readmission Rate Reduction
Insurer-led care medication reconciliation programs reduced the risk of 30-day hospital readmissions by 50 percent and absolute and an absolute risk reduction of 11.1 percent.

ROI: $2 Saved per $1 Spent
79 percent of patients discharged over a six-month period required reconciliation of their medication lists, and 53 percent needed some sort of change or intervention to their therapies.

Patient Care Quality
Adverse drug events contribute to up to two-thirds of 30-day readmissions. It is estimated that 60 percent of all medication errors occur during transitions from one healthcare setting to another. Patients' lives are upset due to frequent hospitalizations

Source: An Insurer's Care Transition Program Emphasizes Medication Reconciliation, Reduces Readmissions And Costs. Health Aff July 2016 35 7(1222-1229)

Please contact **jocelyn.keegan@pocp.com** to learn more.

vendor and provider organizations participate in the build out of use cases and FHIR Connectathon scenarios to support value-based care. Use cases under development for conversion or in testing with FHIR include:

- Quality Measurements
- Attachments
- ADT
- Care Plan
- C-CDA on FHIR
- Explanation of Benefits (EOB)
- Personal Health Record (PHR)
- Consumer data (wearable devices)

We have reached the point where we can truly drive forward a use case of choice to solve real-world challenges that, before now, would be cost prohibitive or too resource intensive to solve. With the increasing support for FHIR by major EHR vendors and the progress made by clinical teams to share data across ecosystems, the time has come to unlock the patient-centric data required to make value-based care a reality.

Want to learn more? Join HL7 members and guests at the 31st Plenary & Working Group Meeting, September 9-15, 2017, at the Hyatt Regency La Jolla at Aventine, San Diego, CA. See first-hand the industry progress and status in tackling the challenges of interoperable exchange.

Stay involved in the conversation!

Join the listserv Value-Based Care! To join this listserv, visit the page on the HL7 website to manage your listserv subscriptions here. In the box on the right titled "All Public Lists" scroll down to "Partners in Interoperability Value-Based Care." Click on the plus sign to expand the box and click the join button. You must be logged-in to the HL7 website in order to join this list.

Newly Certified HL7 Specialists
Congratulations to the following people who recently passed the HL7 Certification Exam

Certified HL7 Version 2.x Chapter 2 Control Specialist

APRIL 2017

David Timmons
Jari Vuonos
Rahul Dubey
Zeeshan Ahmed
Sebastian Bojanowski
Alejandro Escario
Melissa Mendivil

MAY 2017

Julie Prestridge
David Timmons
Jari Vuonos
Rahul Dubey
Zeeshan Ahmed
Sebastian Bojanowski
Alejandro Escario
Melissa Mendivil
David Sanchez-Maroto Esquinas
Sergi Rodriguez Dalmau
Joaquin Feito Mach
Alfredo Gordo Garcia

JUNE 2017

Hanzhong Xu
Inderjeet Bawa
Peaun Lee
Clinton Woodson
Rajdeep Singh

JULY 2017

Hugo Herradón Guinda
Infant Sengol
Francisco Jesús Ruiz de Santa Quiteria Gacía
Rinsi Parappurath
Siddarth Sharma
Federico Montemurri Mengarelli
Pablo García Martínez
Pablo Pico Barro
Julio Iglesias Torres
Salvador Sáez Giménez
Ignacio Montoro Roig
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Juan Vicente Alapont Abril
Francisco Calderón Frías
Germán Barbosa Roa
Meybel Hernández Bernia

Certified HL7 CDA Specialist

MAY 2017

Jose Arquellada
Anita Nayak

JUNE 2017

Eva Nieto Fajardo

Certified HL7 Version 3 RIM Specialist

JUNE 2017

Harsh Sharma

Version 2.8 Certification Available in September!

HL7 is retiring Version 2.7 of the certification exam.

Beginning this September, HL7 will be offering certification in Version 2.8. For more information, please visit:

http://www.hl7.org/implement/certification.cfm

IHIC 2017 embedded within eHealth Forum conference

Join Us for IHIC 2017 in Athens, Greece

IHIC 2017 is rapidly approaching. This year it will be held October 22-24, 2017 in Athens, Greece. Athens is a highly desirable destination in Europe that combines modern attractions with ancient civilization.

The conference program has gained a more defined outline. On Sunday, there will be nine tutorials offered for attendees to choose from:

- **General introduction to CDA** by Kai Heitmann, MD, Germany
- **ART-DECOR: CDA specifications and implementations** in practice by Kai Heitmann, MD, Germany
- **Security and privacy challenges of interoperability** by Bernd Blobel, PhD, Germany
- **Snomed CT and CDA: Mastering the TermInfo-challenge with ART DÉCOR** by Sylvia Thun, Germany
- **FHIR overview** by Rik Smithies, UK
- **Hands on FHIR** by Rik Smithies, UK
- **IHE overview** by Rene Spronk, The Netherlands
- **IHE XDS, XDS-i and VNAs** by Rene Spronk, The Netherlands
- **IHE Gazelle overview** by Abderrazek Boufahja, France

The IHIC scientific program sessions will be introduced with keynote speakers. Three internationally highly acknowledged speakers will be featured in the program:

- **Ed Hammond**, PhD, FACMI, FAIMBE, FIMIA, FHL7, Duke University, HL7 International-US, will present on "A New World for Better Health"
- **Bernd Blobel**, PhD, FACMI, FACHI, FHL7, FEFMI, University of Regensburg, HL7 Germany will address "Standardization for Mastering Healthcare Transformation – Challenges and Solutions"
- **Gora Datta**, CAL2CAL Corporation, HL7 International-US, will tackle the Mobile Health aspects with "mHealth4ALL; Healthcare in the 21st Century"

By Bernd Blobel, PhD
HL7 Germany, IHIC
2017 PC Co-Chair

Alexander Berler, PhD
HL7 Hellas, IHIC 2017
PC Co-Chair

22 papers were submitted before this article was submitted for publication, covering the entire spectrum of interoperability issues from security challenge through national eHealth projects and FHIR implementations. Furthermore, similar to previous years, IHIC 2017 will also offer a platform for EU Projects' meetings that HL7 International and HL7 Affiliates are involved in. Therefore, we expect a very interesting IHIC program this year. Stay tuned for more announcements on the program.

IHIC 2017 is embedded into the eHealth Forum conference, offering attendees the opportunity to get impressions and information on eHealth beyond the scope of HL7. eHealth Forum is an important regional conference and networking opportunity that incorporates various workshops, stakeholders'

and projects' meetings, exhibitions, start up roadshows, datathons, tutorials and many more. More information can be found at www. ehealthforum.org.

Please register for IHIC 2017 through the IHIC website at http://www.ihic2017.eu/. Please plan to attend IHIC 2017 if you have submitted a contribution, if you are involved in projects around eHealth interoperability, or even if you are just interested in innovations and paradigm changes health systems around the globe are facing. Join us in re-shaping healthcare systems! ■

More information online:

www.ihic2017.eu

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More information online: www.ehealthforum.org

By Catherine Chronaki
Secretary General HL7 Foundation, Scientific Coordinator eStandards

Robert Stegwee, Chair CEN/TC 251, eStandards Work package 3 (Roadmap) Leader

Petra Wilson, Task 3.5 eStandards Roadmap Leader for CEN/TC 251; Director Health Connect Partners
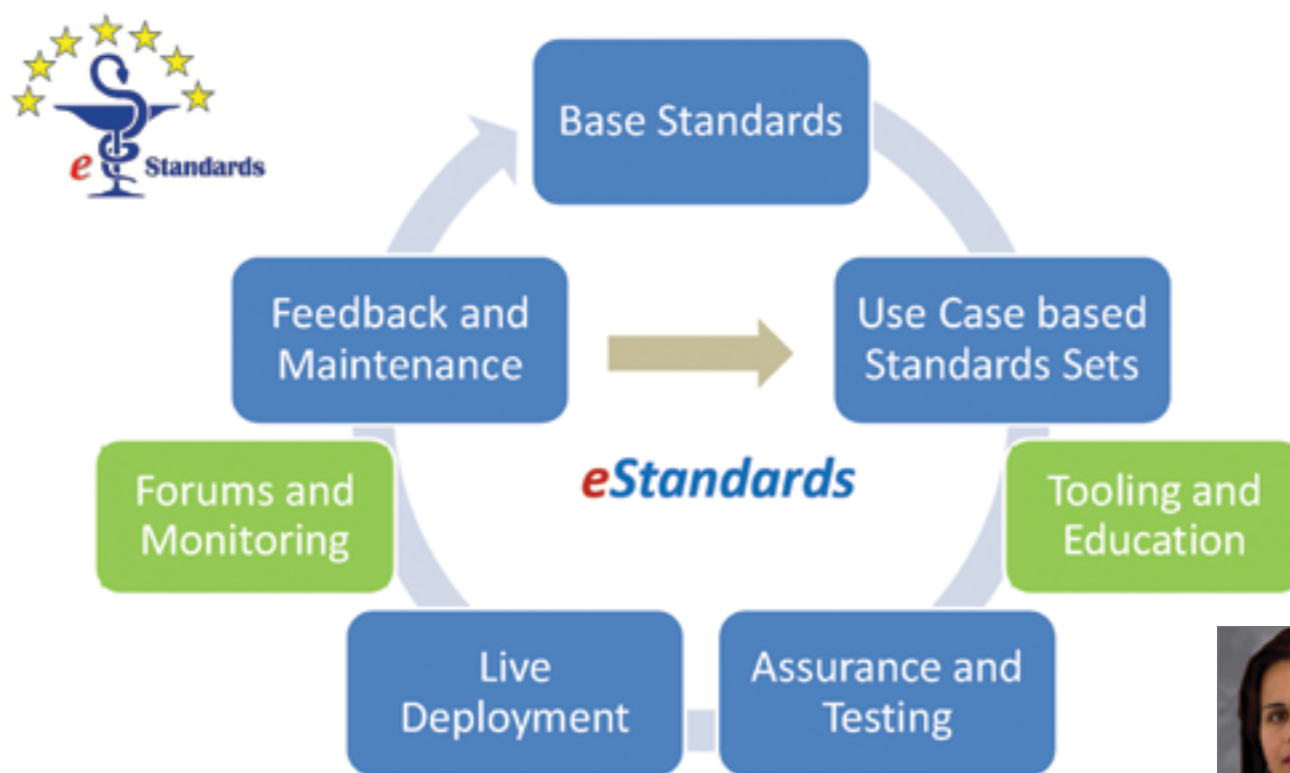
Report on the eStandards Final Conference

eStandards: Standards and Profiles in Action for Large-Scale eHealth Deployment in Europe and Beyond

eStandards is a collaborative project funded by the European Union under the Horizon 2020 programme. Its outcome supports the European Commission's policy work on the Digital Single Market and specifically on eHealth.

The eStandards Project

The eStandards Project (www. eStandards-project.eu) aims to advance eHealth interoperability and global alignment of standards. Bringing together actors involved in standards and specifications in Europe and globally, eStandards compiled a roadmap to accelerate knowledge sharing and promote collaborative standards development and alignment for sustainable eHealth deployment.

The eStandards Project is guided by the vision of a global health ecosystem where navigation tools lead people to safe and informed healthcare and where interoperability assets fuel creativity, entrepreneurship, and innovation in sustainable health systems. This project envisions a new generation of 'live' standards, called eStandards. eStandards are able to drive large-scale eHealth deployment and support the digital transformation of how we manage our health and deliver healthcare.

eStandards presented its roadmap for collaborative and sustainable development of standards in its final conference.

Final eStandards Conference

On June 26-27, 2017, the eStandards project held its final conference, which was hosted at the CEN/TC 251 premises in Brussels.

The conference offered sessions appealing to a multi-stakeholder audience. This included the following groups: standard developers; health ministry eHealth experts; health professional organizations; patient and public representative organizations; ICT vendor associations; and clinical academics. The conference addressed how digital health standards should evolve, building on current best practices to support large-scale eHealth deployment in Europe and globally.

The eStandards roadmap blossomed out of the evidence of best practices in the followin areas: the implementation of eHealth projects; broad international collaboration exemplified in the joint work of CEN and HL7 on the international patient summary project; guidance on clinical content development and quality management in interoperability testing; and an analysis of socioeconomic factors affecting successful cooperation of users with vendors.

The eStandards Roadmap: Co-Creation, Governance, Alignment

The eStandards roadmap provides an agile process framework. It links the needs for a trusted flow of data from the perspectives of the health system, the citizen, the workforce, and the market, to standardized artifacts and interlocked actions in co-creation, governance, and alignment (CGA). This roadmap is atypical and dynamic as it does not dictate or assign actions that are specific, measurable, actionable, realistic, and timed.

Specific roadmaps will need to be taken up by digital health initiatives that actively engage the actors that strive for tangible improvements in health and healthcare, engaging the people and organizations that can make it happen. The objective to realize value for the health of individuals and society will then guide the further development and use of eStandards.

In explaining co-creation, Petra Wilson of Health Partners Connect and former CEO of the International Diabetes Federation, who is Task 3.5 eStandards Roadmap Leader for CEN/TC 251, explains: *"Co-creation is a collaborative process where players from across different sectors – such as companies, social sector organizations, financial institutions and government bodies – come together to co-design and co-implement new or improved products and services that address essential needs of underserved populations. While the process is co-creation – peers working across sectors hand-in-hand to design and implement solutions based on a shared vision – the result is addressing society's challenges at scale, while achieving economic gains. Co-creation represents a fundamental shift in interaction between the business, social, and public sectors to create shared value."*

Governance describes how regions and organizations ensure they run efficiently and effectively. The instruments of governance range from international and European law, all the way down to procedures and protocols in the smallest units of organizations. They cover aspects such as certification of professionals, product and workplace safety requirements, as well as standards and specifications for digital health interoperability. Governance actions seek to develop and review the necessary measures to ensure that eStandards will be deployed at scale.

Alignment has historically been discussed in business literature and tends to focus on the integration of business strategy and delivery systems. We also refer to alignment as fit, integration, harmony, linkage, and fusion. It ensures the sustained usability and use of eStandards across their lifecycle.

eStandards: Standards and Profiles in Action for Large-Scale eHealth Deployment in Europe and Beyond (continued)

Focus on Medication Identification, Patient Summaries, Chronic Diseases and Reference Networks

Four focus areas of specific interest were selected for further analysis, due to their special relevance to healthcare within the European policy setting:

1. *Identification of medicinal products (IDMP)* undertaken as an implementation initiative involving the European Medicines Agency (EMA), serves the goals of good pharmacovigilance practices across Europe: making sure that medications don't harm patients. Meanwhile, proper identification of medicinal products also plays an important role in the delivery of care, the safe prescription of medication, and for measuring costs and outcomes at healthcare system level, at Member States level, and the level of cross-border healthcare provision.

2. *Patient Summary* for unplanned and emergency care, together with cross border ePrescription, has been a top priority for the European eHealth Network in setting up the eHealth Digital Services Infrastructure and connecting Member states to safely deliver cross border care.

3. *Chronic Disease Management* is top concern for practitioners and policy makers across the world, and the Joint Action on Chronic Disease Management (JA-CHRODIS) underlined this importance. Making sure advances in prevention and population health are shared and adopted quickly requires new ways of looking at empowering patients and their care providers.

4. *European Reference Networks* (ERNs) for rare diseases are a main topic in the 2011 European Directive on the application of patients' rights in cross-border healthcare. Patients within Europe should have access to the sparse knowledge on rare diseases and be diagnosed and treated quickly. The knowledge should travel, rather than the patient.

In sessions dedicated to each of these focus areas, experts delivered lightning ninety second/one slide interventions on their sense of co-creation, governance, and alignment as applied to the topic at hand. The Co-Creation-Governance-Alignment (CGA) framework was very well received and conference participants provided important examples and insights.

More information online:

www.eStandards-project.eu

For a video interview with Henk Bakker, please visit:

bit.ly/2sz2c8R

Giorgio Cangioli, co-facilitator of the HL7 International Patient Summary (IPS) project and member of the CEN IPS team, stated that, *"The IPS project is a good example of pre-adoption of the CGA methodology considering the governance role played by the policy level (EC and EU Member States) and the co-creation and alignment actions accomplished by SDOs. New actions should be expected to facilitate the synchronization of the eStandards and the deployment lifecycles, starting from the IPS and the eHDSI projects. Furthermore, since many are the aspects that concur to the IPS lifecycle, and not all of them could be covered by a single organization, a coordination among all the activities covering those aspects should have envisioned, to assure traceability and consistency of all the products that will be produced."*

The lively discussions showed the value of the eStandards Roadmap as a process framework. As Robert Stegwee, chair of CEN/TC 251 and leader of the roadmap development effort, summarized, *"You have shown us that the roadmap invites collaboration on the necessary actions, each from your own perspective. It is that trust in collaboration that will support large scale deployment of digital health solutions, based on sustainable eStandards."*

The roadmap was dedicated to Henk Bakker, an ambassador of the Personal Health Record program in the Netherlands, who passed away. Marcel Heldoorn of the Dutch Patient Federation accepted the dedication on behalf of the family of Henk Bakker, saying, *"Patients become digital citizens faster than hospitals are embracing digital transformation. The patient perspective is a formidable and indispensable driver of change in the digital age, when connected in a safe and meaningful way to the health and wellness professionals. The patients federation of the Netherlands has taken the initiative for a personal digital health environment for which Henk Bakker was one of the early ambassadors. We still share Henk's experiences and ideas to convince people of the importance of digital health tools for patients almost every day. Making a personal health environment meaningful for patients requires standards for information exchange and a clear regulatory framework to drive trust and adoption."*

The conference closed with Professor Dipak Kalra, President of EuroRec, noting, *"What I have found truly remarkable about this conference is that all of the standards bodies represented here have emphasized the centrality of patients and the importance of engaging patients and citizens in the future development of standards, so that they can access and use their own health data, to become empowered players in their own wellness and prevention, health and healthcare."* ◼

Global Community for the Practice of Health Innovation

On May 16-19, 2017, Milan hosted the 27th European Meeting on Hypertension and Cardiovascular Protection. In a joint session of the European Commission (EC) and European Society of Hypertension (ESH), participants shared knowledge and experience in the daily practice of mHealth. Opportunities for synergies between the ESH, members of the EC eHealth stakeholders group (DG-CONNECT) and the eHealth Network (eHN) were discussed, recognizing that it is "Time for Action" in mHealth.

By Catherine Chronaki, Secretary General, HL7 Foundation

Professor Anne Moen of the University of Oslo and immediate past chair of the European Federation of Health informatics (EFMI), presented several innovative mHealth solutions developed by members of the EFMI community. Among these apps was APPETIT, which aims to help aging Norwegians eat healthy food.

Professor Enrico Caiani, biomedical engineer and chair of the e-Cardiology Working Group of the European Society of Cardiology, spoke on the importance of testing validity and reliability of apps and wearables for exercise monitoring.

Professor Gianfranco Parati, a fellow member of the Nucleus of the eCardiology WG of the European Society of Cardiology, presented the results of the ESH CARE app. This app has been translated to more than 12 languages, which resulted in improved blood pressure control.

Catherine Chronaki, scientific coordinator of the Trillium-II initiative and secretary general of the HL7 Foundation, gave a presentation on how the international patient summary standard can help connect the dots.

Terje Pettso, head of the sector for eHealth and ageing policy at the Unit of eHealth, Wellbeing and Ageing of DG CONNECT at the European Commission, presented on the multitude of mHealth initiatives catalyzed by the European Commission.

Ain Aaiviksso, chair of the mHealth subgroup of the eHN and deputy secretary general for e-Services and Innovation at the Ministry of Social affairs of the Republic of

Estonia, welcomed the initiative and stressed the commitment of Estonia and the eHealth network to standards and interoperability.

Javier Ferrero Alvarez, chief information officer at the Andalusian Agency for Healthcare Quality, shared their best practices in assessing and validating mobile apps connected to their healthcare infrastructure as a way to advance digital health innovation.

Henrique Martins, president of the Board of SPMS, serving as

Available Online:

The presentations of this ground-breaking session will soon be available…please visit:

http://www.trilliumbridge.eu

the national eHealth Agency of Portugal, and the chair of the eHealth Member States under the Connected Europe Facility program of the European Union, shared tangible examples of innovative mHealth solutions incorporating elements of patient summaries in Portugal.

Just prior to the session, Catherine Chronaki and Professor Enrico Agabiti Rosei, chairman of the ESH, signed a memorandum of understanding to cooperate in the framework of the Global Community for the Practice of Health Innovation to be established by Trillium-II and to promote the vision of the patient summary as a window to a patient's health information. This is a timely moment, as the ESH promotes its ESH CARE app for citizens with hypertension throughout Europe and the Trillium Bridge II project

aims to promote the broad adoption of the International Patient Summary standard.

A joint working group will be established to elaborate, in a co-creation spirit, patient summary extensions appropriate for capturing and assessing cardiovascular risk factors. The group will also explore the possibility of implementing the international patient summary standard within the ESH CARE app that has been developed under the

auspices of the ESH and is promoted for use by hypertension patients throughout Europe and globally.

Catherine Chronaki thanked the president of the ESH and Professor Gianfranco Parati, stating, "Thank you from the bottom of my heart for the trust conveyed in this agreement. It signifies a unique opportunity for every person at risk of hypertension to make informed decisions about their health and for health professionals to nudge our communities toward healthier behaviors. I am looking forward to increasing the impact of International Patient Summary standards in this area and helping connect, assess and validate the ESH CARE app in health systems around the globe." ▪

Helping Patients and Clinicians in Care Coordination

Making C-CDA Documents More Relevant and Pertinent

By David Tao, Co-Chair,
HL7 Mobile Health
Work Group; Member,
HL7 Structured
Documents Work
Group; Consultant,
ICSA Labs

In April 2017, HL7 published the HL7 CDA® R2 Implementation Guide: Clinical Summary Relevant and Pertinent Data, Release 1 ("RnP" for short) to improve the relevance and pertinence of content in Consolidated Clinical Document Architecture (C-CDA) documents.

Why Was RnP Written?

EHRs offer the promise of sharing information, but the average patient and clinician has not fully realized that promise, despite many advances in technology and standards.

Providers have been confounded by the difficulty of obtaining patients' prior records in a timely way. Likewise, as patients, many of us have experienced the frustration of repeatedly filling out a "clipboard" from scratch when we see a new provider.

We may wonder why the provider doesn't have our previous information. While each provider understandably asks patients to verify that information is current, there is medical history from previous providers (such as test results/interpretations and past surgical procedures) that patients can't be expected to retain in memory.

Enter the Clinical Document Architecture (CDA)® standard.

Its widespread adoption has been a major success story for HL7 and the healthcare industry.

Standardizing clinical summaries that contain both human-readable narrative and machine-processable structured data has long been sought in the healthcare industry.

One of the main use cases for CDA is **care coordination**, whereby patients' information follows them when they have "transitions of care" (ToC) between providers. Ten years ago, the most common way to send information, if it occurred at all, was by fax, which fell far short of the potential that EHRs offer.

One of the first CDA documents to achieve widespread use was the Continuity of Care Document (CCD®). The CCD was generated by vendors and used by providers to participate in the CMS "Meaningful Use (MU) Stage 1" incentive program. Secure "push" of clinical summaries from one provider to another was required, using the Direct transport standard.

However, despite the government-stimulated sending of CCDs, there were bumps in the road.

Government and private industry evaluated – through public testimony and anecdotal evidence from medical societies, healthcare organizations, and Federal Advisory Committees – how the MU program was meeting its care coordination objectives.

They found discontent among clinicians, whose opinions about the clinical documents they received included words like "bloated," "unusable," and "hard to find what I need." Some complained of receiving documents that were over 100 pages long.

Most of the testimony had been heard by 2015, when MU Stage 2 was beginning. HL7's C-CDA 1.1 (published July 2012) had become the Federally required standard for ToC, and C-CDA 2.1 (published August 2015) was nearing completion.

Was C-CDA a flawed standard, or was the problem that C-CDA had not been implemented properly?

While there was a lot of heat, there was not much light (factual evidence) being generated.

How RnP Data Were Gathered

In an effort to address the aforementioned issues, The HL7 Structured Documents Work Group commissioned a project called ***Relevant and Pertinent*** (RnP). The project's goal was to gather information that could be used to either improve C-CDA itself, or to provide guidance to developers on how to create more useful C-CDA documents, so clinicians would be more satisfied with the clinical summaries they received during ToC. RnP included a structured survey, designed by clinicians for clinicians in ambulatory or hospital settings. It gathered specific, quantitative, actionable data about experiences with clinical documents as well as what needs were not being met. In addition, a more open-ended interview was conducted with 11 organizations. The survey was made available through professional societies in Q4 of 2015, and by January 2016, a total of 613 individual responses were received. To see the surveys and details about the respondents, see the HL7 Wiki http://wiki.hl7.org/index.php?title=Relevant_and_Pertinent.

Next, the 25 questions were analyzed to yield several conclusions and recommendations. The conclusions were based on the survey results. The recommendations were also based on the survey responses, though the project team's detailed knowledge of C-CDA and background in MU and certification were helpful to "translate" the data into recommendations primarily for EHR developers and secondarily for ONC. The project team inferred from the dates of the responses, and statistics from ONC and CMS, that most of the experience was with the CCD/C32 document used in MU Stage 1. While updated software supporting C-CDA 1.1 and MU Stage 2 was available, and C-CDA 2.1 had recently been published, relatively few clinicians had experience with C-CDA 1.1, and none were using C-CDA 2.1 at the time they responded. As a result, the federal requirement to send a "summary of care record" was generally met using CCD, although other document types could have been used (e.g., Discharge Summary, Consultation Note).

Many survey questions asked about "preference" followed by corresponding questions about "experience." RnP analyzed the gap between preferences and experience, assuming that satisfaction *increases* to the extent that preferences are met in experience, and *decreases* as preferences are not met in experience.

Available Online:

See the full report, *HL7 CDA® R2 Implementation Guide: Clinical Summary Relevant and Pertinent Data, Release 1*

http://bit.ly/2hRoiyw

Making C-CDA Documents more Relevant and Pertinent (continued)

Key Findings and Recommendations

Please see below for a high level summary of findings common across hospitals and ambulatory ToC. These recommendations are intended for EHR developers, but also for clinicians who use EHRs.

Tell the patient's story!

A clear summary of the patient's care was often missing. The survey included quantitative rankings of the importance of data to clinicians. For example, the top ten "most valuable" C-CDA sections for ambulatory ToC were as follows: diagnosis, medications, *plan of treatment, chief complaint/reason for visit,* results, *assessment*, procedures, *history of present illness,* problems, and allergies (see chart at right). Yet the italicized sections were often missing (they were not required by CCD or certification). These contain narrative that "tell the patient story," whereas the typically included sections tended to be "lists of things done." As we know from normal human communication, we can't communicate only through lists; we need a narrative that puts everything into context and conveys a message. Clinicians prefer that clinical summaries get to the point rather than include too much extraneous detail. The most effective clinical summaries, like the best conversations, need to be personalized considering the needs of the recipients.

EHRs should provide the capability for users to easily modify (personalize) content of generated C-CDAs to adjust for clinical judgment and context.

This includes the patient's clinical case, who the intended recipient is, and provider preferences such as by specialty. EHRs need to provide the capability to easily personalize the content and providers need to take advantage of that capability when creating clinical summaries.

Value of Sections from Ambulatory Visit Ordered by rank, rating the section "necessary" or "valuable"	
Section	**Percentage of Respondents**
Diagnosis	94%
Medications	93%
Plan of Treatment	88%
Chief Complaint/Reason	86%
Results	86%
Assessment	85%
Procedures	83%
History of Present Illness	81%
Problems	81%
Allergies / Intolerances	78%
Interventions	74%
Physical Exam	64%
Instructions	60%
Vital Signs	56%
Mental Status	52%
Objective	52%
Encounters	50%
Functional Status	50%
Subjective	50%
Advance Directives	47%
History of Past Illness	47%
Immunizations	47%
Medical Equipment	38%
Nutrition/Diet	36%
Social History	36%
Family History	33%
Payer Information	31%
Review of Systems	31%

This is just one of the 34 tables/charts in RnP

Minimize old and repetitive data.

While the story was sometimes missing, even the relevant details were sometimes obscured by inclusion of too much repetitive and/or old data (e.g., from past encounters rather than the most recent). This was exacerbated by poor formatting, sequencing, and organization, resulting in clinicians experiencing difficulty finding the information that was pertinent to them.

Receiving systems should provide better tools, such as flexible rendering, filtering, and incorporation features for receivers of documents.

It is not possible to automatically generate a clinical summary that will fully meet the needs of the intended recipients and possibly additional recipients (e.g., those who might retrieve it from a Health Information Exchange repository). Regulations placed requirements upon EHRs to *generate* clinical summaries, but had much less emphasis on how those documents would be received and consumed.

The reader is encouraged to read the RnP guide for more detailed recommendations as well as to understand the different results for ToCs from hospitals versus ambulatory providers.

Call to Action

HL7 has produced a flexible, powerful and widely adopted C-CDA standard, but there is much room for improvement in how it is implemented and used. The RnP guide informs developers of clinicians' experiences and preferences. By following the RnP recommendations in addition to the C-CDA Companion Guide, EHR developers should seize the opportunity to improve the quality and relevance of C-CDA in the field and remove barriers that clinicians have experienced trying to use clinical summary documents. As these barriers are removed, and as gaps in needed information are filled, clinician satisfaction and productivity should increase. As clinicians increasingly find C-CDA documents helpful to coordinate care and inform their decision making, EHRs will have happier customers and the all of us as patients will benefit. ◼

Affiliate Spotlight: HL7 UAE

HL7 UAE (United Arab Emirates) joined as an affiliate in May 2017. The driving force behind establishing the affiliate was the Emirates Health Informatics Society (EHiS) team led by Dr. Mohammad Al Redha and Dr. Osama Elhassan. The EHiS team engaged in lengthy discussions with fellows in the Federal Ministry of Health, Dubai Health Authority (a government healthcare provider), Khalifa University (the top research university in the UAE) and the Canadian Hospital IT team to formulate a petition to join the HL7 organization.

Who are the current members of the HL7 UAE Board?

The Board of HL7 UAE consists of Dr. Mohammad Al Redha (Chair). Dr. Osama Elhassan (Co-Chair), and Mrs. Mubaraka Ibrahim (Secretariat). The affiliate plans to organize formal elections before the end of this year to fill the remaining positions.

What is the mission of HL7 UAE and how do you plan to advance the use of HL7 in your country?

Our mission is to:
1. Support eHealth initiatives in general
2. Develop health interoperability standards to be utilized by the national HIE and other health data sharing applications
3. Contribute to certification programs of data sharing protocols in collaboration with EMR/EHR and mobile apps vendors
4. Provide education and training

Is HL7 currently being used in UAE? If so, which standards have been implemented and what are the most successful implementations?

Health IT standards are currently being implemented in UAE. Coding standards are widely used in the eClaim exchange space. HL7 Version 2.X is being deployed in several inter- and intra-hospital applications as well. HL7's Fast Healthcare Interoperability Resources (FHIR®) is also gaining momentum in the country.

Does UAE use other, non-HL7 healthcare standards?

Yes; eClaims systems are very stable as they use variety of standards such as ICD 10, CPT4, HCPS and some few locally developed coding standards.

By Dr. Osama Elhassan, Head of eHealth, Dubai Health Authority

Mrs. Mubaraka Ibrahim, Director of HIS, Ministry of Health and Prevention

Does your affiliate plan to ballot any HL7 standards or implementation guides for your country?

Yes. This will be a cornerstone of our federal HIE plan.

What other activities does HL7 UAE participate in and are you planning any meetings or taking part in any events?

HL7 UAE is planning to develop two meeting per year for disseminating interoperability knowledge. We will likely advocate for using HL7 Version 2.X and the Consolidated Clinical Document Architecture (C-CDA®) across these projects. Our affiliate will promote the gradual adoption of FHIR-based integration standards.

What role do you see HL7 standards playing in your country over the next 1-3 years?

HL7 UAE will be a key player in developing the country-wide standards to support federal and local HIEs. We are expecting these projects to be launched this year. In addition to our official meeting, we also plan to organize a FHIR summer school in 2018. ◾

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Upcoming International Events

Date	Website	Location
September 21-22, 2017 — Swiss eHealth Summit 2017	www.ehealthsummit.ch	Lausanne, Switzerland
October 15-20, 2017 — SNOMED International Business Meeting	www.snomedexpo.org/register-now	Bratislava, Slovak Republic
October 22-24, 2017 — HL7 IHIC 2017	www.ihic2017.eu	Athens, Greece
October 31-November 1, 2017 — EHiN 2017	ehin.no/en/	Oslo, Norway
November 15-17, 2017 — HL7® FHIR® DEVDAYS 2017	www.fhirdevdays.com/	Amsterdam, The Netherlands
January 19-21, 2018 — HEALTHINF 2018	www.healthinf.biostec.org	Funchal, Madeira, Portugal
February 26-March 3, 2018 — GS1 Global Forum 2018	www.gs1.org/events/487/gs1-global-forum-2018	Brussels, Belgium
March 5-9, 2018 — HIMSS18	www.himssconference.org/	Las Vegas, Nevada
April 24-26, 2018 — MIE 2018	mie2018.org/	Gothenburg, Sweden
May 27-29, 2018 — HIMSS Europe Conference and Exhibition	http://www.himsseuropeconference.eu/barcelona/2018	Barcelona, Spain

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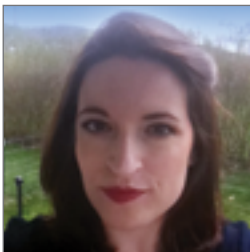**Director of Membership and Administrative Services**
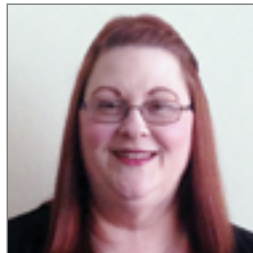
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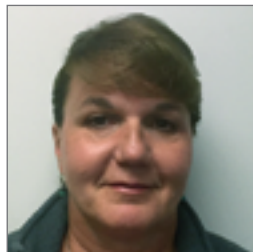
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Upcoming Working Group Meetings

September 9-15, 2017
31st Annual Plenary & Working Group Meeting
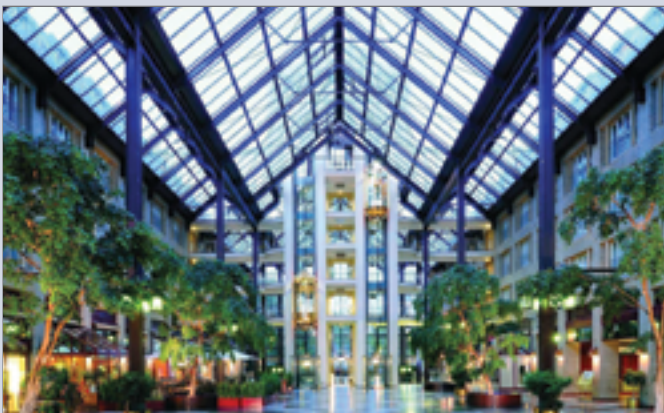
Hyatt Regency La Jolla at Aventine

San Diego, California

January 27-February 2, 2018
Working Group Meeting

Hilton New Orleans Riverside

New Orleans, Louisiana

May 12-18, 2018
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Maritim Hotel Cologne

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September 29-October 5, 2018
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