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NEWS

Leading EHR Interoperability in a New Decade

2020 HL7 International Strategic Plan

Better Access to EHR Data through APIs CARIN Alliance

CodeX Propels mCODE into New Use Cases

Gathering Medical Data in Your R Client

Plus: GATEKEEPER – Smart Living Homes, Updates on ONC Grant, Gravity Project, Trillium Bridge and much more!

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HL7 News

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Update from Headquarters

By Mark McDougall, HL7 Executive Director

33rd Annual Plenary Meeting

HL7's 33rd Annual Plenary and Working Group Meeting convened September 14-20, 2019 at Marriott Marquis Hotel in Atlanta, Georgia. The meeting attracted 786 attendees, which shattered the previous attendance record by 149, or 23%. Over half of these attendees also attended the FHIR connnectathon (414). During the week, over 40 work groups met, 30 tutorials were given, and co-chair elections were conducted for 18 work groups.

The plenary meeting featured exceptional keynote presentations from:

- Gregory Simon, JD, former president, Biden Cancer Initiative
- Chesley Richards, MD, MPH, deputy director of public health science and surveillance, Centers for Disease Control and Prevention
- Brad Wolters, director, federal government relations, Marshfield Clinic Health System
- Shez Partovi, MD, worldwide lead, healthcare life sciences, genomics, Amazon
- Aashima Gupta, director, global healthcare solutions, Google
- Greg Moore, MD, PhD, corporate vice president, health technology and alliances, Microsoft

We are pleased to also recognize many individuals and organizations for their invaluable contributions to HL7 this year and over the last three decades.

HL7 Fellowship Award

The HL7 Fellowship award was presented to eight individuals during the 33rd Annual Plenary and Working Group Meeting in Atlanta, Georgia. The award was established to recognize members with at least 15 years of active membership as well as outstanding service, commitment and contributions to HL7. We are honored to recognize these recipients of the class of 2019 HL7 Fellowship Award for their incredible service to HL7:

- Marivan Abrahão, MD
- Catherine Chronaki
- Gora Datta
- Martin Entwistle
- Julie James
- Lenel James
- Robert Jenders, MD
- Brian Pech
- Francisco Perez
- Timo Tarhonen

Membership Milestones

As I've have stated from the podium for almost 30 years, HL7's community of incredibly talented and dedicated volunteers are HL7's most valuable asset. Such a community is dependent upon the service of hundreds of key members who drive the organization forward via various leadership roles such as on the Board, TSC, work groups, mentors, facilitators and tutorial speakers.

The co-chairs of our 50 work groups are truly the backbone of the organization. These co-chairs drive HL7 forward via meetings and conference calls throughout the year. We thank all of our co-chairs listed on pages 42-45 for their invaluable contributions to HL7.

HL7 affiliates have the incredibly important role of promoting the use of HL7 standards and educating professionals on how to implement such standards around the globe.

We are also pleased to recognize HL7 affiliates who have been in operation for more than 20 years as well as individuals who have supported HL7 for more than 25 years. We sincerely thank the following for their incredible contributions to the industry and dedication to HL7.

Congratulations to these HL7 affiliates who have been in operation for more than 20 years:

HL7 Australia
HL7 Canada
HL7 Finland
HL7 Germany
HL7 Japan
HL7 Netherlands
HL7 New Zealand
HL7 UK

HL7 members for 25-29 years:

Hans Buitendijk
Albert Edwards
Ted Klein
Virginia Lorenzi
Clem McDonald, MD
Charles Meyer
Doug Pratt
John Santmann, MD
Mead Walker

HL7 members for more than 30 years:

Gary Dickinson
W. Ed Hammond, PhD

Volunteers of the Year Awards

It is amazing to realize that we are already in the 23rd year of recognizing incredible efforts by our dedicated volunteers via our W. Edward Hammond, PhD HL7 Volunteer of the Year Awards. While there are certainly dozens of individuals who merit this recognition each year, the Awards Committee is challenged to limit the annual award to only a few.

This year's recipients have contributed hundreds, if not thousands, of hours and have served HL7 extremely well for many years. HL7 is pleased to recognize this year's recipients of the W. Ed Hammond HL7 Volunteer of the Year Awards.

- Jean Duteau
- Reed Gelzer, MD
- Emma Jones

Highlights of their many contributions to HL7 are provided on page 9.

Board Election Results

New members join the HL7 Board of Directors in 2020. As recently announced, the election results for 2020 Board positions are pictured at right. We look forward to working with them and are happy to extend warm congratulations!

Treasurer
Floyd Eisenberg, MD

Affiliate Director
Peter Jordan

Director—Clinician
Julia Skapik, MD

Director—Implementer
Viet Nguyen, MD

Plenary Meeting Sponsors

We are pleased to recognize these organizations that sponsored key components of our 33rd Annual Plenary and Working Group Meeting:

- AEGIS
- Da Vinci Project
- iNTERFACEWARE

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

Mark Your Calendars

Please plan to join us at these upcoming HL7 working group meetings and FHIR connectathons:

February 2-7, 2020
WGM at the ICC in Sydney, Australia

May 16-22, 2020
WGM at the Hyatt Regency Riverwalk, San Antonio, Texas

September 19-25, 2020
34th Plenary and WGM at Hyatt Regency Inner Harbor, Baltimore, Maryland

January 16-22, 2021
WGM at Hilton Lake Las Vegas Resort & Spa, Henderson, Nevada

May 22-28, 2021
WGM at Hilton New Orleans Riverside, New Orleans, Louisiana

Benefactors and Gold Members

We are pleased to recognize the valuable support provided by HL7 benefactors and gold members. Representatives from these organizations are pictured below.

A special thank you is extended to the list of firms that represent our 2019 HL7 benefactors and gold members.

Join Us at the Sydney Australia WGM

We are thrilled to return to Sydney for another exciting WGM on February 2-7, 2020. This time the venue will be the new and state of the art ICC Sydney convention center located at Darling Harbor. The WGM will cover all of the activities that you expect, such as:

- FHIR connectathon
- Work group meetings
- Tutorials
- Presentations from HL7's Chair, CEO, CTO, TSC Chair and International Council
- Invaluable networking with the industry's leaders

For more information and to register today, please visit https://hl7.sydney/

Organizational Member Firms

HL7 is proud of the impressive list of organizational member companies as listed on pages 36-39. We sincerely appreciate their ongoing support of HL7 via their organizational membership dues.

In Closing

A sincere and heartfelt thank you to all of you who have supported HL7 throughout the years.

On behalf of the HL7 staff, we extend to you and your loved ones our best wishes for good health, much happiness, and lots of smiles and hugs this New Year and beyond.

Advantages of HL7 Membership

MEMBER BENEFITS

Enhanced FAQs on HL7.org

To better serve our community, we recently expanded and updated the FAQ section at http://hl7.org/about/FAQs/index.cfm

- Quickly search the FAQs by pressing Ctrl+F on your keyboard and typing in the term. Press "Enter" to cycle through the matches.
- Links to additional FAQ options are also featured, including Confluence, Listserv and OID Registry.

Join a Work Group + Make A Difference!

Our working groups are always looking for extra help, so find a work group that matches your interests or needs at http://www.hl7.org/Special/committees/index.cfm.

To join a workgroup listserv to start participating, go to http://www.hl7.org/myhl7/managelistservs.cfm.

Member Spotlight on Jason Steen

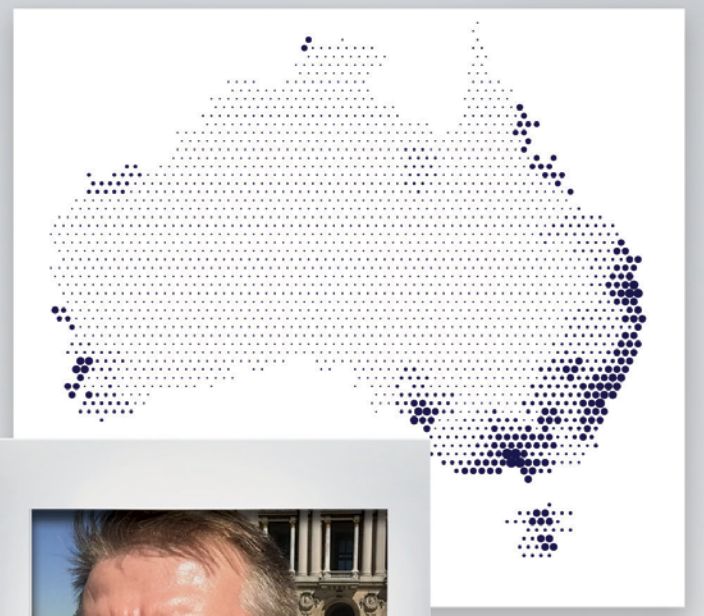
Professional Life

90% of the Australian population lives within 100km (62 Miles) of the coast. Jason's life and career has stayed true to the maxim. Growing up in a small country town of under 15,000 residents, halfway between Sydney and Brisbane, Jason has never lived more than 15km (10 Miles) from a beach. However, the coastal area of his hometown still remains his ideal.

Jason attended the University of Newcastle in NSW, where he went on to lecture in Information Technology and established his IT consulting practice. His IT career commenced in the early 1990s consulting in the mining industry of the Hunter Valley that surrounds the industrial coastal city. The Hunter Valley is a region of Australia that successfully merged the dual identities of coal mining and the steel manufacturing region with a surfing holiday destination and renowned wine production. If asked, Jason can recommend a good Cabernet Sauvignon from the Hunter Valley.

The East Coast of Australia has been central to Jason's life and work. He has lived in Brisbane and Melbourne, but predominately Sydney. His IT career has crossed a diverse range of industries from mining, superannuation, investment banking, telecommunications, funds management, law enforcement, insurance, energy utilities and for the last seven years, health.

Jason's first introduction to healthcare IT was when he joined eHealth NSW as head of enterprise architecture. eHealth NSW provides healthcare IT for 160,000 clinicians across 228 hospitals. As all who have experienced IT in other industries and then move to health, Jason can see lessons and technical architectures from other industry verticals that could greatly improve healthcare IT and, in turn, patient care. One of these lessons is to open the architectures within health to great interoperability through the use of modern and robust standards. This observation lead Jason to join the board of HL7 Australia just over four years ago. He has served as the chair for the last three years.



90% of the Australian population lives within 62 miles of the coast–Jason Steen's life and career has stayed true to this maxim.

One of Jason's photos of the Australian coast.

In his spare time, Jason enjoys swimming and photography. He has also traveled extensively throughout Europe and hopes to visit Japan and South America.

Jason and the HL7 Australia Board are proud to be hosting the 2020 International Working Group Meeting February 2-7, 2020 and encourages all those in the community that have not experienced Sydney in the summer to head there for this event. Visit https://hl7.sydney to register.

Thank you for your service and commitment to HL7

Noting Retiring HTA Members and New Faces

By Julie James, FHL7, Chair, HL7 Terminology Authority and Health Informatics Consultant, Blue Wave Informatics LLP

The HL7 Terminology Authority (HTA) is an HL7 Board-appointed group that is responsible for the creation, implementation and management of HL7 processes involving external terminology – the external code systems referenced in our HL7 artifacts. Collaborating closely with the Vocabulary Work Group, the HTA is currently working to improve the community's ability to reliably reference and identify external code systems in HL7 Fast Healthcare Interoperability Resources (FHIR®) and to ensure that external code system content is given its correct attribution and licensing in all our artifacts. The HTA works through the Technical Steering Committee (TSC) to implement processes or polices that impact work groups

Retiring Members

In September, three of our long standing HTA members came to the end of their term and we would like to publicly thank them for their service. They have overseen the time when the HTA has grown from existing to act solely as the single point of contact for HL7 new content requests to external systems (which of course we still do) to having responsibility for all the HL7 processes involving external terminology content. We and the entire HL7 community would like to thank them for all their work and contribution to the HTA.

Heather Grain is the international director of the Global eHealth Collaborative and a noted educator in eHealth, including in her role as director of course development at eHealth Education. She has served as chair of the HTA since its inception and has been instrumental in steering it through to the present day. Thank you, Heather, for the leadership and vision you brought to the HTA.

Jean Narcissi is the director of dental informatics at the American Dental Association and is the former director of Electronic Medical Systems at the American Medical Association. She has served faithfully on the HTA and we thank her for her steadfast service and her unique and invaluable contribution through understanding of SNODENT.

Rob McClure, MD, FHL7 is president of MD Partners, Inc., an HL7 Fellow, a current Vocabulary Work Group co-chair and serves as an Infrastructure Steering Division co-chair to the Technical Steering Committee. Therefore, although he is retiring from service on the HTA, he is "replacing" that with service on the TSC, where we know he will speak directly to terminology matters. Thank you, Rob, for all your service on the HTA.

New Members

We would also like to welcome and introduce our new members of the HTA to the HL7 community. Each of them brings a unique and invaluable contribution to the work of the HTA, which will help serve the whole HL7 community. The new members are as follows:

Carol Macumber, PMP, FAMIA is the vice president of Apelon, Inc., a fellow of the American Medical Informatics Association and a current HL7 Vocabulary Work Group co-chair. She will now service as the newly elected vice-chair of HTA.

Reuben Daniels is the principal consultant of Saludax, a current HL7 Vocabulary Work Group Co-chair and is a previous Board Member of HL7 Australia. Previously, he was the lead architect at the National Electronic Health Transition Authority (NEHTA) in Australia.

Davera Gabriel, RN is senior research terminologist at Johns Hopkins University. Prior to this role, Davera served as a research informatician at both Duke University and the Center for Health and Technology at UCD.

HTA Membership

The remaining members of the HTA are listed below:

Roel Barelds, senior business consultant, ICT Automatisering bv (The Netherlands)

Sylvia Thun, charité visiting professor, stiftung charité, BIH University of Applied Science Niederrhein, and chair, HL7 Germany

Susan Matney, terminology and modeling initiative leader, Logica Health

Julie James, health informatics consultant, Blue Wave Informatics LLP

Report from IHIC 2019

Health Interoperability: Specifications, Validation, Testing

By Roman Radomski, MD, Chair, HL7 Poland

The 19th International HL7 Interoperability Conference (IHIC) took place October 22-24, 2019 in Warsaw, Poland. This year's event was organized by HL7 Poland with a slightly modified format and focused on the implementation of healthcare interoperability standards, with special interest in project specifications, conformance validation and testing.

110 participants from 16 countries met at the Polin Conference Center in Warsaw to participate in seminars delivered by top international experts and to discuss several international, regional and local eHealth projects. There were two keynote presentations, the Power of HL7® FHIR® and How FHIR is Changing Healthcare given by W. Ed Hammond, PhD, FHL7 and ISO/CEN Interoperability Reference Architecture and Its Impact on HL7 Standards Development and Deployment by Bernd Blobel, PhD, FHL7. In addition, the development of the International Patient Summary and European exchange of cross-border patient summary with the eHealth Digital Service Infrastructure as well as national eHealth projects in Slovakia, Ukraine and Poland were also presented. Project representatives from across Europe came to Warsaw to discuss initiatives such as the Dutch MedMij, Małopolska Medical Information System, the FHIR based implementation of ISO Identification of Medicinal Products standard and system integration using CareConnect profiles. One of the recurrent themes at the conference was how FHIR implementers deal with the fast-growing number of new FHIR profiles on international, national and local levels.

The third day of the conference was designed to hold the second edition of Integraton, an interoperability testing event open for developers of software solutions based on interoperability standards and profiles. All tests were performed on the Tukan platform, the national testing tool delivered and maintained by HL7 Poland.

IHIC 2019 presentations are available at http://ihic.info

Recognizing Volunteers as HL7's Most Vital Asset

HL7 2019 Volunteer of the Year Award Recipients

HL7 honored three members with the 23rd annual W. Edward Hammond, Ph.D. Volunteer of the Year Award. Established in 1997, the award is named after Dr. Ed Hammond, one of HL7's most active volunteers and a founding member as well as past board chair. The award recognizes individuals who have made significant contributions to HL7's success. The 2019 recipients include:

- Jean Duteau, director, Duteau Design, Inc.
- Reed Gelzer, M.D., HIT policy and EHR specialist, Trustworthy EHR, LLC
- Emma Jones, expert business analyst, Allscripts

Volunteers of the Year Award Winners pose with W. Ed Hammond. Pictured, from left to right: Emma Jones, W. Ed Hammond, Jean Duteau and Reed Gelzer.

About the Volunteers:

Jean Duteau has been a member of the HL7 Canada affiliate since 2006 and HL7 International since 2007. Jean has held several positions throughout his 10-year tenure at the organization. He currently serves as a member of the HL7 Architectural Review Board, the CDA Management Group and the Education Advisory Council. Jean is also the modeling and methodology facilitator for the Pharmacy Work Group and as the publishing facilitator for the Public Health Work Group. In addition, he currently serves as a co-chair for the Modeling and Methodology and Pharmacy Work Groups, an interim co-chair of the Cross-Group Projects Work Group and is one of two international representatives on the HL7 Technical Steering Committee.

Reed Gelzer, M.D. first became involved in HL7 in 2004 and joined as a member in 2011. As a physician and EHR compliance expert, he provides valuable information integrity insights and clinical expertise to the development of HL7 standards, particularly those under the leadership of the EHR Work Group. From 2004 to 2016, Reed was a major contributor to the group responsible for the development of the HL7 EHR Records Management and Evidentiary Support Standard. In 2008, he was a member of and the co-facilitator of the Podiatry Profile Group within HL7, advancing the FHIR test of concept for the Accuracy and Authenticity project test of concept in the form of a Wound Assessment and Treatment Template.

Emma Jones leads a team of developers for Allscripts and has been a member of HL7 since 2010. A registered nurse with a background in home health and chronic care management, she brings invaluable experience to HL7. She has served as co-chair of the HL7 Patient Care Work Group since 2015 and is a contributing member of the HL7 Da Vinci project.

News from the HL7 Project Management Office

ONC Grant Funded Project Update

By Dave Hamill,
Director, HL7 Project
Management Office

2019 Grant

Work has concluded on the projects funded by the Office of the National Coordinator for Health IT's (ONC) 2019 $1,360,000 grant for Maturing C-CDA and FHIR Standards. Under this grant, we were able to accomplish the following:

1. System test the Unified Terminology Governance (UTG) pilot;
2. Continue work to migrate the FHIR issue/project tracking and ballot reconciliation to JIRA;
3. Provide support for FHIR implementation guide (IG) publishing and balloting processes;
4. Provide an administrator for each FHIR Connectathon;
5. Ballot and publish the FHIR Bulk Data Implementation Guide;
6. Develop a test suite and utility to verify vendor compliance with the bulk data specification Flat FHIR format; design a bulk data import approach; maintain reference implementation by adding performance monitoring and user/traffic management;
7. Conduct two face-to-face C-CDA Implementation-A-Thons (IAT) and one virtual IAT;
8. Perform a comparison between the International Patient Summary and the Argonaut/US Core Implementation Guides;
9. Provide increased administrative support for standards development, publication and maintenance to facilitate the release of each new version of the FHIR core specification work as well as with other key FHIR subject matter experts to implement specific improvements for long-term, sustainable FHIR processes and tools;
10. Reconcile and publish the US Core Implementation Guide;
11. Create Health and Human Services (HHS) branded FHIR fact sheets aimed at federal government project/program managers leading HL7 related projects;

12. Initiate the work to produce a sustainable, efficient means of publishing new versions of C-CDA as a web specification (similar to FHIR);
13. Update the C-CDA Companion Guide;
14. Conduct a FHIR IG Workshop to build capacity within the HL7 community for creating and reviewing high quality FHIR IG;
15. Modify the existing FHIR IG Publisher Templates Framework into a single new framework that uses the newly developed publisher template approach;
16. Prepare to ballot the FHIR Implementation Guide for International Patient Summary;
17. Provide support for the FHIR Terminology Server including rebuilding the FHIRServer project when code updates are made and updating SNOMED CT to the latest versions;
18. Apply eLTSS IG FHIR constraints to resources (eLTSS profiles)

The ONC extended the grant for another year, and with that, awarded an additional $1.36 million to HL7 for continued maturation of the C-CDA and FHIR standards. Work identified under this endeavor includes the following:

1. Implement the Unified Terminology Governance (UTG) process;
2. Conduct additional C-CDA Implementation-A-Thons;
3. Complete improvements to the FHIR Jira ballot process;
4. Continued support for FHIR IG publishing and balloting processes;
5. Continue to provide administration for the FHIR Connectathons;
6. Continue work on Bulk Data Access and Push;
7. Produce additional HHS FHIR Fact Sheets and other educational material;
8. Publish updates to the US Core Implementation Guide
9. Reconcile and publish the HL7 Informative Document: C-CDA Rubric, Release 1;
10. Ballot and publish the FHIR Implementation Guide for International Patient Summary;
11. Continued support for the FHIR Terminology Server

HL7 appreciates ONC's continued support of C-CDA and FHIR for 2020 and beyond. ■

Details and deliverables for the above ONC funded projects can be found on the HL7 Wiki at:

http://wiki.hl7.org/index.php?title=ONC_Grant_Project_Page

Upcoming International Events

February 2-7, 2020 HL7 International Conference & WGM	www.HL7.org Sydney, Australia	April 15-17, 2020 eHealth Week Croatia	www.ehealthweekcroatia.org Rovinj, Croatia
February 17-21, 2020 GS1 Global Forum 2020	www.gs1.org/events/526/gs1-global-forum-2020 Brussels, Belgium	April 28-May 1, 2020 MIE2020	www.mie2020.org Geneva, Switzerland
February 24-26, 2020 HEALTHINFO 2020	www.healthinf.biostec.org Velleta, Malta	May 26-28, 2020 HIMSS & Health 2.0 European Conference 2020	www.himsseuropeconference.eu/ Helsinki, Finland
March 9-13, 2020 HIMSS20 - HL7 Booth #2921	www.himssconference.org Orlando, FL	May 31-June 3, 2020 eHealth Canada	www.e-healthconference.com Vancouver, BC

Tooling Update

Advanced Degrees

By Wayne Kubick,
CTO
HL7 International

After nearly four years of retooling efforts at HL7 – equivalent to earning a bachelor's degree – it has become obvious that HL7 tooling is going to need to apply to grad school. We now have a lot of the basic pre-requisites in place, but we haven't quite nailed our areas of specialization, and there are still a few missing course credits. Filling the gaps will be a focus of 2020, in addition to finally awarding a few significant diplomas.

Access to Information and Collaboration

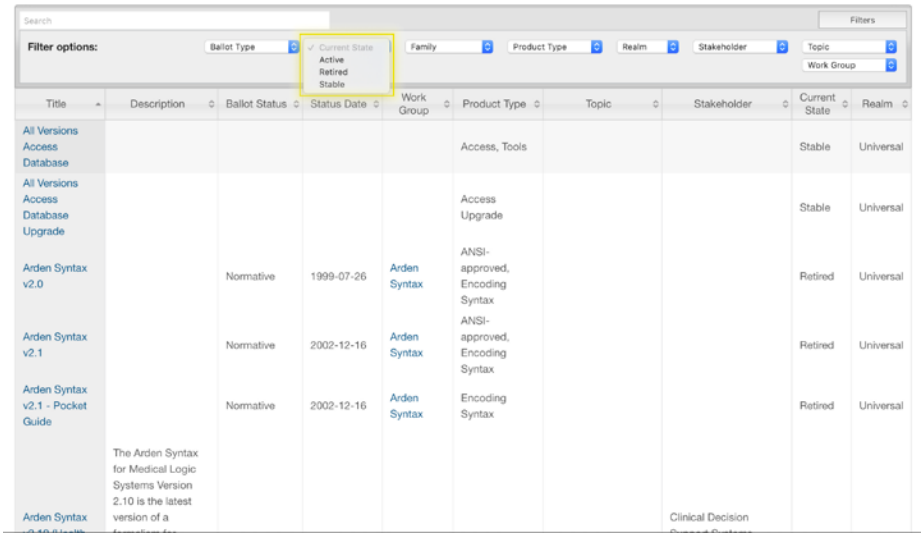
As part of our strategic objective for simplification and process efficiency, HQ has delivered new features that should make it easier to find what's going on in the world of standards. First, the Standards Master Grid has been updated with new filters and search items, including a new filter that will indicate the lifecycle state of each standard as active (undergoing regular updates), stable or retired. Of course, it will be up to the work groups to assign those states, as requested by an ongoing TSC project.

Second, a new page called Standups has been created which will provide a log of all newly published standards—a running chronology—along with ability to search by publication date, product family and tags for keywords such as realm and ballot type.

Confluence

On the Confluence front, our members continue to get more comfortable and extend the reach. However, we still need to finish migrating content from the HL7 wiki (notably the FHIR wiki) to complete the move. We're also working to focus on essential information in Confluence as our single source of truth, making important information a click away. Of particular note are guidance tips for new projects (especially FHIR accelerators) and what will be a simpler, more accurate HL7 Co-Chair Handbook.

Work continues on porting additional process forms to Confluence. One important new form will be a Project Proposal—a quick, lightweight declaration of a possible new project area to be explored. This form, submitted before a full PSS is completed, will give work groups and individuals a chance to get in on the ground floor, identifying possible overlaps and conflicts before too much work and time is invested. This will help HL7 to focus more on doing the most important items. A TSC Task Force is working out the remaining details for streamlining the full PSS process—whereby most approvals will be attained simultaneously in a common review step before getting the final OK from TSC.



In the updated Standards Master Grid, the current state of a standard can be Active, Retired or Stable.

JIRA

With JIRA, our priority projects include completing migration from tracker; and using JIRA to replace the STU update system so all feedback and change requests will be centralized. We're planning

to rollout JIRA-based balloting in 2020. A new project is now exploring how to manage future WGM agendas in JIRA, with several other new apps to come.

As you can see, our strategic intent is to drive most collaborative tooling operations to these tools You can stay informed of new functions and helpful tips at confluence.hl7.org.

Standards Development

We continue to increase the reliability and support of the FHIR IG Publisher, most recently by incorporating standard templates to ensure a common look and feel for HL7 implementation guides (IGs), while allowing other collaborating organizations who produce FHIR IGs (such as IHE) to define their own separate template formats. The templates will be enhanced over time to improve the consistency of content and structure as well as look and feel.

One of our most ambitious new tooling initiatives, Unified Terminology Governance (UTG), is finally entering the home stretch in its goal to replace harmonization in the first half of 2020. You can already see a preview of the outputs of this powerful new system at terminology.hl7.org.

In addition to these developments in our collaboration tooling stack, the FHIR team has also made significant progress in improving the capacity, operational efficiency and sustainability of the FHIR IG Publication tooling environment. In addition to providing a more stable, operational publishing environment for FHIR IGs, the FHIR IG Publisher is also being considered for publishing other HL7 standards, beginning with C-CDA. The ability to support multiple templates for publishing separate documents will also make it possible for the FHIR IG Publisher to support additional HL7 standards and perhaps even publications by certain external partner organizations later this year. This enhanced tooling, together with the availability of process checklists and some new training material, should help the community scale up to handle a higher volume of IGs, as well as help us become more efficient at reviewing what should become a more consistent set of ballot documents.

Administrative Systems

Our HL7 HQ IT team has added a new network specialist, Bryn Evans, to join David Johnson and Joshua Procious. David and Bryn are continuing to move remaining HL7 servers to the cloud, including the HL7.org website. This is a critical step in reducing our vulnerability and increasing performance and reliability. The migration has also involved upgrading several component systems, including databases and the listservs.

For next year, we are seeking to advance a critical project to replace our aging membership management and ballot systems. Since these are front-line systems for the member community, vital to HL7 operations and our standards development processes, I'll be devoting a future tooling update to describe where we're going in more detail.

So, our odyssey toward a more robust HL7 tooling environment continues, though we still have more miles to go before we sleep. If you're interested in keeping up, visit the CTO tooling plans page at https://confluence.hl7.org/display/CTO/HL7+Tooling+Plans.

Update from the CARIN Alliance

Better Access to EHR Data through APIs

By Ryan Howells, Program Manager, CARIN Alliance and Principal, Leavitt Partners

Our vision is to rapidly advance the ability for consumers and their authorized caregivers to easily get, use and share their digital health information when, where and how they want to achieve their goals. In summary, we envision a future where any consumer can choose any application to retrieve both their complete health record and their complete coverage information from any provider or plan in the country.

The CARIN Alliance was one of the first FHIR Accelerator programs within HL7. Two of our work groups are focused on the development of FHIR API implementation guides to advance person-centric interoperability. The CARIN Alliance is a membership-based organization open to anyone who would like to join. To learn more about the CARIN Alliance, our initiatives and to get involved please visit HL7.org/CARIN.

CARIN Alliance Work

Consumer-directed exchange occurs when a consumer or an authorized caregiver invokes their HIPAA Individual Right of Access (45 CFR § 164.524) and requests their digital health information from a HIPAA covered entity (CE) via an application or other third-party data steward.

Recently, new clarifying HIPAA guidance (e.g., consumer rights to get, use, store and share a copy of their own health information); new economic incentives (e.g., value-based care contracts); and new technologies (e.g., high adoption of standardized EHRs, app-ready smartphones and new APIs), have set the stage for rapid advances in consumer directed exchange. However, there is a need for private-sector leadership to move consumer-directed exchange (CDEx) to the next level.

Currently, the CARIN Alliance has five work groups which are focused on the advancing policies, regulations, technology and operational topics related to consumer-directed exchange:

The CARIN Alliance is a non-partisan, multi-sector alliance promoting the ability for consumers and their authorized caregivers to gain digital access to their health information via open application programming interfaces (APIs).

1. CARIN Blue Button FHIR Implementation Guide (HL7 FHIR Accelerator project)

Our health plan work group released the CARIN Blue Button® data model and draft implementation guide as part of the White House Blue Button® Developers Conference. The CARIN Blue Button® draft implementation guide includes more than 240 claim data elements that have been agreed on by multiple regional and national health plans. These data elements are included in what we are calling the common payer consumer data set (CPCDS). We have taken these data elements and mapped them to HL7® Fast Healthcare Interoperability Resources (FHIR®) resources to better assist health plans implement the CMS Interoperability and Patient Access proposed rule.

2. *Consumer-facing Real-time Pharmacy Benefit Check FHIR Implementation Guide (HL7 FHIR Accelerator project)*

This work group is focused on developing a consumer-facing API version of real-time pharmacy benefit check to enable consumers to access their drug formulary and benefit information, financial responsibility, therapeutic alternatives and cash price to operationalize the Patients Right to Know Drug Prices Act. You can learn more by visiting our website at https://confluence.hl7.org/display/CAR/RTPBC+Project.

3. Trust Framework and Code of Conduct

This work group has developed a trust framework with an enforceable code of conduct for third-party applications to self-attest to how data will be used outside of HIPAA. Industry organizations and other consumer platform companies are adopting the CARIN Code of Conduct as part of their application registration and onboarding process to determine whether consumers or their authorized caregivers are provided informed, proactive consent for how their healthcare data is collected, used and shared by third party applications which are not covered by HIPAA. This work group continues to develop ways to make this information accessible to consumers, so they are equipped to make informed decisions about their healthcare data in line with their personal preferences.

4. Policy and Regulatory

The policy and regulatory work groups make recommendations to help inform the Department of Health and Human Services (HHS), Office of the National Coordinator (ONC), Office of Civil Rights (OCR), Federal Trade Commission (FTC) and other regulators about ways to support the private sector in advancing CDEx, opportunities to harmonize relevant policies across government agencies, and protect consumer right to consent and privacy.

5. Digital Identity and Authentication

A crucial component of advance CDEx is the ability to identity-proof individuals securely, consistently, and in a trusted way across systems and to map them to their existing identifiers. The CARIN Digital Identity work group is developing a set of best practices and a framework for implementing the NIST 800-63-3 guidelines related to implementing Identity Assurance Level 2 (IAL2) and Authenticator Assurance Level 2 (AAL2) in healthcare. We have convened and continue to work with cross-industry leaders, from both inside and outside healthcare, on how to digitally identify individuals across systems without the need for portals. We seek solutions to improve the exchange of data across systems leveraging a person's individual consent preferences and the use of FHIR® APIs. The group considers best practices and open standards for securely identifying, authenticating and matching individuals to their health information across multiple health plans, providers and health information exchanges (HIEs) in a trusted way with consumer consent. We are collaborating on several workflows to offer solutions for how the industry could use open standards to federate digital IDs.

In Summary

Consumers and their authorized caregivers should be able to easily access, use and share their digital health information when, where and how they want. We believe this is a crucial component of advancing value-based care, improving care and cost transparency, and empowering consumers to make informed care decisions.

The MOCHA project website is located at www.childhealthservicemodels.eu.

MOCHA's primary objective was to map the different ways in which European countries provide primary care services to children, and to assess which had better outcomes. ■

Radiology, Prior Authorization, Comparative Effectiveness

CodeX Propels mCODE into New Use Cases

Launched in the fall of 2019, CodeX (Common Oncology Data Elements eXtensions) is an exciting addition to HL7's FHIR Accelerator program.

By Steve Bratt
CodeX Project Co-Lead, The MITRE Corporation

By Greg Shemancik, CodeX Project Co-Lead, The MITRE Corporation

CodeX™ Common Oncology Data Elements eXtensions

CodeX is building a community around mCODE (minimal Common Oncology Data Elements), a data standard designed to accelerate advances in patient care and inform research by enabling analysis of data across thousands of cancer patients. mCODE is being established as the semantically-interoperable set of data elements that will be used to populate all electronic health records (EHRs) for patients with cancer.

mCODE was developed by the American Society of Clinical Oncology, CancerLinQ, the Alliance for Clinical Trials in Oncology, the U.S. Food and Drug Administration, and the MITRE Corporation. It has been balloted as a standard for trial use (STU) through HL7, and mCODE v1.0 is expected to be finalized in 2020.

CodeX is a rapid developing multi-stakeholder community dedicated to creating solutions for high-priority oncology use cases that can be implemented everywhere. This broad

2019 HL7® FHIR® ACCELERATOR

community—including patients, providers, researchers, regulators, payers, EHR and information technology vendors—is working together to:

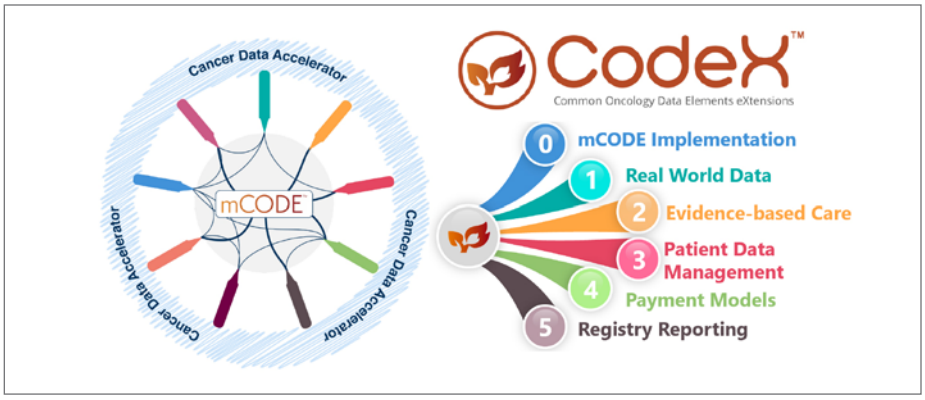
- Revolutionize cancer patient data collection, data sharing and care by developing high-quality FHIR implementation guides, reference implementations and pilots that demonstrate value
- Leverage the capabilities of mCODE, adding the additional data elements needed for new use cases
- Exchange data through EHRs and other systems in an interoperable way
- Streamline data collection in a way that doesn't burden the clinicians.

Founding members of CodeX will drive initial priorities, prioritize work on use cases, create and ballot initial implementation guides, and develop reference implementations.

Why Focus on Oncology?

Only three percent of adult cancer patients participate in clinical trials that gather high-quality data for cancer research. CodeX believes that leveraging standard technologies and sharing knowledge will allow us to learn from 100 percent of cancer patients, thereby improving cancer care for all.

There are currently many barriers to collecting and sharing valuable patient data, including the inconsistent use or absence of data standards and the difficulty of transforming how we receive, access and share patient information in a complex and non-interoperable healthcare system. Every interaction between a clinician and a cancer patient has the potential to provide data that could be used to improve care for that particular patient, as well as for all who follow.



Caption Goes Here

CodeX will speed the development and interoperability of new data models necessary for improved cancer research and care, with most of those models leveraging some or all of the mCODE core data model. Extensions around mCODE would be based on priority use cases.

Why Join CodeX?

CodeX membership offers valuable opportunities for all stakeholders. Members will define and drive the next set of challenges to be solved, committing time and resources to support development of use cases, FHIR implementation guides and reference implementations.

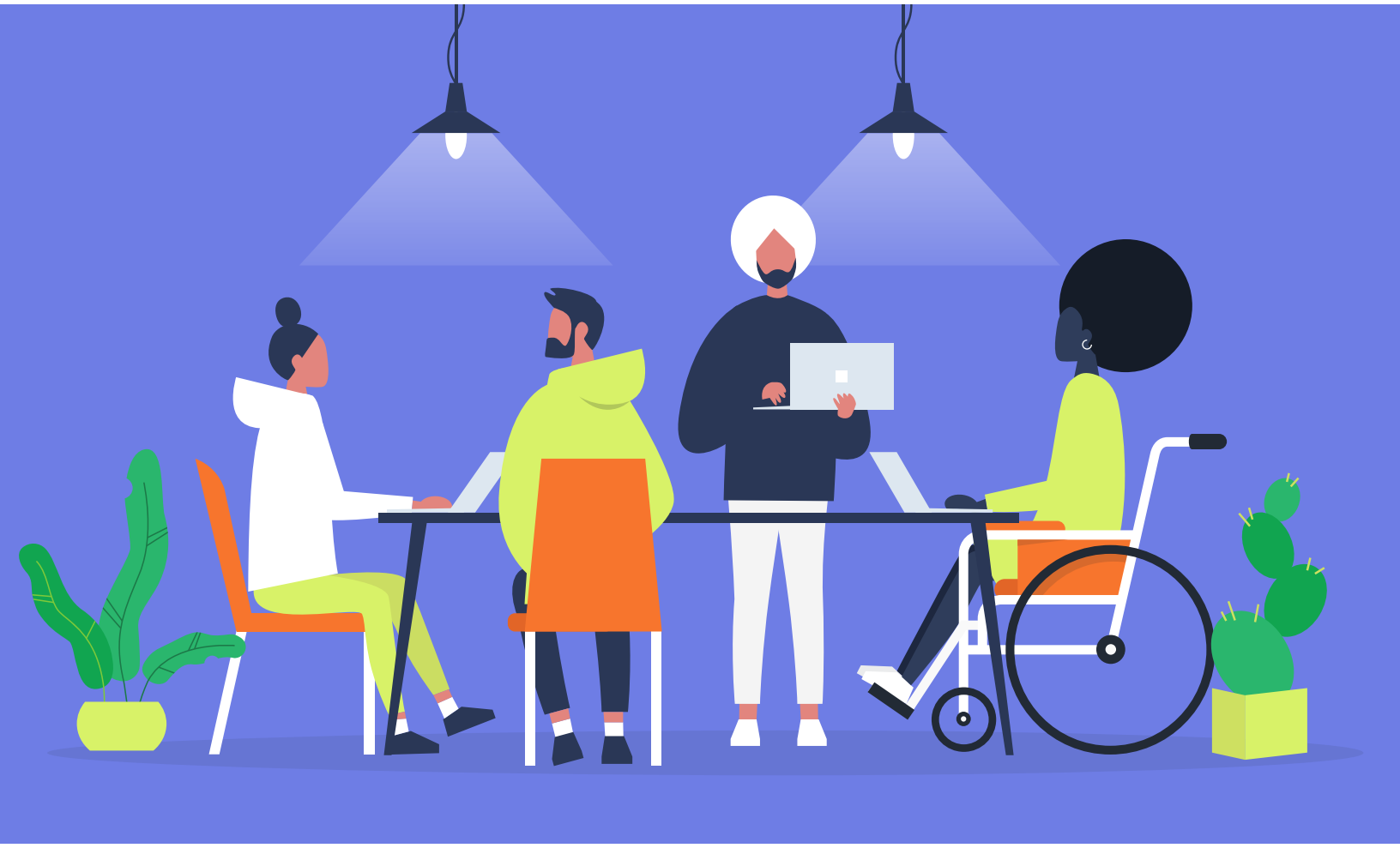
CodeX membership benefits include:

- Create and pilot new use cases in critical areas such as:
  - Prior Authorization
  - Radiation Oncology
  - Patient Data Management
  - Evidence-based Reporting
  - Research Trials
- Highlight your role as a leader in the effort to make data interoperability in cancer care a reality
- Get early access to products to support informed business decisions
- Learn best practices from industry leaders ■

For more information on CodeX, please visit www.HL7.org/codex/

or contact the CodeX project co-leads:

Greg Shemancik
gshemancik@mitre.org
Steve Bratt
sbratt@mitre.org



Creating a Vital Organization with Human Resources

HL7's Policy Statement on Diversity, Equity and Inclusion

By Walter G. Suarez, MD, MPH, Board Chair, HL7 International

As an international, membership-based non-profit organization, HL7 has a corporate responsibility to ensure that every aspect of its work – both inside and out – is implemented in a manner consistent with strong, foundational values of diversity, equity and inclusion.

For years, HL7 had an implicit understanding of the importance of considering these values across the entire organization, its people, processes and products. However, as the organization continues to grow and the membership participants and stakeholders expand and become more diverse, it is now imperative for HL7 to formally and intentionally establish, embrace, execute and periodically evaluate the implementation of these core organizational values. It is not just the right thing to do. It is vital to the organization's health, effectiveness, sustainability and overall future.

The Meaning of Diversity, Equity and Inclusion

Diversity

In basic terms, **diversity** refers to the wide range of differences and similarities that exist among people and encompasses the various characteristics that make one individual or group unique. While diversity

is often used in reference to race, ethnicity and gender, HL7's policy embraces the broadest definition of diversity to also include other characteristics such as age, national origin, religion, disability, sexual orientation, socioeconomic status, education, marital status, language and physical appearance. In addition, our definition includes diversity of thought: ideas, perspectives and values. We also recognize that individuals affiliate with multiple identities.

Equity

Equity refers to the fair treatment, access, opportunity and advancement for all people, while at the same time striving to identify and eliminate barriers that prevent the full participation of some groups. Improving equity involves increasing justice and fairness within the procedures and processes of institutions or systems, as well as in their distribution of resources. Tackling equity requires an understanding of the root causes of outcome disparities within our society.

Inclusion

Lastly, **inclusion** refers to the acts of creating environments in which any individual or group can be and feel welcomed, respected, supported and valued to fully participate. An inclusive and welcoming climate embraces differences and offers respect in words and actions for all people. It's important to note that while an inclusive group is, by definition, diverse, a diverse group isn't always inclusive. Increasingly, recognition of unconscious or implicit bias helps organizations to be deliberate about addressing issues of inclusivity.

Purpose and Scope of the HL7 Policy on Diversity, Equity and Inclusion

The HL7 policy states that "HL7 International and its affiliates reaffirm their commitment to diversity, equity and inclusion across the entire organization, as a key strategic business priority and driver that is essential to pursuing and maintaining the highest quality and most efficient and effective product and service development and delivery, and the status as a best place to be a member and to work."

...vital to the organization's health, effectiveness, sustainability and overall future.

The purpose of the policy is to affirm HL7 International and its affiliates' commitment to, and focus on, diversity, equity and inclusion as core organizational values. The policy applies to all HL7 International internal processes and activities, its board, committees and working groups, affiliates, contracted employees, members and participants.

Policy Provisions

HL7 has long operated under a published Code of Ethics, which is articulated in its Governance and Operations Manual, and more recently published a Code of Conduct. Both statements underscore the organization's commitment to diversity, equity and inclusion. Taken together they address the following five components:

1. **People:** HL7 International utilizes the full potential of the organization's most valuable diversity asset, the people of HL7.
2. **Work Environment:** HL7 International maintains a work environment that embraces diversity, equity and inclusion throughout the entire organization, which fosters creativity and innovation.
3. **Defining Characteristics:** Fairness and equity are defining characteristics of the HL7 International work environment. Discrimination and harassment are not tolerated or condoned, in accordance with the Equal Employment Opportunity and Affirmative Action policies.
4. **Integration:** HL7 International strives to integrate its diversity, equity and inclusion strategy into its core organizational and operational activities, and all aspects of the development of its products and services.
5. **Diversity and Inclusion Strategy:** HL7 International leverages its rich diversity of people and enduring commitment to inclusion in order to remain a leader in the development of international healthcare interoperability standards and services.

Pillars of the HL7 Diversity, Equity and Inclusion Strategy

HL7 International's diversity, equity and inclusion strategy, developed and approved by the Board of Directors, is founded on the following four pillars:

1. **Services:** Provide the best services to its members, participants and customers, eliminating disparities and fostering equity.

Continued on page 20

Continued from page 19

HL7's Policy Statement on Diversity, Equity and Inclusion

2. **Workforce:** Optimize diversity representation at every level including the HL7 board of directors, staff, contracted personnel, work group and committee co-chairs, and all other levels of organizational leadership to create an inclusive workplace environment to optimize all talent potential.
3. **Industry and Community Partnerships:** Collaborate with a diverse group of stakeholders and organizations to create standard that advance our interoperability goals.
4. **Diversity and Inclusion Compliance:** Enable a process for confidential reporting and receipt of response to perceived violations of this policy.

Governance

Ensuring implementation of HL7 International's diversity, equity and inclusion strategy is the responsibility of everyone involved in HL7. Following is a list of various HL7 components and their responsibilities towards this policy:

- **HL7 International Board of Directors:** Develops, approves and oversees the ongoing implementation of the diversity, equity and inclusion policy and strategy.
- **HL7 International Executive Team:** Operationalizes the implementation of policy and strategy at all levels of the organization.
- **Affiliates:** Carry forward the HL7 diversity, equity and inclusion policy and strategy in a manner that is sensitive to and consistent with national needs, culture and laws.
- **Leadership of Committees, Work Groups, Councils, and other HL7 International Organizational Units:** Fulfill the policy at their respective levels and carry it forward within their respective groups, processes and products.
- **Members, Participants and Customers:** Are empowered to report perceived violations of this policy to the current chair of HL7 International at Ethics@HL7.org.

What's Next

As the new decade begins, HL7's work to implement its policy will focus around the following five areas:

1. Create a culture of inclusion, equity and diversity starting with a communication and education strategy as well as ongoing professional development directed to all levels of the organization, including areas such as: unconscious bias awareness; inclusive processes that are respectful and embraces our membership diversity; setting the tone in meetings to engage participants with diverse communication styles; ensuring leaders in all our working groups and committees are 'inclusion advocates', and others.
2. Developing an operational strategy for this policy that includes appropriate diversity, equity and inclusion alignments with, and references in existing and new internal and external policies, procedures, products and services. The strategy will need to include mechanisms to evaluate how the organization is doing with respect to the implementation of the policy.
3. Identify and disseminate internally a series of curated tools and resources that support the most effective implementation of the policy.
4. Set clear expectations for inclusive leadership behaviors among all leaders within the organization.
5. Align the overall mission, vision and strategy of the organization with the broader diversity, equity and inclusion issues being faced by our members, stakeholders and the communities we serve.

If you have questions, comments or suggestions about our new HL7 Policy on Diversity, Equity and Inclusion, please send them to Ethics@HL7.org..

HL7 Standards Approved by ANSI Since July 2019

Name	Designation	Date
HL7 Version 3 Standard: XML Implementation Technology Specification - V3 Structures for Wire Format Compatible Release 1 Data Types, Release 1	ANSI/HL7 V3XMLITS STRUCT4WFCR1DT, R1-2014 (R2019)	07/31/2019
Health Level Seven Arden Syntax for Medical Logic Systems, Version 2.10	ANSI/HL7 Arden V2.10-2014 (R2019)	08/01/2019
HL7 Version 3 Standard: Clinical Statement Pattern, Release 1	ANSI/HL7 Arden V2.10-2014 (R2019)	08/01/2019
HL7 Version 3 Standard: Regulated Studies - Annotated ECG, Release 1	ANSI/HL7 V3 ECG, R1-2004 (R2019)	08/01/2019
HL7 EHR Behavioral Health Functional Profile, Release 1	ANSI/HL7 EHR BHFP, R1-2008 (R2019)	08/01/2019
HL7 EHR Child Health Functional Profile, Release 1	ANSI/HL7 EHR CHFP, R1-2008 (R2019)	08/01/2019
HL7 EHR Clinical Research Functional Profile, Release 1	ANSI/HL7 EHR CRFP, R1-2009 (R2019)	08/01/2019
HL7 FHIR R4 Observation, Release 1	ANSI/HL7 FHIR® OBS R1-2019	08/09/2019
HL7 FHIR R4 Terminology & Conformance, Release 1	ANSI/HL7 FHIR R4 TERMINOLOGY R1-2019	08/09/2019
HL7 Version 3 Standard: Context-Aware Retrieval Application (Infobutton); Knowledge Request, Release 2 (revision of ANSI/HL7 V3 INFOB, R1-2010)	ANSI/HL7 V3 INFOB, R2-2014 (R2019)	08/12/2019
HL7 Version 3 Implementation Guide: Context-Aware Knowledge Retrieval Application (Infobutton), Release 4	ANSI/HL7 V3IG INFOB, R4-2014 (R2019)	08/15/2019
HL7 Version 3 Standard: Unified Communication Service Interface, Release 1 - US Realm	ANSI/HL7 V3 SOA EPSSRVINT, R1-2019	8/30/2019
HL7 Version 3 Standard: Event Publish & Subscribe Service Interface, Release 1 - US Realm	ANSI/HL7 V3 SOA UCRSVINT, R1-2019	9/06/2019
HL7 Version 3 Standard: Transport Specification - MLLP, Release 2	ANSI/HL7 V3 TRMLLP, R2-2006 (R2019)	9/06/2019
HL7 Version 3 Implementation Guide: Data Segmentation for Privacy (DS4P), Release 1	ANSI/HL7 V3 IG DS4P, R1-2014 (R2019)	9/13/2019
HL7 Clinical Document Architecture, Release 2.1	ANSI/HL7 CDA, R2.1-2019	12/06/2019
Health Level Standard Standard Version 2.9 - An Application Protocol for Electronic Data Exchange in Healthcare Environments	ANSI/HL7 V2.9-2019	12/06/2019

Whole Interventions Demonstrator for People at Health and Social Risks

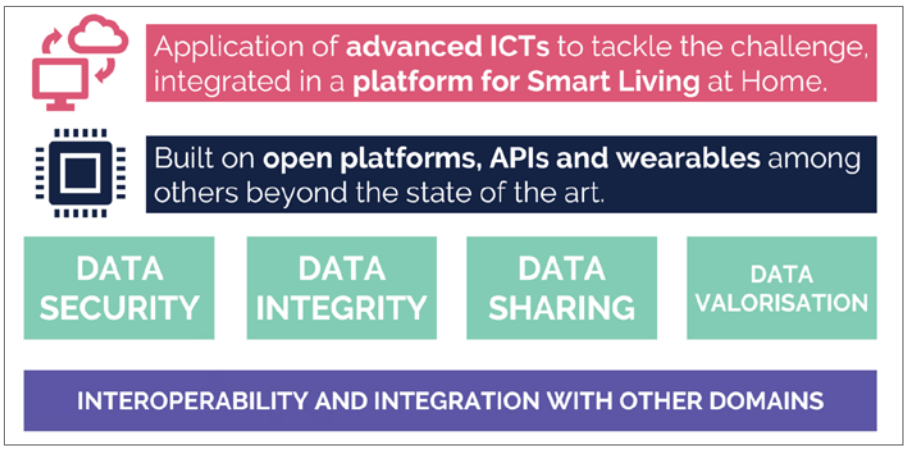
GATEKEEPER - Smart Living Homes

On October 23, 2019 in Madrid, Spain, the European Commission kicked off the GATEKEEPER project, a €21.3 million initiative with 43 partners, including the HL7 Foundation Europe, that aims to connect all actors in the healthcare environment through an open platform to improve healthcare services to an increasingly aging population.

By Giuseppe Fico, University Polytechnico de Madrid, Technical Coordinator GATEKEEPER Project

Giorgio Cangioli, Chair, HL7 Italy

Catherine Chronaki, FHL7, Secretary General, HL7 Foundation



GATEKEEPER SCOPE

The scope of GATEKEEPER is the application of advanced Information and Communications Technologies (ICTs) to tackle the challenge of improving the quality of life of citizens while demonstrating its significant efficiency gains in health and care delivery across Europe.

The GATEKEEPER open platform will combine information obtained from the health ecosystem and the user's daily activity with all security and privacy guarantees, making possible the use of "big data" for the benefit of individual care. In this way, it will enable the innovative development of a wide range of digital health services with the aim of improving early identification and better treatment of prevalent diseases such as diabetes, heart disease and Parkinson's, among others.

The main focus of the project is on digital technologies such as the internet of things, big data or artificial intelligence, new techniques that allow the improvement of the personalization, intervention and early detection of increasingly prevalent chronic diseases.

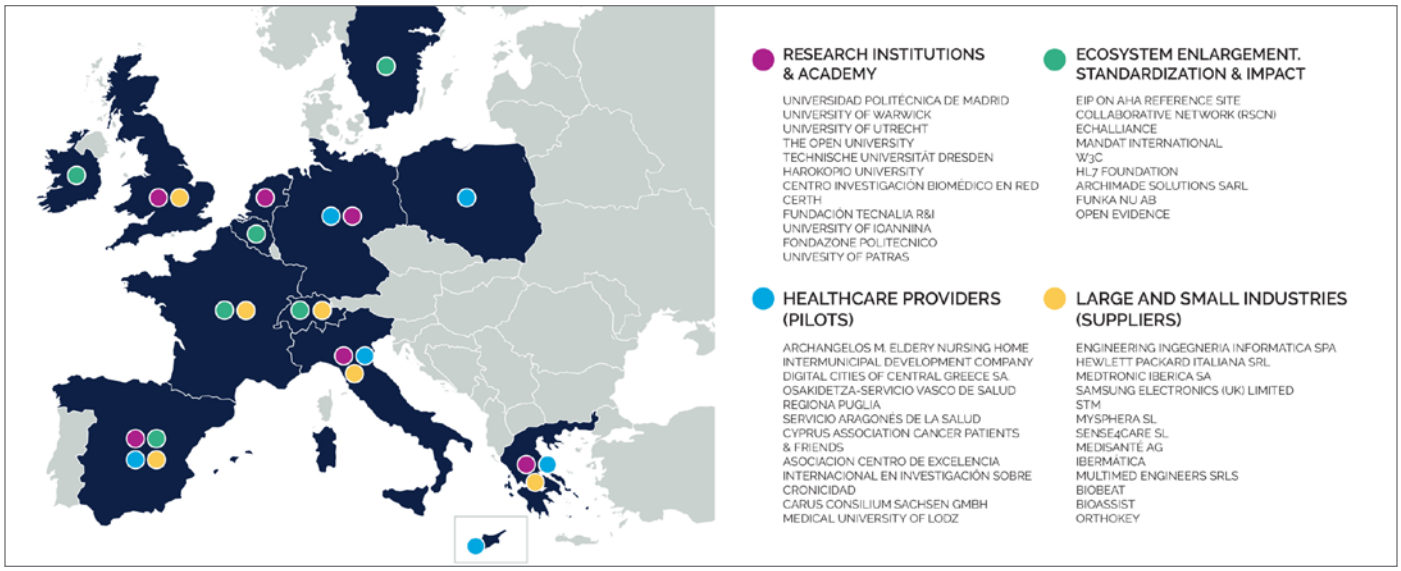
GATEKEEPER engages healthcare technology companies, research institutes, large universities, healthcare providers and European and international networks on technological innovation, under the coordination of Medtronic Ibérica and the auspices of the European Commission. According to the coordinator of this initiative, Germán Gutiérrez, "The European Commission has

GATEKEEPER Resources:

Website
www.gatekeeper-project.eu

Twitter
@GATEKEEPER_EU

LinkedIn
GATEKEEPER PROJECT



opted for this project because it represents an innovative approach to face the socio-health system challenges in this progressive aging of the population, and because the consortium has the multidisciplinary team with the experience and prestige necessary to fulfill the ambitious objectives of the project".

GATEKEEPER contemplates the deployment of a large-scale experience that will be developed over the next three and a half years and will involve about 40,000 elderly individuals in seven countries in the European Union. Mature health solutions will be deployed in homes and people's care centers, in order to demonstrate that the identification of risk situations can improve the progression of chronic diseases.

The pilots will be implemented in the following locations: Basque Country; Aragon; Saxony (Germany); Greece; Puglia (Italy); Milton Keynes (United Kingdom); Cyprus; and Poland. In the words of the deputy coordinator of the project, Sergio Guillén, GATEKEEPER has an enormous potential in different areas: "It is an innovation project that aims to create and test evidence based on quality indicators, on the positive impact that massive data use will have through technologies of artificial intelligence, big data and data analytics both in the quality of care and health outcomes, as in the early detection and management of the chronic disease care process".

Guillén affirms that this initiative will also have a direct implication in the development of a European services platform, which facilitates the interaction between the agents of the socio-health system, the technology and services companies and the citizens for the co-creation of intelligent solutions adapted to the current needs on prevention and health management. He states, "GATEKEEPER will be a flagship project in the execution of the European Union strategy on digitalization of the industry and socio-sanitary systems, and in the sustainable development of safe and reliable digital technologies, which guarantee the privacy and rights of the citizens. There is only one scale and it is European".

Western countries and Europe are witnessing the rapid aging of the population due to the increase in life expectancy and the low birth rate in the continent, a phenomenon that is expected to increase in the coming years. This trend is especially worrisome in the case of Spain, where those over 65 will represent more than 30% of the total population in 2050, surpassing four million people.[1] "Fortunately, diseases that were previously considered deadly have become chronic, and this clearly requires a different approach to this type of patient. Change leaders must take full advantage of digital technologies to offer the solutions that chronic patients really need", concluded the Guillén.

The HL7 Foundation is thrilled to be part of the initiative contributing to the standardization strategy for smart living environments as well as certification mechanisms and the overall governance for procurements. Additionally, HL7 will work with W3C and the Web of Things to leverage HL7 Fast Healthcare Interoperability Resources (FHIR®) in living environments.

1 AGING: FGCSIC STRATEGIC LINE

Consensus-driven Data Standards on Social Determinants of Health

Gravity Project Progress Update

By Evelyn Gallego,
Program Manager,
Gravity Project

Launched in May 2019 as a multi-stakeholder public collaborative, the Gravity Project has convened over 800 industry-recognized clinical, social care, academic and technical experts from across the nation to develop, test and validate standardized social determinants of health (SDOH) data for use in patient care, care coordination between health and human services sectors, population health management, public health, value-based payment and clinical research.

The project is a direct response to multi-industry recommendations and calls to action around creating national standards for representing SDOH data in EHRs. There is a broad consensus that SDOH information improves whole person care and lowers costs. This is supported by growing evidence demonstrating strong links between social risk and an individual's health and healthcare utilization. This correlation has led health systems increasingly to incorporate social risk data into clinical decision making to help reduce costs and provide more targeted services to at-risk populations.

Why is a SDOH Standardization Project Important?

Despite increased interest around identifying and addressing social determinants in the context of U.S. healthcare settings, existing medical coding vocabularies remain poorly equipped to describe related clinical activities. Consensus is needed on core concepts used to describe clinical activities related to social determinants (e.g., screening, diagnosis, goal setting and interventions), as well as on codes and value sets that will adequately reflect these concepts.

In August 2019, the Gravity Project officially joined the HL7 FHIR Accelerator Program with the American Academy of Family Physicians (AAFP) serving as convener and sponsorship provided from SIREN, the Blue Cross and Blue Shield Association (BCBSA) and AmeriHealth Caritas. As a FHIR Accelerator project, the Gravity Project will demonstrate how HL7 Fast Healthcare Interoperability Resources (FHIR®) can be used to promote the collection and use of SDOH data, facilitate the sharing of SDOH data across clinical and non-clinical organizations, and facilitate payment for social risk data collection and intervention activities.

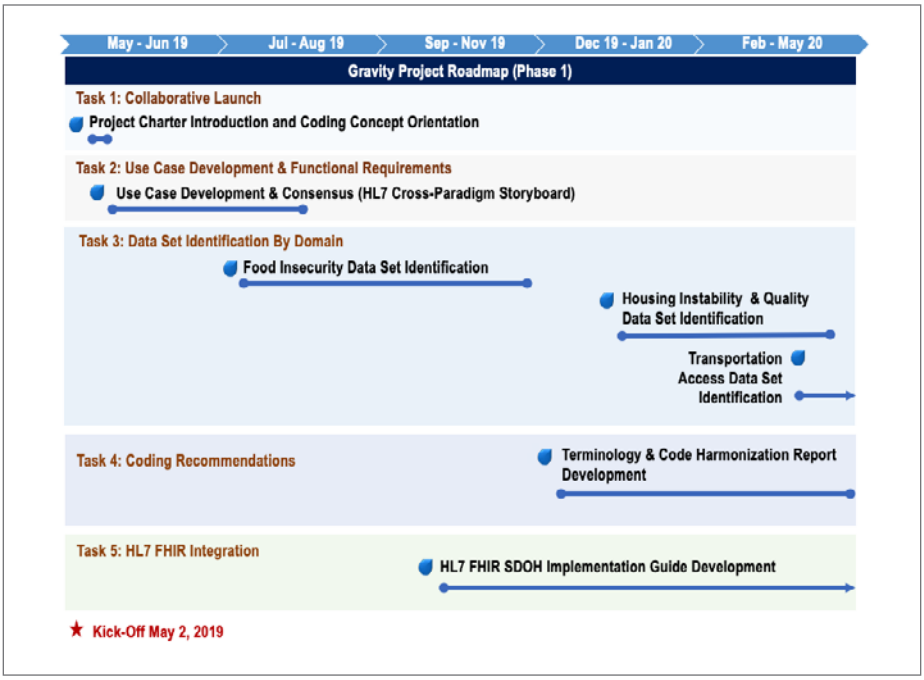
The Gravity Project was initiated by the Social Interventions Research and Evaluation Network (SIREN) with funding from the Robert Wood Johnson Foundation and in partnership with EMI Advisors LLC.

Gravity Project Scope and Phases

The Gravity Project seeks to identify coded data elements and associated value sets to represent SDOH data documented in EHRs across four clinical activities: screening, diagnosis, goal setting and interventions.

Phase 1 deliverables (2019 – 2020) are as follows:

- Develop use cases to support documentation of SDOH data in EHRs or related systems
- Identify common data elements and associated value sets to support the use cases specific to three priority SDOH domains: food insecurity, housing instability and quality, and transportation access
- Develop recommendations on how best to capture and group the common data elements for interoperable electronic exchange and aggregation
- Initiate development of an HL7® FHIR® implementation guide based on the defined use cases and associated data sets



Phase 1 Deliverables

Phase 2 deliverables (2020 and beyond) are:

- Address coding gaps defined in Phase 1 by collaborating with coding and technology suppliers
- Develop and test coded SDOH data sets for use in FHIR
- Develop and ballot an HL7 FHIR SDOH Implementation Guide

Ultimately, the Gravity Project will lay the groundwork for national standardization of food, housing and transportation needs data. Future phases will focus on developing standards for other social risks increasingly addressed in clinical settings (e.g., social isolation, low education, lack of personal safety).

Gravity Use Cases and HL7 FHIR Acceleration

On October 10, 2019 the Gravity Project initiated the development of the SDOH FHIR Implementation Guide (IG). The IG will define FHIR profiles needed to represent SDOH information as discrete data. It also will provide guidance on how to utilize transactions, messages and other FHIR-based information exchange mechanisms defined in existing FHIR IGs already in use within the health IT community. The three use cases that will be addressed in the SDOH FHIR IG are:

1. Document SDOH data in conjunction with the patient encounter
2. Document and track SDOH related interventions to completion
3. Gather and aggregate SDOH data for uses beyond the point of care (e.g., population health management, quality reporting and risk adjustment/risk stratification)

The Gravity use cases were developed to represent high-value data transactions as defined in the illustrative Gravity Patient Story and Personas. The final consensus approved Use Case Package is available at https://confluence.hl7.org/pages/viewpage.action?pageId=51227176#GravityUseCasePackage-GravityPersonas

The Gravity SDOH FHIR IG is targeted for balloting as a Standard for Trial Use (STU) in September 2020. To support this ballot, the Gravity Project team will participate in three FHIR Connectathons in 2020: one in spring 2020, a second in May 2020 and a third in September 2020. To follow and participate in the IG development and testing activities, visit the Gravity FHIR IG site: https://confluence.hl7.org/display/GRAV/Gravity+SDOH+FHIR+IG

Gravity Project Approach

The Gravity Project is facilitated as an open public collaborative fueled by broad stakeholder engagement across the health and human services ecosystem to include clinical provider groups, community-based organizations, standards development organizations, policymakers, researchers, public health groups and health IT vendors. Stakeholders are welcome to participate and contribute to the development and review of Gravity deliverables.

To learn more about the Gravity Project and participate, visit: https://confluence.hl7.org/display/GRAV/The+Gravity+Project

To join the collaborative, visit: *https://confluence.hl7.org/display/GRAV/Join+the+Gravity+Project*

For additional questions or to request a project overview meeting, contact: gravityproject@emiadvisors.net

With the Help of the Open Source R on FHIR library

Gathering Medical Data in Your R Client

By Rob Mulders, Chair, HL7 Netherlands

and Sander Laverman, Software Developer, Firely

In medical research programs, statistical programming using R is often used to analyze data into result sets. Gathering data however, is still mostly a clumsy and error prone process. As the use of HL7 Fast Healthcare Interoperability Resources (FHIR®) gets more widespread in the academic world, opening up legacy applications, it is good to know that the open source library R on FHIR helps researchers to collect data from FHIR endpoints in a structured manner.

The R on FHIR package is available on The Comprehensive R Archive Network (CRAN). R on FHIR is, as you can tell from the name, an R package that supports R users with fetching data from FHIR servers. It provides simple but powerful tools to perform read, version read and search interactions on FHIR servers and fetch the resulting resources in an R friendly format.

R on FHIR consists of two classes called fhirClient and searchParams, just like most HL7 FHIR client API libraries. The fhirClient provides functions to perform read and search operations and to use the FHIR paging mechanism to navigate around a series of paged result bundles. The searchParams class provides a set of fluent calls to allow you to easily construct more complex queries.

Here is an example of what the most basic R on FHIR script looks like:.

```
# Install and load the RonFHIR library
install.packages("RonFHIR")
library(RonFHIR)

# Create client and read patient from public Vonk endpoint
client <- fhirClient$new("https://vonk.fire.ly")
pat_example <- client$read("Patient/example")

# Print the structure and contents of pat_example
print(pat_example)
```

Figure 1

Most of the time researchers want to perform a search query based on different parameters. The example in Figure 2, top right, searches for patients with a resolved Condition 'Pain in Ear' (SNOMED-CT code = 16001004):

Using search parameters brings us to the point that FHIR delivers results in bundles. FHIR uses a paging mechanism to return bundle resources. The API only returns the results of the first page. This means that if there are more pages, you will need to retrieve them as well. The code in Figure 3, at right, is an addition to the previous script, so please combine the code to make it run:

Going further, in the end we are able to let our R script construct a graph, showing patients with ear pain in relation to different age categories. The Ear Pain graph on Vonk data looks like Figure 4, at lower right.

Please note that the output can vary from minute to minute, since the public Vonk FHIR server is used by many for testing purposes, which means data gets modified all the time. If you are interested in knowing how to complete the final step, going from the third code example to the final graph, please visit www.learnfirely.one, to see where all code examples are.

Happy coding!

```
library(RonFHIR)
client <- fhirClient$new("https://vonk.fire.ly")

# Create a searchParams object
# https://github.com/FirelyTeam/RonFHIR
query <- searchParams$new()

# See http://hl7.org/fhir/STU3/condition.html#search for the right search parameters
query$where(c("code=16001004", "clinical-status=resolved"))

# Search on the endpoint with the selected search arguments
# https://github.com/FirelyTeam/RonFHIR
ears_bundle<- client$searchByQuery(query, "Condition")

# For a search the server returns a Bundle containing the Condition resources
# Display the onsetDateTime (http://hl7.org/fhir/STU3/condition.html#resource)
ears_bundle$entry$resource$onsetDateTime

# Display the subject reference
ears_bundle$entry$resource$subject$reference

# Display the total number of results on the server
ears_bundle$total

# Display the number of results
nrow(ears_bundle$entry$resource)
```

Figure 2

```
# Create empty vectors to store the birthDates of the patients and the onsetDateTimes
birthdates <- c()
onsets <- c()

while(!is.null(ears_bundle)){
  # servers can return url or path, so we need to be able to handle both
  patient_references <- str_extract(ears_bundle$entry$resource$subject$reference, "Patient/.*")

  # read each patient and return the birthdate
  bds <- sapply(patient_references, function(x)if(is.na(x)){return (x)}else{pat <- client$read(x);
return (pat$birthDate)}, USE.NAMES = FALSE)

  # save the birthdates and onsets
  birthdates <- c(birthdates, bds)
  onsets <- c(onsets, ears_bundle$entry$resource$onsetDateTime)

  # Go to the next page of the bundle using FHIRs paging mechanism
  ears_bundle <- client$continue(ears_bundle)
}

# Show the birthdates and onsets
birthdates
onsets
```

Figure 3

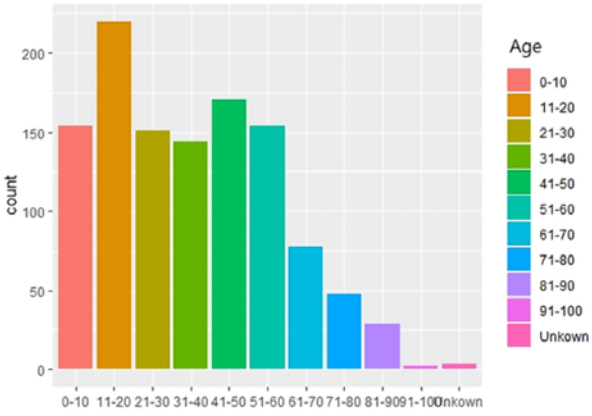


Figure 4

Do you want to run the code? There are two ways to do it. Choose one:

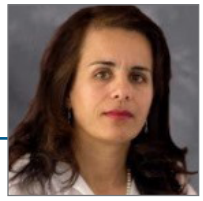
A. Download and run R Studio from https://rstudio.com/ then copy/paste the code into the editor and click on Run.

B. Visit http://www.learnfirely.one then copy/paste the code in the edit box and click on Run.

In option B the download of any software to your computer is not needed and the line of code with install packages is not needed either.

IPS Global Community of Practice for Digital Health Innovation

Beyond Trillium Bridge II



By Catherine Chronaki, FHL7, Secretary General, HL7 Foundation

Trillium Bridge (2013-2015) was a European Initiative that compared specifications of patient summaries used in Meaningful Use in the United States (i.e. Continuity of Care Record) and epSOS (HL7 Clinical Document Architecture Release 2 (CDA® R2)) in Europe.

Using format transformation, it tested and successfully demonstrated the feasibility of exchanging electronic health records across the Atlantic at HIMSS15. Its main recommendation was to create an International Patient Summary (IPS), a single patient summary specification for global use.

Trillium Bridge Recommendation: Advance International Patient Summary (IPS) standards to enable people to access and share their health information for emergency or unplanned care anywhere and as needed. At minimum, the IPS should include immunizations, allergies, medications, clinical problems, past operations and implants."

Then, Trillium II (2016-2019) began with the ambition to scale up adoption of the IPS by taking a closer look at sociotechnical aspects building on the principles of eStandards, including the following areas: address the needs of all stakeholders, consider the full standards lifecycle, and work on co-creation, governance and alignment. Trillium II worked on harmonized specifications in HL7 CDA and HL7 Fast Healthcare Interoperability Resources (FHIR®) and also supported the use of the IPS beyond unplanned cross-border emergency care. In addition, Trillium II engaged with organizations and consortia to understand how patient summaries could be used to improve health and care of people, changing the way with think about health data interoperability.

Cooperation Agreements

Cooperation agreements were signed with the European Society of Hypertension (ESH), the FrailSafe project, the C3Cloud project, the MOCHA project and European Mobile Field Hospital Project (EMFH). Patient summaries were framed as the minimum but essential core set of health information blocks: problem list, allergies, medication, etc. Additional building blocks were considered optional, such as the following: vaccination list, medical devices, vital signs, encounters, clinical problems and therapeutic plans.

The European Society of Hypertension (ESH) worked with us on including core IPS data in a blood pressure monitoring App to facilitate monitoring of hypertension and assist remote consultation with

experts. Health information data blocks were linked to each other and sometimes, one piece of information (e.g. a lab result) explained another (e.g. a diagnosis). The notion of a two-level patient summary emerged – along with renewed focus on provenance, i.e. when the health information was produced and under what circumstances.

The FrailSafe project dealt with risk assessment of elderly patients at risk of frailty. Collaboration with Trillium II concerned the question of getting information from the patient summary to populate the risk assessment questionnaire for frailty. Can we place in context, patient case characteristics that lead us to assume high risk of frailty? Can we actively monitor the risk of pre-frailty?

The C3Cloud project used health data from the IPS to construct care plans for chronic disease patients based on medical guidelines. NICE professional guidelines were used to select the right health data and compute a care plan for patients with diabetes.

The MOCHA project deal with patient summaries for children, focusing on vaccination, building on the work of WHO in home records and the yellow card of WHO. In a workshop hosted by WHO Europe, we asked the question: Can the IPS support the requirements of a European or Global Vaccination Card? The expert workshop revealed essential information about the structure of the vaccination component and, in particular, the reason for non-vaccination.

The European Mobile Field Hospital accepted disaster victims carrying an IPS on their mobile and allowed the integration of a patient summary to the hospital information system during a MODEX exercise. Surprisingly, what we were able to demonstrate in the simulation exercises of the European MODEX Exercises, is exactly what is was that emergency departments sought to improve productivity and quality of care. Interviews with emergency teams revealed the importance of voice interaction with the patient summary of the incoming patient.

The tools for implementing the IPS have improved after the following events: a datathon in Gothenburg, Sweden, in April 2018; a FHIR Connectathon in Baltimore, MD, U.S., in September 2018; a disaster exercise in Bucharest, Romania, in October 2018; a hackathon in Athens, Greece, in February 2019; and another medical exercise in Saaremaa, Estonia in April 2019. Are we there yet? Unfortunately, no.

What's Next?

The Trillium II project concluded on June 30, 2019. So, what's next? Has the International Patient Summary work finished? Have we discovered and analyzed the use cases? Can IPS work sustain itself? Do we have enough test data? Do we have the tools to accelerate adoption? (Un)fortunately, no.

If interoperability standards like the IPS implementation guides wish to reach universal adoption in the mobile health arena, we need more. Consider a STARTUP Kit for implementers to pick and choose the IPS components, connect to multiple test servers, and within minutes validate correctness of their implementation, leaving space for features that matter like patient engagement and usability.

There is pressing need to scale up and constantly innovate. The IPS implementation guides shows how HL7 FHIR resources and tools can serve as infrastructure for innovation, making the cost of interoperability so low that it becomes the obvious and only choice. We need to build capacity and knowledge around the IPS. This is the only way the IPS specifications can evolve and serve their purpose in the data economy. This is exactly where the IPS community of practice comes into play.

IPS Global Community of Practice of Digital Health Innovation

At its end, Trillium II proposes the creation of a global IPS global community of practice (CoP) of digital health innovation as a sustainable mechanism to fuel innovation, build skills and capacity. This CoP will allow the friends of Trillium II to stay connected, continue sharing, exploring, and developing the ideas behind patient summaries, and seek opportunities for further focused joined projects.

A CoP is a domain of knowledge, a community, and a practice, according to Wegner.

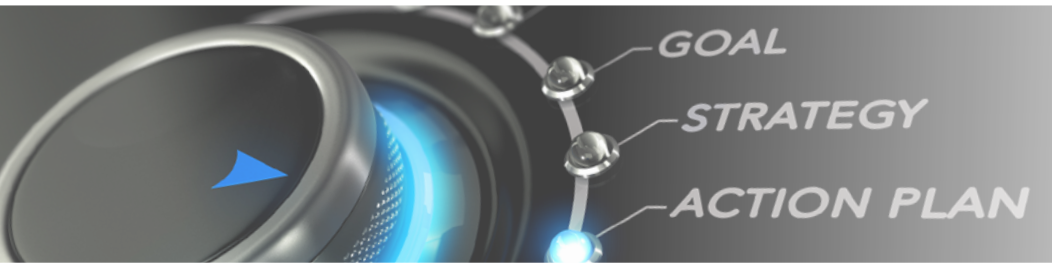
For the IPS CoP, the domain of knowledge creates and inspires members to strive for interoperability in digital health, i.e. legal, technical, organizational, and semantic as noted in the European Interoperability Framework. Community members at different levels of expertise participate guiding and being guided in their learning of eHealth standards.

The practice is the quest of interoperability and quality in healthcare technology. It is this global CoP that weaves the social fabric of mutual learning that fosters interactions and encourages the sharing of ideas, connecting existing people, ideas, projects and helping shape new ones. Mutual learning occurs in different meetups, testing events, hackathons, datathons and connectathons where people elaborate on implementation of new ideas on use cases, tools, services and data sets.

In the end, the IPS CoPs is the reference site for our shared knowledge, the meeting place of the IPS community. ■

For more information:

https://trillium2.eu/ips-global-community-of-practice/



HL7® International

Core Strategic Goals, Organizational Vitality and Standards

HL7 International Strategic Plan

By Calvin Beebe, FHL7,
Vice Chair,
HL7 International

The HL7 International Strategic Plan identifies the core strategic goals as well as the strategic objectives for our organization.

As a member based non-profit organization, the board assumes the responsibility of establishing the goals and objectives and challenges the executive leadership with the task of developing their action plans to support these goals on a yearly basis. The HL7 Board of Directors approved the current goals and objectives on September 17, 2019.

It can occasionally be difficult to see how these goals and objectives are being fulfilled, as they tend to be strategic and abstract. I'd like to highlight just a few of the changes that have occurred over the last few years, which are tied to the HL7 International Strategic Plan.

HL7 International Strategic Plan

VISION

A world in which everyone can securely access and use the right health data when and where they need it.

MISSION

To provide standards that empower global health data interoperability.

CORE STRATEGIC GOALS

Image	Organizational Vitality	HL7 Standards
Enhance the public image and achieve recognition by stakeholders as the leading SDO for worldwide health data interoperability standards	Secure long-term sustainable revenue to realize the vision and improve customer experiences (internal and external)	Establish HL7 FHIR as the primary standard for global health data interoperability Enhance and maintain quality and accessibility to HL7 standards in current use

Core Strategic Goal: Image

Enhance the public image and achieve recognition by stakeholders as the leading SDO for worldwide health data interoperability standards

Objectives

PRIORITY: IMMEDIATE
must begin objective in next fiscal year

- Expand c-suite image/ perception of HL7 from standards to solving problems and improving the bottom line
- Increase HL7 FHIR usage worldwide

PRIORITY: MIDTERM
may begin objective, if resources permit, in next fiscal year

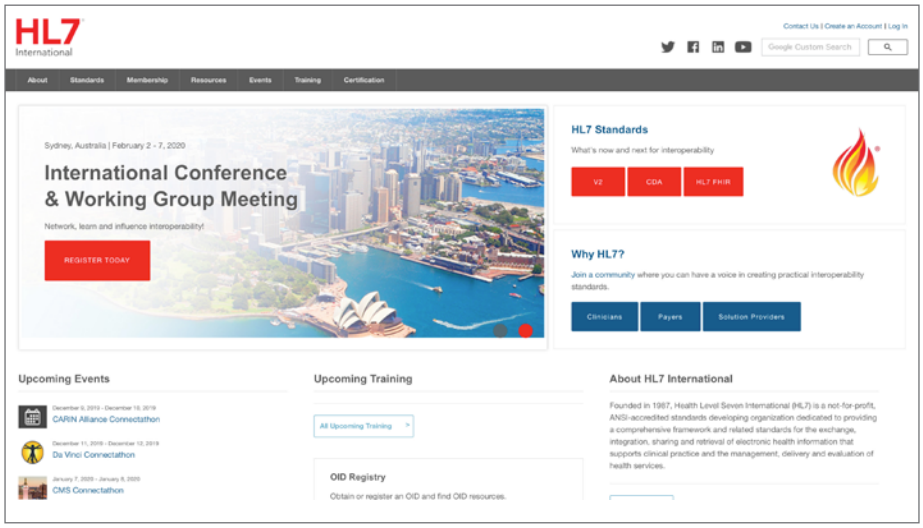
- Improve relevance of HL7 International with key target audiences globablly and establish/strengthen relationships with key stakeholders

PRIORITY: LATER
Begin objective in subsequent fiscal year

- Enhance value of standards to target audiences globally

Image

Sometimes change can seem small. Take, for example, the new HL7 logo announced at HIMSS in 2019. The old logo was changed to one which both supports product family designations (FHIR, CDA, and HL7 V2.x) and enables easy localization by HL7 affiliates.



Other times the changes are greater, such as those made to the HL7 website. Not only was the website refreshed, new content that reaches out to those not in our community was added. There are easy links to some of our most used standards, as well links which speak to stakeholders such as clinicians, payers and solution providers.

Did you have the opportunity to hear from the big technology players at this year's plenary meeting in Atlanta? When was the last time you heard speakers from Amazon, Google and Microsoft speak at an HL7 plenary? Of course, HL7 Fast Healthcare Interoperability Resources (FHIR®) has brought them to the table, with its ability to open up systems and make clinical information flow. As HL7's newest standard, FHIR is not only recognized by many, but is also changing the healthcare industry.

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HL7 International Strategic Plan

Core Strategic Goal: Organizational Vitality

Secure long-term sustainable revenue to realize the vision and improve customer experiences (internal and external)

Objectives

PRIORITY: IMMEDIATE
must begin objective in next fiscal year

- Protect existing revenue sources
- Increase the net capacity of staff and volunteer resources to meet growing demands such as implementer support

PRIORITY: MIDTERM
may begin objective, if resources permit, in next fiscal year

- Increase sustainable, profitable revenue streams from existing and new sources such as implementers

PRIORITY: LATER
Begin objective in subsequent fiscal year

- Develop and implement a profitable business model

Organizational Vitality

Seven years ago, I was asked if I would be willing to assume the role of treasurer on the HL7 board. It was a challenging time for HL7 as the IP was free, but the organizational membership took a plunge.

Over the course of the intervening years, many attempts were made to encourage membership and increase revenue. Not all attempts were successful, but the leadership kept trying.

HL7 FHIR DevDays

HL7 FHIR DevDays is one of the success stories. It is an educational event unlike any other that HL7 has undertaken.

We partnered with Firely to bring their program format to the US in 2018. The first event was a success, but more importantly we learned valuable lessons. So much so, that the 2019 event attracted 511 attendees and 69 speakers, with an excellent venue and program at the Microsoft campus. It also does not hurt that it generated more revenue for HL7 than any event in our history.

HL7 FHIR Accelerator Program

The HL7 FHIR Accelerator Program can be traced back to the launch of the Argonaut Project in 2014. As a private sector initiative, this project needed HL7 to provide some services to support bringing their community together and enabling them to focus on their needs. It didn't take long before more communities were coming to the table.

The HL7 FHIR Accelerator program has helped those on the outside find their way to HL7 International to work on their FHIR implementation guides.

These communities represent both an opportunity and a challenge for HL7. As more and more groups work to create the implementation guides, we are challenged to create new and improved processes and procedures to ensure quality and consistency across our standards portfolio. Under the leadership of the CEO and CTO, and with the support of the Technical Steering Committee (TSC), a number of improvements have been made or are being worked on (see the CTO Tooling Update article on pages 12-13 for more information).

The affiliated FHIR Accelerators

Core Strategic Goal: HL7 Standards

Establish Hl7 FHIR as the primary standard for global health data interoperability

Enhance and maintain quality and accessibility to HL7 standards in current use

Objectives

PRIORITY: IMMEDIATE
must begin objective in next fiscal year

- Implement strategic lifecycle tooling plan for standards

PRIORITY: MIDTERM
may begin objective, if resources permit, in next fiscal year

- Demonstrate the value of HL7 FHIR in enabling interoperability
- Ensure resources are most effectively prioritized
- Increase efficiency and effectiveness of standards update process
- Improve accessibility to standards

HL7 Standards Development

This brings us to the last goal category: HL7 standards. Wayne Kubick, HL7 CTO, and Austin Kreisler, Chair of the TSC, have worked together to streamline the HL7 processes. Some of the changes are as follows:

Confluence

A significant move from the wiki to Confluence has been undertaken. The tooling enables easier editing of minutes and the establishment of workflows, which will transform the project approval process. We all have benefited from this upgrade.

UTG – Unified Terminology Governance

This new process replaces the current harmonization process for the management of HL7 vocabularies, concept domains and value sets. By providing an asynchronous and open consensus-based solution, the goal is to minimize ongoing support requirements and leverage a single solution for all of HL7's product families.

FHIR Jira Ballot

The move from GForge Trackers to a new JIRA-based ballot process is in progress. The current plan calls for JIRA to be used for the FHIR ballot after the Sydney International Work Group Meeting. Other standards will follow, once the FHIR ballot process is stable and working.

Product Management Groups

The three management groups strive to reach HL7s goal of providing high quality standards in an efficient and effective manner. They ensure that HL7 has the best standards available for implementers across the globe.

- **FHIR MG** - The FHIR Management Group (FMG) has been in operation for a number of years and was put in place to provide day-to-day oversight of FHIR-related work group activities, including performing quality analysis, monitoring scope and consistency with FHIR principles, and aiding in the resolution of FHIR-related intra and inter-work group issues. It's worked so well that the TSC asked the Product Line Architecture project to look at how to extend the concept to the Clinical Document Architecture (CDA) and HL7 Version 2 (V2) product lines.
- **CDA MG** – The Clinical Document Architecture Management Group (CDA-MG) provides day-to-day oversight of the processes related to CDA products throughout their lifecycle. This includes the following: ensuring CDA product quality; monitoring scope and consistency with the Standards Governance Board (SGB) principles; and aiding in the resolution of CDA related intra and inter-work group issues.
- **V2 MG** – The Version 2 Management Group provides day-to-day oversight of the processes related to V2 products throughout their lifecycle. This includes the following: ensuring Version 2 product quality; monitoring scope and consistency with the Standards Governance Board (SGB) principles; and aiding in the resolution of Version 2 related intra and inter-work group issues.

Continued on page 34

Continued from page 33

HL7 International Strategic Plan

Making It Happen…

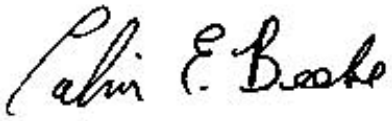
Away from the technical meetings on standards and work on the processes, HL7 CEO Charles Jaffe, MD, PhD has undertaken the herculean task of reaching out and building a network of contacts both nationally and internationally with leaders in health, IT industries and government agencies. With a relentless drive to support both HL7 and the work of FHIR, he has found opportunities and sources of funds which have enabled many of the projects underway at HL7. One such source of funding is the ONC grants.

Summary

The strategic goals and objectives represent the changes we attempt to make each year at HL7 to positively impact the organization, its members, staff and others who engage with us. The changes I've shared only represent a small set of the work underway at HL7 International. Some changes can be difficult, others can take multiple years, but all of them are moving us forward. All members who take the time to volunteer, vote on a ballot or participate in a work group calls are contributing in part to these goals.

Because, without your time and effort we could not reach them. For that reason, I want to thank you, the members of HL7 International, along with all the HL7 staff and leadership who make HL7 International what it is.

Thank You



Calvin E. Beebe

ONC GRANT

This year's ONC grant was entitled: Maturing C-CDA and FHIR Implementations in 2019. It provided funding for a number of critical enhancements and supported HL7 International.

The following are brief descriptions of each project created under the Maturing C-CDA and FHIR Implementation 2019 ONC grant. Project deliverables are also linked with each project.

1. Project: Flat FHIR (Bulk Data & Push)
2. Project: Unified HL7 Terminology Governance (UTG) Pilot
3. Project: C-CDA Implementation-A-Thons
4. Project: Improve FHIR JIRA Ballot Process & Tooling
5. Project: FHIR Implementation Guide Publication Coordinator
6. Project: FHIR Connectathon Administrator
7. Project: Compare IPS & Argonaut US Core IGs - Complete
8. Project: FHIR Product Support
9. Project: US Core Ballot Reconciliation Support - Complete
10. Project: FHIR Education Fact Sheets
11. Project: C-CDA Web Publication Tooling
12. Project: C-CDA Companion Guide Update
13. Project: C-CDA Release 2.2 – Phase 1
14. Project: FHIR IG Workshop
15. Project: FHIR Bulk Data Meeting
16. Project: Finish the IG Publisher Templates Framework
17. Project: Ballot the IPS FHIR Implementation Guide
18. Project: FHIR Terminology Server Support
19. Project: US Core Updates for Provenance - Complete
20. Project: eLTSS Reference Implementation

You can also read the PMO report by Dave Hamill to learn more about the ONC grant on page 10.

Benefactors

accenture
Allscripts
AMA American Medical Association
CDC Centers for Disease Control and Prevention
Cerner
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Therap Services LLC
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University of Arkansas Medical Sciences
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Vynyl

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American Clinical Laboratory Association
American College of Obstetricians and Gynecologists
American College of Physicians
American Dental Association
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ASIP SANTE
Association of Public Health Laboratories
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DGS, Commonwealth of Virginia
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Duke Clinical & Translational Science Institute
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European Medicines Agency
Florida Department of Health
Food and Drug Administration
Georgia Department of Public Health
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Health Sciences South Carolina
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HSE - Health Service Executive
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Idaho Health Data Exchange
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Jopari Solutions
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National Association of Dental Plans
National Cancer Institute
National Centre for Healthcare Information Systems
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NCQA
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SMART Health IT
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State of New Hampshire
Tennessee Department of Health
The Joint Commission
The Sequoia Project
U.S. Department of Defense, Military Health System
U.S. Department of Veterans Affairs
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UCSF Center for Digital Health Innovation
UHIN (Utah Health Information Network)
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Organizational Members (continued)

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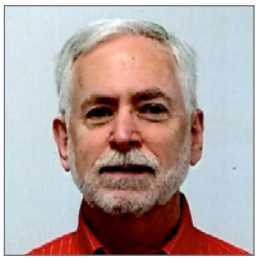

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February 2-3, 2020
FHIR Connectathon
February 4-7, 2020
Working Group Meeting

ICC Sydney

Sydney, Australia

May 16-22, 2020
Working Group Meeting

Hyatt Regency San Antonio on The Riverwalk

San Antonio, TX

September 18-25, 2020
Working Group Meeting

Baltimore Renaissance Harborplace

Baltimore, Maryland

May 22-28, 2021
Working Group Meeting

Hilton Lake Las Vegas Resort & Spa

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January 16-22, 2021
Working Group Meeting

Hilton New Orleans Riverside

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June 16-18, 2020
HL7 FHIR DevDays

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