Abstract

HL7 FHIR (Fast Healthcare Interoperability Resources) is now 10 years old. To date, it has been implemented in over 3000 sites worldwide. FHIR supports the broad continuum including patient care, population health, evolving payment models and clinical research. In March of last year, both the Center for Medicare and Medicaid Services (CMS) and the Office of the National Coordinated for Health IT (ONC) released two complementary Notices of Proposed Rulemaking (NPRM) to improve the Interoperability of health data. This panel will explore the emergence of FHIR implementation across the broad continuum of biomedical research, clinical care, patient empowerment, value-based payment systems, and population health.

Introduction

This panel will provide the attendees with the background, the rapidly evolving processes, the technical elements, and the innovative approaches to solving the complex problems of interoperable data exchange. In the last decade, FHIR has been embraced by developers of technology solutions, by government regulatory bodies, by academic institutions, and by Public Health agencies worldwide. The adoption of FHIR-based solutions has been accelerated by coalescence around a single API structure. The process has been embraced by both public- and private-sector initiatives and by reliance upon a highly consistent maturity model and a reliable strategic roadmap.

Within the scope of this panel, we will highlight the innovative approaches to these strategic goals and articulate the framework for their solution. Unprecedented collaboration by private-sector companies and by broad based coalitions have largely refined the business model for application development. Moreover, innovative government-based initiatives have fostered the sharing of genomic data for both applied and basic research.

Perhaps the most far-reaching acceleration of FHIR adoption was predicated on the publication of the notices of proposed rule making by both CMS and ONC. For the first time, this established HL7 FHIR as the platform by which biomedical information will be exchanged.

Defining the challenges

For standards development organizations and the supporting programs that provide implementation solutions, there are major hurdles for enhancing interoperability while respecting the enormous investment in legacy systems. During the debate, in both academia and industry, some solutions have accelerated enhancements to the integration of basic and clinical science into the challenges of patient care. At the same time, public health agencies, both local and national, have benefited from innovative solutions for collecting data and reporting critical healthcare emergencies and population-based recommendations for preventative care. This is apparent in the fields of cancer care and metabolic diseases. Even more prominent is the integration of genetic and genomic data into diagnosis and treatment. In addition, government agencies are requiring standards that support the complexity of our reimbursement systems. Moreover, as our fiscal model for healthcare financing shifts from payment for services to payment for quality, additional standards are required to accelerate delivery and to support analytics.

SMART on FHIR

Currently, an ONC-funded project at Boston Children’s Hospital emerged to leverage the commitment to the API model of data exchange and reuse. In close partnership with HL7, SMART on FHIR emerged as a critical solution to achieving inter-system interoperability. The support for OpenAuth 2 and Secure ID, two ISO standards that enable a
consistent trust framework for internet-based authentication and financial transactions and provide a much-needed layer to the emerging FHIR stack. Most critically, the partnership enabled a fabric for both cross-system and cross-EHR platform data exchange. SMART on FHIR grew on two fronts. Not only did it become a critical enabler of future interoperability programs, such as the Argonaut Project, but it also fostered the development of an app store for production level FHIR-based applications and solutions.

The Technical Growth of HL7 FHIR

The success of the Argonaut Project has provided a clearly defined catalog of FHIR-based profiles and implementation guides that support the objectives defined in the US-centric Meaningful Use requirements. Because of the technical rigor and consistency of the process, the Argonaut framework has been adopted by government outside of the US, with particular attention on the FHIR-compliant APIs. To the significant impact of the Argonaut Project profiles on intersystem interoperability, the private sector collaboration has been further enhanced by the adoption of these implementation guides by the Sequoia Project Carequality initiative, built upon a national health information network and trust framework, as well as the CommonWell Health Alliance program for patient matching. This commitment to the FHIR-enabled platform has fostered far reaching enhancement of patient matching and the concomitant reduction in matching errors and the attendant costs.

During the last two years, the broad landscape of compensation for care has evolved from a fee-for-services model to one in which compensation is driven by clinical outcomes. This value-based care scenario has been embraced by the Centers for Medicare and Medicaid Services (CMS) as well as by the private-sector payers. This had lead to the creation of the Da Vinci Project, in which this community of payers collaborate in a pre-competitive environment to leverage FHIR for delivering clinical data for a broad range of use cases that foster value-based care. In addition to the payer community, Da Vinci includes EHR vendors, academic health systems, and application developers. The vision of the Da Vinci consortium embraces a broad range of innovative approaches to streamlined payment systems including real-time prior authorization.

Lastly, ONC has funded HL7 to develop a critical addition to the FHIR platform for collecting bulk data for integration and analytics. Now referred to as Bulk Data on FHIR, the uses for this data extend far beyond payment systems, including the CMS introduction of Blue Button 2.0, which enables Medicare recipients to download their clinical data. Other Federal agencies, including the Centers for Disease Control & Prevention (CDC) envision the use of this specification for bio-surveillance, as well as morbidity and mortality reporting.

Nearly a year ago, HL7 announced the publication of Release 4 of FHIR. Now an ANSI standard, R4 is backward compatible, more stable, and capable of incorporating additional data and information sources. At the same time, HL7 continues of the development of R5, expected to be published in the summer of 2020. R5 will provide more normative resources, more seamless integration of HL7 v2 and CDA specifications, as well as multi-language support and federated servers.

Growing the Community of Implementers

Google Brain and Verily leverage FHIR for a host of development projects, not limited to analytics. In conjunction with several leading EHR vendors, the clinical decision support landscape if being re-imagined with the emergence of CDS Hooks. This technology enables a broad range of clinical decision support data sources to be integrated into the point of care without leaving the EHR environment. Most critically, Apple announced that it had integrated the FHIR platform into iOS 11.3, in collaboration with now more than 350 health systems and providers, to potentially transform the means by which patient access their data from across multiple sources and systems.

Lastly, the FHIR Accelerator Program has been created to streamline the on-ramping of new FHIR implementation communities. When introduced early this year the program was comprised of already established implementation initiatives, including the Argonaut Project, the Da Vinci Project and the CARIN Alliance. Throughout the year, additional communities including, Gravity, supporting Social Determinants of Healthcare, the Consortium for Agile Genomics, as well as Codex, the diverse oncology consortium, have all implemented FHIR to advance care delivery.
Conclusions
At the conclusion of this interactive panel, participants will be able to 1) articulate the value model of the HL7 FHIR platform for patient care, applied research, population health, or patient engagement; 2) formulate technical, business, and workflow strategies that enable the integration of open APIs (Application Programing Interfaces) and HL7 FHIR resources to enhance interoperability initiatives and data integration; 3) exploit the ease of FHIR implementation to enhance technical strategies, reduce development time, decrease project implementation costs.

2. SMART on FHIR. http://smarthealthit.org/smart-on-fhir/