

SESSION INFORMATION

Submission ID#: 551955016

Topic Category: Health Info Exchange, Interop, Data, & Standards

Sub-Topic: Open source data approaches (FHIR)

Content Stream: Technology

Format/Level: 60 Minute Lecture/Intermediate

Audience Professional Roles: CIO/CTO/CTIO/Senior IT / Clinical Informaticists / IT Professional

Global Audience: Yes

Region/Country Specific: No

If so, list region/country:

CONTENT DETAILS

Session Title: FHIR Interoperability: Point of Care Healthcare Apps in the Real World

Submitted By: Geisinger Health

Brief Description: Health information interoperability has historically been a daunting issue for healthcare systems with differing Electronic Medical Records (EMR's) or those looking to export or import technical solutions developed on other EMR's. Fast Healthcare Interoperability Resources or FHIR are an open-source solution that's been increasingly adopted across EMRs and healthcare systems with the recent example of Apple including a personal health record in iOS, allowing patients to access their own data. While data sharing is becoming more feasible, there is practically little in the way of EMR-integrated, point of care healthcare applications (apps) utilizing FHIR that could be broadly scaled across both healthcare systems and EMR's. This session will describe Geisinger's evolving approach to using FHIR resources to extend homegrown apps beyond our current EPIC EMR system, allowing us to share our innovation more broadly than ever before.

Learning Objectives:

- Describe FHIR and its role in interoperability
- Identify the potential challenges presented in developing apps using FHIR
- Explain several Geisinger use cases utilizing FHIR
- Describe potential approaches for successful utilization of FHIR

Describe the TOPIC/ISSUE that will be presented and how it was identified.

FHIR is an HL7, open, standards-based platform designed to enable sharing data with and/or connecting apps to multiple EMR's. FHIR provides "resources" or detailed sets of Application Programming Interfaces (API's), references, and "core" data models. If an EMR supports FHIR resources, then data or apps using FHIR are essentially EMR-agnostic. FHIR follows an 80-20 principle—covering 80% of common healthcare data resources (e.g., medications, problem list diagnoses, etc.) while allowing for 20% customization—which makes it an adaptable and flexible solution. Additionally, FHIR is often paired with authentication protocols such as oAuth2, SMART, etc. to ensure security. Use of FHIR in EMR-integrated, point of care healthcare apps has been limited and much of the challenges and obstacles that systems and software engineers will face are not well documented. Currently, Geisinger has FHIR-enabled several of its healthcare apps and through case studies has identified some of the challenges and considerations systems will face when using FHIR-based apps.

Please describe the APPROACH(ES) used to address the topic/issue.

Geisinger first utilized FHIR in 2015, FHIR-enabling a Rheumatology app and launching it in multiple EMR's [Geisinger sets SMART apps on FHIR. (2017, January 24). Retrieved July 10, 2018, from <https://www.digitalhealth.net/2015/04/geisinger-sets-smart-apps-on-fhir/>]. This was one of the first, if not the first, existing point of care EMR-integrated apps to be FHIR-enabled in other EMRs. We learned a lot in converting the apps API's from standard web services to FHIR services, but while the app consumed data from the EMR using FHIR ("pull"), it could only return data to Cerner EMR using FHIR ("push"). Additionally, the app was highly customized to Geisinger's Rheumatology department and we were limited by the relatively few EMR-supported FHIR resources. Subsequently, in 2018 we have FHIR-enabled additional apps with more robust interactions with both patients and providers. We completed FHIR-enabling of a Cancer family caregiver app that coordinates care between patients and their caregivers and providers, utilizing a more current version of FHIR (STU3) and are working on a medication adherence and reconciliation app. While the caregiver app is in specialty care, it was designed to be broadly disseminatable and the medication adherence app is designed for both primary and specialty

care. Both apps use a wide array of FHIR resources that are now available today through larger EMR's (e.g., AthenaHealth, Cerner, EPIC, etc.).

Please describe the CHALLENGES/BARRIERS faced.

The primary challenges to using FHIR resources in point of care healthcare apps includes data accuracy and availability, FHIR version compatibility, and software engineering capability. Currently, the FHIR sandbox environments made available by some EMR's and companies like SMART Boston, do not have the realistic and robust data found in EMRs. When working on the Cancer family caregiver app, we ran into issues finding realistic data relating to chemotherapy appointments, radiation oncology, etc. As an example, some fields used for diagnoses were accepting free text values which aren't found in actual EMRs and visit data specific to Oncology was missing. Populating realistic data in these sandbox environments isn't an option for systems who must instead rely upon the vendor to supply the data. Beyond this, FHIR resources may accept multiple standard codes such as ICD-10 or SNOMED and individual FHIR implementations may choose to accept either or both. Another challenge is that FHIR now has multiple versions as recent iterations are enhanced based upon feedback of older versions. For example, at the time of this submission Cerner supports DSTU2 while EPIC's latest release will support STU3 and DSTU2. This can make choosing a version difficult and often requires weighing the cost/benefits of choosing one over another. Finally, while FHIR has eliminated the need for software engineers to be well versed in multiple EMRs and their corresponding layers of complexity, it does require software engineers that are not only good at development, but also knowledgeable in how EMRs and healthcare systems operate. Absent that knowledge, even a good software engineer wouldn't know that their app shouldn't accept free text diagnoses values or what realistic data looks like to say nothing of how workflow and utilization could determine how the app is accessed and utilized within a system.

Please describe the CONCLUSION/OUTCOMES ACHIEVED.

The solutions to the challenges and barriers we faced are multivariate and require access to a healthcare system and its EMR—developing apps without this access will be difficult due to the data issues we noted above. Where possible we compared data returned in the FHIR resources to data returned in standard EMR web services to validate both how we should expect data to appear in the app and its accuracy (i.e., is this the correct value or a misnomer?). We were able to consider options to accept multiple values to handle scenarios where a system implements FHIR using one value over another. It is not possible to predict what future iterations of FHIR will look like, but we were able to ascertain that EMRs will be using STU3 in 2019 and used that knowledge to dictate the version we used in FHIR-enabling our apps. Finally, we were fortunate to have software engineers that have been building EMR-integrated apps for the past decade and were familiar with what accurate, realistic data should look like.

Please describe the RECOMMENDATION(S) you would offer.

We would recommend that systems be prepared to use their existing EMRs as sources of truth when using FHIR resources and not rely solely on FHIR sandbox environments that may be provided. We would additionally recommend that EMRs provide more robust, realistic, and well-supported sandbox environments to allow companies and software engineers outside of healthcare to develop apps that will work in real-world scenarios. Systems should come together to call for universal adoption of FHIR standards with agreed upon release dates of new versions that allow all parties to prepare in advance of these releases so that FHIR implementations are as closely related as possible. We are only as interoperable as the versions and their associated implementations are.

SPEAKER DETAILS

Speaker Role: Primary Speaker

Name: Jon Billet

Title/Org/City/State/Country: Director of Software Engineering and Enterprise Software Architect, Geisinger Health System, Danville, PA, USA

Worksite: Hospital, Multi-Hosp Sys, Integrated Delivery Sys

Time in Field: Greater than 15 years

Speaker at HIMSS18: No

If so, Venue:

Speaker at Past HIMSS Conferences: 1

Bio: Jon Billet serves as Director of Software Engineering and Enterprise Software Architect at Geisinger. In his roles, he is responsible for all custom software activities including team direction and strategy that support project

and organizational initiatives. Jon serves as the internal and external key contact for development and advisory related activities the Software Engineering team performs. Prior, Jon worked as a federal government contractor before entering healthcare. Duties included architecting software for the Department of Defense, the State Department, the GSA, the IRS, and other government agencies. Jon brings over 15 years of experience in the software engineering arena. Jon Billet serves as Director of Software Engineering and Enterprise Software Architect at Geisinger. In his roles, he is responsible for all custom software activities including team direction and strategy that support project and organizational initiatives. Jon serves as the internal and external key contact for development and advisory related activities the Software Engineering team performs. Prior, Jon worked as a federal government contractor before entering healthcare. Duties included architecting software for the Department of Defense, the State Department, the GSA, the IRS, and other government agencies. Jon brings over 15 years of experience in the software engineering arena.

Past Speaking Experience: Lecturer at UPenn Innovation Summit to CEOs/CIOs, co-presenter at HIMSS 2015 Innovation Showcase, extensive experience speaking to CEOs and Venture Capitalists of large healthcare software companies on the complexities of software and app development that interact with EMRs, and presenter at Geisinger Innovation Conferences focused on FHIR efforts.

Will provide up to two pieces of content (i.e., a blog post, pod cast, twitter chat, or other type of content) leading up to conference that will promote your session to a broader audience: Yes

Will comply with the HIMSS19 deadline dates to be published upon acceptance: Yes

Speaker Role: Co-Speaker 1

Name: Ryan Van Loan

Title/Org/City/State/Country: Manager Research and Development, Geisinger Health, Danville, PA, USA

Worksite: Hospital, Multi-Hosp Sys, Integrated Delivery Sys

Time in Field: 6 - 10 years

Speaker at HIMSS18: No

If so, Venue:

Speaker at Past HIMSS Conferences: 0

Bio: Ryan Van Loan is a Research Development Manager for the Center for Clinical Innovation (CCI). As a Research Development Manager, Ryan focuses on implementing innovation and research throughout Geisinger by managing the administrative, operational, and technical facets of his projects in the CCI portfolio which have ranged from epidemiological research to clinician-facing population health and FHIR-enabled point of care applications to patient-facing 365-days-a-year, mobile applications. Ryan sought out a career in the non-profit healthcare space after serving six years in the United States Army National Guard as a Non-Commissioned Officer (Sergeant, E-5) with a combat deployment to Afghanistan and his focus has been on finding roles that allow him to leverage his skillset to improve patient care, health, and outcomes through innovation and research here at Geisinger. His work has spanned a broad spectrum with nearly nine years' experience in leading teams focused on solving patients' and clinicians' needs through health information technology and research and application development. In addition to his project-specific work, Ryan has experience in funding and administration: managing multi-million dollar portfolios; commercial and stakeholder relations: presenting applications to the C-suite of U.S. Market at Merck Pharmaceuticals, xG Health Solutions, Orion Health and many others; and dissemination: as a lead author on scientific abstracts presented at national conferences with publications in the Journal of Managed Care and Specialty Pharmacy, American Journal of Managed Care, and Journal of Patient-Centered Research and Reviews. Finally, Ryan has been a repeat guest lecturer at Pennsylvania State University's Master of Health Administration Graduate Program.

Past Speaking Experience: Ryan has been a guest lecturer at Pennsylvania State University's Master of Health Administration Graduate Program. He has presented posters on abstracts at the annual Academy of Managed Care Pharmacy, Health Care Systems Research Network, and the Bucknell Geisinger Research Initiative conferences. In addition to lectures and conferences, Ryan has presented projects and software applications before the Executive Board of large pharmaceutical, technical, health care software, and venture capital corporations.