Missing Link
Hand Off Document

Project Summary

Team Missing Link has produced a FHIR standard implementation guide (proof of concept) for the existing CDA (Clinical Document Architecture) version of the Electronic Initial Public Health Case Report (eICR). The final implementation guide and profiles can be found at Simplifier.net, at the below links. You will need to create an account to access them. Copies are also include as part of the project files on the Team GitHub Repository and the zip file provided to the mentors. Further instructions on Simplifer.net can be found below.

- https://simplifier.net/ui/ig/GATECHCS6440eICRImplementationGuideHL7toFHIRConversionProofofCon
- https://simplifier.net/GATECHCS6440eICRImpl

Software

The profiles were authored using the official FHIR profile authoring tool called FORGE. All work was done in version 13.2 of Forge. A copy of the one click install file is included with the project files. The most recent version of the FORGE software can be downloaded from simplifier.net. However, since it was released in the past week we have not tested it with our profiles. We recommend view the profiles via simplifer.net instead of Forge to reduce compability / install issues.

Using FORGE, the implementation guide profiles can be imported from simplifier.net and modified as needed. When done, it can be published back to simplifier.net. Validating the profiles as you work on them can also be performed within FORGE, verifying references, value sets, resources, etc. are correct.

The implementation guide was created using the beta version of simplifier.net. Our mentors, John Loonsk and Laura Conn have been granted admin access to the IG, so they should be able to provide access to others. At this time we are working off of a free subscription that the Simplifer.net people granted us until the end of 2016 to act as beta testers. If the EICR team wishes to go down this path, our contact is Ardon Toonstra a.toonstra@furore.com. The missing link team will be more than glad to help communicate any need to transfer the project and the IG if needed. Also a pdf copy and markdown copy have been provided as part of the project files.

Assessment/Errata

With the team's introductory and limited knowledge of healthcare data needs we set out to find resources and tools to help in the cross referencing of HL7 CDA standards to FHIR standards. Simplifier.net and FORGE propelled our project in the right direction. The tool enabled us to map CDA resources to FHIR resources in an efficient manner, as well as publishing our final guide and making it accessible to future teams.

Our starting point was the work that had been done by the a Consulting GroupLantan on mapping basic CDA templates to FHIR resources and the work done to convert the Data Access Framework to FHIR by HL7 International. More infomation on CDA on Fhir can be found at http://hl7.org/fhir/current/ccda/ and the DAF work can be found at: http://wiki.siframework.org/Data+Access+Framework+Homepage

The team, however, sometimes faced difficulty in finding valid FHIR resources that directly mapped to a specific CDA resource. In these situations (Social History Section, for example) we took liberties in extending existing FHIR profiles with added resources and/or extensions in an effort to completely represent the existing CDA templates. See Figure 1 below for relevant mappings of CDA to FHIR resources.

Within the mapped resources there are references to standards called the Data Access Framework, or DAF, standards. These standards provide consistent data use necessary to access and extract data from within an organization's health IT system. There are 2 DAF resources used within the implementation guide, and although published openly, they are not available to the FORGE/Simplifier.net application, for reasons unknown. In these instances you will see an error flag in FORGE stating that the referenced resource cannot be found.

Figure 1

C-CDA	FHIR	NOTES
Encounters Section Encounter Activity Encounter Diagnosis Problem Observation	Encounter Activity Encounter Activity Location Encounter Diagnosis Observation	
History Of Present Illness	History Of Present Illness	
Immunizations Section	Immunization	DAF-ImmunizationList

Medications Administered Section Medication Activity Medication Information	Medications Administered Medication Statement Medication Activity	
Problem Section Problem Concern Act Problem Observation	Problem Concern Act Health Status Observation Observation	
Reason for Visit Section		LOINC
Results Section Result Organizer Result Observation	DAF-ResultObs	U.S. Data Access Framework (DAF) Results Profile
Social History Section Social History Observation	Social History Observation Pregnancy Observation Smoking Status Observation Tobacco Use Observation Related Person Cultural And Religious Observation Characteristics of Home Environment	
US Realm Header US Realm Address US Realm Date and Time US Realm Person Name	US Realm Header	C-CDA on FHIR US Realm Header

What's Next?

The first thing we suggest for future development is working with standardizing group like the Lantana Consulting Group, and the DAF working group, to determine which resources should be standardized outside of the eICR. A big part of FHIR is the ability for resources to be reused. So the more sections of the eICR that are standardised, the easier it will be to get the health community to adapt CDA on FHIR. In addition the resources used from the various groups all need to be on the same FHIR version so coordination will need to

The second item we suggest is validation of the profiles with actual health care data on a FHIR server and compare the outputs with a CDA eICR. This will be a large undertaking as someone will have to take existing eICR add the data to the fhir server and then create an eICR and see how well the composition resource covers the goals of the original the cda document.

Conclusion

At the beginning of the semester we knew very little about Health IT. With the luck of the draw, we formed a great team. Together, we have learned a lot about FHIR standards and enjoyed getting to know each other along the way. We hope that our efforts will lay the groundwork that will make the eICR on FHIR successful.