The accelerating importance of HL7 FHIR for the U.S. Healthcare Industry

HL7 FHIR (Fast Healthcare Interoperability Resources) is a long overdue modernization of healthcare data interoperability. While currently most healthcare interoperability is still transacted in a 30-year-old EDI flat-file standard HL7 v 2.x that allows a lot of variability in the payload, over half of healthcare providers polled by IDC[1] expect the HL7 FHIR standard will have an above-average to significant impact on the industry – and this market sentiment is still too conservative.

HL7 v2 is certainly the workhorse of the healthcare industry on the provider side right now with some larger organizations transacting hundreds of millions of transactions every day through interface engines, chief among them Infor's Cloverleaf with thousands of installations in healthcare systems around the world. This has proven to be a very safe, reliable, and scalable way to ship data from the central Electronic Medical Record System (EMR) to hundreds of applications or vice versa. But the standard has its shortcomings in the modern world of interoperability, which will be addressed by HL7 FHIR:

- HL7 v2 is a broadcast message standard for a given set of data senders and receivers – it is not suitable to build a modern, agile, workflow oriented responsive architecture. HL7 FHIR, on the other hand, is based on JASON components and can be used to persist data in a data store (FHIR Server) and support responsive web services.
- HL7 v2 has a wide variability. While that flexibility makes implementation easy and allows accommodation for institutional preferences, it makes it hard to utilize aggregated data without extensive data cleansing and normalization. HL7 FHIR, on the other hand, has stricter data standards for the payload and is very suitable to persist clinical data without information loss.
- HL7 FHIR allows fine grained access. Modern smart applications for clinical decision support might require very specific data about a patient, for example the BMI. FHIR resources allow exactly this – access to specific data elements exactly when they are needed in near real time. Older document-based standards such as CDA were instrumental in allowing data exchange, but not the granularity level and speed afforded by HL7 FHIR.

While HL7 FHIR is not new – the standard was first announced in May of 2012 – and its promise for modernizing Healthcare is enormous, adoption has been slow. As a matter of fact, the same IDC study reports that a little over a quarter of respondents remain neutral and 17% believe HL7 FHIR won't have an impact on the industry. Knowing Healthcare, this slow adoption is not surprising – after all, technology is not a value in itself, so healthcare providers need to see valid

[1] Mutaz Shegewi, IDC Survey Spotlight What impact will the HL7 FHIR standard have on healthcare?

use cases that provide a compelling reason to invest in new technology. Additionally, it is important to ensure that the existing transactional infrastructure is not disrupted.

Infor and AWS are collaborating to deliver exciting solutions that offer strong value to customers to dip their toes into utilizing FHIR infrastructure while maintaining their current operational infrastructure. Common to all these use cases is that Infor Cloverleaf extracts securely data from the existing infrastructure, transforms it into FHIR, and loads it into the AWS HealthLake where it can be used for data analysis. In addition, Infor CloudSuite (or Lawson v10) customers can also use Clinical Bridge to extract data from operation systems, such as supply chain management or workforce management. By intelligently combining clinical and operational data, strong customer value can be created:

- **Clinical Science:** Predicting Care-Provider workload based on census and acuity of patients. This solution utilizes clinical data as a predictor of care provider workload and leverages this data insight to optimize work schedules.
- **Decision Intelligence:** Predicting supply needs for both consumables and implants based on scheduled procedures, Physician preferences, and acute census by loading bot clinical and operational data parameters into HealthLake for predictive analytics, which are then fed back into contract management and supply chain management to ensure care providers always have critical supplies available, and implants and billed accurately and timely.
- **Clinical Quality:** collect clinical data from multiple collaborating providers within an Accountable Care Organization (ACO); convert all the clinical data from HL7 v2, CDA, csv or databases into FHIR resources, apply data cleansing (EMPI, Terminology); load data into HealthLake to apply analytics, and calculate clinical quality metrics, and then provide near real-time KPI dashboard and reports
- **IOT/Wearables:** Collect data from IoT/wearable devices through an API interface into the HealthLake, where specialized algorithms identify useful data (signal) that is separated from unremarkable data. The useful data is then pushed into the EMR after converting the data from FHIR into HL7 v2 or other formats compatible with legacy EMR systems.
- **SoDH:** Integration of healthcare data with non-traditional data and services important for health outcomes, so called Social Determinants of Health (SoDH), such as nutrition or transportation. Workflows can we orchestrated that combine discharge workflows with Rideshare APIs to organize safe transportation and integrated billing or health appropriate nutritional supplies from grocery stores
- **Burden Reduction / Payer workflows**: Cures Act compliant automated exchange of clinical data between Providers and Payers to reduce workload and time-delays for prior authorization. For this workflow data is converted on the provider side from HL7 v2 to FHIR and on the Payer side from FHIR to X12, the mandatory EDI standard for claims adjudication.

As the aforementioned examples demonstrate, there are many reasons for providers to meet the quadruple aim (Patient and Provider experience, Cost reduction and Clinical outcome improvements) with an investment into FHIR based workflows. Utilizing the expertise and strengths of both Infor and AWS, the value of these investments can be maximized by leveraging existing infrastructure in combination with modern and secure cloud infrastructure and ETL solutions that ensure highly valuable analytics and modern, flexible workflows.