



Seizing the Value of Health Information Exchange Data

An insight paper that details an innovative technology approach to harness value out of the two most common file formats within the Health Information Exchange infrastructure to support growing data needs.

Project Highlights:

- Parse C-CDAs to unlock the valuable clinical data that lives within these files
- Tap into unstructured text information to augment parsed HL7v2 and C-CDA data
- Leverage a Unified Data Model to create meaningful unions between data elements and convey a representative story

The Parsed C-CDA Difference

Simply put, a Consolidated Clinical Document Architecture (C-CDA) document is an electronic document formatted in a standardized way regardless of the electronic health record system that produces it. The undoubted value of the C-CDA is the comprehensive clinical information that lives in these files that can supplement HL7 v2 data. To meet WI DPH's business requirements for developing a COVID-19 solution required a strategy to maximize all data available in WISHIN's Data Mart, not just HL7 v2 data.

During a current-state analysis, it was found that a comprehensive set of C-CDAs was present but being stored as a Blob. Indeed, if a technology solution could parse and normalize the rich C-CDA data and transform it into a discrete and usable format, surely it would enhance WISHIN's ability to meet the immediate and long-term use cases being asked of WISHIN. This is exactly what KPI Ninja did and continues to do in real time to fulfill the HIE's distinct value proposition.

Supplementing Parsed Data

At the most basic level of health care data, codes and value sets serve as the means to communicate clinical concepts. HIEs looking to support participants' growing data needs often struggle given the considerable variability found in the standards and the way the data is collected at the bedside and recorded in the electronic health record.

At the onset of this project, WISHIN and KPI Ninja set out using the guidelines of the Centers for Disease Control and Prevention and the World Health Organization for identifying "COVID-like" cases and other industry standards for COVID-positive cases. Specific codes for COVID-19 symptoms, diagnoses, laboratory tests and associated results were extracted. Despite dealing with parsed HL7 v2 and C-CDA data, fairly quickly WISHIN and KPI Ninja learned that pulling data based solely on these codes was not representing the full story. Not everyone had adopted and was using the COVID-19 codes, especially early on, so there was an immediate need to create a strategy to maximize the Data Mart by other means.

Through detailed analysis of WISHIN's Data Mart, it was discovered that more revealing diagnosis information lived within the problem description but was presented in a text format. A similar situation was occurring within the laboratory data. Not all HL7 v2s and C-CDA data, even parsed, had the relevant LOINC codes. Looking deeper, we found critical information lived within the laboratory test names of the parsed files. With advanced technology and a rigorous data validation process, specific words and phrases were extracted from both the problem description and laboratory test name fields to convey a more accurate and representative story that local authorities could have the most complete clinical data with which to respond to and manage the COVID-19 pandemic.

Example of Merged Laboratory Data for the COVID-19 Positive Roster

HL7 V2 CODES	C-CDA CODES	UNSTRUCTURED TEXT
94364-7	41000-1	COVID19-PCR
94420-7	94318-3	SARS-CoV-2 IgG Index
94145-0	94487-6	Covid19, sars-cov-2
94532-9	94146-8	LAB115
93414-1	93414-1	Coronavirus (seasonal)

Valid-Phenomena Representation

In general, when you bring together various data sources and formats as HIEs do every day, there is inherent complexity in harmonizing the data to represent phenomena in an accurate way. This complexity is further magnified when you bring in unstructured data, as KPI Ninja did with the text data from the parsed files.

For this advanced work, KPI Ninja leveraged its Unified Data Model, a proprietary data information model that maximizes the overarching data architecture of technology, data types and attributes to meet strategic objectives. As one of the most comprehensive, interoperable platforms on the market serving stakeholders throughout the ecosystem, KPI Ninja time and again has proven the extensibility and value of their Unified Data Model.

“Pandemic or not, health care organizations need real-time, comprehensive information to drive positive health outcomes,” said Steve Rottmann, Chief Operating Officer at WISHIN. “The combination of our strong client relationships and comprehensive data set with KPI Ninja’s advanced technologies help assure that customers feel the value of the health information exchange infrastructure. We do the heavy lifting from a technical end so that our participants can use clinical insights to decrease inefficiencies while upholding the highest quality of care.”

Key Takeaways for the HIE Industry

- HIEs are building on their expertise in moving, staging and storing clinical data to deliver actionable population-health information and advance knowledge. This means they need new kinds of technology and technical partners.
- The Strategic Health Information Exchange Collaborative's 2019 [Annual Survey](#) estimates that upward of 524 million CCDs are received by our nation's HIEs each year. We find that some HIEs are storing and exchanging these files exactly as received in a XML format. The rich clinical information that lives within these files is not always being maximized by HIEs to support participant use cases.
- It has been estimated that nearly 80 percent of medical data is unstructured. With numbers like that, it is essential for HIEs to find technologies that can parse HL7 v2 and C-CDAs *and* reduce the amount of work needed to tap into this large volume of unstructured data.
- A proven Unified Data Model can act as a foundation upon which HIEs deliver value across multiple stakeholder groups, allowing HIEs to build a high-performing, interoperable infrastructure cost-effectively to meet the diverse needs.

Conclusion

As healthcare scales technology solutions and health data ecosystems become more complex, HIEs need innovative technologies to be at the vanguard of these transformations to position for long-term sustainability. While this report details an innovative technology approach to meet these needs, it is intended to serve as a demonstration piece to convey the tremendous value HIEs have within the health care ecosystem to be *the solution* to enabling population health when technical capabilities are aligned to the needs.

About WISHIN

[WISHIN's mission](#) to promote and improve the health of individuals and communities in Wisconsin through the development of information-sharing services that facilitate electronic delivery of the right health information at the right place and right time, to the right individuals. Statewide electronic HIE offers the promise of timely, relevant information that can lead to better clinical decisions, less duplication, more effective transitions of care, and reduced administrative costs. It all adds up to better information and better outcomes.

About KPI Ninja

[KPI Ninja](#) is a healthcare analytics company that supports healthcare organizations to meet their population health and value-based initiatives. Using our signature mix of innovative technology solutions and services, we work shoulder-to-shoulder with clients to accelerate goal achievement. In harmony with our data-centered ethos, we truly believe that our success is strongly correlated with yours. We are differentiated by our comprehensive capabilities that transcend value-based programs and data sources to support stakeholders' use of data to improve outcomes. Our platform is aligned to initiatives led by CMS, ONC, NCQA, including holding [NCQA's eCQM Certification, Measure Certification for HEDIS® Health Plan 2020, PCMH and PCSP Prevalidation](#); demonstrating our commitment to providing you a trusted brand.