

Pulse

Apelon Newsletter

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Dear Jennifer,

In this edition of Pulse we consider open source tools used in healthcare terminology maintenance and deployment. Apelon's professional services work has taught us that terminology and interoperability problems are rarely due to something as simple as a want of appropriate tools. These challenges usually include significant elements of process and content. But tools are important. Our work has exposed us to probably everything that is available, and the good news is: there is some very interesting stuff out there. But there are two key problems: support and practicality. In the first article below, we'll offer our thoughts on these considerations.



Health Information Exchanges (HIEs) provide very contemporary examples of the need for semantic interoperability of clinical information. In this issue's Consultants Corner, we discuss HIE requirements and how open source technologies, including Apelon's Distributed Terminology System (DTS) vocabulary server, can provide cost effective solutions to these needs. And speaking of DTS, our Product Forum article announces the latest release of this popular open source project.

We hope the ideas in these articles will assist you in your interoperability projects.

As always, we welcome queries and feedback to pulse@apelon.com or write me directly at scoady@apelon.com.

Regards,

Stephen Coady
President and CEO
APELON

Open Source Tools - Support and Practicality

Open Source is a relatively new, much less expensive model for the adoption and deployment of enterprise applications. Despite the success of horizontal open source products such as Linux and Eclipse, use of open source software in healthcare lags behind, even though attention to HIT is at an all time high. Key to understanding this disconnect are issues of support and practicality.

Why have software support systems not developed concurrently with the open source applications, and why do the applications so frequently get so out of synch with practical user requirements? The answer lies in the production history:

- In the past, most open source development was funded by grants, which were typically secured by and implemented in academic environments. Think graduate students, high turnover, short term horizons, interest on cutting if not bleeding edge, etc. Designs did not generally incorporate business considerations like supportability, reusability, software life cycles, and so forth.
- A more recent source of healthcare-related open source software is independent engineers. The problem is that these individuals don't scale, so while the software tends to be very good, production capacity is severely constrained, and there is no bench strength. The engineer-developers have for so long been removed from the problems of "average" users that they aren't sensitive to the needs of low level end-user support. And, written by experts, the applications are usually geared toward power users, even when most of what needs to be done in the near term does not require such complexity and sophistication.

The core problem: many instances of open source software are undoubtedly useful to the research community, but commercial users do not want a mission critical activity to be dependent on software that lacks professional support or is essentially dependent on one developer or even a small development team.

An alternate to these "ground-up" open source models is one where licensed software that has had a significant installed user base is taken open source. A key economic challenge in such a transition is whether a lower support fee from a much larger number of users can successfully replace the software revenue from a relatively smaller number of licensees? If "yes", then the case is a powerful one, because that code is certainly practical and there is doubtless a professional support team already in place.

Apelon has experienced the full spectrum, from being largely a software company developing and selling a suite of proprietary products, to being largely a support, training, and consulting entity, completely agnostic regarding several available open source platforms. We look forward to the day when there will be more and better open source healthcare informatics platforms, and are proud to have been an early contributor. It pleases us greatly that the same DTS code that once caused sticker shock is now regularly downloaded and used by graduate students, researchers and healthcare professionals throughout the world.

Consultants' Corner - Creating Effective Health Information Exchanges

There are nearly 200 active health information exchange (HIE) efforts in the US, according to the eHealth Initiative's 2009 survey on Health Information Exchanges (available at <http://www.ehealthinitiative.org/hiesurvey/>). While the survey shows that HIEs are growing and are increasingly able to demonstrate a positive impact on care and a return on investment, many challenges remain, including:



- Protecting patient privacy and data security,
- Wisely investing the sudden influx of funds from the American Recovery and Reinvestment Act,
- Demonstrating "meaningful use" of health data, and
- Navigating a legal and regulatory patchwork with major health reform looming large on the horizon.

Key requirements for any HIE include the collection and display of disparate clinical information. While simple "by-rote" redisplay of information from different sources is possible, the real business value of an HIE platform lies in its ability to convert and integrate this information into standard forms so that it can be consistently aggregated and analyzed for clinician dashboards, decision support and clinical outcomes analysis. Standard terminologies play a foundational part in helping HIE platforms achieve this kind of integration.

Exchanging data in such a way that the meaning of the data is understood across systems is called semantic interoperability. In a white paper entitled, "[Evaluating Open Source Software for Health Information Exchange](#)," HIMSS explains that achieving effective HIE is dependent on the shared use of clinical information and the use of standards for ensuring semantic interoperability is essential.

The Office of the National Coordinator for Health Information Technology (ONC), through its funding of the Health Information Technology Standards Panel (HITSP) and other initiatives is working to simplify the correct selection of normative standard terminologies for national reporting. Still, the "terminology problem" hasn't gone away, as HIEs must manage multiple standard terminologies (such as SNOMED CT, RxNorm, NDF-RT, LOINC, ICD-9-CM and CPT), a myriad of legacy code systems and multiple domain use cases, from describing a single laboratory test order to summarizing an entire encounter.

Our experience is that open source products and technologies can be of significant value in helping organizations create efficient and effective HIEs. Besides the software licensing cost advantages, open source products enable organizations to leverage the communities that contribute to the evolution of the product. The availability of commercial support and the commitment of ongoing maintenance and development are also seen as beneficial for HIEs considering the use of open source tools.

HIEs bring together many business partners, and each has its own set of vendor relationships. HIEs that use open source tools to implement open service and data specifications can help build trust among partners, avoiding the perception that the HIE is serving one partner over the others. Open source vocabulary servers such as the Distributed Terminology System (DTS) and open interface specifications such as Health Level 7's Common Terminology Services (CTS) can greatly simplify the development of robust, scalable, extensible terminology services capabilities for HIEs. As a repository for terminology standards and associated information, DTS can hold all the required HITSP standards, as well as representing correspondences (or mappings) between local codes sets from HIE participants and these standards. DTS is used in HIE projects such as those at MedAllies in New York and by suppliers such as Carefx and InterSystems. With DTS, different laboratory test codes from three hospitals and a commercial laboratory can be mapped to the LOINC standard to facilitate grouping for display/reporting and aggregation testing for decision support rules. Portal applications can access this mapping information over the network to provide the required functions.

Terminology services can also be enhanced through open interfaces. While Java APIs and web services are frequent interface technologies, HL7 has specified CTS as a common protocol (available in multiple technologies) for interfaces to HIE platforms. Apelon and Intel developed a CTS-based protocol for connecting DTS to Intel's SOA Expressway for Healthcare HIE platform. Apelon is playing a lead role in the development of CTS version 2, recently approved by HL7 as a Draft Standard for Trial Use. CTS2 specifies functional requirements and conformance criteria for a complete set of terminology server interfaces, and will permit HIEs to rely on an openly available interface through all phases of their standard terminology implementation.

While the availability of easy-to-use, open source tools for data interoperability is a great benefit to integrators and developers, the task remains of managing the terminology content and the development and evolution of data mappings. These tasks fall into the realm of what we call Terminology Asset ManagementSM (TAM), the people and processes at the core of interoperability. TAM encompasses a wide range of business functions, but typically includes terminology assessment, acquisition, updating, domain subsetting and governance processes. (See [Pulse Volume 1, Issue 2](#) for further details on TAM.) Our experience working with leading integrators such as Accenture, HP Enterprise Services (formerly EDS), and IBM, has demonstrated the critical role that these processes play in delivering true semantic interoperability in an HIE engagement.

There is little doubt that HIEs are growing: more data in more domains is being exchanged among more providers, covering more patients. Standard terminologies remain one of the most powerful tools to help clinicians and others make sense of all that data. While selection of terminologies for interoperation is slowly being rationalized by HITSP and others, the need to maintain multiple sources for mapping, aggregation and analysis remains a challenge for many HIEs. While all HIE projects are unique in their requirements and use cases, open source technologies should always be considered as a part of the implementation strategy and architecture.

To learn more about open source solutions for HIEs, contact Apelon's Director of Business Development, Lisa Nelson, at LNelson@apelon.com.

Product Forum - DTS Version 3.5

We are very pleased to announce the availability of DTS Version 3.5. This commercial release of 3.5 was posted on SourceForge on September 21, 2009. DTS 3.5 contains two significant new capabilities: support for the InterSystems Caché® database platform and local Role definitions.



A key trail on the DTS Roadmap is support for new database platforms. With Version 3.5, we add support for InterSystems Caché high-performance object database. Caché is a very popular database platform in the healthcare community, including its use in the Department of Veterans Affairs' VistA® electronic medical record system. Caché users now have access to all of DTS' terminology development, management, mapping, and run-time deployment features. This new addition facilitates the integration of DTS data interoperability features with other InterSystems products such as the Ensemble® rapid integration and development platform and the HealthShare™ platform for regional and national electronic health records.

The second major feature of Version 3.5 is local Role definitions. Local Role definitions provide new capabilities to DTS's powerful Modular Classification facility. Modular Classification allows users to extend Description Logic-based terminologies such as SNOMED CT with their own, local concepts, using the same semantic rules that are used by the creators of the terminology. An organization creates these new concepts in a local Extension Namespace, specifies the concepts' defining characteristics (Defining Concepts and Roles) and then classifies the concepts, placing them into the correct location with respect to the base terminology.

Prior to 3.5, only Role Types present in the base terminology could be used in concept definitions. DTS 3.5 permits the creation of new Role Types in the Extension Namespace. These new Types provide for new aspects of concept definition and classification. Local Role Types were developed in cooperation with Dr. Jim Campbell at the University of Nebraska.

Since its open source release under the commercial-friendly Apache2 license, DTS has been downloaded over 2000 times and is being used in research and production projects around the world. Apelon is very excited about this new release and invites all members of the DTS community to give it a look. For downloads and further information on all the features and improvements in DTS Version 3.5, see <http://apelon-dts.sourceforge.net>.



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