AXOLOTL®
HEALTHCARE CONNECTED

Disease Outbreak Stopped Dead by Connected Community

Achieving value with Axolotl's standards-based interoperability services

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Information Gaps in Health Care

The health care industry has yet to fully enjoy the information boom unleashed fifteen years ago by the Internet. While doctors and patients now have unprecedented access to general health information, access to patient-specific information is still an elusive goal of all health care stakeholders. Patients leave the doctor's office with nothing more than a prescription and a vague understanding of what ails them. Lacking knowledge of their patients' past health care events, providers order duplicative tests that add to the national health care burden. Meanwhile, as swine flu spreads across the world, public health officials must rely on scant reports that arrive by fax or post.

Why do these information gaps persist in health care while other industries have long ago found effective ways to gather and share data? The answer lies in the fragmented nature of American health care. Information about a single patient is divided among several different business entities and often among innumerable different information systems. Thus, the central challenge in health information technology is to develop solutions that allow these disparate information systems to communicate. When health care systems are interoperable, the patient returns home to find a list of diagnoses and instructions in his personal health record; the physician is warned by her electronic health record that the test she is trying to order was already ordered two weeks ago by her colleague; and the public health official can track in real-time the spread of swine flu across his state.

At Axolotl, interoperability is our business. We have been connecting health care communities, regions and states since 1995.

Interoperability in Action

HealthBridge—the largest health information exchange (HIE) community in the nation, which serves the tri-state region surrounding Cincinnati, Ohio—relies on interoperability to prevent the spread of infectious diseases. HealthBridge receives lab result data feeds from over 80 sources, including hospital and private laboratories, then routes the results to various stakeholders (e.g., the ordering provider, the patient's primary care physician, etc.) via Axolotl's Elysium Exchange. While

processing in-bound result feeds, Elysium detects lab results which indicate that a patient is positive for an infectious disease included on the State of Ohio's reportable diseases list. Results that are reportable are routed to the local public health organizations' information systems as well as the state public health department's information system.

The region that HealthBridge serves has greatly improved their ability to prevent disease outbreaks. Prior to implementing an interoperable solution, detection of potential disease outbreaks typically took 5 to 8 days. That time has been subsequently reduced to detection within 48 hours, thereby greatly improving their ability to stop an outbreak. With interoperability, the region no longer reacts to infectious disease outbreaks; instead, it responds quickly and prevents outbreaks from occurring.

Interoperability and Standards

Interoperability without standards is like language without grammar. In both cases, communication can be achieved but the process is cumbersome and often ineffective. For example, imagine that "General Hospital" decides to send an electronic message containing lab orders to "A-1 Laboratory." A-1 receives the message, but the message is written in a confusing format, thereby requiring extra work for A-1 to understand the message. In the end, A-1 receives the order and is able to act upon it; however, the process is complex and error-prone. To improve this communication, both General Hospital and A-1 Laboratory could adopt a standard such as HL7, which defines a common message format.

Imagine if the systems in the HealthBridge community did not use standards. Translating messages from one system's format to another's would waste precious time and thus increase the community's reaction time to potential infectious disease outbreaks. Interoperability based on standards is an essential weapon in every public health department's arsenal.

With so much at stake, Axolotl has made a firm commitment to building its interoperability solutions based on standards. For more than 15 years, we have relied on standards such as HL7, NDC and LOINC. In recent years, many health care stakeholders have turned to the Integrating the Healthcare Enterprise (IHE) initiative as a way to coordinate their standards activities. IHE provides recommended paths (called "profiles") for implementing well established standards. Axolotl places great emphasis on developing and implementing IHE profiles. As an IHE member organization, Axolotl actively participates in IHE profile development, in testing our implementations at the annual Connectathons and in demonstrating our IHE capabilities at each annual HIMSS Interoperability Showcase.

While many of the IHE profiles describe interoperability solutions for specific clinical use cases (e.g., retrieving an ECG report, delivering lab results, etc.), the foundation of all IHE activities is

the IT infrastructure (ITI) domain. Within the ITI domain, various profiles describe how to manage patient identification across systems and how to exchange documents across those systems. Axolotl representatives sit on both the planning and technical ITI committees.

In addition to these IHE committees, Axolotl also participates on several other standards-related groups including (among others):

- CCHIT Networks Working Group;
- HITSP/CCHIT Joint Working Group;
- Nationwide Health Information Network;
- eHealth Initiative.

Interoperability Standards R&D

A significant portion of Axolotl's research and development work focuses on standards compliance. We develop and rigorously test our standards-based products in a lab environment before releasing them to our customers. For instance, over the past four years, Axolotl has successfully integrated its HIE solutions with over 40 other vendors at the annual IHE Connectathons. The IHE profiles tested at previous Connectathons and demonstrated at past HIMSS Interoperability Showcases include ATNA, CT, PIX, PDQ, XCA, and XDS.

Live Implementations of Standards

At Axolotl, IHE profiles are not just lab experiments. The latest version of the Elysium SOA Platform, which is currently used in production at many of our customer sites, offers several IHE services. Our customers are leveraging these IHE services to solve real-world problems. For example, four customers in the state of New York[1] employ the Elysium SOA Platform's IHE services to meet the State Health Information Network of New York (SHIN-NY) interoperability requirements.

SHIN-NY Background

New York State is currently making major investments in the IT infrastructure necessary to connect health care actors across the state. SHIN-NY is the technical foundation of the state's efforts to establish links between regional health information organizations (RHIOs). It is also the

[1] WNYCIE (Buffalo, NY), Rochester RHIO, Interboro RHIO (Queens, NY) and Bronx RHIO

focus of the state's efforts to help build the Nationwide Health Information Network (NHIN). All of Axolotl's New York customers are committed to making SHIN-NY a success, and therefore, they are dedicated to adopting IHE and other national standards to enable effective and efficient interoperability.

Standards-based Services

SHIN-NY's services, which other HIE communities can use to accomplish common interoperability tasks, are a collection of open standards. These services include (among others):

- PIX profile: an IHE standard for cross-referencing patient IDs across systems;
- PDQ profile: an IHE standard for discovering the locations of patient data;
- XDS profile: an IHE standard for retrieving clinical documents located within the local health information exchange community;
- XCA profile: an IHE standard for retrieving clinical documents located outside of the local health information exchange community;
- Audit Log Query Service: a NHIN standard for requesting and retrieving audit logs from external communities;
- Consumer Preference Service: a NHIN standard for exchanging consumer-defined preferences concerning exchange of the consumer's data.

To accomplish these core services, Axolotl's New York customers rely on the Elysium SOA Platform's standards-based interoperability features.

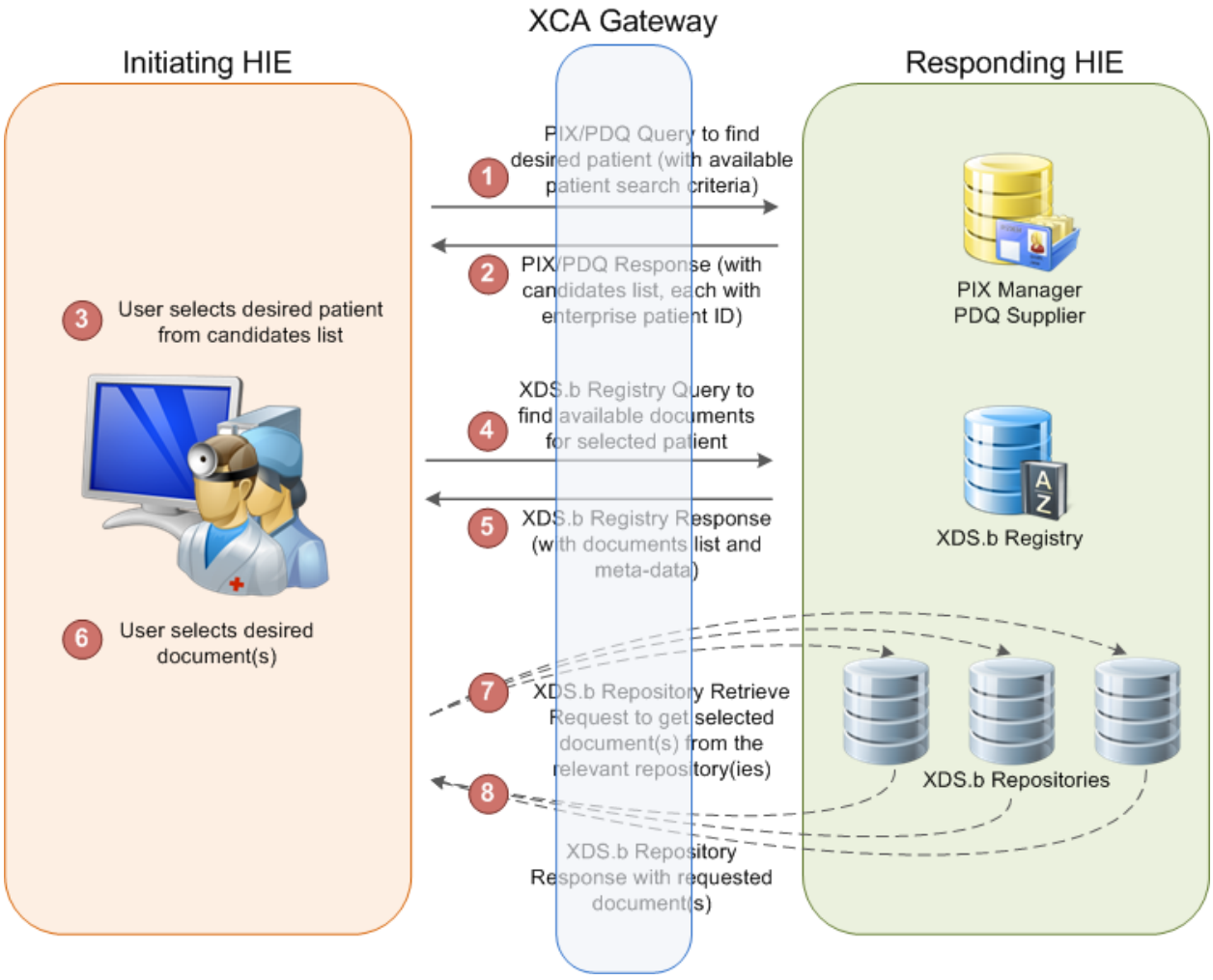

Figure 1: How IHE services are used to exchange data between HIE communities

Summary

Increasing interoperability among disparate health information systems is slowly filling the information gaps that health care actors have faced for decades. To accelerate this process, the health care industry must continually develop and adopt standards. From lab to live implementation, Axolotl is committed to leveraging the latest standards wherever possible to create simple-to-implement and reliable interoperability solutions.