FlexITy® SOLUTIONS

Medical Data Exchange
A New Approach to Healthcare Interoperability

Introduction

The healthcare industry has reached a tipping point. Costs have escalated at an unprecedented rate—in Canada alone, healthcare costs are approximately 10.5% percent of gross domestic product (GDP). Despite this, healthcare continues to face challenges when it comes to delivering quality care—in Canada, medical errors account for nearly 24,000 deaths annually, and are the sixth leading cause of death in hospitals.

The industry, however, is making a global push to increase the quality and efficiency of care through healthcare information IT (HIT). Government support is on the rise, including funding for medical data exchange to improve access to medical records. According to an article in CIO magazine, "…public healthcare market profile - 2010/2011- forecasts that total spending rose from £2.25 billion in 2006/2007 to £2.52 billion in 2009/2010. Meanwhile, a key area of focus is for interoperability solutions to meet the demands for access to care."

Merely digitizing a paper-based system, however, will not deliver improvements in quality or efficiency. What will is the effective exchange of information, which will enable practitioners to make better decisions at the point of care. Governments have realized this and are beginning to provide funding for the creation and operations of electronic health record (EHR) exchange systems.

Challenge

Today, most patient information is stored in disparate systems across the healthcare community—physician offices, imaging clinics, other hospitals—and many of these systems do not interoperate. A practitioner in private practice may have difficulty obtaining complete information about a patient currently being hospitalized. Or, a practitioner may repeat tests and procedures because he or she does not have prior information about the patient.

In addition to quality challenges, are those posed by manual paperwork processes, which are expensive to both patients and practitioners. For example, a patient may have to hand-deliver a paper copy of his/her record to another physician, or the provider may have to fax it to the physician or copy the patient record to a CD. These tasks could amount to $15 to $20 each and are not a reimbursable expense. The alternative is to proceed with the current patient encounter without prior visit history.

The healthcare industry has been exploring methods of interoperability for years. These approaches have their merit, and a certain degree of standards have been established. The industry's efforts to date, however, have been slim due to limitations in business models and technology. For example, the Community Health Information Networks (CHINs) of the early 1990s did not prosper; technology could not meet interoperability challenges, was too costly, and was not adopted by a sufficient customer base. Furthermore, Regional Health Information Organization (RHIO) and Health Information Exchange (HIE) models have not been able to meet customer needs or obtain enough customers to be profitable.

Unlike healthcare, other industries have solved interoperability challenges related to information exchange. For instance, most financial firms use secure "financial exchange" gateways to exchange information among organizations. This capability is now available in the healthcare domain.

Creating interoperability among healthcare systems to seamlessly and easily exchange information in near real time is critical to making meaningful improvements in healthcare delivery. Interoperability is complex and cannot be solved by focusing only on individual standards and quasi solutions. A new approach will remove the complexities associated with interoperability and pave the way for next-generation healthcare.

A New Operating Model for Hospitals
Imagine a healthcare community where access to a patient's medical history is available— from allergies, current medications, medical and surgical history, to MRIs— according to the patient's care requirements. For example, a clinician may only need to view data regarding the patient's prior medication to confirm appropriate treatment. Or, a clinician may need to compare a prior MRI with a current one in real time, and/or with multiple colleagues. In another example, a physician may want to order medication from a local pharmacy over a secure, interoperable network.

Across all levels of interoperability, a record of care is created based on a patient-centric, not an application-centric view. In this way, healthcare information can be "pushed" to virtually any device, anytime, or anywhere over a secure and flexible network—much in the same way information is pushed to consumers online. Each of these levels requires secure connectivity and standards-based data access. This type of operating model enables practitioners to access all relevant information to make the best decisions related to their patients' care.

Medical Data Exchange Solution (MDES)
Healthcare providers cannot afford to take an application-centric approach to interoperability by migrating major clinical applications to new systems or performing major upgrades because they will likely face challenges with scalability and performance, as additional applications features will consume processing resources.

FlexITy, through its partnership with Cisco Systems, offers a Medical Data Exchange Solution (MDES) that enables healthcare providers to utilize the network as a platform to view, access, or record patient data. MDES provides network-based services that

recognize information coming from known data sources, then formats and translates data in real time. MDES is powered by an intelligent network that extracts relevant data from disparate systems; translates information into a common, usable format; and delivers the right data at the right time to the right users.

MDES is based on the internationally recognized IHE (Integrating the Healthcare Enterprise) framework, which utilizes clinical data, imaging, and medication standards, removing the boundaries of interoperability among key stakeholders within the healthcare ecosystem. MDES verifies and validates the identity of patients for whom data is being exchanged. Furthermore, if a remote practitioner does not have an EMR, MDES can present the information through a web-based portal, providing services for viewing, accessing, or transacting services to align with patients' needs.

Technology Building Blocks

Not only should an interoperability solution enable the seamless exchange of information among healthcare institutions, it should also meet medical requirements for availability, security and flexibility. MDES is an appliance-based solution that provides connectivity, security and free exchange of medical information. The interoperability application runs on a module inside a router. MDES can scale to larger environments that need more computing power by adding modules incrementally, or moving to the more robust unified computing system (UCS). This architecture enables an organization to start small, build momentum behind their exchanges services, and then scale the foundation to align with the growth in interoperability transactions. Even if a large institution requires several routers, the key tenant of simplicity prevails.

The IHE protocol, a key standard for the exchange of healthcare information, is a core component of Cisco MDES. This standard, combined with message translation capabilities, enables MDES to connect clinical systems regardless of vendor or application.

Interoperability in Action

As described above, the scalable architecture links disparate systems using the IHE frameworks. Several steps based on specific scenarios are presented to show how MDES can make a difference for patients and practitioners.

Use Case 1: Hospital upgrades or changes to EMRs

1. Practitioner logs into a new EMR

2. It is connected to MDES and pulls information from the old EMR

3. MDES connects old and new EMR

4. Information is sent to requesting practitioner

Use Case 2: Hospital Integrates Clinical Applications

1. Practitioner logs into EMR

2. New EMR is connected to MDES, which pulls information from clinical applications

3. MDES connects clinical applications (such as PACS, LIS, CPOE) and sends information to the practitioner

Use Case 3: Hospitals Exchange Clinical Applications

1. Practitioner has patient that uses two hospitals. Practitioner logs into patient's EMR

2. Hospital information systems are connected via MDES, which pulls information from the other hospital's clinical systems

3. MDES connects old and new EMR

4. Information is sent to requesting practitioner

Use Case 4: Hospital Physicians Access Patient Information

1. A hospital practitioner logs in to the EMR to view his information

2. Hospital EMR is connected to practitioner offices via MDES. MDES pulls information from physician's office and sends to hospital

3. MDES connects hospital and practitioners EMR

4. Information is sent to requesting practitioner

Benefits for each Use Case include: (1) Improved information access to the practitioner, (2) Improved practitioner satisfaction, (3) Improved efficiency, and (4) Greater physician loyalty.

These four use cases provide examples of how MDES can help hospitals deploy clinical and business applications that most suit their needs, without being concerned about connecting to other partners in the healthcare delivery system.

Conclusion

After years of slow technology adoption, the healthcare industry is finally making inroads into HIT. For HIT to improve healthcare quality and efficiency, practitioners need to exchange information seamlessly to make better decisions at the point of care. Clinicians must be able to access and view information based on patients' needs, not on the needs of the organization or IT systems.

FlexITy's Healthcare Practice Team along with Cisco's MDES technologies offer an innovative approach to interoperability. MDES leverages features of clinical applications and FlexITy's cross industry experience in protocol translation and connectivity to deliver required interoperability services. MDES enables an interoperability services bus to help reduce the costs and complexities of care for both providers and patients. National electronic health record initiatives, health information exchange funding, meaningful use criteria and community health project are driving the need for interoperability services. MDES provides organizations with the capabilities needed for these initiatives.

Organizations interested in pursuing IHE's and similar initiatives can look to MDES to utilize the network as the platform upon which applications connect to gateways to provide a patient-centric view. Utilizing the network as a platform, the time is now to make meaningful contributions to the healthcare industry.