The Enterprise Archive - A strategy for patient-centric management of clinical healthcare information.

White Paper

Executive Summary:

Today, healthcare information technology (IT) is a mosaic of disparate applications across multiple hospital departments and free-standing medical practices, all supporting the same patient population. Within hospitals, local healthcare communities and beyond, the result is an inability to communicate information across the continuum of care efficiently and cost-effectively. Shared standards for healthcare software interoperability are crucial to support integrated healthcare IT, which leads to enhanced efficiency, clinical decision-making and, ultimately, patient care. The Integrating the Healthcare Enterprise (IHE) initiative has been a vital force in integrating such standards and is expected to play increasingly important role in reaching that goal.

The most efficient, cost-effective and ultimately practical strategy for integrating healthcare data is at the storage/archival-level, as opposed to mandating new standards for software applications across every medical specialty or creating and maintaining dozens of customized interfaces to connect existing IT systems.

The emerging IHE Cross-Enterprise Document Sharing (XDS) standard and workflow protocol for medical data archiving is creating a blueprint and a practical path towards information sharing among healthcare providers that can be easily implemented today. It is effective not only throughout the enterprise but also among multiple unrelated healthcare entities throughout a medical community and will help sites pave the way towards a comprehensive electronic health record (EHR).

With the renewed emphasis on healthcare reform from President Obama's administration's American Recovery and Reinvestment Act (ARRA), sharing electronic patient information, in general, and through an EHR in particular is crucial, and the demand for standards-based data access will only increase.

Crucial to maximizing the value of this change will be implementation of the standards-based consolidated healthcare data enterprise archive. Medical institutions that are in the forefront of adopting the Health Information Exchange (HIE) initiative to achieve this will realize an unprecedented opportunity within their communities to become the focal point of a patient's consolidated medical record. Healthcare institutions facilitating such records through these standards will deliver a valuable service contrbuting to building patient loyalties and physician referrals, realizing new revenue steams and a higher standard of care.

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Historical overview of healthcare IT

The fragmented healthcare IT environment mirrors the decentralized healthcare system overall. Historically, the broad range of medical specialists who treat patients across the continuum of care for a specific condition and during the course of their lifetimes, generally function autonomously rather than as a cohesive group.

Accordingly, the software applications that support these clinicians in individual clinics or physician group practices have been generally selected independently of those used at other medical facilities treating the same patients.

In hospitals, the situation is similar. Clinicians in individual medical departments, rather than enterprise IT departments, typically select or play a key role in the selection of most IT software applications. Granted, in most cases, physician involvement is crucial in the choice of the technology that often plays a key role in patient care itself. However, in both settings, little consideration is given to application interoperability and information sharing beyond primary users.

The result is that digital data is stored in a broad range of incompatible formats that have become isolated silos of information. These silos remain tethered to the software and often the hospital departments or group practices that created them. Without the ability to integrate this isolated data from multiple systems, an electronic health record (EHR) is not possible without duplication of data and its storage.

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The implications of a fragmented IT environment and data silos.

Currently, healthcare providers rely on various inefficient means in an attempt to share information beyond these silos. Some install multiple copies of costly applications for key physicians who are not primary users, while others rely on scaled down web-based versions of these applications or ask patients to hand carry CDs across the continuum of care. Still others install customized data interfaces among different software applications. These strategies all involve high costs and often make significant workflow demands on secondary users. For example, data silos each require independent management, support and disaster protection, again at significant costs. As software applications are upgraded, their data repositories often require costly migration processes.

In addition to communication difficulties, these information silos contain large amounts of duplicated information, such as the patient demographics and perhaps abbreviated portions of patient medical histories gathered from other IT systems and from patients themselves. These partial data sets create the possiblity for duplication of tests and the potential for medical errors.

Compounding all this, as the number, sophistication and diversity of healthcare software systems grow, the volume of this data is exploding. The costs in both archiving hardware and system maintenance are already enormous and expanding.

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Today's focus on integration and change.

As part of the new administration's sweeping overhaul of the healthcare system, much-needed emphasis is being placed on the integration of healthcare IT and the implementation of comprehensive patient EHRs.

The 2009 ARRA provides incentive payments to eligible providers adopting EHRs. To qualify, providers must demonstrate "meaningful use," including the incorporation of diverse medical data and diagnostic images into the EHR, which provides further incentive for adoption of cross-application standards. Eventually, reimbursement from private and public sources will be reduced to those who do not adopt EHRs.

The enterprise archive as an agent of transformation.

Given that a comprehensive EHR involves patient health information from multiple sources and of multiple formats - from a pharmacy to radiology and clinical - the problem of data incompatibility and silos must be overcome.

An enterprise active archive used to store comprehensive clinical information in a fixed format, whatever the native software application, provides a practical and cost-effective path to healthcare data integration that will not call for a modification in specific software used at the physician level or any significant alteration of physician workflow. Such an archive is well positioned to support the evolving EHR in the future.

Alternatives to the archive-driven EHR are impractical and cumbersome. As noted above, duplicating proprietary systems in multiple departments or clinics, as is often the case today, is costly and demands personnel training and systems maintenance. This also is true for custom-developed data interfaces, which are site-specific and do not lend themselves to replication on a more global level.

At the same time, designating a specific approved IT application for every clinical specialty or a highly structured set of standards that extend into the software application itself would mean the expense and complexity of replacing a significant portion of today's existing IT infrastructure.

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The emerging XDS standard.

Developed to share clinical information among providers, the Integrating the Healthcare Enterprise (IHE) XDS (Cross-Enterprise Document Sharing) and XDS-I (Cross-Enterprise Document Sharing for Imaging) profiles are data frameworks based on a standard method of exchanging files of multiple types.

XDS establishes an encapsulation of the data with defined field structures that enables IT systems to rapidly assemble all data for a particular patient across multiple software applications to create a comprehensive patient medical record. IHE also defines the roles and application of digital imaging and communications in medicine (DICOM) for medical images and HL7 information.

Strategies for implementing the enterprise archive.

Once a site makes a decision to implement a clinical enterprise active archive, it may choose to implement and support it in-house or to rely on a professional archiving service provider. In either case, sites should be aware that setting up and maintaining an enterprise archive is a demanding process.

Implementation In-House

Generally, installing and supporting an enterprise archiving system calls for highly specialized IT staffing familiar with IHE workflow frameworks and protocols, including the XDS standard. A healthcare organization should carefully examine its ability to retain and budget for ongoing XDS archive support and necessary IT infrastructure.

Many organizations elect to hire specialized consultants to set up an enterprise archive and assist them with ongoing maintenance or selection of outsourcing maintenance staffing.

To plan archiving architecture, budgets and purchases, a healthcare organization must be able to reasonably predict the growth of its data storage needs. At some point, legacy technologies will need to be upgraded, calling for additional time and expense.

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Strategies for implementing the enterprise archive.

Outsourcing the archive

Contracting with an experienced, reliable archiving service provider can eliminate many of the difficulties and costs associated with installing and maintaining an enterprise archive in-house. Selecting a provider experienced with XDS is important. However, because XDS is an emerging work-flow strategy, only a few providers have relevant experience. In addition to XDS experience, DICOM medical imaging experience is valuable because the images are a crucial and demanding part of the XDS archive.

In general, a carefully chosen archiving and data aware content managed service provider can implement an archive solution that is effective and efficient for less cost overall than an in-house implementation.

Along with archiving expertise, important among the benefits, such a provider can offer is the ability to focus IT staff on training and application maintenance. They can also eliminate obsolescence issues for hardware and software. Most provide full data back-up and data recovery assuring business continuance and enabling HIPAA compliance. Economies of scale can also provide a reduction in operating costs with the ownership of hardware and software as well as data warehousing facilities operations.

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Moving beyond the enterprise.

Today, as the EHR takes center stage, hospitals and large medical facilities have a unique opportunity to move beyond the enterprise and implement a community-wide archive and become the overseers of the patient's comprehensive medical histories and the focal point of their patients' integrated medical care for positive patient outcomes.

Conclusion

Today's fragmented healthcare IT system significantly hampers provider efficiencies and can impact patient care. By facilitating data integration across disparate software applications, promoting information sharing among providers and supporting a comprehensive electronic patient record, a standards-based archive framework for data storage is a highly effective solution to these problems.

The Integrating the Healthcare Enterprise (IHE) is recognized for establishing such healthcare data standards protocols. Its Cross-Enterprise Document Sharing (XDS) framework for healthcare data storage is rapidly gaining acceptance.

An XDS-compliant archive draws on an internal database to search across multiple file formats to assemble all data for a particular patient, whatever the native software application. As a significant benefit, because XDS is implemented at the archive level and does not alter the underlying data format, it enables continued use of software applications already in place.

Implementing an XDS archive requires specialized IT expertise. Institutions seeking to integrate patient data can realize significant cost savings and efficiencies by seeking out an experienced outsourced healthcare archiving provider.