

WHITE PAPER

Improving HL7 Integration for Healthcare Providers

Magic Software Enterprises
January 2010

Introduction

Computers and their associated IT systems play a vital role in today's healthcare environment. The structure of modern healthcare systems ties together a number of providers to form healthcare communities consisting of hospitals, physician practices and specialized labs such as Radiology and Cardiology. Each of these units uses computers and IT applications for the specific aspects of their healthcare activity.

Hospitals receive electronic demographic data about their patients, doctors receive electronic patient lab reports and testing centers need to send those electronic test results to both hospitals and doctors.

Due to the growing complexity of electronic information exchange, all of these healthcare communities require a way of effectively and efficiently interfacing electronic information in order to productively address the needs of their patients.

The Role and Setting of HL7

The HL7 community, established in the US in 1987, was designed to produce a standard for hospital information systems. Today HL7 has been adopted or is in the process of being adopted by a growing number of countries outside of the US including the Netherlands, Germany, Belgium and the UK.

The HL7 protocol created a series of conceptual, document, application and messaging standards designed to enable diverse healthcare IT systems to communicate clinical information with each other. The purpose was to allow healthcare provision to become of a single, consistent standard within the healthcare environment and across diverse geographical locations.

HL7 standards are currently being applied to three main healthcare IT settings:

1. Within hospital information systems (HIS), also known as Clinical Information Systems (CIS)
2. Within an Electronic Health Record (EHR)
3. Within a National Electronic Patient Record (EPR)

The Role of IT Integration within Healthcare

As the healthcare community becomes rapidly more IT enabled, it raises a number of challenges.

Lack of information is a common source of frustration for healthcare and patient decision makers. In an environment of multiple IT systems, much of this problem can be traced to the fact that information is 'siloed' within individual IT applications or systems, meaning that it cannot be electronically shared across the healthcare organization or between different IT applications.

Lack of effective data integration can lead to slow patient diagnosis, irritated patients and healthcare professionals, misdiagnosis and wrong treatment. The purpose of an integration platform is to synchronize the patient-critical data within existing healthcare applications so that information can be normalized across core systems to achieve:

- A full and accurate view of a patient's health history and situation (via application integration within an Electronic Health Record),

- The smooth function and cost-effective management of hospitals and clinics (via application integration of a Hospital or Clinic's Information System),
- The provision of high quality care for patients situated away from their usual physicians, healthcare providers, or in different regions or countries (via application integration within a National Electronic Patient Record).

Using Metadata Integration Platforms

With the need for application integration established above, we now turn to the ways and means of achieving that integration.

In any healthcare scenario, the role of an integration platform should be to enable rapid deployment of integrated systems and automatic interfacing and messaging between diverse healthcare applications.

When implementing common integration scenarios, extensive programming is usually required to build the interfaces and custom workflows between the applications in the enterprise. This process requires skilled programmers, using Java, C#, TCL, Python or other programming languages.

Metadata integration platforms are based upon a 'business centric' approach rather than the use of specific programming languages. Using pre-compiled and pre-configured business information and functionality, or 'engines', a metadata approach gets around the technical complexity of the integration process, allowing developers to focus instead on the information linkages and specific healthcare integration scenarios required.

A metadata approach to integration also has the advantage of using a single skill set for integrating between diverse healthcare applications, protocols such as HL7, and technology environments. This reduces integration implementation time, enabling healthcare providers to effectively test and more quickly deploy their integration.

The Introduction of Electronic Patient Records (EPR's)

An Electronic Patient Record (EPR) provides health information and history about individual patients or demographic groups. Recorded in a digital format that's embedded in a network-connected enterprise wide system, an EPR is designed to

make patient information accessible within and across different health care settings including hospitals, clinics or doctor's offices.

EPRs by definition are designed to help provide physicians and healthcare professionals with accurate and historical information to aid medical decisions and reduce potential medical errors.

In order for various different file formats to be integrated successfully into a central EPR information hub, they must run according to the HL7 protocol. Integration is thus required to enable application files for patients to be integrated into any overall system.

EPRs must therefore integrate a whole range of patient electronic medical files from pharmaceutical medication history to laboratory test results, hospital files, general practitioner files, radiology images, and billing information.

Integrating Healthcare Applications for National Electronic Patient Record (EPRs)

National EPR's are now being implemented in a number of countries.



What is metadata?

Metadata is data about other data, or information about a thing, apart from the thing itself.

A 'metadata engine' is a ready-made business application engine containing pre-written technical and administrative functions and services. It enables you to bypass the intensive technical code-writing stage of application development and move quickly and efficiently to deployment.

Metadata platforms enable:

- Focus on 'goals' rather than 'means'
- Intuitive development - with a focus on modeling and configuration rather than coding
- Development that's independent of the underlying deployment platform
- Developers to work natively on multiple platforms & databases

The healthcare advantage:

- Higher project success rate
- More ability to meet budget and timeline requirements
- More value and return from existing IT applications and greater IP asset life
- Ability to quickly and cost-effectively adapt integration to changing healthcare needs
- Gain a real time, full view of patient's medical file records

The Netherlands AORTA system, started in 2003 is a national infrastructure that uses the HL7 protocol to provide for the efficient exchange of information between healthcare providers.

In order to be able to continue working with national EPRs such as AORTA, healthcare IT suppliers with ERP, CRM, or other healthcare applications need to become HL7 certified.

They face the challenge of transporting their current health data to the HL7 protocol and their applications must now make all their data transactions in the HL7 format.

On a technical level this requires companies to integrate their applications with the HL7 format quickly and cost-effectively or risk being excluded from customers such as pharmacies and hospitals within the national EPR system.

In such a time-critical situation, often limited to weeks or a few months, IT application providers can leverage the greater productivity of metadata integration platforms to shorten the HL7 integration delivery cycle.

Integrating Hospital Information Systems (HIS/CIS)

A Hospital Information System (HIS), also known as a Clinical Information System (CIS) is an overall information system that integrates the various IT applications within clinics or hospitals in order to improve the efficiency of administration, finance and healthcare within the organization.

Like any large enterprise, hospitals and clinics today use a variety of large and powerful IT applications including CRM systems, web applications, laboratory and testing applications, radiology applications, patient nutritional information, and more.

Based upon a Service-Oriented Architecture (SOA) that allows hospitals to achieve a standard delivery architecture integrating the multiple processes within the organization, metadata integration platforms can be used to quickly and cost-efficiently build and deploy an Enterprise Service Bus – sometimes more suited to the complex architectures of healthcare organizations that require event-driven, HL7 standards-based messaging integration.

Summary

The introduction of the HL7 protocol was a direct outcome of the growing number and role of IT applications within the healthcare environment today and the knock-on implications for healthcare costs.

In many countries it is now vital that hospitals and healthcare IT providers quickly and cost-effectively transport their applications to the HL7 standard in order to continue supplying key healthcare capabilities and to provide an effective and efficient service to patients.

From the days when such integrations needed to be hard coded by teams of developers, the IT environment has today evolved with the availability of specific industry-focused integration platforms that contain pre-programmed functions and capabilities. Such platforms enable healthcare providers to become more rapidly connected, more productive, more flexible and more efficient. Such solutions are essential in order to meet the rising challenges and changes in healthcare organization and provision.

About iBOLT

iBOLT is Magic Software's metadata platform for business and process integration. It enables organizations to synchronize data within diverse applications and provides enhanced workflows, automation of manual processes, and a real-time view of business activity.

iBOLT simplifies the design and integration process by separating business logic from integration technology. iBOLT makes changes to prototype business models without affecting actual business or technical layers, and before you invest in full connectivity.

iBOLT features user-friendly, code-free tools such as wizards, drag-and-drop options and tables, creating seamless connections with enterprise applications deployed on any hardware, operating system, or database.

iBOLT is a recipient of multiple industry awards and is recognized by leading industry analysts including Gartner and Forrester.

Magic Software's products are used by healthcare IT providers and hospitals around the globe including Caresoft, CB Medical, Clinical Financial Services, Norfolk and Norwich Hospital NHS Foundation Trust, Sheba Medical Center and FKB.

iBOLT Special Editions

iBOLT quickly and cost-effectively integrates a wide range of IT business applications including SAP Business One, SAP R/3, Salesforce.com, Oracle JD Edwards, Lotus Notes, Microsoft Office, IBM i (AS/400), HL7 applications and Google Apps.

About Magic Software

Magic Software Enterprises (NASDAQ: MGIC) is a global provider of application platforms and business integration solutions. With over 25 years of experience, our technology gives our partners and customers the power to leverage existing IT resources, enhance business agility, and focus on core business priorities.

Magic Software has thousands of successful customer installations worldwide and a global network of ISVs, system integrators, value added distributors and resellers, and consulting and OEM partners. Our technological approach, product roadmap and corporate strategy are recognized by the leading industry analysts. Magic Software has 10 offices worldwide, a presence in over 50 countries, and partner alliances with global IT leaders including SAP AG, Salesforce.com, IBM and Oracle.

For more information about Magic Software and its products and services, visit www.magicsoftware.com, and for more about our industry related news, business issues and trends, read the [Magic Software Blog](#).