

# HL7 Integration: From Trial and Error to Predictable Project Outcomes and Margins

White Paper



## Can You Keep Pace with Customer Needs?

A 2008 HIMSS survey found that 60% of hospital CIOs were juggling over 100 applications in their information systems. The same survey revealed that 85% of hospital CIOs were dealing with over 50 interfaces, while 60% were managing more than 100.

#### **Executive Summary**

If you're responsible for implementation, interfacing, or technical services, you've got a lot riding on client projects. As a VP or director, maintaining operating margins and topline growth are probably your top concerns. If you're a manager, you're continually seeking ways to do more with less, including ensuring effective use of resources and on-time project delivery. But the way interfacing is currently handled likely prevents you from achieving these goals. Considering that hospitals are dealing with an explosion of interfaces, your organization needs to find a way to effectively keep pace.

By nature, an interfacing project consists of many unknown unknowns. And far too many developers rely on trial and error and drawn-out iterative processes to get projects completed. Unfortunately, those in charge often lack the transparency into accurate information about project status. The result is an inability to predictably hit a target go-live date, impacting your customer's planning and your ability to extract the maximum value from project resources.

The costs and risks associated with the entire interfacing lifecycle are no longer acceptable in a world that requires fast turnarounds and go-live dates. Those implementing HL7 interfaces can tap into new – and proven – best practices for more effective scoping and overall project success.



#### **The Pitfalls of HL7 Interfacing**

The biggest bottleneck in HL7 interfacing isn't coding or setting up the interface. With modern interface engines, that's relatively easy. The real struggle is knowing how a system is constructed, where the gaps are, and what needs to be coded – this drives all the work. In fact, when this scoping is handled effectively, all other aspects of interface creation and management go well. But when this stage is not well-managed, the impact trickles down to affect all other phases.

#### Data, Data Everywhere

The scoping stage largely revolves around coming to terms with dataexchange requirements. On average, for each message transferred between two systems, over a thousand pieces of data are exchanged. To make sure data is entered correctly in the receiving system, developers need to understand the data being received along with its format and meaning.

For example, the admit status gender of a patient can be indicated using up to six different attributes or coded values. That said, very few systems use all six possibilities, instead using three or four. Even then, each hospital can choose different signifiers for the options and remain HL7 compliant. While one may designate male as "M" and female as "F," another might use a "1" and a "2."

Or consider the variations possible for lab requests and result codes. In one system, the code for white blood cell count might be "ABC" while in another it might be "456." In light of the fact that the Logical Observation Identifier Names and Codes (LOINC) dictionary alone contains more than 42,000 codes, it's easy to see how quickly permutations can occur from one system to the next.

#### Loose Guidance Leads to Mind-Numbing Tasks

Many assume HL7 eases the process of mapping and exchanging disparate datasets. However, while the HL7 standard provides some guidance regarding options for organizing data, every hospital takes advantage of HL7's flexibility to adapt the data organization to its clinical workflows. Even when two hospitals are using the same version of an admission, discharge, and transfer (ADT) system from the same vendor, they will most likely organize the data differently, as just illustrated.



### How Can You Help Your Customers Succeed?

Nearly 64% of hospital CIOs and 68% of managers plan to increase HL7 integration activities/efforts in the next 12 months. The majority of CIOs and managers said that healthcare integration is integral to all of their priorities.

Q3 2011 Core Health Technologies 2011 HL7 Interface Technology Survey As a result of the many variances and adaptations of the HL7 standard, there's no truly standard way that systems are implemented and data is handled. In response, analysts and interface engineers are forced to undertake lots of manual, tedious work: read the specification document, ask the customer for feedback, and hope to catch major differences between the two. This assumes the spec is available, which is often not the case. Even when a spec is available, it's often not up to date.

It's no wonder analysts and interface engineers frequently refer to themselves as pipe counters: each HL7 message is a long string with each section delimited by a pipe. To validate data, technical consultants and teams spend inordinate amounts of time counting pipes instead of tackling a known list of what needs addressing.

#### **Trial and Error Has Run Its Course**

To make matters worse, this arduous process only addresses the first phase of an interfacing project. By basing this process on manual efforts and trial and error, organizations set themselves up for issues every step of the way.

Today's interfacing is already causing customers and vendors to miss deadlines and fail to satisfy critical organizational needs. With the tidal wave of data coming about due to initiatives such as Meaningful Use – which will force data integration among numerous systems – the problem will only be exacerbated.

Relying on trial and error and hoping to make deadlines is no longer sufficient. After all, interfacing is often on the critical path within an implementation project. Improving the interfacing process can boost the overall effectiveness of implementations, leading to better use of project resources, and higher levels of hospital user adoption and customer satisfaction.



#### Why the Interface Lifecycle Matters

Just as Application Lifecycle Management enables developers to implement high-quality solutions faster and operate them at lower cost, the same is true of Interface Lifecycle Management. Though the Interface Lifecycle Management term is new, the concept isn't. In fact, every time a hospital or healthcare organization needs to implement or deploy a new system, those in charge of implementing or interfacing the new system with existing ones need to go through the cycle shown in Figure 1.



*Figure 1. Every healthcare organization goes through the interface lifecycle management cycle at some point.* 

**Scoping:** In the scoping stage, the first step is to understand what systems are in place, what data is available, when it is available, and in what format. Management usually underestimates the amount of effort for this phase, assuming the HL7 standard helps streamline this process. But as discussed,



the standard is used in such a variety of ways that it provides just a loose framework, leading to lots of trial and error.

**Configuration:** The next step is to configure the interface, or build a bridge that connects two systems. In most cases, developers use an interface engine to handle the mapping and transformation of data from the source format to the destination format/semantic. Even with the use of an interface engine, correctly handling configuration requires strong and accurate analysis in the scoping phase.

**Validation:** In the validation phase, developers need to test the configuration before putting it into production. Some rely on a non-formal approach, creating fake messages with information to test. In addition to being time-consuming, this approach can lead to further complications. If the underlying analysis isn't strong, the configuration and subsequent validation won't be correct. Moreover, organizations may not discover gaps until the system is in production. This is especially true if the developer used a small sample of messages for testing. Such issues affect data quality, user adoption, and potentially quality of care. Moreover, they delay the interfacing project. Worse yet, organizations can't predict when the project will conclude because it's impossible to anticipate the defects they'll uncover.

After Go-Live, Monitoring: Once a system is in production, someone needs to monitor for defects that may have been missed earlier in the process and to ensure all runs smoothly if codes are added to systems after go-live. At the same time, the migration of any system associated with the integration can impact data exchange and formatting, and how these are handled at the interface level. Due to resource constraints, some organizations take a reactive approach to interface monitoring, simply waiting to see if end users experience problems with the system. Even then, they struggle to address all issues because the required information from the scoping stage is trapped in emails and spreadsheets. Similarly, they find it difficult to manage these issues because they rely on emails and spreadsheets to track and communicate about them. This approach minimizes the ability to exchange and reuse information, and makes it hard to keep people in sync.

**Maintenance and Support:** In addition to monitoring for defects, someone needs to ensure that the system works as expected on an ongoing basis and



that steps are taken to address any defects, whether that means adjusting the system configuration or conducting more analysis.

**Upgrade Decision:** An organization may decide to migrate to a newer version of a system for added benefits. In making the decision, it needs to evaluate what must change within the existing interfaces, and the entire interface lifecycle starts again.

The key challenge in managing this lifecycle is that different people may lead each activity. Plus, without a true standard to work from, developers are resorting to many manual processes and lots of trial and error to bring projects to completion.

#### Launch Interfaces into Production Faster

Forward-thinking vendors and hospitals are moving away from trial and error and adopting Caristix software, which streamlines the entire interface management lifecycle, bringing new efficiencies to existing integration investments. The following outlines the capabilities of Caristix software.



Figure 2. Caristix provides a collaborative platform that streamlines the entire interface management lifecycle.



**Automate gap analysis:** With Caristix software, developers can create a machine-readable HL7 conformance profile that reflects the customer's environment. This can be shared in a Word report so analysts, developers, tech support reps, and customer stakeholders are all on the same page.

Validate complex interfaces with realistic test plans. By effectively managing the scoping stage, organizations set themselves up for fewer issues to correct once systems are in production. After all, better analysis in the scoping stage arms developers with a larger data set and the ability to more easily identify a greater number of test cases. This leads to better configuration and fewer oversights. Instead of making up test cases arbitrarily and wasting time testing irrelevant scenarios, interface analysts can use Caristix software to automatically create messages that take into account the gaps identified in the scoping stage. Plus, they can conduct standalone, repeatable testing before implementation, as well as testing once the interface is integrated into a full-fledged staging system.

**Use realistic data while ensuring privacy:** Caristix software de-identifies protected patient data at the source, in HL7 logs and message flows, producing auditable reports after each de-identification. Developers can easily generate clinically valid data for interface development, testing, and analytics — and remain compliant with HIPAA policies and procedures.

**Streamline troubleshooting:** When troubleshooting an HL7 interface, it can take hours just to find the problem message. With Caristix software, information from every stage of the interface management lifecycle is readily available in a central repository, easing collaboration and troubleshooting. Plus, Caristix software is like an x-ray machine that reverse-engineers data. It provides insight into the structure and content of data, and makes it possible to surface and freeze evidence in a useful form. Moreover, it helps sift through days or weeks of HL7 message logs in mere minutes.



"We were aiming to cut 20 to 25% off our troubleshooting time. Instead, Caristix software enabled our interface engineers to streamline troubleshooting much more significantly. In one case, what was a 2 hour task now takes just 10 minutes."

Barry Holleman VP Clinical Technologies Cardinal Health Canada

# **Conclusion: Move from Trial and Error to Predictable Outcomes**

When it comes to developing and integrating interfaces, trial and error is increasingly problematic. After all, it's time-consuming and leaves much to chance, leading to drawn-out project timelines. Plus, it's certainly going to get tougher to sustain such an approach to interfacing once Meaningful Use forces further data integration, with multiple sources of clinical data coming into and going out of the EHR and other information systems.

A couple of decades ago, interface engines greatly improved interface integration. The next revolution comes from automating the manual scoping and configuration work involved in interfacing, leaving integration analysts free to add value on other, more complex data integration projects.

Caristix streamlines the delivery of interfaces that support the flow of data in healthcare, empowering vendors and providers to scope HL7 interface requirements more quickly before coding, test more thoroughly before golive, and troubleshoot over the interface lifecycle. The benefits include lower interfacing costs, faster time to value, and reduced process waste and risk. At the same time, vendors can avoid the risks associated with project estimations, namely lost revenues. By tapping into the history and analytical capabilities within Caristix software, they can better estimate timelines and costs for similar projects, leading to higher margins and happier customers.

Ready to streamline your HL7 interfacing projects?

- <u>Watch this 2-minute video</u> on how Caristix Interface Lifecycle Management can help.
- <u>Request a demo</u> of Caristix technology.



#### **About Caristix**

The average US hospital runs up to 100 IT applications. Not a single one of them can share patient information out of the box. So hospitals and vendors turn to data interfaces – 50 to 100 of them in an average hospital. Each interface can take months of painstaking manual work to set up.

Caristix has developed a software suite to automate manual interface work. Our software reads HL7 data and outputs a list of interface requirements. As a result, Caristix software can reduce months of work to a few days. Reduce interface deployment time by 50%, reduce hospital testing time by 75%, and cut interface maintenance time by 90%.

Learn more at <u>www.caristix.com</u>.

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