

## NINE QUESTIONS TO ASK BEFORE REPLACING AN INTERFACE ENGINE

*Choosing a modern integration platform for your healthcare enterprise*

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## Introduction

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In healthcare, the outcome of a life-or-death decision can depend on the available information. To help deliver the right information at the right time and place, healthcare organizations traditionally have used HL7 interface engines to share data among clinical applications.

But the world of healthcare information technology is changing so rapidly that HL7 interface engines are no longer sufficient. The technology landscape now includes new protocols and architectures, and the business environment has changed as well. Health information is being shared across broader populations of users and organizational boundaries. Clinical and administrative staffs need more information, faster, to improve patient care and control costs. And real-time analysis of information flowing through a hospital's applications is essential for improving care and the organization's financial health.

To meet these needs, a new class of advanced integration platform is replacing legacy HL7 interface engines and enabling the creation of connected healthcare environments. The best products in this class provide a range of capabilities for connected healthcare in a single, coherent package. They enable interoperability of systems from the emergency department to the billing department, from the chief medical officer to the office of the chief executive, and out through the healthcare community.

This white paper provides a guideline for selecting a modern integration platform to replace a legacy interface engine. Through a series of 9 key questions it will help you to clearly define your selection criteria and the important architectural components to consider. This clarity is especially important when it comes to integration software. Far from being isolated applications whose strengths or weaknesses will have little effect on others, integration platforms will seamlessly connect applications, people, processes, and information across your organization. Asking these questions up front will help your organization identify the appropriate integration solution for its needs, save time and money, and reduce risk.

## Basic questions that integration platform vendors must address

### 1. How reliable?

No matter how much you harden your information systems, something beyond your control might take them down. The Chilean earthquake of February 2010, for example, shifted the city of Santiago 10 inches to the west. It generated a blackout that affected 93 percent of the country's population, for several days in some locations. And the building that houses InterSystems' data center in Santiago was severely damaged. Yet the InterSystems Ensemble®-based healthcare information system hosted there was available the entire time, without loss of data, despite the shaking, structural damage, and power outage. This type of rock-solid technology foundation provided by Ensemble is absolutely essential in healthcare. Where lives are on the line, system downtime or data corruption is not an option.

Reliability means proven performance, guaranteed message delivery, and the ability to minimize downtime through automatic recovery from hardware failures without data loss.

*The InterSystems Ensemble rapid integration and development platform is built on InterSystems Caché database technology to minimize downtime and maximize performance. The reliability of Caché has been proven through use in over 100,000 systems worldwide, used each day by millions of people.*

*"When we first started with Ensemble, we had a seven year old server that we weren't using. We installed Ensemble on it and it ran for 2 years with no unscheduled downtime. Ensemble is a really solid application."*

*– InterSystems customer Metro Health (Grand Rapids, Michigan).*

*Ensemble saves all messages and queues in its embedded high-performance database. Even in the event of system failure this guarantees message delivery, ensures data protection, and enables Ensemble to automatically restart where it left off – without operator intervention. In addition, Ensemble provides several state-of-the-art options for high availability and disaster recovery.*

### Proven performance

Mission-critical infrastructure technology, such as an integration platform, must be proven in wide-spread use, in complex as well as simple integration environments. And it must operate without undue complexity, which can hinder manageability, lead to instability of integrated systems, and give rise to recurring "fires" to extinguish.

### Guaranteed message delivery

Critical healthcare data must always be available at the point of care, exactly when needed. You can avoid data loss and message delivery delays if your interface engine replacement includes a high-performance embedded database.

### Minimizing downtime

In the event of a hardware failure, power loss, or other adverse event, the integration platform must provide recovery options to match your service-level goals and tolerance for latency.

## 2. How scalable?

As your hospital or IDN grows, as medical devices are connected into EMRs, the messaging traffic your integrated systems must support will increase dramatically. Some healthcare organizations already are handling message volumes that would have been unheard of five years ago. For example, Cedars-Sinai Medical

Center, in Los Angeles, is processing an average of 6 million HL7 messages per day, plus non-HL7 messages such as X12 and custom formats, through InterSystems Ensemble. And going forward your integration platform will be called upon more often to process large and complex HL7 v3, CCD, IHE profile, and other XML-based documents.

Addressing this issue by building larger server farms is good for the hardware vendor, but not for your organization. It only adds to the complexity of your IT environment, and complexity is the enemy of uptime. It's crucial that the integration platform you select uses computing resources efficiently, and can provide cost-effective scalability.

*In a 2010 benchmark test on a commodity 2 CPU system\*, using a complex workflow that included data transformation and rules-based message routing, Ensemble sustained a rate of 326 inbound and 1304 outbound HL7 v2 messages/second. This combined rate of over 50,000,000 messages per 10-hour day clearly demonstrates that Ensemble can provide the scalability needed to manage large connected healthcare systems, and millions of messages, even when running on commodity hardware. Throughout the tests, Ensemble preserved a first-in, first-out order of messages, and stored the content and status of all inbound and outbound messages, and queues, in its embedded database.*

## 3. How easy is development?

Developing a connected healthcare environment is more complicated than just creating HL7 interfaces. But that doesn't mean the development platform must be complicated. Look for a platform that provides:

- A single, consistent, graphical development environment
- Creation of HL7 interfaces without programming
- The ability for sophisticated users to extend functionality of the system without resorting to an external development environment
- Graphical tools for business process modeling and orchestration, business rules, workflow, and data transformations
- Rule-based message routing

*Ensemble includes advanced technology aimed at simplifying development. Its internal object technology enables use of the same graphical development environment to create interfaces for solutions using HL7, X12, XML, SOAP, SQL, and other standards. This minimizes the learning curve, and reduces complexity for users of Ensemble.*

*From messaging to composition to process orchestration and business activity monitoring, Ensemble simplifies and accelerates modeling and automating of business processes. And it enables extremely rapid service-oriented development of integration solutions.*

\*Dual hexa-core, Intel Xeon X5670 "Westmere" processors (total of 12 cores @ 2.93GHz, 2 chips, 6 cores per chip, 2 threads per core), with 32 GB RAM. The OS used was Red Hat Enterprise Linux Server release 5.5 (Tikanga).

#### 4. How easy is management?

A solution is developed once, but the need to manage it is long term, making ease-of-management a critical selection factor. The less time key developers have to spend diagnosing and fixing operational problems within an integration solution, the more time they'll have to spend on clearing your development backlog.

Connected healthcare solutions can be difficult to manage, because they link disparate application components, often spanning multiple hardware platforms, operating systems, and technology frameworks. The integration platform should provide a single, consistent management portal to view, monitor, and manage all components of such solutions.

Features to look for include:

- Dashboards for viewing system status at a glance.
- Automated alerts via email, phone, or other means upon detection of significant events. An event may be when something has happened (a message queue has exceeded its limits for that day and time), or something has not happened (there have been no messages from the emergency department in a given period of time). Alerts should enable operators to quickly understand the problem and provide a fast way to diagnose and fix it.
- The ability to aggregate, analyze, and report on messages flowing through the system without resorting to external database and analysis software.
- The ability to stop, start and upgrade individual interfaces while the system is running.
- The ability to trace any message through the system, to see how it is transformed at each stage, any errors associated with it, and the duration of each step in the process.

*Ensemble provides intuitive, browser-based, end-to-end configuration and management capabilities. These features enable rapid problem identification, isolation, and resolution from a central console in any secure location. Ensemble Visual Trace, graphical dashboards, its rules engine and alert mechanisms provide immediate notification of existing or potential problems.*

*Ensemble's embedded database automatically stores the content of all messages passing through integrated systems, and relevant meta-data. This data is available for business activity monitoring, for operational insights using Ensemble's optional real-time business intelligence component, or for access by third-party SQL reporting tools.*

## 5. How good is support and how accessible is the vendor?

*For over 30 years InterSystems has provided high-performance database, integration, and development technologies for healthcare. InterSystems has a reputation for excellence in customer support. InterSystems' Worldwide Response Center provides expert technical assistance to customers 24 hours a day, every day. Headquartered in Cambridge, MA, but with personnel based in cities around the globe, the Worldwide Response Center provides expert, multilingual, 24 x 7 support for Ensemble and InterSystems' other products.*

Vendor support for any mainline application in healthcare is critical. It's even more critical for integration solutions that unite multiple applications and Web services. Ask other users of the integration software about the level of knowledge and dedication of the vendor's customer support personnel. Will you be able to immediately reach an engineer by telephone, 24/7, who knows your situation and understands healthcare? Does the vendor have support specialists in your time zone?

***"To exploit its legacy business value and meet future interoperability demands, an HDO [healthcare delivery organization] should move beyond intelligent messaging and data integration. It should deploy a next-generation integration platform from established enterprise application integration vendors with solid healthcare experience."***

– Barry Runyon, Gartner, Inc., in *Hype Cycle for healthcare Provider Technologies and Standards, 2010*. July 26, 2010.

## Questions to take your business forward

Ask the following questions to ensure that your interface engine replacement enables you to do what you *can't* do today.

### 6. How does the vendor define "advanced"?

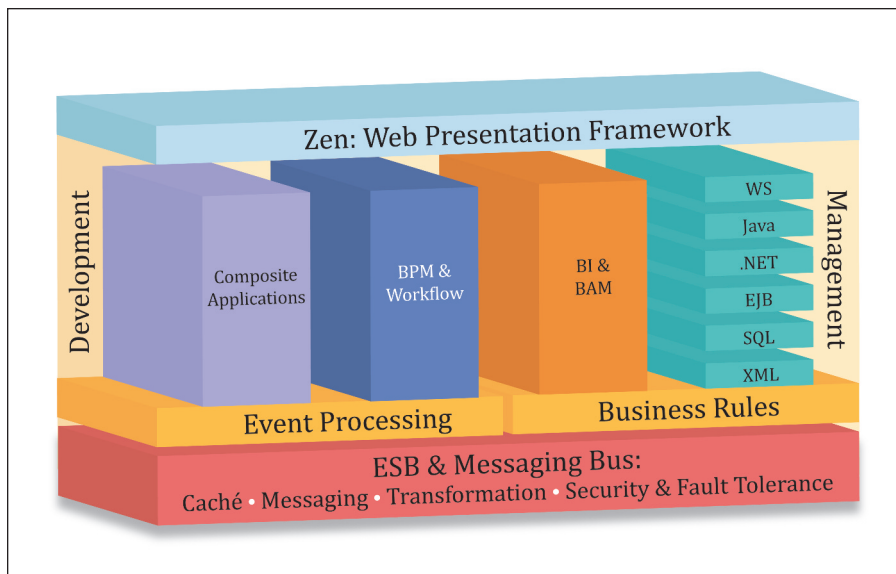
*Ensemble is an advanced yet easy-to-learn and easy-to-use platform that provides all the functionality needed to create a connected healthcare environment. For example, Ensemble can help consolidate patient information from many sources throughout the healthcare organization and present it in a patient portal. The portal could allow a patient to not only see her lab results on a smart phone, but also to see that she is overdue for a pap smear, schedule an appointment, and pay a bill from that same device.*

Will the technology you select today to replace your interface engine also enable you to face tomorrow's challenges? Driven by the ARRA and HITECH acts in the U.S., and government calls for higher efficiency in other countries, one of those challenges is to deliver better, safer care, at lower costs. An advanced technology will provide the functionality you need to create a connected healthcare environment to meet this challenge, and many others.

It takes more than HL7 messaging to enable connected healthcare. An advanced integration platform will provide:

- Support for a wide range of communication standards and development technologies, *and* a world-class HL7 interface engine
- A development environment optimized for creating connected healthcare systems using service-oriented and event-driven architectures
- Business process automation capabilities, including human workflow and business rules engines
- Business activity monitoring (BAM) and business intelligence (BI) capabilities
- An embedded database management system for storage of messages and meta-data, and to function as a source of information for BAM and BI
- End-to-end management





*Ensemble includes all the technology needed for efficient creation of connected healthcare solutions. In operation, Ensemble is a single technology stack with one consistent GUI and one rapid learning curve.*

*Ensemble's high-performance messaging engine, guaranteed message delivery, reliability, business process management features, end-to-end management, and support for a wide range of standards ensure successful integration with external organizations. In addition to HL7 v2 and v3, and exceptional handling of XML, Ensemble supports most of the standards, protocols, and profiles now gaining importance in healthcare including SOAP, WS-Security, WS-Policy, IHE profiles, and CCD. B2B standards supported include ebXML, X12, EDIFAC, Kerberos, SSL/TLS, X.509, and HTTPS.*

*Ensemble's embedded high-performance database is key to its robust capabilities in B2B use cases as well as exchange of clinical information. It automatically stores every message flowing through integrated systems, as well as current system state. This, combined with a range of automatic failover features, ensures that data is never lost, and an interrupted business process of any duration can resume exactly where it left off.*

## 7. How interoperable is the integration platform?

Going forward, your organization will need to exchange health information electronically more broadly – with external physicians, labs, public health agencies, and insurance companies, for example. And the capability to integrate your business processes with supply-chain partners (a supplier of hospital consumables, for example) is becoming increasingly important as a parallel route to higher efficiency and lower costs. Having one integration platform that can address clinical and business-to-business (B2B) use cases will increase the efficiency of your IT group while reducing the complexity of your IT environment.

*InterSystems Ensemble provides two paths to real-time insights. Both work with live data captured by Ensemble and without the expense and management overhead of a data warehouse.*

*One path is with Ensemble's optional InterSystems DeepSee™ real-time business intelligence software. Embedded in hospital business processes, DeepSee can deliver actionable insights for all levels of workers – from physicians and nurses to procurement and management personnel. DeepSee can operate on the information in the Ensemble database at the heart of your integrated systems, on the Caché databases inside the applications your organization already may use, and on information Ensemble can draw as needed from other data sources.*

*The other path is via Ensemble's sophisticated built-in business activity monitoring (BAM) capability. Ensemble BAM can track key performance indicators of the system itself, display that information in graphical dashboards, and kick off alerts to system administrators or other personnel based on user-specified thresholds and events. In addition, Ensemble can take programmatic actions based on events (such as a message queue exceeding its limit, or a business process taking too long) without operator intervention.*

*Consider the long-standing commitment of InterSystems to healthcare, to product innovation, and to backward compatibility. For more than 30 years InterSystems has been one of the world's leading providers of database and integration technology for healthcare. Our customers have grown with our software, and our software has advanced with our customers. Our commitment to the success of our customers has won InterSystems a worldwide following.*

## **8. Can the integration platform provide operational insights?**

To gain insight and maximize hospital performance, your organization needs to analyze up-to-the-minute information from potentially hundreds of separate applications. An integration platform, operating at the heart of a connected healthcare environment, is the central location where this information naturally comes together. An integration platform with an embedded database, and the power to automatically persist all message traffic, is the ideal data source for analytics solutions.

Data warehouses and retrospective reports that tell caregivers and administrators what happened last month, or last week, aren't good enough. To optimize processes and decisions in the chaotic environment of healthcare you need to deliver real-time information and insight.

## **9. Does the product have a growth path?**

Once you've set off on the path to connected healthcare, will your chosen integration platform be able to keep up with you? Will it grow with you? Make sure the vendor has a positive track record in healthcare and an ongoing commitment to product innovation and backward compatibility. You don't want your progress stifled because your vendor "sunsets" the product you've chosen while it still shines in your organization. The product you choose should enable you to deliver solutions and meet changing business requirements over the next 10 years or more.

## **The final questions**

This is the time to gather input from other healthcare organizations using the product under consideration. Has the product lived up to the vendor's claims? Has the vendor been there for them before, during, and after product rollout? Has customer service exceeded their expectations? We're confident you will like the answers you get from our Ensemble customers.

To learn more about Ensemble, please call us at 1.800.753.2571 from the US or Canada. From other locations call +1.617.621.0600, or visit [InterSystems.com/offices](http://InterSystems.com/offices) to find an office near you.

The logo for InterSystems, featuring the word "INTERSYSTEMS" in a bold, blue, sans-serif font. The letters are spaced out, with "INTER" and "SYSTEMS" being larger than the "S" in between.

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