

Healthcare IT Breakthrough: Evolving to Advanced Integration Technology



A business case for the transition from eGate to InterSystems Ensemble®

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From interface engine to integration platform

Healthcare IT is evolving so rapidly that the term “HL7 interface engine” may soon become extinct. Forces driving this evolution include:

- Government and markets pushing hospitals and integrated delivery networks (IDNs) toward broad-based health information sharing, within and between organizations
- Clinical and administrative staffs needing more information, faster, to improve patient care and control costs
- The need for real-time business intelligence capability to measure progress toward goals, whether Meaningful Use objectives or the organization’s own patient care, safety, and profitability targets

Legacy interface engines, such as eGate, simply do not have the architecture or capabilities needed to adapt to these forces. Instead, healthcare IT organizations are turning to a new type of integration and development platform.

The platform must be a world-class HL7 interface engine. But it also must support a range of other data interchange and messaging standards (such as XML, X12, and SOAP) and provide rapid development of connections to data sources and applications that don’t “speak” HL7. The integration platform should be a central resource that stores all the messages that pass through it for concurrent or later analysis by business intelligence applications. And it must be ready to support new types of integration and process automation as you bring them into your IT infrastructure. This includes service-oriented architecture (SOA), event-driven architecture (EDA), business process management, and adaptable workflow.

The limitations of legacy interface engines in meeting these new requirements make the need to replace them increasingly urgent. Using examples from six healthcare organizations, this document presents a business case for replacing interface engines, like eGate, with the advanced capabilities of the InterSystems Ensemble rapid integration and development platform.

Complete more projects, faster

After a thorough review of products on the market, the choice for Metro Health was whether it should switch to eGate’s then successor, ICAN, or upgrade to Ensemble. Main motivations for Metro Health’s choice of Ensemble were its speed of interface development, and its well integrated set of application integration and business process automation features. These features enable Metro Health to take integration, and the IT systems of its medical campus, well beyond interfacing. For Metro Health, and for other organizations presented in this document, Ensemble is a strategic technology supporting new directions in connected healthcare IT.



“Our study of InterSystems Ensemble revealed software that would enable rapid connectivity and interaction with virtually all of our applications and data repositories. Equally critical, Ensemble offers a development environment that supports continued growth with new processes and information.”

Bill Lewkowski, CIO, Metro Health

Moving past the limits of eGate

At Rush University Medical Center, limitations of its eGate interface engine drove the transition to a new technology. The version of eGate in use didn't provide adaptors for technologies such as SOAP and XML, and the eGate upgrade path would have required a total rewrite of all interfaces. Instead, Rush switched to Ensemble for increased developer productivity, superior operational monitoring, and architectural flexibility – all critical qualities in the medical center's high-availability environment.

“Based on benchmarking the development process, Ensemble clearly enables higher productivity than the other products we evaluated. Ensemble also provides the ability to track transactions at a level of detail that we view as extremely important.”

Scott Finkle, Director of Development, Architecture and Integration, Rush University Medical Center

A compelling ROI

Speed of development and ease of management with Ensemble enable interface specialists, other developers, and administrators to accomplish tasks in less time. This time savings translates into money saved, for a return on investment, in Metro Health's case, of less than one year. But the complete business case for Ensemble, and an even more compelling ROI, is made from considering broader productivity increases and resulting business gains realized in three areas: development, post-development, and future expansion enabled by an advanced integration platform.

Development productivity gains

Ensemble's comprehensive and consistent architecture delivers breakthrough time-to-solution for messaging or complex integration and development projects, and dramatically reduces the management overhead associated with loosely coupled, service-oriented solutions. Ensemble's single, unified development environment leverages a powerful underlying object model, and the InterSystems Caché® database, to provide a consistent interface and development platform across the widest range of project types.

Ensemble's unique object abstraction and virtualization technology provides rich bi-directional support for Web services, Java, and .Net, delivering the greatest range of choices for the application developer and system integrator.

Rapid development dividends

The rapid development capabilities of Ensemble lead to more solutions getting into production use sooner and delivering their intended value to the enterprise. For example, George Washington University Medical Faculty Associates (MFA), a large medical group practice in Washington, DC, used Ensemble to build a management information portal, in about one month, that had an immediate, positive impact on the business.

This browser-based portal draws live financial and other operational data from nine separate sources, including MS Excel and applications based on Caché, Oracle, and Microsoft SQL Server databases. The portal presents a consolidated view of the information using Ensemble's built-in business activity monitoring and dashboard capabilities.

“We wanted to develop and deploy a dashboard solution in thirty days. All the data was there already, so why not? We just needed a product powerful enough and easy enough to use to make it possible, and that was Ensemble. Providers now check the dashboard first thing in the morning and last thing at night, measuring and managing their productivity on a day-to-day basis.”

Praveen Toteja, CIO, Medical Faculty Associates



Messaging

When used to build HL7 interface engine solutions, customers have reported dramatic reductions in interface development time with Ensemble, and message throughput and data integrity to satisfy the most demanding of environments.

“Our interface specialists say Ensemble enables nearly three times faster interface development than eGate, and provides message persistence which is lacking in eGate. Ensemble processes messages over 200 percent faster while providing nearly effortless FIFO setup as compared to eGate.”

Bill Lewkowski, CIO, Metro Health

Physicians and administrators now monitor up-to-date consolidated financial and operational information on the practice, departmental, and individual levels. Comparing key performance indicators to established goals, these users drill-down into the consolidated information to look at details and make immediate adjustments in their day-to-day work.

The payoff from this Ensemble application was rapid and dramatic.

Since the portal rollout, all departments have met their monthly and annual budgets, and new charges have risen. For example, in one month shortly after rollout in 2005, charges increased \$466,000 over the same month in 2004, representing a very rapid return on MFA's Ensemble investment. For that month and the next, combined charges were up \$1,400,000 compared to the same months in 2004. The business value MFA derived from Ensemble, and the organization's ROI, has gone well beyond what time savings calculations alone would yield.

At Metro Health, for example, the time taken with Ensemble to build an HL7 v2.x message structure was 1.7 hours, exclusive of testing and documentation. It took 4.8 hours using eGate. In both cases this included defining and documenting the transformation logic, defining filtering logic and routing rules, configuring FIFO setup, and defining the interface and its IP address and port for a McKesson Start 2000 ADT A01/A08 message to a GE Centricity Ultra system. Metro Health determined that upgrading its interfaces from eGate to ICAN would take 33% longer than it did originally to create them with eGate – or about 6.4 hours per interface compared to 1.7 hours with Ensemble.

Composite applications

When used for initiatives that span multiple systems using different development and integration technologies, such as electronic health record (EHR), regional or national health information exchanges, and bio-surveillance, Ensemble's advantages become even more apparent. Ensemble's powerful object model and abstraction technology enables composite application development with consistent messaging, business rules processing, workflow, alerting, and real-time business activity monitoring across all the disparate systems involved.

Ensemble's unique "single stack" architecture avoids the need for IT to integrate separate development and integration tools, enables a single, rapid learning curve, and dramatically reduces time-to-solution, management overhead, and long-term cost of ownership.

"We chose Ensemble because it is an extremely tightly integrated engine, and is much quicker and easier to use than other products, allowing us to rapidly set the project in motion due to our tight timescales. It is a strong design environment and doesn't leave the user to grapple with disparate utilities – everything you need can be found within two tools. This means, for example, that we don't have to write as much code as before, which gives us a massive jump-start..."

Mike Eagles, Head of Software Development, Barts and the London NHS Trust

A virtuous circle with Ensemble

The positive kick-start Ensemble provides to projects impacts the economic landscape of a healthcare organization, and not just the IT environment. By addressing the broadest range of integration and business process challenges with a single, comprehensive product, your projects can incorporate systems based on multiple infrastructure technologies and programming languages, components developed can be re-used in additional projects, professional services costs are reduced, and developers have only a single learning curve.

"We were looking for a vendor that is both solid and innovative and an integration platform that does more than just interface...one that will enable other technology products in an innovative way. InterSystems and Ensemble are the right combination."

Bill Lewkowski, CIO, Metro Health

At Partners Healthcare, a leading Boston-based integrated healthcare delivery network, a key project encourages electronic medical record (EMR) adoption by all community physician practices in the Partners system. Operating under tight deadlines, Partners uses Ensemble to rapidly integrate data from a variety of community-physician practice management and scheduling systems, as well as third-party laboratory systems, into Partners' internal EMR. Ensemble also integrates this information with

Partners' enterprise master patient index application to ensure consistent identification of patients between the external and internal medical records systems. Community physicians access this EMR, as well as Partners' clinical data repository, via a Web interface.

The result is a system that literally keeps everyone on the same page, while allowing for diversity of medical records and scheduling systems at each community practice. All parties now benefit from easy access to complete patient information. This increases physician productivity and makes for better medical decisions, better clinical results, and higher customer satisfaction. As a result, Partners can attract more customers and generate higher revenue, which enables the organization to continue to improve its services and perpetuate this Ensemble virtuous circle.

"This project would have taken much longer without Ensemble's rich HL7 support. Ensemble has given us tremendous flexibility with data transformations, and made us much more agile in delivering on this type of integration. Plus, uptime and reliability of Ensemble has been superb. Based on our experience so far, and on our experience with InterSystems products throughout our organization, we expect this Ensemble platform to easily accommodate rising message volumes as we bring more medical practices onboard."

Steve Flammini, CTO, Partners Healthcare

Post-development gains

Enterprise integration solutions can be the most difficult type of systems to manage, because they link disparate application components, often spanning multiple hardware platforms, operating systems, and technology frameworks. Ensemble's built-in, persistent message warehouse, its rules engine, and a well designed, easy-to-use management interface reduce administration and maintenance costs, and enhance the value of projects. Ensemble provides complete reporting and analysis capabilities for message contents that flow through the solution, and operational statistics about the solution itself.

“Requirements for rapid integration, sophisticated, end-to-end management capabilities, and a real-time message warehouse drove our move to Ensemble.”

Bill Lewkowski, CIO, Metro Health

Business rules

Non-programmers, such as business analysts and support personnel, can use Ensemble’s rules engine to configure and change message routing and filtering rules in a matter of minutes. This reduces the cost of making such changes. It also frees programmers to focus work on new projects – reducing backlogs and delivering value, sooner.

Reliability

The loss of data integrity in a healthcare information system is unacceptable, as is the potential cost. The same applies when critical data is not available when needed at the point of care. Ensemble’s high-performance, persistent message warehouse enables reliable and rapid FIFO-guaranteed messaging. This increases the quality of service by ensuring data integrity, and by guaranteeing that vital information is promptly and always available to clinicians.

Cost savings accrue by avoiding the time it would take to resend messages, check and test the system, involve application specialists to help identify the problem, and so on. Additional benefit from Ensemble is realized by avoiding the potentially tragic cost of medical errors and their negative impact on the healthcare institution’s reputation.

Troubleshooting

Ensemble provides intuitive, browser-based, end-to-end configuration and management capabilities. These features, including Visual Trace™ of message paths, business activity monitoring, graphical dashboards, event processing, and alerting, enable rapid problem identification, isolation, and resolution from a central console in any secure location.

“End-users are automatically notified and everyone in the affected departments as well as the IT staff is aware when interface issues arise. If, for example, an order is placed for a lab test for a person coming into the emergency room, the clinicians are automatically informed if the lab application is unable to receive the test order. In a scenario such as this, the clinicians will call in the order, eliminating wait time that can be critical in emergency scenarios.”

Michael Keselman, CTO, Stanford Hospital and Clinics

Immediate awareness of developing problems, and the ability to rapidly diagnose and correct them, avoids costs estimated in the tens of thousands of dollars a year to medical centers.

“Ensemble’s Visual Trace tools and integrated object database make it easy to determine when and why a record from any of the integrated data sources didn’t reach its appropriate destination. This can be done dynamically in real-time, which is a major improvement over the logs typically provided by other integration products. Instead of a cumbersome, time-consuming manual search, problems can be identified and resolved very quickly.”

Bill Lewkowski, CIO, Metro Health

Hardware cost reduction

Ensemble’s efficient performance and use of storage reduce capital and ongoing maintenance costs while increasing scalability to support many thousands of users. Superior performance and scalability reduces hardware costs, facilitates economies of scale, and reduces long-term cost of ownership.

“We found that Ensemble could run as fast as we needed on a straightforward and easy-to-manage configuration which supports the performance and scalability demands of the NSP [Netherlands National Switching Point health information exchange].”

Bob Schat, Solution Architect, Computer Sciences Corporation



The future

Healthcare IT management faces many ongoing challenges. Among them, the most significant are:

- Optimizing workflow throughout the enterprise, including financial and administrative functions, eliminating manual exchanges of data and opportunity for error
- Health information exchange with other healthcare organizations
- Reducing the number of point-to-point interfaces that must be developed, tested, managed, and maintained, while enabling best-of-breed purchases
- Capturing the valuable information in messages that pass between systems, so that it can be used for real-time business intelligence

Unlike legacy interface engines, Ensemble, with its advanced integration and business intelligence capabilities, can meet these challenges. The fact that Ensemble is a tool for improving hospital workflow and processes, and not just for creating interfaces, has not been lost on leading healthcare institutions. These enterprises expect a significant return from Ensemble that will be measured in more than just dollars.

Cedars-Sinai Medical Center, for example, switched from eGate software, motivated by speed of development and Ensemble's ability to address the entire range of its requirements. Cedars-Sinai sees Ensemble as a critical component of its long-term IT strategy.

"Our long-term strategy is aimed at building a single system environment for our clinical IT platform. Ensemble provides the extensibility, speed-to-deployment and wide choice of adaptors needed to replace the current integration engine and is critical to implementing our organization's IT strategic vision."

Darren Dworkin, CIO, Cedars-Sinai Medical Center

Going forward, your developers and business analysts can leverage skills learned with interface engines, and new Ensemble capabilities, to rapidly automate business processes and workflow, develop composite applications, portals, and executive dashboard solutions, and dramatically reduce the time-to-solution and costs associated with realizing your future IT goals.

About InterSystems

InterSystems Corporation is the worldwide leader in software for connected healthcare. With headquarters in Cambridge, Massachusetts, and offices in 25 countries, InterSystems provides advanced software technologies for breakthrough applications. InterSystems Ensemble® is a seamless platform for integration and the development of connectable applications. InterSystems CACHE® is a high performance object database that makes applications faster and more scalable. InterSystems HealthShare™ is a platform that enables the fastest creation of an Electronic Health Record for regional or national health information exchange. InterSystems DeepSee™ is software that makes it possible to embed real-time business intelligence in transactional applications.

For more information, visit **InterSystems.com**.

Advanced software technologies for breakthrough applications

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The logo for InterSystems, featuring the word "INTERSYSTEMS" in a stylized, blue, serif font. The letters are bold and have a slightly irregular, hand-drawn appearance.