

ENSEMBLE WHITE PAPER

EVALUATING INTEGRATION SOFTWARE

InterSystems
ENSEMBLE[®]

INTRODUCTION

We created this white paper to help senior IT leaders and business managers who are evaluating integration software. On the following pages you will find descriptions of thirteen technical selection criteria, and you'll learn how they apply to Ensemble Rapid Integration Software from InterSystems.

PUTTING THE SELECTION PROCESS IN PERSPECTIVE

When purchasing any type of enterprise software, it's important to clearly define your criteria and the important architectural components to consider. But it's especially important when it comes to integration software. Far from being isolated applications whose strengths or weaknesses will have little effect on other applications, integration solutions (by their nature) are designed to intimately tie heterogeneous applications together. Defining the correct criteria by which to evaluate integration solutions can help organizations identify the appropriate integration solution for their needs, saving time and money while reducing risk.

With the advent of mainstream service-oriented architectures and the proliferation of Web services, many integration and development projects have converged. Existing products and technologies have proven unsuitable for delivering the new breed of solution resulting from this convergence. CIOs and System Integrators are now demanding a comprehensive platform that has the power to handle the full range of integration

and composite application development projects essential for the Real-Time Enterprise.

Ensemble is the only integration software to incorporate the functionality of an integration server, application server, high performance object database and a tightly integrated development and management environment in a single, architecturally consistent product. This unique fusion of technologies delivers an application integration platform that provides the power required to integrate the most complex systems with ease and efficiency.

Ensemble enables exceptionally fast integration as well as extremely rapid composite application development. Designed with today's service-oriented and event-driven architectures in mind, Ensemble excels at quickly building and deploying new business solutions that leverage the functionality of existing applications, orchestrate new business processes, and integrate data from across the enterprise.

CRITERION #1. ADAPTERS

Adapters are an integral part of all integration solutions. Adapters are programs that connect the integration platform to the applications and data that are being integrated. They work by speaking the native protocols of the target resources, and by exposing their underlying functional interfaces. The use of pre-built adapters greatly speeds up the integration process and significantly reduces the costs associated with writing code for each connection.

Ensemble uses pre-built adapters to communicate natively with a wide variety of applications, databases, and technologies. While each adapter has unique attributes – determined by the application, data source or technology to which it connects – all adapters share a common set of capabilities that ensure a simple, consistent integration model and provide reliable and manageable operations.

Ensemble's six adapter classes ensure the widest range of connectivity. Data Adapters link legacy pre-relational and relational databases as well as

object databases, such as Caché. Application Adapters link to popular enterprise applications, such as SAP, as well as specialty vendors, such as I2. Transactional System Adapters for systems such as Tuxedo and CICS, allow new applications to interact with legacy systems while maintaining the transactional integrity of the transaction processing system. Emulation Adapters link applications running on host computers, such as IBM 3270 systems, by simulating a series of keystrokes. Protocol Adapters link specialized (often industry-specific) protocols, such as HL7 for healthcare and SWIFT for banking. Technology Adapters link to everything from low level communications protocols to email systems.

While pre-built adapters can accelerate integration efforts, most projects also involve connections to unique applications for which custom adapters must be created. Ensemble delivers the fastest adapter development in the industry by using object inheritance and SOAP services to minimize the development effort required.

CRITERION #2. CONNECTIVITY

Once you have used an adapter to connect to a target resource (data or applications), you need an efficient way to move the target data between the integration platform and the adapter or between integration platforms deployed in a distributed architecture.

Ensemble provides connectivity to a host of legacy platforms and technologies through its extensive adapter library. Ensemble also supports

a variety of distributed configurations, both with multiple logical servers (separate instances of Ensemble operating on the same physical computer) and with multiple physical servers. Connectivity between servers is provided by Ensemble's built-in high performance distributed cache protocol (ECP) technology, as well as via standard messaging protocols such as WebSphere MQ and JMS.

CRITERION #3. INTELLIGENT ROUTING

Intelligent routing extends basic connectivity by enabling administrators to define routing rules and flows based on the content of the message itself, as well as message subscription. For years it has been an important part of products such as IBM's MQSeries (now WebSphere MQ) and TIBCO's Rendezvous.

Ensemble supports both content-based and publish-and-subscribe routing, as well as both synchronous and asynchronous application

integration. For asynchronous event-driven integration, Ensemble's powerful messaging system routes messages to specific business processes by message type, content and subscription. It includes queue management, guaranteed message delivery, and assured transactional integrity. Ensemble's routing and rules-based flow control capabilities are customizable and extensible, supporting both the simplest and most complex scenarios with ease.

CRITERION #4. TRANSFORMATION AND ONTOLOGY-BASED TRANSFORMATION

Since most organizations are using integration solutions to connect disparate heterogeneous systems, transformation services are a critical component. Transformation services refer to the ability of the integration platform to convert information and data from one format to another. For example, while you would use an adapter to retrieve data from an SAP system, that data would initially be in an SAP format. Transformation services would be used to convert the data from the SAP format to any desired target format – perhaps eliminating unnecessary fields,

appending additional characters, or performing pre-defined mappings – on the fly. Ensemble includes powerful data transformation capabilities to bridge differences in application semantics and data schemas. Transformations can use simple formulas or lookups in data tables (internal or external), and can be extended to any degree of complexity by adding customized functions. In addition to its wizard-driven transformation tools and highly optimized transformation engine, Ensemble includes a built-in XSLT processor for XML documents.

CRITERION #5. METADATA MANAGEMENT

Application integration platforms are designed to provide a common and consistent framework for integrating diverse applications and data sources, orchestrating business processes and developing composite applications. A shared metadata repository information about all the components that comprise an integration solution. It enables rapid and efficient sharing of information making it

possible to create a consistent set of interfaces to, and information about, each of components.

All integration components are stored in the Ensemble shared metadata repository, enabling faster integration, rapid development, easier management, and greater extensibility.

CRITERION #6. MESSAGE WAREHOUSE

Since integration platforms coordinate the flow of transactional data between disparate applications, as well as automate long-running cross-application business processes, it's critical to be able to monitor and audit these data exchanges. The message warehouse component of an integration platform provides the mechanism for maintaining a log or record of every message that passes through the system.

Unlike other integration products, Ensemble has a fast, scalable, object database "embedded" at its core. The Ensemble database supports tens of thousands of concurrent users and terabytes of data, with the scalability and reliability demanded of an enterprise system. It is the foundation for Ensemble's shared metadata repository, high performance message warehouse, and reliable state persistence for long running business processes and transaction compensation.

Through unique transactional bit-map index technology, Ensemble's message warehouse enables real-time access to both live and previously processed messages for business activity monitoring (BAM), auditing, and management. And, because the database is fully SQL-compliant, off-the-shelf query and reporting tools provide powerful auditing, investigative and analytical capabilities.

Integrated applications often have their own data storage requirements, ranging from cross-application indices that enable multiple applications to work together, to high-demand information for which legacy applications cannot provide adequate performance. Ensemble's "embedded" database meets this need with built-in storage capabilities, eliminating the cost and overhead of using a traditional database.

CRITERION #7. BUSINESS PROCESS MANAGEMENT

Business Process Management (BPM), deals with the modeling and automation of integrated application business functions in support of dynamic business process models. An area of primary focus for BPM is long running processes, which span multiple applications and often include human work activities. BPM requires that process states be maintained through the entire length of the process—be that hours, days, weeks, or months, and typically includes a modeling component that allows business users to define, view and manage complex cross-application processes.

Ensemble provides unique full-spectrum orchestration services to define process flow and integration logic via graphical diagrams, XML documents, and code. The ability to “mix and match” these three synchronized integration

approaches enables Ensemble to efficiently address the widest range of integration projects.

Using Ensemble’s built-in graphical modeling tool, business analysts can specify work and information flows with a focus on the logical interactions between source and target systems, freed of lower-level concerns about application interfaces, adapters, or middleware mechanisms. Ensemble’s XML orchestration – a superset of the standard BPEL document specification – enables Ensemble to work with third-party business process management tools. Finally, Ensemble’s code-based orchestration meets the demands of the most complex business process integration logic with a highly productive object-programming model.

CRITERION #8. BUSINESS ACTIVITY MONITORING

The aim of Business Activity Monitoring (BAM) is instantaneous awareness and appropriate response to events across the enterprise. Exploiting event-driven architectures, BAM solutions enable enterprises to remove delays in managing and executing their critical business processes. By providing business leaders with instant access to the real-time status of their enterprise-wide business processes – via dashboard style interfaces – BAM solutions reduce the costs and enable faster implementation of key business strategies.

At its broadest levels, BAM is the convergence of operational business intelligence (BI) and real-time application integration. Ensemble’s real-time data analytics and numerous notification mechanisms, coupled with broad based connectivity options, reliable messaging, an ultra-fast/ultra-scalable message warehouse and integrated powerful BPM tools, make Ensemble the perfect platform for building Business Activity Monitoring solutions. Ensemble’s dynamic Web technology provides a built-in development and deployment platform for portals, dashboards and other information delivery techniques.

CRITERION #9. BUSINESS-TO-BUSINESS CAPABILITIES

Business-to-business (B2B) integration is focused on efficient interactions among enterprises and their trading partners (i.e., customers and suppliers). B2B is therefore focusing on integrating applications and data sources external to an enterprise, while application-to-application (A2A) integration is typically focused on integrating applications and data sources internal to an enterprise. While B2B and A2A share many characteristics and it's sometimes hard to differentiate between the two at a higher level, there are definite distinctions. A2A integration solutions do not necessarily provide the appropriate capabilities needed for B2B, and vice versa. Among the key differences that organizations should examine are security standards, support for industry standards (such as Rosettanet), and support for B2B-specific capabilities such as trading standards and catalog information sharing.

In addition to addressing application-to-application (A2A) integration requirements, Ensemble is also well suited for business-to-business (B2B) solutions. Ensemble's comprehensive Web services support enables it to easily integrate business partners by exposing portions of any Ensemble integration process as a Web service. In addition, its broad range of adapters supports a variety of B2B-related protocols and applications (everything from HIPAA and HL7 to SWIFT and RosettaNet), reducing the time required to complete B2B integrations and decreasing project risk. It also provides robust security functionality, including support for a variety of standard-based security mechanisms such as authentication and authorization. Ensemble's integrated end-to-end management and monitoring supports the required tracking and management of business processes that is so critical in a B2B environment.

CRITERION #10. ADMINISTRATION AND MANAGEMENT

Management is one of the most important aspects when considering application integration solutions – both during the development and deployment phases. Integrated applications can be among the most difficult to manage, because they link disparate application components that were not designed to work together, often spanning multiple hardware platforms, operating systems, and technology frameworks.

To address the management challenge, Ensemble includes a built-in, end-to-end, management system that provides centralized configuration functions and exposes real-time status information.

Ensemble's management and monitoring portal is entirely browser-based and highly customiz-

able, enabling operations staff to “zero in” on critical resources and rapidly resolve any problems, locally or remotely. Ensemble's unique Visual Trace message tracking capabilities enable both developers and administrators to trace the flow of every message through the system. In addition, Ensemble supports popular third-party systems management products, as well as standard management API's such as SNMP.

Ensemble security is based upon a rich underlying framework with support for multiple authentication mechanisms (including Kerberos), built-in strong encryption functions, LDAP support, and flexible authorization for access to a variety of Ensemble-standard, as well as site-specific, resources.

CRITERION #11. WEB SERVICE SUPPORT

Web services are self-contained, self-describing application functions with well-defined interfaces that can be published across the Web. One of the main attractions of Web services is that they are based on industry standards and can be implemented on a wide variety of platforms without great difficulty. The ubiquitous nature of their underlying standards, coupled with the inherent simplicity of the Web services definition has made this service-oriented architecture implementation the most popular to date.

Web services can be built from scratch, composed from other services, or wrapped around existing application functions. From an integration perspective, Web services are well suited to real-time, request/reply exchanges between loosely coupled applications. They are eminently suitable for composite transactions – complex real-time processes that are represented as a single transaction – as they hide the complexity of the composition and integration behind the wrapper interface.

Key Web services standards are XML, SOAP, WSDL, and UDDI. XML provides a common language or interface among applications, while SOAP is an access protocol that enables different systems to communicate. WSDL is used to describe individual Web services so that other Web services or developers can access their functions, while UDDI is a centralized registry where Web services can be listed and accessed.

Ensemble is both a Web service provider and consumer platform. Any Ensemble method or business process can be published as a Web service. Ensemble supports assembly of Web services into composite, as well as orchestration of Web services using a superset of the BPEL4WS standard, and it supports UDDI.

CRITERION #12. OVERALL EASE OF USE AND POWER

No matter how sophisticated or powerful an integration solution is, it will not be a success if your developers can't use it effectively and efficiently. Thus, it's often important to step back from the detailed technical requirements when looking at an integration platform to consider how the overall product package enables (or inhibits) the rapid creation and easy on-going maintenance of a variety of different types of complex business integration solutions.

Ensemble is the only application integration platform to incorporate the functionality of an integration server, application server, high performance object database and a tightly-integrated development and management environment in a single, architecturally-consistent product. This unique fusion of technologies delivers an integration platform that provides the power to tackle the most complex integration tasks with ease.

Consider how Ensemble enables ease of use:

- **Consistency:** One data model, one metadata repository, one message warehouse, one database, one development environment – for adapters, transformation services, intelligent routing, business process orchestration, and composite application development – one management environment and one learning curve.
- **Partitioning of Labor:** Full-spectrum development environment supporting graphical BPM modeling tools (business analysts), document-based development (third parties via BPEL support), and code-based development (developers).

- **Language Support:** Ensemble supports ObjectScript and Basic for code-based development, a superset of BPEL4WS for business process orchestration and .NET and J2EE for composite application development. All languages can be mixed and matched and used where appropriate.

In addition, Ensemble abstracts all data structures, application interfaces, business processes and services as a consistent set of Ensemble classes. This efficient, unified representation of diverse technologies, data and programming models, removes the complexity and drastically reduces the time normally associated with integration projects.

Finally, Ensemble's single, easy-to-use environment for accomplishing all aspects of an integration project – from building adapters – to modeling and orchestrating business processes, to adding new functionality and developing user-facing composite applications – provides the power and ease to quickly integrate and rapidly develop the most complex business integration solutions.

CRITERION #13. FUTURE PRODUCT DIRECTION

While it's important to find an integration platform that complements the most important parts of your existing environment and that supports the technologies and standards on which you have built your IT infrastructure, it's also important to consider your future needs. IT infrastructures, applications, and technical standards change over time. Make sure to investigate the stated future architecture, standards, and product direction of potential integration products and map how closely they match your organization's strategic goals.

InterSystems understands that integration platforms, like businesses, can't stand still. That's why Ensemble is designed to solve today's integration problems, as well as tomorrow's. As industry standards such as Web services, BPEL4WS and XML evolve, Ensemble will evolve along with them. As the needs of the integration market develop, Ensemble will develop to support these new strategic business initiatives.

InterSystems is an established technology company, with over 25 years of experience providing high-performance development and data management products that power over 100,000 systems around the world. That's over 100,000 proven deployments of mission-critical applications that are used by over 4,000,000 people every day.

Ensemble continues InterSystems' long heritage of delivering powerful and innovative technologies that help organizations address complex problems quickly and easily. Ensemble will make it easier for organizations to embrace the real-time enterprise, regardless of changes in IT infrastructure, technology standards, or business drivers – today or tomorrow.

KNOW YOUR NEEDS

Selecting integration software will largely depend on your business or project goals, your current IT infrastructure, and your technology philosophy (build/buy) and resource (budget/ staff). It's also important to consider how your internal and external integration strategies and products are related.

Ensemble takes integration to the next level by enabling organizations to rapidly implement new business solutions that leverage the functionality

of existing applications, orchestrate new business processes and integrate data across the enterprise. Ensemble excels at enabling rapid creation of composite application – new strategic business solutions that integrate the functionality of existing applications, new business process logic, and data from across the enterprise. It's a comprehensive platform that delivers the capabilities required for the rapid implementation of even the most complex enterprise application integration initiatives.

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