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Butler Group
a Datamonitor Company

TECHNOLOGY AUDIT

Ensemble v4

InterSystems

BUTLER GROUP VIEW

ABSTRACT

InterSystems describes Ensemble as rapid integration software. Yet that simple phraseology does not adequately describe the range of functionality inherent within the product set. Ensemble has multiple layers and multiple levels; all contained within a single technology stack. At this level, Ensemble is not just middleware for integration, but a totally integrated solution for developing, deploying, and orchestrating service-oriented and process-centric applications. It follows a strong object model that makes it ideal for cross-platform integration, whether J2EE, .NET, Web, or legacy based. The core of the product is its high-performance object database that allows messages, object state, and metadata to be maintained within a central repository. Due to the process-centric nature of the integration methodology, users can create composite and service-oriented applications quickly and easily; carrying out integration at the most acceptable level.

KEY FINDINGS

- ✓ Strong object model built on proven technology.
- ✓ Implemented as a single technology stack.
- ✓ Object database maintains state.
- ✓ Unified/single development environment that is Windows based and a browser-based management environment.
- ✓ Strong elements of BPM and BAM.
- ✗ No true out-of-the-box drill-down and drill-through from the UI.

Key: ✓ Product Strength ✗ Product Weakness ⓘ Point of Information

LOOK AHEAD

The distinction between EAI, BPM, and BAM and the overall trend to SOA and EDA architectures, continues to overlap, and Ensemble addresses all of these topics. Ensemble states that it has focused its positioning as a combined rapid integration and development product, and it intends to strengthen its market position through enabling its usability and capabilities.

FUNCTIONALITY

Product Analysis

At a base level, Ensemble from InterSystems is best described as one product that comprises of a series of integration services that facilitate event-driven workflow, messaging, service-oriented application development, and business process optimisation. Ensemble has multiple layers and multiple levels; all contained within a single technology stack. At this level, Ensemble is not just an integration platform, but a totally integrated solution for developing, deploying, and orchestrating process-centric applications, and is particularly well-suited to application developers who want to rapidly create high-performance, 'connected' applications.

In many aspects, Ensemble could be considered as a Business Process Management (BPM) solution, yet to do so would be to ignore some of the extended functionality that the product has when compared to 'pure-play' BPM offerings. It is not intended as a BPM solution per se but does have strong elements of both BPM and Business Activity Monitoring (BAM); the latter of which is also found in 'pure-play' BPM.

Yet to consider it is as a *'pure-play'* integration solution, with an emphasis on connectors and adapters, and the less dynamic nature of many of these solutions is also to undervalue the benefits that Ensemble brings to market. In short, it is probably best to consider Ensemble as a process-centric integration platform that allows organisations to create dynamic (and static) couplings based upon a process paradigm.

Further functionality also exists within a messaging substructure, and analytic capabilities. Again, it is worth noting that four core competencies of Ensemble; namely:

- Development/Deployment.
- Messaging.
- Orchestration, including human workflow.
- Analytics.

These are all delivered as a single integrated technology stack. It is not a set of modules that require separate implementation and integration within themselves. This is one of the defining features of Ensemble, and the effectiveness of this model should be considered closely when making comparisons with what might be best described as 'best-of-breed' independent solutions in the four integration models highlighted.

InterSystems has had a great deal of success with its database product, Caché; the fact that Caché is built upon the object model is relevant to Ensemble, which follows the same design controls and shares Caché technology.

This object paradigm allows a high degree of interconnectivity (or interchange) between the four integration models. This is best demonstrated by the unified/single development environment that is windows based, and a browser-based management environment. More benefits of the singularity of the browser-based UI (or Windows-based Studio) are shared metadata, reusable components, a single learning curve, consistent architecture, ease-of-use, and a consistent object paradigm.

Similarly, the user can move in the same seamless manner from orchestrating and deploying a process to monitoring the process in real-time. This is why the integrated technology stack within Ensemble is so important; it provides a consistency of view and operation not always available in other products.

Product Operation

The central element of the Ensemble product is its highly-scalable, distributed, SQL-compliant (ANSI-92) object database. As previously mentioned, InterSystems has had a great deal of success with its Caché product. Caché is a relation/object hybrid (the term 'hybrid' is slightly misleading as Caché can be considered as three databases in one – pure relational, pure object, and the third type, which allows direct manipulation of the underlying multi-dimensional arrays).

By having this interoperability, we have a situation whereby the object database contained inside Ensemble can be ANSI-92 compliant and yet still maintain the required functions of storing objects on process state information, messages, and associated metadata. It can achieve this without the overhead of the traditional relational model (even if a relational model could handle the complexity and volume of information that Ensemble collects from the integrated infrastructure).

The object/relational model provides a central infrastructure element that delivers the 'best of both worlds'. It has to be stated that this is not simply a question of putting a Caché database as the repository for integration 'information', it is the use of the tried and proven technology that is important when considering the Ensemble solution.

It is impossible to overstate the power that the object model, as implemented in Ensemble, brings to the integration problem. This extends through the whole integrated technology stack that is the Ensemble product. It should also be noted that, as the Caché technology is security certified to Common Criteria EAL3, Ensemble inherits an industrial-strength level of security which is increasingly vital to integration solutions given the application interdependencies that they create.

Before considering the other elements of Ensemble, it is worth taking a moment to consider the *raison d'être* for undertaking integration. The basic principle is to allow for cross-application functionality to take place. This demands the creation of composite applications (applications that are not tied to the specific functionality set implemented within an application). This is what Ensemble allows users to do – to create new applications that span current applications, Web services, and data sources.

The user has a single, browser-based interface for managing all aspects of the Ensemble solution. This Web UI utilises scalable vector graphics throughout, which provide fast updates and make the UI eminently usable even when dealing with complex screens.

From the client-based UI, integration models can be designed (these can be considered as process-based) at a high level and the mapping and transformations required can also be created. This would include any data transformations or the inclusion of any adapters between applications. InterSystems provides a variety of adapters for this purpose. From the same UI it is possible to drill down into underlying code to make final adjustments to the integration model or composite application.

The methodology of managing integration projects in this manner is very similar to BPM-type solutions, yet there is a depth within Ensemble that goes beyond many BPM offerings. Butler Group has always considered BPM as more than a layer across the top of the technology stack. To make it truly workable, there also has to

be the ability to drill through the stack to the technical detail required to create applications with new functionality. Ensemble, as a single integrated stack, answers this requirement most elegantly. It is an integration solution that does not also require integration itself.

The BPM analogy is also extended with other aspects of Ensemble. The process-centric applications that it creates have a dependency on rules to bind the process flow together, including human workflow. Ensemble has its own rules designer, and as with any well-implemented object model, the rules are deployable as separate objects – this allows them to be managed and maintained within the embedded database alongside all the other objects.

The rules design element is not comparable to other dedicated offerings in the complexity of rules it can create, but it handles hierarchical rules well, and for more complex scenarios it can integrate directly to rules created by other designers – using the object model yet again.

Ensemble's integrated Workflow Engine takes full advantage of the product's unified architecture and rules designer. It automates the distribution of tasks among users automatically, according to a predefined strategy, making task assignment more efficient and task execution more accountable. Workflow tasks are represented as objects and stored in Ensemble's database. As a result, any automated business process can use the stored tasks as easily as it can use a Web service, an enterprise application, a data source, or another technology modelled in Ensemble's repository. Because the Workflow Engine is fully integrated within Ensemble, user-based process definitions can be separated from business logic, allowing developers and analysts to define each segment distinctly within a cohesive whole, and composite applications can easily incorporate complex manual interactions that reach across geographical, technological, and departmental divisions.

Thus far we have seen how Ensemble handles the design, deployment, and maintenance of composite applications. The final piece is monitoring the runtime instances of the new application types. This falls under the general heading of BAM, although as with BPM, Ensemble should not be compared directly with a dedicated BAM solution.

From a high-level viewpoint users can access system events through the UI to monitor the runtime instances. There are a number of dashboard gadgets provided in the BAM style that allow visual representation of these events. As with much of Ensemble, the real power lies with the detail provided.

As a message-based system the user can access specific messages to gain a detailed understanding of the running processes. However, the navigation between high-level view and message detail is not true drill down; that is the user cannot point and click from one view and be presented with the message(s) that are relevant to the area selected. For example, a *'spike'* shown in respect of a running process on the graphical interface cannot be accessed directly by clicking on that spike to open up the relevant messages, however, this may not be possible out-of-the-box, but it is achievable with user modification or configuration.

There are a number of filters available within the different views that allow the detail required to be presented, – it is simply that the navigation is not as elegant as it is in some dedicated BAM solutions. One has to bear in mind that implementing a dedicated BAM solution comes with an associated cost and the requirement to integrate that solution with the infrastructure; this is not the case with Ensemble as the whole package is self-contained. One highlight of the BAM capabilities lies in the computed bitmap indexing that it uses; this allows access to real-time data from both structured and unstructured sources.

These capabilities contain all the elements required to create, deploy, maintain, and monitor composite applications. It is in effect a three-in-one product. In the final analysis the question that requires answering is whether or not the whole is greater than the sum of its parts. As an integration product it clearly demonstrates all the functionality expected, and does so in an architecture that makes integration across diverse systems relatively pain free.

As a BPM solution it allows for much of the functionality expected, and in some cases it has greater functionality than some dedicated solutions in this space. Where it has weaknesses (in respect only of BPM), such as the lack of true point-and-click drill-down mentioned previously, it allows seamless integration of third-party solutions.

The picture is the same when comparing Ensemble with dedicated BAM solutions. In some areas (such as the use of computed bitmap indexing) it could be judged as having higher levels of functionality than many other solutions on the market, yet there are weaknesses as well – most notably the navigation aspect. That having been said, it should also be noted that the development side of Ensemble would allow users to create more extensibility in both BPM and BAM.

Product Emphasis

Ensemble is a difficult product to review, owing to the cross-over elements highlighted above. As a *'pure'* integration product it stands with the best. The process-centricity (from an integration viewpoint) provides for modern requirements, and the use of the object model ensures cross-operability between J2EE, .NET, Web, and legacy environments.

In the BPM and BAM space it lacks certain detail, but also has some nice touches that lift it up from run-of-the-mill products in those areas. The final analysis has to come down to the value of the product to the end-user. It allows the creation of composite applications at different levels of detail from graphical design to detailed coding. It manages those applications with strong state management. It supports both synchronous and asynchronous messaging. Finally, it allows the monitoring of the composite applications to be carried out.

If one takes the larger view then one can see that Ensemble is a valid product in the integration market. The fact that it extends a large part of that validity into both the BPM and BAM spaces without any additional cost or integration requirements should be gratefully accepted as a bonus.

DEPLOYMENT

- Ensemble has comprehensive O/S support and runs on:
- Apple (Intel x86) Mac OS X 10.4 and (PowerPC) Mac OS X 10.4.
- HP (Alpha) OpenVMS 7.3-2, 8.2, and Tru64 UNIX 5.1B.
- HP (Itanium) HP-UX 11i v2, and OpenVMS 8.2-1.
- HP (PA-RISC) HP-UX 11 and HP-UX 11i v2.
- IBM pSeries AIX 5L 5.2 and 5.3.
- Microsoft Windows 2000 (SP4), XP Pro (SP2), and Server 2003 (SP1) (x86 32-bit).

- Microsoft Windows Server 2003 (SP1) (x86 64-bit), and (SP1) (Itanium).
- Red Hat Enterprise Linux (x86 32-bit) AS 4, (x86 64-bit) AS 4, (Itanium) AS 4.
- Sun (SPARC) Solaris 10.
- SuSE Enterprise Linux (x86 32-bit) 9 (SP2), (x86 64-bit) 9 (SP2), (Itanium) 9 (SP2).

By their very nature, integration projects have a high degree of complexity, and although Ensemble is designed to reduce this complexity, there will still be a requirement for the intervention of a professional services organisation. This fits in with InterSystems' marketing strategy of targeting Systems Integrators carrying out large integration projects. InterSystems does not provide implementation services itself, preferring to partner with appropriate service organisations. InterSystems concentrates its implementation efforts on overall project architecture and in ensuring that Ensemble is used most effectively.

An implementation often starts with a pilot, which can take as little as two days to demonstrate the applicability of Ensemble for any given integration requirement. InterSystems believes that the implementation costs of Ensemble are much lower than those of competing products. It claims that less hardware is required, it is faster to implement, and easier to manage than similar products. Maintenance of the system once deployed requires minimal effort, and this can be carried out by the customer or a third-party supplier.

InterSystems offers a choice of a three-day or a five-day 'Building Productions with Ensemble' course. The company recommends that integration partners who are already familiar with InterSystems' technology attend the three-day course. Integration partners who are new to InterSystems' technology should attend the full five-day course, which includes two days of learning about InterSystems' core technology.

Training is also available on-line with a free eLearning programme – where currently there is a 17-part Ensemble Webcast series.

In addition, there is an Ensemble Professional Integrator programme in which students can study and achieve the level via a series of on-line exams.

Ensemble includes a comprehensive library of adapters for Relational Databases, Java, J2EE, JMS, XML, SMTP, POP3, File, Pipe, SQL, FTP, TCP, Telnet, TN3270, HL7 2.x and 3.x (addressing CDA and RIM), HTTP, iWay Adapters (with more than 250 different adapters), LDAP, MQSeries, MSMQ, SOAP, and a range of application adapters, including PeopleSoft, SAP, and Siebel, etc.

One of the capabilities of integration software should be the ability to integrate legacy back-end systems with new front-end applications. Ensemble provides a consistent object representation of different programming models, programming interfaces, and data formats. This enables Ensemble to take a global view of all data and requests travelling through the system. This results in the ability to access legacy data as reusable Web service, .NET, or J2EE components using Ensemble's development tools and technologies.

Scalability is typically achieved via multi-tier configurations of the technology. Ensemble has been built using technology, which is massively scalable across several architectures, namely InterSystems Caché. In single-server configurations, InterSystems technology has been proven to scale linearly up to 24 CPUs. In multi-server configurations, Ensemble can use Enterprise Cache Protocol (ECP) networking or shared-disk clusters to achieve even higher levels of scalability. The underlying persistence engine of Ensemble has been benchmarked to support 24,000 concurrent users with over 1,500,000 database accesses a second, in a multi-tier configuration.

Ensemble supports automatic failover on the following Operating Systems: Windows 2000; XP, Server 2003; RedHat Linux; IBM AIX; and Solaris. Additionally, Ensemble supports true clusters on: HP Alpha VMS and HP True64.

Ensemble has an in-built backup capability and a journaling mechanism for recovery of data to a particular point in time. In addition, there is a shadowing capability in which a copy of the underlying persistence repository is synchronised in near real-time.

The major risk to the business that may cause the project to fail, according to InterSystems, is a failure to scope the project into deliverable units of functionality, which can be accepted by the user as being achieved. This is why InterSystems regards the involvement of a Professional Services organisation to be vital in Ensemble projects.

PRODUCT STRATEGY

In marketing terms, Ensemble has a horizontal focus. It addresses issues that are pertinent to most vertical markets. Its target in terms of size is large corporate end-users, typically with revenues in excess of US$200 million and over 1,000 employees. However, healthcare, finance, telecommunications, retail, and e-government are seen as key market opportunities for Ensemble.

Butler Group believes that a good market opportunity for InterSystems is to work with Systems Integrators that have expertise in specific vertical markets and can market Ensemble in these areas. InterSystems feels that its major market opportunity comes from organisations that have a requirement for complex application integration, composite application development, and BAM capability, especially when projects span multiple initiatives and integration models.

The product is licensed directly to end-users by InterSystems, but implementation is delivered in conjunction with third-party service providers such as Systems Integrators and consultants with vertical industry expertise, as well as the IT staff of the end-user organisations.

InterSystems is actively recruiting implementation partners for Ensemble and has an impressive list of major System Integrators in both horizontal and vertical market spaces.

Due to its wide range of functionality, InterSystems finds itself competing with vendors in a number of different areas. As highlighted previously, Ensemble does have a great deal of functional crossover in such areas as BPM and BAM. The core market for the product has to be in the process-centric integration space, rather than attempting to take on ‘pure-play’ vendors in any one specific space. If this message remains constant, and the value of the single integrated technology stack can be promoted, then there is a strong market for the product.

For common, end-user integration projects the licence cost typically accounts for one third to a half of the total project cost, which InterSystems maintains is significantly lower than with other integration products. Annual maintenance and support is 22% of the licence fee. In response to the growing need of the Small to Medium Business (SMB) market for application integration, InterSystems offers entry-level pricing for point-solution use, that scales as users expand the project scope; e.g. to increase the number of applications, application adapters, or users. There is also a licence scheme for application partners to embed Ensemble into their applications, to enrich existing and develop ‘connected’ applications, with integrated processes, or even complete new service-oriented applications using Ensemble as the application platform.

General release updates are issued twice a year, point releases are driven by real-world customer feedback.

InterSystems sees the main threat to its market share deriving from commoditisation at the lower end of the integration market with off-the-shelf packages that undermine the pricing of complex integration projects but offer limited capabilities.

Butler Group believes that InterSystems can shield itself from these threats through its close ties with integration partners that generally work with very large organisations, by establishing a large customer-base in specific vertical markets, and encouraging application partners to use Ensemble as their application development platform.

COMPANY PROFILE

InterSystems Corporation is a privately-owned company headquartered in Cambridge, Massachusetts, USA, currently employing over 520 people, with approximately US$200 million in revenue in 2006. Founded in 1978, InterSystems has been a technology innovation leader in database and integration software. The Caché high-performance object database, Ensemble rapid integration software, and HealthShare health information exchange platform, enable developers to quickly create, deploy, and integrate high-performance systems. InterSystems has offices in 22 countries and provides support to customers in 88 countries.

InterSystems is a leader in integration technology and the world's #1 database provider in healthcare, with its products used by most major hospitals and labs, including America's ten best hospitals as rated by U.S. News and World Report.

Ensemble was launched in November 2003 and has steadily built an impressive customer list. This includes The London Bartholomew Hospital Trust, several of the UK Cancer Registries, Kimberly-Clark, Moorfield's Eye Hospital, The Netherlands National ICT Institute for Healthcare, Partners Healthcare, Petrobras, The Royal Marsden Hospital, The Daily Telegraph, and Westpac Bank. Overall, Ensemble is in place in hundreds of sites worldwide, mainly in Healthcare, but increasingly across Government, Telecommunications, Finance, and Logistics.

SUMMARY

Overall, Ensemble is a strong contender in the application integration market. As Ensemble is architected as a single technology stack it allows the user to concentrate on integration from the point-of-view of process rather than technology, although any required technical integration detail is handled well within the product.

Those users who want the basic elements of BPM and BAM are also well-served by Ensemble, and if a higher degree of functionality or specialisation is required in these two areas, then Ensemble will allow for easy integration to third-party solutions, or allow the creation of extensible systems using the design environment.

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