Developers use integrated IBM technologies to maximize the power of WebSphere Application Server, WebSphere Host On-Demand and Enterprise Java Beans

Honeywell's award-winning approach to Web-based development

Industry
Aerospace

Application
Nonconformance Corrective Action System (NCAS)
Paperless shop floor
Matrix/MACPAC interface

Software
VisualAge® for Java (Version 3)
WebSphere® Application Server (Version 2 and 3)
WebSphere Host On-Demand (Version 5)
WebSphere Studio (Professional Edition)
MQSeries®
COBOL
DB2®
IMS®
MVS®
AIX®
Windows

Solution
Enterprise Resource Planning (ERP)

Developers at Honeywell's Aircraft Landing Systems are not only earning industry awards for Java application development; they are saving their company hundreds of thousands of dollars annually. How? By using a wide spectrum of IBM® e-business technologies – including VisualAge for Java, WebSphere Application Server and WebSphere Host On-Demand – to build integrated solutions that rapidly extend legacy data to the Web.

Led by Michael Michele, Director of I/T, Honeywell has launched an innovative approach to rapid, high-quality Web-based application development. Michele explains: "We wanted to put an architecture in place that would enable us to wrap legacy business data and rules, then use that layer as we migrate into the world of Customized Off-The-Shelf software (COTS). By using IBM VisualAge for Java, in combination with technologies such as WebSphere Application Server, WebSphere Host On-Demand and MQSeries, we have no limitations to where we go. We have complete flexibility, whether in terms of software development and management, or from a systems perspective. This will allow us to deploy our COTS solutions, meeting our business objective on any platform and still have access to legacy business rules and data."

The initial success: an award-winning Web-based application

Honeywell started with a three-tier Internet application, called the Non-Conformance Corrective Action System (NCAS). NCAS is used to track defects and corrective actions on the shop floor of its manufacturing plant in Rocky Mount, North Carolina. In 1999, this Web-based solution earned major industry recognition, including:

- The 1999 Intelligent Enterprise Magazine RealWare Award for "Best Enterprise Application Integration Implementation" and;
- Runner-up of the 1999 AD Trends Magazine Innovator Award for "Best Object-Oriented/Component Based Development."

The solution has resulted in first-year cost savings of $225,000 and additional cost avoidance of up to $425,000.

To build NCAS, Honeywell developers combined technologies such as VisualAge for Java, MQSeries, DB2, MVS and Windows. Its three-tier architecture features:

- A simple, easy-to-learn presentation layer (GUI) made up of reusable objects developed in VisualAge for Java, running on thin client workstations via the Internet
- A business logic tier also developed using VisualAge for Java, running on Windows NT server
- An enterprise tier that features legacy wrapper programs which enable developers to leverage business rules within legacy core business applications
- MQSeries for communications between the business layer and the enterprise server.

Developers used the parallel processing capabilities of MQSeries to reduce response

times dramatically. They created a technique that can execute many mainframe leverage processes simultaneously, instead of sequentially. With this approach, the overall response time is slightly longer than the longest of the mainframe leverage processes. And, if an application resides on multiple platforms, MQSeries will drive processing of the company's AIX, NT server and mainframe systems simultaneously.

"It's a powerful solution to help us leverage our investment in our legacy business rules," says Dave Kulakowski, Development Manager, Honeywell Aircraft Landing Systems. "With the parallel processing capability we gain through MQSeries, we've improved response times sevenfold. We can now create all kinds of applications that weren't possible in the past due to unwieldy response times."

"In addition," he adds, "by using a Web-based application model, we have reduced our software deployment costs by 98 percent. We can distribute software and updates centrally, from a developer workstation, rather than distributing software to each desktop as we've had to do in the past. This approach gives us the added advantage of improved version control as well. We know everyone's using the same release."

The next step: a new approach to boost developer productivity using EJBs

Honeywell has since deployed a second project based on the architecture created for NCAS: a new Shop Floor application which helps streamline the process of making engineering changes available to the shop floor. It features VisualAge for Java servlets running on WebSphere Application Server (Version 2).

The results, in terms of improved cycle time, have been spectacular. In the past, it took engineers approximately two to three hours to compile new specifications on paper and make them available for production. With the new, Web-based application, the process happens in near real-time, electronically.

The application is also important in that it marks Honeywell's first venture into using Enterprise Java Beans (EJBs). Says Kulakowski: "We believe we will achieve significant productivity gains by using the built-in functionality provided in the EJBs. Our goal is to be able to turn around working code in a couple of weeks, not months. Once we amass 20 or 30 core business objects, we expect to see an explosion of new applications coming quickly into production. The sparks are already starting to fly."

The evolution continues with WebSphere Host On-Demand

In January 2000, for example, Honeywell developers began work to build a Java-based interface that will join two core business applications together:

- Matrix, a COTS application which engineers use to design new parts; and
- MACPAC, Honeywell's Enterprise Resource Planning (ERP) system, which supports the manufacture of the new parts.

The goal was to build a real-time interface that will enable manufacturing specifications and drawings for new products to flow more quickly to the shop floor. The interface would also notify users of any data errors immediately and provide pop-up wizards to help resolve them.

Developers naturally looked for the shortest route to market for developing the new interface. Their search led them to WebSphere Host On-Demand, in conjunction with WebSphere Application Server (Version 3) and EJBs within VisualAge for Java. Host On-Demand's Host Access Beans provide host connectivity to incorporate legacy data into new custom e-business applications. The main benefit, according to Kulakowski, is reduced development time. "No code needs to be written for the legacy side," he says. "Once we got through our first project, we have been able to create applications in a matter of weeks compared to months."

"Using WebSphere Host On-Demand's Host Access beans with VisualAge for Java, we were able to quickly create and deploy Enterprise Java Beans (EJBs) that integrate mainframe transactions with new business logic," he adds. "With Host On-Demand, you can easily wrap other technologies around it and reuse the components over and over again. As a result, our development processes are faster and more flexible."

The new interface launched in May. Honeywell anticipates it will eliminate a substantial amount of time previously spent keying data into the MACPAC screens

The result: a dramatically shorter time to market

Meanwhile, Honeywell continues to leverage its library of EJB part components using WebSphere Host On-Demand to improve speed to market. It took developers just four days to integrate a prepackaged production planning application with MACPAC and the company's order entry system. They simply built new screens and then added navigation functionality within the reused EJBs.

Kulakowski adds: "With these recent projects, we're doing much more than simply building a new application. We're building a collection of core business objects that can be deployed rapidly to build new applications. This speed to market is particularly important for our evolution into e-business. It will ultimately redefine the entire role of our development team. We see ourselves becoming far more proactive in showing how technology can transform our business."

Looking ahead: a smooth transition to pervasive computing

Always looking ahead, Honeywell developers are now preparing to launch three new projects designed to explore the potential of pervasive computing. Their strategy is simple: take the business objects already created and apply them to create yet another new development paradigm.

"Our direction is to take EJBs running under WebSphere Application Server and build new links to our business data," explains Kulakowski. "We want to be able to download information easily to wherever it's needed – whether it's a workstation on the shop floor or a palmtop in the hand of a sales representative. Our users will have information at their fingertips, wherever they go."

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