

Scoring with Web Services

By Kelli Wiseth

Web services are becoming integral to IT—and to business

Ask Whit Andrews about Web services, and he'll tell you a story about plastic. At some point, explains the Gartner research director, "plastic became integral to a variety of other products and established a new baseline—consider the dosage cup that's packaged with cough medicine these days—it's integral to the product itself" in a way that was never imagined when plastic first emerged from the polymer industry.

As with plastic, suggests Andrews, the uses to which Web services technology is being put today may be vastly different than the uses to which it will be applied in the future. Yet at some point, Web services technology "will no longer provide competitive advantage—the technology will become a baseline, a competitive necessity." As an example, Andrews notes how tracking package delivery by phone was at one time a big deal and then that ability became a commodity. At a later point, tracking packages "using the company's Web site was news—and then it became a commodity," says Andrews.

The next turn of the wheel in the evolutionary process of shipping packages, according to Andrews, involves being able to track packages by using a Web service so that you get programmatic information and actionable data, offering huge benefits to large companies that ship or receive thousands of packages a day.

In short, Web services will have an impact on business models, much as plastics technology has had on products as diverse as soft drinks and medication, says Andrews, and it will provide another excellent example of the long-term iterative impact of a technology.

This impact is expected to include the transformation of organizations, and their interaction with and response to each other is one of the anticipated benefits of advanced Web services built on standards such as BPEL, WS-CAF, and WS-Security that can ultimately support business process management across disparate organizations (see the "Beyond the Basics: Emerging Web Services Standards for Business Process Management" sidebar). The vision includes dynamically connected, long-running business services that function in real time across various organizations.

But to get to a real-time enterprise, you need to start with basic Web services. "About 50 percent of midsize and large enterprises have gotten started with basic Web services," says Andrews. By 2006, according to his organization, more than 70 percent of new applications will use Web services in their architecture.

Although the usual place to start with Web services is internally, many forward-thinking companies are finding ways to put Web services technology to work today to meet a wide range of interenterprise

Snapshots

Gimlisoft

Partille, Sweden

www.gimlisoft.se

Oracle partner and independent software vendor Gimlisoft provides a metadata-driven CRM solution that can be easily customized.

Software: Oracle JDeveloper, Oracle9i Application Server, Oracle Database

Ecquaria Technologies

Singapore

Esplanade (a Web Services Alliance Project)

Web Services Alliance

www.ecquaria.com

Ecquaria Technologies is an enterprise business platform provider and a founding member of the Web Services Alliance (www.webservicesalliance.org), a business-driven initiative aimed at syndicating a broad range of Web services for its members. In partnership with Green Dot and other WSA members, Ecquaria developed and launched a business-to-consumer Web service site for Esplanade—Theatres on the Bay.

Software: Oracle9i Application Server, UDDI server, Web services, Oracle9i Database Release 9.2.0.3.0

Bruns Pflanzen-Export GmbH & Co.KG

Bad Zwischenahn, Germany

www.bruns.de

A family business founded in 1876, Bruns was one of the first commercial garden suppliers in Germany. Today it is one of the leading tree nurseries in Europe, offering a range of some 4,000 plant species and varieties.

Software: Oracle8i, Oracle9i Application Server, Oracle Reports, Oracle Forms

House of Fraser (Stores) Limited

London, England; Glasgow, Scotland

www.houseoffraser.co.uk

Britain's leading retailer of designer brands, House of Fraser has a sales volume of more than £ billion annually.

Software: Oracle9i Database, Oracle9i Application Server, Oracle JDeveloper, Oracle Discoverer, Oracle Forms, Oracle Reports

Infomedics

Almere, The Netherlands

www.infomedics.nl

Founded in 2001 to lower costs associated with medical insurance claims processing, Infomedics has developed an innovative infrastructure that streamlines the interaction between healthcare providers and health insurance companies.

Software: Oracle JDeveloper, Oracle9i Designer, Oracle9i Application Server, Oracle9i Database, Oracle Consulting Services, Oracle9iAS Portal, Oracle9iAS Containers for J2EE

Vertex, Inc.

Berwyn, Pennsylvania

www.vertexinc.com

With 25 years' experience in the tax software and research industry, Vertex provides more than 10,000 customers with tax reference products and software solutions designed to make processing taxes easier and more efficient. Vertex technology and research solutions handle every major business tax, including income, sales, consumer-use, value-added, communications, payroll, and property tax.

Software: Oracle Database Oracle E-Business Suite applications

integration, application interoperability, and other needs, opening the door to new business models in the process.

Web Services Provide Easy Syndication for Creating Business Models

Identifying new business models based on Web services can be more challenging than the technology itself, according to Dr. Foong Wai Keong, president and chief executive officer for Singapore-based Ecquaria Technologies, an enterprise business infrastructure provider. Ecquaria is a founding member of Singapore's Web Services Alliance, whose members include Esplanade—Theatres on the Bay, Green Dot Internet Services, Oracle Corporation Singapore, and Sun Microsystems.

The Web Services Alliance aims to forge close business relationships among its members and to create new business value for members and their customers through cobranding and syndication of Web services. Syndication allows businesses to cross-sell related products and services from other businesses, resulting in a richer, customer-centric experience.

Using the Ecquaria Service Oriented Platform (SOP), Ecquaria has developed several Web services for Esplanade—Theatres on the Bay, a performing arts center located at Marina Bay, Singapore, that includes two major convention centers, 1,000 shops, 300 restaurants, and 150 bars, to showcase the alliance's possibilities. The services have since been syndicated and are being used by other members. For example, the "Combing Singapore for You" Web site (can.com.sg), a location-based interactive lifestyle portal, leverages Esplanade's event calendar Web service.

Conceiving relevant, business-focused Web services that can work together to bring added value to alliance members is the real challenge of Web services, according to Foong. "The syndication and consuming of Web services is pretty simple. That's one of their advantages."

However, more important than dealing with the technology, says Foong, "we had to look at the business, to help the customer—Esplanade—understand the business model that can evolve from using Web services."

The goal of the Web Services Alliance is to provide a rich network of business Web services that members can leverage to enhance their own business. Among its activities designed to promote collaborative efforts, the alliance sponsors an Oracle9i Application Server (Oracle9iAS)-based UDDI Web services registry where providers can publish business-focused Web services.

Web Services Provide Interoperability Between Leading Software Package and Plant Wholesaler

In addition to creating new market opportunities and enhancing business value, another of the key benefits of Web services is increasing operational efficiency. For example, by moving its order process online and supporting Web services connection with a market-leading software package, one of Europe's largest nursery wholesalers, Bruns Pflanzen-Export GmbH & Co.KG, has changed the way it does business with thousands of landscape architects throughout Europe.

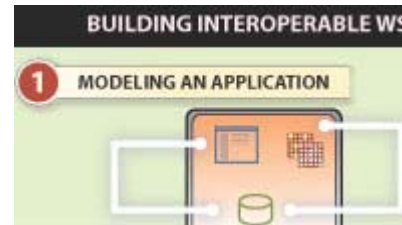
A family business founded in 1876, Bruns Pflanzen, of Bad Zwischenahn, Germany, was one of the first commercial garden suppliers in Germany. Today it is one of the leading tree nurseries in Europe, offering some 4,000 plant species and varieties. Bruns sells plants on a wholesale basis to large nursery chains throughout Europe, and it also sells directly to small, independent landscape architecture firms and individuals.

Bruns runs its business on Oracle software, using a custom-built ERP system based on Oracle8i, with Forms and Reports 6i, to manage orders, its product catalog, and all other business-critical processes. According to Bernd Schmidt, Horticulture Department manager at Bruns, "Oracle products have been the strategic platform for Bruns Pflanzen for more than 10 years."

For its wholesale business, Bruns supports business-to-business processing by using EDI connections with the large nursery chains it supplies. However, shrinking margins in the nursery business forced Bruns to look for additional efficiencies in its operations. The order process used by Bruns' other market—landscape architects—provided an opportunity for improvement, because these customers ordered from Bruns via fax—a less-than-ideal process, considering that a project might encompass a customer on the scale of EuroDisney. Faxed orders were then manually entered into Bruns' ERP system.

Developed by systems integrator OSC IM-Systems and deployed with Oracle9iAS, Bruns' Web site, Bruns Online, was launched with partial funding from a government-sponsored initiative, b-online. This Oracle9iAS Web site initially provided an online catalog and a Web-based ordering process that integrated with Bruns' Oracle8i back end. A later phase of

development by OSC-IM Systems created the Web services support for Bruns Online and ultimately the support for Web-services-based integration with DataFlor software. Used by about 70 percent of all landscape architects throughout Europe, DataFlor Software is the market leader in software systems for the landscape design industry, with a product line including everything from CAD tools for design to ERP modules for project management, invoicing, and ordering. DataFlor's Business V.6 product provides support for Web services, which Bruns Pflanz recognized as an opportunity to deepen its connections with this portion of its customer base.



Building Interoperable WS-1 Basic Profile
1.0-Compliant Web Services

When a DataFlor user connects to the Bruns Online site, the WSDL (Web services description language) file describing the Bruns Web service is sent to the DataFlor software, which then communicates by sending SOAP packages (containing xCBL-formatted documents) over HTTPS. (xCBL is XML Common Business Library, an XML component library for business-to-business e-commerce that first emerged in 1997, offering a migration path for EDI users.) Oracle JDeveloper was used to generate the WSDL and other artifacts (web.xml and oracle-webservices.xml, for example) needed to host the Web services capabilities, for deployment to the Oracle9iAS hosted site. The hosted site thus functions as the Web services endpoint, connecting the DataFlor Web services client to Bruns' Oracle database ERP system.

The Web-services-based integration of DataFlor with Bruns Pflanz allows a landscape architect to order directly from Bruns, from within the software used to manage the project. At the press of a button, a landscape architect or engineer using DataFlor can connect to Bruns Online to retrieve price quotes and estimates for a project and can also order the plants necessary for the project and generate invoices. In effect, the Bruns order process has become an extension of the DataFlor software, providing Bruns with greater efficiency by eliminating the need to enter data from faxes into the ERP system, and with competitive advantage due to ease of ordering. "Web service offers the ideal end-to-end connection from our ERP system to our customers' software," says Schmidt.

Web Services Provide Integration with Third Party—and Reuse of Existing Code

The ability of Web services to provide this deep integration between a company's internal applications and external business partners led Andrew Bond, development services manager for the U.K.-based House of Fraser, to Web services as the ideal solution for a complex integration challenge.

House of Fraser is Britain's leading retailer of designer brands, with 47 stores throughout the U.K. In May 2003, House of Fraser launched "Recognition," a new customer loyalty scheme. The Recognition FraserCard (the store's credit card) offers three points for every £1 spent, and the Recognition card alone offers two points for every £1 spent.

Behind the scenes, Web services support the infrastructure for the program, which involves integration between House of Fraser and a service provider that handles the customer call center operation.

The loyalty program relies heavily on an Oracle data warehouse that has been in place for many years at House of Fraser, originally built with Oracle7 Release 7.2 but now running on Oracle9i Database. Every customer transaction is captured in the data warehouse, which drives the calculation of points for the loyalty program. The data warehouse also lets House of Fraser analyze the results of marketing campaigns, explore buying patterns, and so on.

The loyalty program didn't start as a Web services implementation, however. During an initial pilot of the program, says Bond, House of Fraser and its call center provider kept two distinct sets of customer data that were synchronized overnight. "As we expected, that was rife with all the issues that arise the moment you have multiple sets of data—who has the latest version? What happens if there's a breakdown in communication and data sets get out of sync? And so on. We wanted to avoid all those problems," says Bond.

Based on experience gained during the initial pilot, House of Fraser decided that it wanted to maintain complete control over the customer data and didn't want the call center to create any of its own data. Rather, says Bond, "we wanted a mechanism by which the third party could work directly with selected portions of our database." Furthermore, the third party used Microsoft technologies, whereas the House of Fraser customer database is based on Oracle technology. "All of our CRM system and all of our CRM team were based on Oracle," says Bond.

Having defined all these requirements for integration, "we then took a look around at various approaches," says Bond, and decided that Web services really were "the ideal solution—they were the right technology to solve our specific business challenge."

Using JDeveloper, Bond's development team was able to generate the WSDL from an existing code base of PL/SQL procedures—so, says Bond, "we didn't need to spend significant amounts of time retraining, and we were up and running

with Web services in a week." Another advantage, says Bond, is that the team members were able to reuse the code they had, by wrapping the procedures in Web services interfaces generated by JDeveloper. "We could reuse the PL/SQL stored procedures we already had—we could simply take the existing stored procedures we were using for several other things, and we could either tie them together or just expose them immediately as Web services," says Bond.

The House of Fraser Web services are running on Oracle9i/AS, which provides the caller mechanism for the stored procedures and hosts Oracle Discoverer and Forms. Says Bond, "We're using it not just internally but also to power some of our extranet offerings. For example, we have some reports we allow suppliers to see, and also some forms, which we allow suppliers to query."

Bond sees Web services as being increasingly strategic to House of Fraser. "They're one of those technologies that can solve real business problems," says Bond.

Web Services Stream Line Payments Processing—and Reduce Costs

For House of Fraser, Web services solved an integration problem in order to support of the company's core business, retail. For Infomedics, integration itself is the core business. Founded in 2001 for the express purpose of creating a processing infrastructure for medical insurance payments in the Netherlands, Infomedics integrates insurance companies, hospitals, and individual medical and dental practices into an automated invoicing and payment system. The system was created to reduce overall costs associated with processing medical invoices.

According to Adrian Rietberg, chief operating officer (COO) of Infomedics, although the cost for a typical medical visit is fairly inexpensive—US\$35 to US\$40—the cost of processing invoices for healthcare is proportionally high, at about US\$3 per invoice for the insurance company and US\$3 for the doctor or hospital. Through its payment-processing infrastructure, Infomedics cuts those costs down to 10 percent, or roughly 30 cents per invoice. The cumulative savings are substantial, because Holland produces about 100 million medical invoices annually, says Rietberg. In fact, although Infomedics currently serves only 5 percent of the total market, the company processes the equivalent of one billion U.S. dollars in invoices each year.

The infrastructure was designed and developed with the help of Oracle Consulting, and the system runs on Oracle technology. "Oracle had a complete, integrated solution for our development and deployment needs, including Oracle9i/AS, a complete application server solution, and Oracle9i JDeveloper, a productive Java and Web services development tool," says Rietberg, "We knew that Oracle could scale to support the volume of transactions we expected our system to have." Hosted by an ISP in Apeldoorn, the Netherlands, an Oracle9i database sits behind two Oracle9i/AS instances, running on two separate servers with a load balancer doling out requests between the two. Each server runs an Oracle9i/AS Containers for J2EE (OC4J) cluster. A third Oracle9i/AS instance runs as the Web server handling requests on the front end. At a high level, the system provides four primary Web services:

1. Electronic invoice Web service, which is used by hospitals and doctors' offices to submit electronic invoices to the system and receive payment information from it
2. Payment information Web service, which is used by health insurance providers to receive electronic invoices from the system and submit payment information to it
3. Ex-ante check Web service, which collects data from third-party service providers and provides a master patient index used by Infomedics to validate the status of a patient's insurance
4. Billing and management Web service, which Infomedics uses to collect billing and other management information from the hosting provider

Some of these Web services are composites of several finer-grained Web services. Security for this system was also a top priority and has been engineered into the system from the ground up. Ernst & Young provided guidance in the design of the system security and conducts regular security audits. The system relies on Oracle Single Sign-On (SSO) and Secure Sockets Layer (SSL) and is also using the virtual private database (VPD) functionality to partition various insurance companies' data securely.

Infomedics works directly with the IT departments of hospitals to set up the Web services connections between the hospitals' infrastructure and the Infomedics system, and once the connections are established, processing invoices from the hospital and payments from the insurance company to the hospital is completely automated: The system routes invoices electronically from hospital to insurance company after the patient authorizes the hospital to do so, and payments from the insurance company are credited to the hospital's bank account.

Because individual medical and dental practices typically don't have an IT department, Infomedics works with the various software companies that specialize in medical office software, providing the software companies with the information they need in order to support Infomedics' processing infrastructure from their software packages. For practices that don't use

back-office software, Infomedics hosts an Oracle Application Server Portal site for entering the invoice and insurance details.

Infomedics has many plans to continue evolving and extending its processing capabilities. For example, says Rietberg, many small medical practices have asked that the system be able to accommodate all their invoices, not just those that go to insurance companies. These small practices would also like to have Infomedics handle everything that cannot be cleared through the insurance companies, so any balance outstanding after the insurance company's portion is applied would automatically generate a statement balance to the insured party. Infomedics is partnering with third parties, such as the Dutch postal service, to provide such ancillary back-office processing services and plans to support these via Web services.

Web Services Lower Overall Maintenance Costs

The improved efficiencies of Web services make them a compelling choice as the basis of forward-thinking companies' product lines. For example, using Web services and XML as the foundation of its new O Series product family, Pennsylvania-based Vertex, Inc., will be able to provide a software product line that is easier to maintain than its previous products and provides lower total cost of ownership over the products' lifecycle. Vertex tax software supports the full range of business tax types, and its products integrate with leading financial and billing systems, such as Oracle E-Business Suite applications.

According to Chris Zangrilli, enterprise system architect at Vertex, "The O Series product was engineered from the ground up to be a tax platform that can handle multiple tax types and support all the needs of our customers as well as our partners."

At the center of the O Series line is the "transaction processing system," which exposes both a Web services interface and a Java interface through which the host system can integrate with the underlying tax service engine. This Web services and XML-based processing engine does the work for Vertex O Series products for transaction taxes (such as sales, consumer use, and value-added tax), calculating the tax, sending back results to the host system, and capturing results to the central tax journal. Data in the tax journal (also common to all Vertex instances) can be used to populate tax returns and for audit and management reports. Setup, maintenance, and reporting are common across all instances of Vertex O Series products. This core engine and related components provide a centralized tax resource for all instances of Vertex tax software modules as well as all ERP or CRM systems that use the information.

Eventually, the O Series will support tax processing and remittance for every major tax type through this common interface, so a single instance of Vertex will be able to support multiple business units and multiple instances of Oracle applications (or other partner financial applications), according to Tom Kirk, account executive for Strategic Alliances at Vertex.

Furthermore, because the tax modules also share a central source of tax data, updates will be a lot more manageable. For instance, Vertex tracks more than 8,100 sales-and-use tax rates and more than 37,000 tax rules for states, counties, and cities in the United States and Canada for use in its sales and use-tax-calculation software solutions, typically sending out monthly updates to its customers. Maintaining a centralized Web-services- and XML-based tax resource that can be used across all instances offers a huge advantage in terms of maintenance costs.

There's a Great Future in Web Services

The reasons for implementing Web services are as diverse as the industries and markets encompassed by the organizations that create them. No matter the reasons, organizations that are putting Web services technology to work today are gaining the benefits of a flexible services-oriented architecture that can provide the agility required of a real-time enterprise, laying a solid foundation for the future.

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