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October 2002

Web Services Platform Shootout

Helping Business Thrive On Technology Change

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OCTOBER 2002

Web Services Platform Shootout

Web services require a new infrastructure to secure, manage, and orchestrate both messages and endpoints. Firms should start with a Web services platform from a winner like IBM or Microsoft.

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MARKET OVERVIEW

Web Services Create Infrastructure Challenges

Web services standards give developers new tools for building partner links and employee portals and extending the value of existing systems. But the lack of supporting infrastructure will hamper large-scale deployments.

WEB SERVICES OPEN NEW APPLICATION DOORS

Web services standards crush the traditional barriers to integration: incompatible software platforms and the absence of a wire to connect them. Standards like SOAP, WSDL, and XML-Schema bridge incompatible systems, and standard transports like HTTP, FTP, and email connect apps over the Internet. The result? Firms can tackle projects that were previously out of reach, including:

- **Low-cost integration.** Many firms are already using XML and Web services for simple integration projects, for example to link a content repository to an employee portal. For a small investment, developers can tackle integration projects that would never be funded as a six-figure TIBCO deal.
- **Process portals.** With Web services and tools from vendors like FileNET and Savvion, firms are going beyond simple content to build *process portals*. These portals weave content, data, and business logic from different applications and then tailor them to serve individual employee roles (see the June 26, 2002 Forrester Brief "Gear Up For Process Portals").[1]
- **Business Web services.** Firms are composing and hosting business Web services that dramatically lower the cost of partner connections and consolidate software assets like pricing engines and tax calculators (see the May 2002 Forrester Report "The Truth About Web Services").[2] At uBid a Web services seller interface has reduced the auction aggregator's integration costs by 90% (see the September 5, 2002 Forrester Brief "uBid: A Web Services Case Study").[3]

Web Services Extend The Value Of Existing Applications

Web services are a thin layer of protocols and interfaces that don't require massive rewriting of existing code. Despite some performance and transaction constraints, the Web services standard SOAP is quickly becoming a preferred interface to:

- **Packaged applications like SAP and PeopleSoft.** Every major application vendor is adding SOAP interfaces to its product suites this year, and vendors like Actional are adding SOAP faces to their adapter libraries. These standardized interfaces will finally open the door to the data and processes locked inside enterprise apps (see the May 2002 Forrester Report "Apps Market, Interrupted").[4]
- **Mainframe systems.** IBM's "enterprise modernization" project turns WebSphere into a Web services tool kit for mainframe applications. So the work that firms have already done with putting HTML interfaces on their mainframe data can now be quickly retooled as a Web service.
- **Existing services like user directories and messaging backbones.** Middleware and security services are also gaining Web services faces. Properly clothed in SOAP, these services can become available to any applications that need them. So Oracle developers can create a simple, shared mechanism for checking access authorization or transforming a RosettaNet message into an internal format.

BUT INFRASTRUCTURE PROBLEMS LOOM

Web services interoperability is real today: A Web service built on a Microsoft box or CICS mainframe is available to a partner's J2EE application across the street -- or across the ocean. Over the next two years, firms will use this interoperability to their advantage, building thousands of new SOAP interfaces. But the infrastructure to handle the resulting millions of SOAP messages doesn't exist. SOAP traffic today isn't necessarily:

- **Secure from unauthorized access.** Firms can secure simple Web services today -- SSL encryption and user name/password authentication works. But if developers bury security into each application endpoint, they make it difficult to reuse the interface and almost impossible to manage as the number of distinct endpoints mushrooms (see the June 2002 Forrester Report "Securing Web Services").[5]
- **Provisioned to meet enterprise demands.** Building a SOAP interface composed of multiple back-end systems is easy; deploying and operating it to meet large-scale service demands is challenging. If each SOAP interface must be provisioned independently, the cost of servers and the hassle of separate deployments will cripple large-scale projects (see the April 2002 Forrester Report "Organic IT").[6]
- **Functional at large scale.** How do you make changes to an interface without breaking the existing links? Load balance message traffic to fulfill service-level agreements? Perform common data transformations in a single place? These problems today are ceded to individual interfaces. But this leads to unbearable complexity and a version control/configuration nightmare.

ANALYSIS

Platform Vendors Will Dominate Infrastructure

Web services infrastructure will transform today's software runtimes into a more flexible service-oriented architecture. IBM and Microsoft today lead the charge with the best strategy and strongest Web services platforms, while Sun lags. Firms should fill in the gaps with infrastructure specialists.

INTRODUCING WEB SERVICES INFRASTRUCTURE

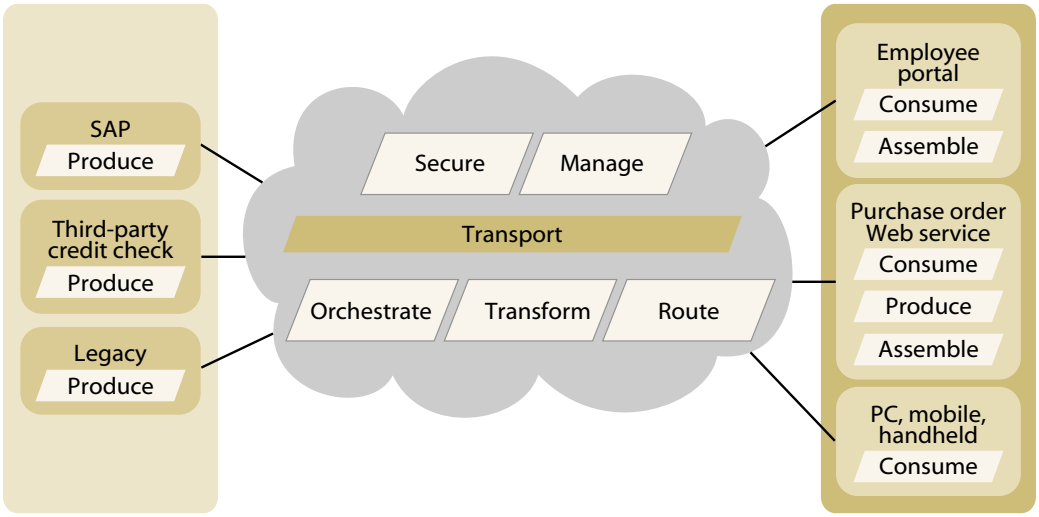
To overcome these infrastructure challenges, IT must build out a new tier of infrastructure over the next four years. The goal should be to build a service-oriented architecture in which every Web service is an enterprise-ready asset that can be consumed by any application, secured from prying eyes, and scaled to meet rising and falling service levels. The architecture requires (see Figure 1):

- **Dumb endpoints.** Web service endpoints are the interfaces that consume and produce SOAP messages. They should be ultimately simple -- unencumbered by security and management features -- so they can be reused by many different applications and partners without modification.
- **Smart infrastructure services.** The essential features that make Web services work in the real world -- such as message-oriented security, management, data transformation, and business process orchestration -- must be centralized in the network. These services, accessed via SOAP interfaces, will mature by 2005.
- **Reliable Web services networks.** The primary job of the Web services network is to move SOAP messages reliably. Because security and management functions are provided by network-attached infrastructure services, the network itself can remain stunningly simple.

Platform Vendors Will Dominate The Market . . .

A Web services infrastructure is built on products in which firms have already made significant investments: application servers, messaging middleware, integration servers, security servers, portal servers, and databases. Which vendors win in the long run? The software application platform vendors: BEA, IBM, Microsoft, Oracle, and Sun (see the June 2002 Forrester Report "Which Web Services Vendor?").[7] Why? Because:

Figure 1 Web Services Infrastructure In 2005



Endpoint services

Consume	Receive and process messages.	• Find and bind to Web service endpoints. • Transform messages to native formats. • Interoperate with different vendor's platforms.
Produce	Formulate and send messages.	• Maintain sessions. • Bind to different transports. • Handle messages, headers, and attachments.
Assemble	Assemble messages from multiple components.	• Compose coarse-grained Web services. • Assemble Web services dynamically from WSDLs. • Disassemble and expedite SOAP requests.

Infrastructure services

Orchestrate	Host business processes that span applications.	• Model, host, and manage reusable processes. • Maintain long-running processes. • Manage human workflow.
Secure	Authorize, authenticate, and encrypt messages.	• Consolidate security resources and policies. • Secure messages, not just endpoints. • Secure across boundaries.
Manage	Manage quality of service, versions, and performance.	• Intercept and manage messages. • Balance message loads. • Implement and monitor service level agreements.
Transform	Map messages in and out of native formats.	• Transform using XSLT or in code. • Ship with prebuilt mappings. • Scale independently of other services.
Transport	Move messages from one endpoint to another.	• Securely and reliably move messages. • Interrupt and accept messages. • Connect across security and transport domains.
Route	Direct messages to the correct interface.	• Map messages to the right version of the interface. • Switch messages from one transport to another. • Scale to massive message volumes.

Source: Forrester Research, Inc.

- **Firms want fewer software infrastructure suppliers.** In the late 1990s, IT shops dramatically increased their ranks of software infrastructure vendors. But now they're paying for that complexity -- and working hard to reduce the number of vendors to a manageable handful. Large platform vendors with broad portfolios are most likely to make the cut.
- **Developers are already devoted to an application platform.** Web services are great at extending the value of existing applications. This makes an existing application platform from a vendor like BEA or Microsoft the natural environment for building and hosting Web services.
- **Platform vendors alone have the scale and endurance to wage battle.** Here are the facts: Microsoft has 20,000 developers working to enable its products for Web services. IBM has 10,000 doing the same. While huge resources don't always guarantee success, midsize firms like BEA and Novell will labor to keep up -- and Forrester doesn't believe any startup can gain the necessary critical mass.

. . . In Three Stages

The Web services market today is highly fragmented. But over the next four years, platform vendors will assume control over Web services infrastructure (see the August 22, 2002 Forrester Brief "Software Innovation Shifts To Platforms & Portfolios").[8]

- **2000-2002: Begin with Web services endpoints.** The platform giants, led by IBM and Microsoft, have been adding Web services endpoint features to their core runtimes, middleware, and tools for two years. Startups like AmberPoint and Systinet have jumped into the service-oriented architecture gaps with a wide range of Web-service-native products -- but at the end of the day they won't survive intact.
- **2003-2004: Build toward a service-oriented architecture.** As IBM has already done with its WebSphere Business Connection, platform vendors will adopt a message-oriented architecture (see Figure 2). Together, platform vendors will commercialize standards for security, reliability, and management. Specialists like Blue Titan Software and Westbridge Technology will dance with the platform giants by innovating ahead of the standards and by sharing code and deal flow.
- **2005 and beyond: Battle for the middle tier.** By 2005, the war will become bloody as each platform vendor battles for a share of the CIO's middleware and software budget. They will compete first on ease-of-use, scale, and time-to-value. In time, the conflict will escalate with tactics borrowed from more mature industries: channel lock-up, vendor financing, and annuity pricing models.

Figure 2 The Web Services Infrastructure Difference

	Today's Web services	Tomorrow's Web services infrastructure
Architecture	Tightly coupled, endpoint-centric	Loosely coupled, message-oriented
Security	Provided by every endpoint	Provided by a message gateway or firewall
Performance	Dependent on the application server	Load balanced across endpoint instances
Data transformation	Part of every endpoint and application	Data transformation engine attached to the network
Business processes	Processes tied to a single application	Reusable processes hosted in a process engine
Version control	Handled at the endpoint	Message router handles based on requester, header, and content
Service level agreements	Provided by the application	Implemented and monitored by a QoS engine

Source: Forrester Research, Inc.

Startups will be acquired, flee to niches, or innovate ahead of the standards that define the platform.

PICK A PLATFORM WINNER TO ANCHOR YOUR INFRASTRUCTURE

Forrester has evaluated nine platform vendors on their Web services capabilities using the Forrester Wave™ methodology (see Figure 3 and see the July 22, 2002 Forrester Brief "The Forrester Wave™ Explained").[9] Readers can go online to download the individual product scorecards and prioritize the criteria to reflect their needs. Overall, these results show that:

- **Current offerings are ho-hum.** By Forrester's reckoning, no single vendor offers a complete Web services infrastructure today -- all lack real message-oriented security and management. But it's not all gloom and doom: Today's tools are good enough for today's simple Web services applications, and they will evolve to meet more complex needs over time.
- **Vendor strategies show promise.** The platform vendors understand the power of Web services and the important standardization that is underway. We believe that they will accelerate their Web services efforts, plugging holes in the short run.

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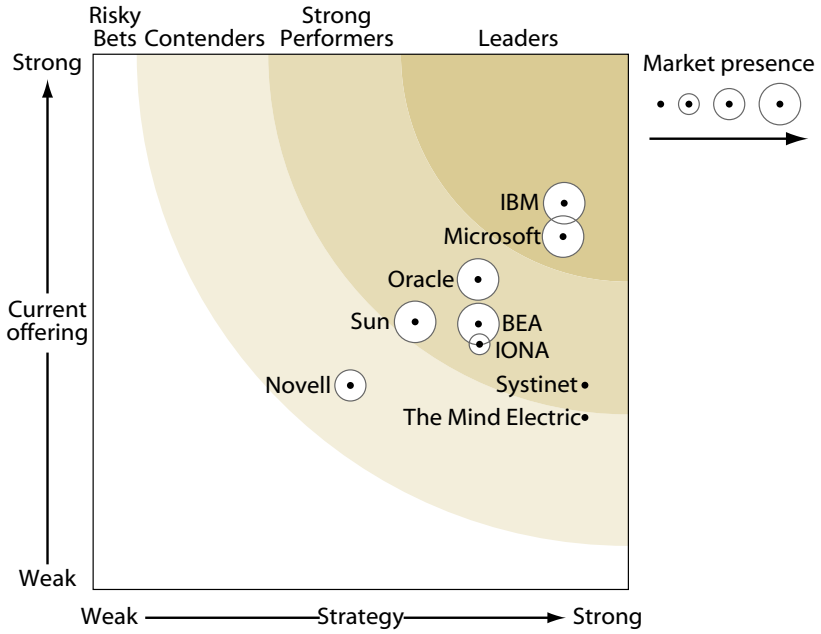
Figure 3 Forrester Wave™: Web Services Platforms, Q3 '02

A spreadsheet is available by clicking the online "Get Data" button above this figure.



Source: Forrester Research, Inc.

IBM And Microsoft Hold The Clear Leadership Positions

The large platform vendors will dominate the market for Web services infrastructure over the long haul. How do they stack up today?

- **IBM and Microsoft have the strongest offerings.** IBM and Microsoft have led the Web-services-standards charge, and it shows in their products. Both vendors clearly demonstrate the required breadth and depth. However, neither one has a definitive lock on the market for Web services infrastructure because neither one can ditch its application server in exchange for a lightweight Web services execution engine and a message-oriented architecture.
- **BEA and Oracle follow close behind.** These two Java-oriented vendors have strong products and a clear vision. BEA suffers because of version-one tools and the lack of a messaging infrastructure. Oracle is playing catch-up because it was late to deliver a quality application server and it isn't at the forefront of creating standards.
- **IONA is ready for the CORBA-committed.** IONA has been on top of Web services standards from the beginning, and this hard work has paid off. This transport- and integration-focused vendor is a good fit for firms with a big CORBA investment and that want to publish their interfaces as Web services.

- **Sun falls short.** The vendor with the strongest track record of openness and standards support is ironically the one with the weakest standards-driven Web services offering today. A recent conversation with Sun software executives leads Forrester to believe that Sun will back away from enterprise-scale app servers and focus instead on *ubiquity* by giving away its entry-level app server.

Check Out Two Startups For Their Tools And Architectural Vision

Two startups are worth a look -- and they offer free developer starter tools and a services-oriented architecture to boot.

- **Systinet has the right infrastructure focus.** Systinet has a track record for building Web services endpoints; its product is already in its fourth version. The 100-person company is extending its products to include message-oriented security and management and is actively seeking OEM relationships.
- **The Mind Electric is the "Turbo Pascal" of Web services.** The Mind Electric's GLUE product is targeted at Java developers who don't want to deal with the overhead of a J2EE application server and are looking for tools. GLUE delivers, as it can execute in a very small footprint on a Java virtual machine.

Fill Infrastructure Gaps With Specialists

After picking a platform vendor, augment the platform with specialists that share a technology foundation -- J2EE or .NET -- and offer the features missing from your vendor's platform (see Figure 4). Firms should look at four kinds of specialists:

1. **Integration-focused vendors for process orchestration.** Check out stalwarts Vitria and webMethods, which are shedding their messaging backbones and beginning to host reusable business processes. Also consider Java-centric Cape Clear and Microsoft-centric Avinon for this role.
2. **Messaging backbone providers for transport and transformation.** Look at established players like Sonic Software and TIBCO as well as emerging vendors like Kenamea and KnowNow. Why the new players? Because these vendors offer messaging backbones that cross business boundaries and messaging protocols.
3. **Message-oriented startups for security and management.** A horde of startups are tackling Web-services-native security and management infrastructure services. It's probably too early to make a big commitment, but firms should start by looking at AmberPoint, Blue Titan Software, and Westbridge Technology.

Figure 4 Platform Vendors' And Infrastructure Specialists' Focus

A spreadsheet is available by clicking the online "Get Data" button above this figure.

Web services platforms	Consume	Produce	Assemble	Orchestrate	Secure	Manage	Transform	Transport	Route
BEA Systems	✓	✓	✓	✓					
IBM	✓	✓	✓	✓	✓			✓	✓
IONA	✓	✓	✓	✓				✓	
Microsoft	✓	✓	✓	✓	✓			✓	
Novell	✓	✓	✓	✓	✓				
Oracle	✓	✓	✓	✓					
Sun Microsystems	✓	✓	✓	✓	✓				
Systinet	✓	✓	✓						
The Mind Electric	✓	✓	✓						
Infrastructure service specialists									
Actional					✓	✓			✓
AmberPoint					✓	✓			
Avinon				✓			✓		
Blue Titan Software					✓	✓			✓
Cape Clear Software	✓	✓	✓	✓			✓		
Corporate Oxygen						✓			✓
DataPower Technology							✓		✓
Digital Evolution					✓	✓			✓
Infravio					✓	✓			
Kenamea							✓	✓	✓
Kinzan	✓	✓	✓						
KnowNow							✓	✓	✓
Sarvega							✓		✓
Sonic Software				✓			✓	✓	
Talking Blocks					✓	✓			
TIBCO	✓	✓	✓	✓			✓	✓	
Vitria Technology	✓	✓	✓	✓			✓		
webMethods	✓	✓	✓	✓			✓		
Westbridge Technology					✓				✓
WestGlobal						✓			

Source: Forrester Research, Inc.

4. **Infrastructure "services in silicon" startups for high-performance tasks.** Because of their simplicity and programming model, many XML tasks can be performed quickly, cheaply, and reliably in the chip itself. Firms that are pushing large traffic volumes should consider DataPower Technology for XML transformation and Sarvega for XML message routing.

ACTION

First ask, "Why not use Web services?"

Business decision-makers: Web services are a sure thing. Use Web services in any project that ties applications together or reuses data, unless there is a good reason not to -- such as high message volumes or transactionality. And if IT rolls out CORBA, J2EE, or EAI, make sure it has talked with its vendor recently: Chances are the vendor has a Web services alternative.

You have no choice: Work with Microsoft .NET servers.

Like it or not, CIOs must accept a relationship with Redmond beyond the desktop. Why? Three reasons: 1) Microsoft's servers are Web-services-enabled and ready for enterprise-scale projects; 2) Microsoft's platform gives departments and small project teams the tools and cost-effective, pre-integrated servers they need to get started quickly; and 3) Microsoft Office will soon transform dumb spreadsheets into smart documents that use XML to link best to, you guessed it, Microsoft servers.

Settle on a single Java giant.

There's no leverage or joy in maintaining separate infrastructure commitments with BEA *and* IBM *and* Oracle *and* Sun. You know you want to, so do it. Throw three of 'em out and settle on a relationship you can live with.

Demand platform alignment and a standards commitment.

When looking at a startup, niche player, or an application vendor, make sure that they have bet *its* business on *your* Web services platform. And as you choose startups because of their ability to innovate ahead of the standards, make sure they can show you how they'll strip out their proprietary technology and replace it with standards as they mature.

Hedge infrastructure startup bets with extended courtships.

You're reluctant in this down economy to take on the risk of a startup (see the August 2002 Forrester Report "Benchmark North America: Business Technographics® Data Overview").[10] Fine. But some startups get traction for a reason: They offer technology that can give your company a leg up. So don't avoid new technology altogether; instead, lower your risk by doing pilots with two startups and then choose one at the end of the pilot. Promise to pay list price to keep them focused on the prize: your business.

WHAT IT MEANS

Buckle up: The standards process will take two more years.

The first level of standardization -- basic communication -- is commercialized in today's Web services platforms. The next level of Web services standards -- a security framework and process orchestration -- is in committee. But we're still missing standards for transactions, reliable messaging, cross-domain security, and Web services management. Two takeaways: 1) Any product that offers these services will be proprietary, and 2) buckle your seatbelts and prepare to master more "WS" acronyms and specifications.

BEA will be purchased by HP, Sun, or maybe SAP.

BEA's engineering culture and first-to-standardize product strategy has made it the darling of Java gurus and ISVs. With relentless focus and a little-engine-that-could attitude, BEA has often outwitted and outsold IBM, Sun, and Oracle. However, gigantic Microsoft and IBM will eventually wear BEA down. A systems vendor like HP or Sun will likely snap it up. But don't leave SAP out of the bidding: With BEA in its stable, SAP could accelerate its infrastructure build-out and beat out apps vendors like Siebel and PeopleSoft on completeness.

SOAP is a key standard for Organic IT.

Organic IT requires a control framework as comprehensive as the air traffic control system and as heterogeneous as the United Nations. But no framework standards that span software, storage, servers, and networks exist. Never fear -- Web services standards will be the foundation. Forrester believes that IBM, HP, Sun, and Oracle -- yes, Oracle -- are well-positioned to extend these standards and help build Organic IT control centers.

Web services' programming model: blessing and curse.

Web services extend the loosely coupled programming model of the Web -- where smart clients interpret messages -- to applications. Developers who have grown up linking applications through tightly coupled function calls may struggle to master this new model. In contrast, businesspeople will find the lingo of Web services -- documents and contracts -- easy to grasp. Note to developers: Stop thinking like a developer; think like a person, instead.

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RELATED MATERIAL

Online Resources

Figure 3 is backed by an online spreadsheet that includes nine scorecards, each with more than 50 data points. Readers can use the spreadsheet in their own decision process by: 1) customizing the weightings for personal results; 2) trimming the vendors down to a shortlist; 3) sharing the results with other team members; and 4) using the criteria set in RFPs. An online spreadsheet for Figure 4 provides our analysis of 20 specialists.

Companies Interviewed For This Report

Actional
www.actional.com

AmberPoint
www.amberpoint.com

Avinon
www.avinon.com

BEA Systems
www.bea.com

Blue Titan Software
www.bluetitan.com

Bowstreet
www.bowstreet.com

Cape Clear Software
www.capeclear.com

Corporate Oxygen
www.coxygen.com

Cysive
www.cysive.com

DataPower Technology
www.datapower.com

Digital Evolution
www.digev.com

IBM
www.ibm.com

Infravio
www.infravio.com

IONA
www.iona.com

Kenamea
www.kenamea.com

Kinzan
www.kinzan.com

KnowNow
www.knownow.com

Microsoft
www.microsoft.com

Netegrity
www.netegrity.com

Novell
www.novell.com

Oracle
www.oracle.com

Sarvega
www.sarvega.com

Sonic Software
www.sonicsoftware.com

Sun Microsystems
www.sun.com

Systinet
www.systinet.com

Talking Blocks
www.talkingblocks.com

The Mind Electric
www.themindelectric.com

TIBCO Software
www.tibco.com

Vitria Technology
www.vitria.com

webMethods
www.webmethods.com

Westbridge Technology
www.westbridgetech.com

WestGlobal
www.westglobal.com

Related Research

September 5, 2002 Forrester Brief "uBid: A Web Services Case Study"
August 22, 2002 Forrester Brief "Software Innovation Shifts To Platforms & Portfolios"
June 2002 Forrester Report "Securing Web Services"
June 2002 Forrester Report "Which Web Services Vendor?"
May 2002 Forrester Report "The Truth About Web Services"
April 2002 Forrester Report "Organic IT"

GRAPEVINE

"Oracle implemented Apache SOAP." And that's a bad thing for Microsoft.
Jeff Grant, security architect at systems integrator Intelliger, likes that Oracle implemented Apache SOAP, the "de facto reference implementation." So why is that bad for Microsoft? Well, IBM, BEA, Oracle, and Sun draw on the solid products of the open source community. And that spells struggle for Microsoft. Imagine the challenge of competing feature for feature not only with the four Java giants but also with 100,000 open source developers. In the war of Web services infrastructure, even mighty Microsoft will grow weary. Our recommendation to Redmond is to open up to open source. Start by making it easier for .NET shops to work with the Apache Web server.

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"Software architects should stop building the Taj Mahal and do some plumbing."
So says Michael Williamson, CIO of systems integrator Tallán. His point? IT needs experience connecting applications with SOAP before embarking on an overhaul of its software architecture. Forrester's take? Don't wait for a mature Web services infrastructure before building Web services. And don't be afraid to strip out proprietary data transformation or security and centralize it as an infrastructure service when products from Sonic Software, DataPower Technology, and Westbridge Technology mature.

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"Stop investing to increase switching costs."
Todd Dubner, VP of product innovation at Galileo, describes the travel intermediary's evolving distribution strategy and the role of Web services in it. "We want the lowest possible cost of distribution across the travel supply chain and the highest breadth of content." The company has used IBM WebSphere to build and host Web services interfaces to its mainframe system. This means significantly less time and cost to connect to Galileo's data. Dubner's take: "With Web services, barriers for switching have come down -- investing to build them up is a waste."

ENDNOTES

1 "Gear Up For Process Portals" anticipates a new kind of portal application that guides employees through common business activities. This *process portal* is built on an application server foundation and takes advantage of Web services interfaces to tap data and business logic from back-end systems.

2 "The Truth About Web Services" describes the way in which Web services technology will be used to build new software networks that create massive new value by connecting the unconnected and relating the unrelated. The first phase of adoption is bottom-up and opportunistic; the second phase is more top-down and strategic as firms connect their systems to their partners and customers over the Internet.

3 uBid has built SOAP interfaces to its seller systems so that auction aggregators like Auctionworks can post their inventory to uBid's auctions.

4 We expose the fact that today's enterprise applications will disappear under process portal interfaces. The impact on the vendors will be dramatic, as they must learn to license and brand as "headless" process engines.

5 "Securing Web Services" advises using known security techniques -- such as SSL encryption and user name and password protection -- to get started with Web services today. It also describes a message-oriented security framework that's possible when security services are attached to the network.

6 "Organic IT" describes how companies will exercise control over their servers, storage, networks, and software by abstracting and consolidating control. The result? Higher-capacity use, faster deployment, more flexible infrastructure, and massive cost savings.

7 "Which Web Services Vendor?" makes the call that the application server vendors will dominate Web services software. It also presents a list of specialists for consideration.

8 "Software Innovation Shifts To Platforms & Portfolios" describes the structural shift that has happened as companies have moved beyond Internet discovery to Internet build-out. In this maturing phase, firms will look to a strategic platform supplier to consolidate their skills, relationships, and investments. These platforms must be augmented with a portfolio of modules, niche players, and implementation partners.

9 When Forrester evaluates and ranks the major players in a market, we create a Forrester Wave. It is a research graphic built on an open methodology and a straightforward algorithm that exposes vendor scores, key attributes, and weightings in an interactive spreadsheet.

10 Forrester's "Benchmark North America: Business Technographics Data Overview," in which 1,001 executives and managers at North American companies were surveyed, reveals that IT spending is 2.3% higher in 2002 than in 2001 and that more companies will raise budgets over the course of 2002 than those that will decrease them.