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IT solutions

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>GUIDE

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TECHNOLOGIES YOU NEED NOW!

### How to Manage Your Ideas Using Today's *i*-Technologies

Top IT Solution Providers!

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iTKO:
Automated Testing for Enterprise Java

You Know You Need It, But Are You Achieving It?

Test early. Test often. Like flossing, you know it's a good habit. But if you aren't conducting automated testing throughout development, you are exposing your company to a "root canal" problem – a software error that will be both costly and painful to fix.

Quality is the problem

Quality is a proven lever for increased business value in manufacturing, product design and customer service. Despite emerging standards, the software side of business has failed to realize quality. The overall failure rate of enterprise development has remained steady, with only 25 percent of implementation projects successfully meeting budget and timeline. Errors in deployed systems amount to US$5.9 billion in annual costs, according to industry estimates.

Companies try to leverage their existing systems alongside emerging technologies for a competitive edge. While J2EE standards and web services improve widespread connectivity among business systems, supporting an ever-growing set of integration points increases the complexity and risk of enterprise development.

If we need development quality, why hasn't automated testing become a standard?

When you do the math, you realize that it is simply infeasible to thoroughly test a system manually. Developers can unit test what they believe is a right outcome, but they are usually the least qualified to validate that the actual business requirements are met. QA teams can test for front-end bugs, but they have no visibility into the root cause of the errors they find. And no manual test can uncover the long-term effects of sustained or highly variable use on a system.

Many enterprises have invested huge sums into automated testing solutions. In practice, teams will admit that these solutions often end up as shelfware. This occurs for several reasons:

- Tight timelines cause QA processes to get left out of the requirement and design phases of development
- Developers are still expected to write code, and write test code at the same time
- The testing tools are too complex for business owners and QA teams to use and understand
- Testing reports failures, but doesn't uncover exactly where the error occurred
- High total cost of ownership (TCO) of per-user, per-component licensing, implementation and training costs limits the number of participants in the testing process
- Existing tools do not provide true automated test coverage of all the components of a complex J2EE environment

Simply mandating quality will not cut it in software development. Executives need to set realistic standards for quality improvement and get buy-in from the developers and analysts who must work with the testing solution. Quality should be top priority for every participant in the development process, not just developers.

Make everyone own quality with LISA

LISA, from iTKO, is the first and only comprehensive no-code automated testing solution built from the ground up for J2EE and web services development. LISA offers the tools quality demands, including regression, performance, load, soak, JDBC, server, middleware and unit testing (with JUnit/Ant support).
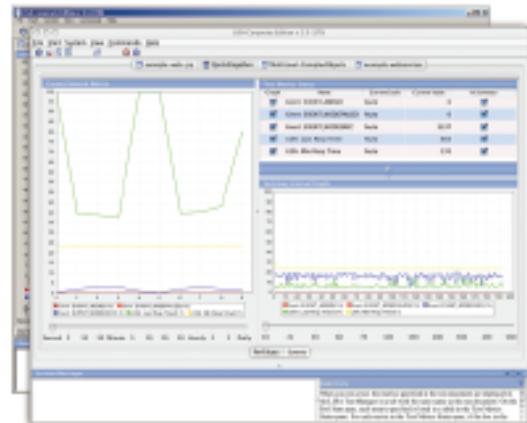
LISA uses "inline testing" to interact with and report live results from web servers, application servers, EJBs, web services and messaging systems.

But the biggest advantage of LISA is that everyone can own quality. Non-technical users can finally participate in the testing process without having to write or understand code. Through an intuitive point-and-click UI, interactive test cases can be created, shared and modified by QA personnel and business managers on the fly, and run on an ad-hoc or scheduled basis. Test results are viewed as live performance graphs or archived to provide developers with the root cause of errors down to the most granular code level.

Quality is not a commodity you can buy. It's an experience that your entire team needs to live. LISA offers deep functionality, high performance and ease of use that you will not find at any price point in the market. But it is priced to allow your entire team to continually test at every phase of development, from requirements to design, development and deployment. ∎

For more information, download a free evaluation copy of LISA 2.0, or sign up to preview the extended functionality of LISA 2.5 at http://www.itko.com.

WHAT DEVELOPERS DREAM OF

Applications made faster.

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Integration made easier.

Imagine your applications performing together as an ensemble. It's easier to make that dream a reality with Ensemble – the *only* integration platform that is so comprehensive it can dramatically reduce the time and cost of any type of integration project. Even the one that is your worst nightmare.

Request an Ensemble pilot project at www.InterSystems.com/Ensemble.

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ENSEMBLE™

Ensemble:
Rapid Enterprise Integration for Rapid Results

InterSystems Corporation's Ensemble is a comprehensive integration platform that enables exceptionally fast integration and composite application development. Designed to leverage today's Web and service-oriented architectures, Ensemble offers the power to handle any scope of integration project and the ease to quickly integrate and rapidly develop to meet the tight deadlines typical of today's competitive environment.

Integration Power on Demand

At the foundation of Ensemble is a Universal Service Architecture that provides consistent, efficient object representation of disparate programming models and data formats to enable use of the latest, most powerful development tools and technologies. Legacy data and functionality, as well as enterprise applications and technologies, can be accessed as reusable .NET or J2EE components, Web Services, XML or as relational tables and stored procedures – all at the same time. A SAP BAPI would be presented to Java developers as a Java class, while .NET developers could access the same BAPI as a C## class or as SQL stored procedures, for example. Developers can use their tools of preference, and there is no danger of lock-in to J2EE- or .NET-specific products.

Complementing this powerful, flexible architecture is Ensemble's distributed, high performance, ultra-scalable, SQL-compliant Persistent Object Engine, which manages and stores all metadata, messages and process state information, without the costs and overhead typical of relational databases. This Persistent Object Engine provides real-time access to both live and previously processed messages for auditing and business activity monitoring (BAM), and high reliability and recoverability for long-running business processes.

Integration Ease for Speed and Cost-Effectiveness

The integration landscape is littered with projects that represent extremely expensive partial solutions. This is especially true of complex integration scenarios involving a wide variety of different integration goals and in enterprises with largely heterogeneous data repositories, applications and development technologies.

Ensemble's comprehensive and innovative functionality makes it possible to dramatically reduce potential services costs and create a successful integration project, due to its consistent architecture and ease of use. Key to developer ease is Ensemble's Full-Spectrum Integration. A unified graphical, XML and code-based development environment simplifies and accelerates modeling and automating of business processes and supports rapid, service-oriented development

of composite applications that leverage existing data and functionality and take advantage of new technologies.

Addressing the critical area of maintaining and administering an integrated system, Ensemble provides easily customizable, extensible and seamlessly integrated end-to-end management and monitoring facilities that support rapid problem diagnosis and debugging via Ensemble's built-in message tracing facility, Visual Trace This sophisticated functionality makes it possible to optimize service levels and minimize staff burdens by automatically monitoring critical resources and generating alerts specific to any enterprise. The result is lower operating expenses and minimized potential for problems tied to using multiple tools from diverse vendors.

Rapid Integration:
From Concept to Reality in 90 Days

The Florida Department of Children and Families (DCF) has clear proof of what rapid integration really means. "We want to integrate the information in 59 different applications running on a variety of operating platforms into a composite portal application that provides a single view of all relevant data about an individual client," explains Ben Harris, Deputy Secretary Operations and Information Technology for DCF.

DCF serves a statewide population with programs designed to provide care and support for Florida's most vulnerable citizens, including abused and neglected children, the elderly and disabled, and those who are physically and mentally challenged or substance dependent.

Getting a single view of client information means integrating applications running on platforms that range from IBM mainframes to PCs and accessing data repositories that include Microsoft SQL, Oracle, IMS, DB2, Access and Visual FoxPro, as well as InterSystems' Caché post-relational database.

Leveraging Ensemble's comprehensive functionality, DCF developers created a test bed integrating information from five systems. The composite application went live just 90 days after project initiation.

Based on that success, DCF is continuing an aggressive initiative that will seamlessly integrate the information across all 59 systems in what is now called the OneFamily application series. The Ensemble integration project is also delivering concrete returns on DCF's technology investment, according to Harris. "With as much as 80% of needed information already existing in our legacy systems, the cost to rewrite all 59 systems would run to hundreds of millions of dollars," he says. "By integrating the legacy information with new screens accessed by an Ensemble-based composite application, we'll save more than 90% of that potential cost." ■

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Citizens Financial Group Realizes Tactical and Strategic Gains From Application Infrastructure Initiative

Leading financial services organization selects Candle's PathWAI solutions to maximize the benefit of WebSphere across the "build, deploy, manage" life cycle.

"Candle's management solutions enable us to maintain tight control over the management of our application infrastructure, which yields higher performance levels and improved business performance."

– Anthony Massaro,
Senior Vice President,
Director of Enterprise
Technology Services,
Citizens Bank

After a brief pause, merger and acquisition (M&A) activity in the financial services industry has resumed its breakneck pace. Financial services organizations are pursuing ambitious acquisition strategies to secure regional leadership. Industry leaders understand, however, that acquisitions to establish regional dominance will only carry them so far. To continue to grow market share, they must also offer customers high levels of service, paired with innovative and highly secure products. Today's financial services organizations require reliable and scalable IT infrastructures to deliver on these objectives.

Citizens Financial Group, Inc., a Rhode Island-based commercial bank holding company that operates more than 825 Citizens Bank branch offices in New England and the mid-Atlantic region, understands today's IT requirements like few other financial services organizations. The group, which has acquired more than 20 institutions since 1990, continues to prosper based on its commitment to service, ability to move rapidly in bringing new solutions to market and strategy to deliver personalized offerings to its 2.4 million customers. Citizens' rock-solid IT infrastructure is fundamental to its success in each of these initiatives.

Investing in the Future

In 2002, Citizens created its Integration Architecture Group (IAG), charged with upgrading the bank's branch technology to streamline customer service. The group also supports M&A integration activities.

"Channel integration was fundamental to the IAG initiative," said Anthony Massaro, senior vice president, director of Enterprise Technology Services, Citizens Bank. "The bank wanted to ensure that customers could access their financial data via any delivery channel. As important, we wanted to ensure integration without the cost or risk of a mass migration to a new core processing system. We realized from the start that message-oriented middleware would be an essential component of the solution."

Citizens required a middleware solution that could empower writer (development) services for a single instance and leverage data across all message connections to provide customers with a common experience. The group selected IBM WebSphere MQ and TouchPoint Enterprise Services, which together meet its requirements for communication and integration among multiple business applications and processes. Citizens also leverages WebSphere Business Integration software to support the integration of new and existing applications and the deployment of new business processes.

"Prior to implementing WebSphere MQ, our branches operated in a stovepipe environment," Massaro said. "Records for various channels and lines of business were stored separately and could not be universally accessed. Our branch associates, therefore, could not always easily retrieve the information that they needed and were saddled with volumes of manual paperwork. Associates, for example, would spend, on average, 50 minutes opening a new account. Today, we can open an account in approximately seven minutes."

Citizens has implemented a new account-opening application and has plans to launch new teller, call center, online banking and integrated voice response system (IVR) solutions as part of its integrated Web services-based architecture.

Protecting Assets

WebSphere MQ – which transmits business-critical information, such as account transactions, across multiple systems – is fundamental to Citizens' efforts to achieve end-to-end management of the customer relationship. Managing its implementation and performance is, therefore, a top IT priority.

"We required a partner that could provide support across the WebSphere 'build, deploy, manage' life cycle," Massaro said. "Architecture support was essential, as we wanted to build a solid foundation on which we could expand as the scale of our operations grew. Time to market was also critical, which drove our need for tuning and deployment support. Finally, our goal of 24x7 availability established our requirement for a proven management solution."

Citizens considered several enterprise infrastructure management providers and selected Candle Corp. and its PathWAI™ solution suite. PathWAI packages enable organizations to optimize their application infrastructure investments by overcoming the performance challenges associated with critical and sophisticated enterprise environments.

"Candle's reputation as a leader in the WebSphere MQ management space, combined with its ability to deliver the architecture, development and deployment services on the front end of the engagement, drove our decision," Massaro said.

Maximizing Yield

Citizens wanted to avoid mistakes that would cost valuable time and money in all stages of the application infrastructure life cycle. IAG selected Candle's PathWAI Architecture for WebSphere Business Integration, which helps organizations accelerate architecture design, minimize new application development cycles and ensure that completed solutions meet required service levels. Candle consultants helped guide IAG through the process of crafting an e-business integration architecture that would support new and emerging standards and technologies, such as Web services.

IAG also leveraged components of PathWAI Developer for WebSphere Business Integration and PathWAI Deployment for WebSphere Business Integration to deliver tuning and implementation services that allowed it to launch the architecture pilot project in just 12 months.

Managed for Success

After creating the infrastructure, the group turned its attention to ensuring the performance and availability of its new middleware environment. Citizens selected Candle's PathWAI Monitor for WebSphere MQ and its monitoring technology for WebSphere Business Integration software. The PathWAI monitoring solutions allow Citizens to automatically view and proactively control WebSphere MQ and WebSphere Business Integration performance across the enterprise. They also enable Citizens to check the validity of changes to the system prior to implementation – to do "what-if" analysis before moving into production – a critical factor in an industry that requires rapid time to market.

"Candle's management solutions enable us to maintain tight control over the management of our application infrastructure, which yields higher performance levels and improved business performance," Massaro said.

PathWAI Monitor for WebSphere MQ includes services that have helped Citizens streamline the monitoring deployment process. Citizens leveraged Candle's installation, configuration and customization services, and extensive education and training programs. The organization has also deployed PathWAI Secure for WebSphere MQ to ensure protection of sensitive information across its WebSphere MQ middleware environment, helping the bank to meet increasingly stringent data security requirements.

Moving the Market

Initially, the Citizens project involved rolling out the new architecture to 10 branch offices. The bank plans to scale the implementation to more than 800 branches in 2004. The architecture will, ultimately, touch millions of users as Citizens incorporates online banking services.

"Results are the proof of a successful implementation," Massaro said. "We have already reported an increase in the number of products sold as well as in the speed of sales. We opened 100,000 new accounts in the first six months of the implementation. Candle's services and tools enabled us to launch an e-business architecture that supports Citizens' business objectives today and into the future."

For more information, please contact Marketing_Operations@candle.com and enter "IT Solutions Guide" in the Subject field.

"Candle's services and tools enabled us to launch an e-business architecture that supports Citizens' business objectives today and into the future."

– Anthony Massaro

!Candle

Managing what matters most™

Merant Professional 8 is the complete yet affordable suite for software configuration management (SCM) and the de facto choice of development teams at thousands of project sites worldwide.

Merant:
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>
> —Richard J. Castellano
> Chief Customer Officer, Omega

> *"There are very few investments one can make that return a business value of five or six times their cost… the results of software process improvement efforts added up to impressive returns on the resources invested."*
>
> *The Benefits of CMM-based Software Process Improvement* (1994),
> — Carnegie Mellon Software Engineering Institute

Built by Merant, the leader in proven SCM solutions and maker of award-winning PVCS products, the new Professional 8 suite focuses on the unique needs of the contemporary development team: managers, developers, build managers and QA/testing engineers working collaboratively.

Merant helps teams tackle the challenges of increasing development complexity and rising IT time burdens and costs. It's part of a strategy you need to quickly align business applications with changing business missions and operational needs.

Merant Professional's automated change management helps you respond to pressure to reuse digital assets, to demonstrate repeatability and provide traceability and auditability of your company's development, IT and IP assets. Professional enables teams to develop higher quality software, faster, with more efficient use of development resources.

The Merant Professional Suite Includes:

- Merant Version Manager to organize, manage and protect software assets during the development process. New Merant Version Manager File Server architecture adds server-based security features to prevent unintentional deletes and overwrites.
- Merant Tracker to capture, manage and communicate software defects, issues and change requests. With this new release Tracker now supports multiple issues and parent/child relationships in defect tracking.
- All-new Merant Build, leveraging Openmake® technology from Catalyst Systems, brings a whole new set of features and benefits, including automated script generation and remote builds. Upgrade to the new Merant Build Enterprise Edition to support cross-platform builds in heterogeneous environments, including UNIX, Linux, Windows and Java.

Why You Need Merant Professional

Development practices have changed dramatically over the years. They have gone from small, local teams working on relatively straightforward applications, to highly complex applications developed and continually enhanced by large, distributed teams.

Contemporary team development depends on too many contributions, from too many individuals, to be managed with notes, status meetings or the heroic efforts of individuals.

In fact, a recent survey of 400 IT projects from companies of various sizes and industries found that only 28 percent were successful; 49 percent were over budget, took longer than expected or had fewer features or functions than originally promised; and 23 percent failed altogether.*

A comprehensive solution is Merant Professional to mitigate development risks and project failures, and benefit the business bottom line with higher quality applications, developed faster.

Merant Professional enhances productivity and boosts application quality because it automatically versions files, labels them and organizes them as they change during the development process. It prevents unintentional code overwrites, which can result in missed bug fixes or customer-specific change requests. The impact of even a few defects or missed changes can seriously overburden support or bring a mission-critical application to a halt. With Merant Professional, you can stop trouble before it starts.

Merant Professional also enables time-saving parallel development. You don't have to wait for one team or developer to finish a task before others can proceed. Instead of developing sequentially, you develop concurrently — because it's safe and easy to do so. Timelines become more predictable when you don't have to wait. You get to market faster. With fewer errors.

With its platform-independence, scalability, superb flexibility and ease of use, Professional is the most popular choice for:

- Organizations with dynamic, fast-paced software development projects
- Project managers requiring rapid start-up of a team-centric SCM solution
- Distributed teams that need to work from a single, protected asset archive regardless of location or platform
- Teams that need to adapt quickly to changing projects, while keeping SCM costs low
- Teams where the project, not an enterprise process, is the primary focus ■

*The Standish Group CHAOS Chronicles, 2000. www.standishgroup.com

GraphOn Corporation:
Global Application Access Made Easy

GraphOn offers cost-effective application publishing and Web-enabling solutions that dramatically lower TCO by enabling access to Windows, UNIX and Linux applications from any location on any platform using ultra-thin-client technology.

How GO-Global Works

GO-Global thin client runs Windows application GUI only

UNIX or Linux Desktop

Internet or Corporate Network

Applications run on a secure central server

Server

Only display commands and mouse/keyboard events are transmitted over the network

Internet or Corporate Network

GO-Global thin client runs UNIX or Linux application GUI only

Windows Desktop
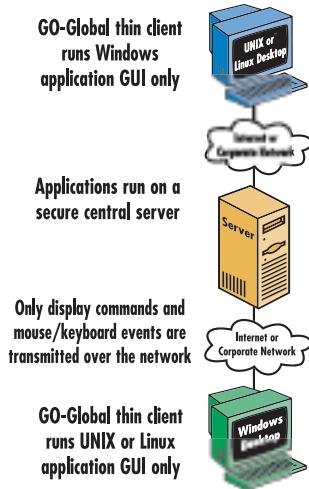
GraphOn is located at 105 Cochrane Circle, Morgan Hill, CA 95037 USA For more information, visit www.graphon.com or call 1.800.GRAPHON or 603.225.3525

Founded in 1982, GraphOn Corporation is a publicly-traded company (OTCBB: GOJO.OB) headquartered in Morgan Hill, California. For over two decades, the company has been an innovator and developer of cost-effective solutions that help customers access existing applications from remote locations.

"Enterprises and ISVs have invested heavily in Windows and UNIX applications," said Bob Peterson, GraphOn's COO. "IT departments are asked to do more with what they already have. Tight budgets mean they cannot always afford major reengineering projects to meet Web-enabling and remote access initiatives. That's where GO-Global comes in."

GO-Global is a cross-platform application publishing solution that instantly makes Windows, UNIX and Linux applications fully accessible to users on any platform and any OS. As a simple, ultra-thin-client solution, GO-Global totally eliminates the need for added software infrastructure such as Citrix, Microsoft Windows Terminal Services (WTS) and local X Server software.

"With GO-Global-enabled applications, an enterprise can quickly and cost-effectively reach new audiences and profit from new revenue opportunities," added Peterson. "GO-Global significantly lowers TCO by centrally publishing applications without any code changes – while at the same time leveraging existing network and management infrastructure.

Simplified Application Management

"GO-Global reduces the complexities of application deployment and management," said John Dilworth, GraphOn's VP of Sales and Marketing. "Application problems can be solved in a central location, not at the individual desktops."

For Windows application publishing, Dilworth explained that unlike WTS, multiple GO-Global sessions can run with a single instance of the Win32 subsystem. "And GO-Global publishes only the application's GUI, not the entire desktop," he added. "Our Rapid X protocol only transmits drawing commands to the device and keystoke and mouse events to the server, rather than entire screen bitmaps. This greatly increases speed and efficiency."

Campus-Wide Customer Deployment Saves 93%

Dilworth stated that Garces Memorial, a private four-year college preparatory academy, recently deployed a campus-wide GO-Global solution that centrally publishes a student information system and Microsoft Office applications to older Windows 98 PCs that the customer did not want to upgrade – as well as to Linux desktops.

"I downloaded a free trial from GraphOn's Web site and was pleased at how easy it was to install," said Jim Pace, Data Systems Manager at Garces. "I was amazed that in less than a minute, I was done. I was able to publish my first app in less than two minutes."

The campus-wide deployment proved to be equally trouble-free, not to mention cost-effective. Pace calculates that purchasing GO-Global was 93% less expensive than upgrading the hardware and software at all the desktops.

Migrating to Wireless and Linux Desktops

Garces installed a wireless solution to serve remote buildings. "With GO-Global, our wireless application access was almost instantaneous," Pace reported. "Future plans call for migrating to high-speed wireless throughout the entire school to provide universal access from laptops and PDAs anywhere on campus."

Migration to Linux desktops is also under way. "A number of our PCs are already using GO-Global's Linux client to access Microsoft Office and other applications," said Pace. "We'll be migrating all our desktops to Linux in the near future."

Government, Healthcare, Telcos and More

GraphOn has an impressive list of customers in market segments such as government, healthcare, telecommunications and more. For example, the U.S. Air Force just made a significant purchase of GO-Global. The Air Force intends to deploy the software as part of their program to provide high-performance, secure application access.

Fastrack Healthcare Systems selected GO-Global to Web-enable their applications for home healthcare providers. "With GO-Global, we are now able to bring a new level of service to our customers based on the product's excellent performance," said Fastrack President Spencer Kay. "GO-Global is easier to support and install for our clients than other Web-enabling solutions. We expect greater patient satisfaction from our enhanced application [which] will prove especially beneficial in situations where nurses and therapists need access to patient information on a remote basis."

Focused on a Global Vision

"Our focus will continue to be on lowering our customers' TCO while accelerating ROI," concluded COO Peterson. "We'll continue to evolve our product solutions to meet our customers' needs as they leverage existing applications to new computing models and wireless access." ∎

Dralasoft is the technology of choice for business process management (BPM)

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Dralasoft:

Dralasoft Debuts Workflow 3.0 For Web Services

Allows Business Partners To Manage Workflows Via Internet

Dralasoft, Inc. announced the release of Dralasoft Workflow 3.0, the newest version of its well-known Business Process Management (BPM) software. Leading the improvements in Version 3.0 is an extensive new SOAP interface that can be used to invoke Workflow Engine as a web service, enabling business partners to seamlessly collaborate in mission-critical workflows via the web.

Web services are increasingly seen as the next—and possibly ultimate—use of the Internet to realize business process efficiencies. Whit Andrews, research director for Gartner, says in his report "Predicts 2004: Web Services", "…the service-oriented architecture (SOA) that Web services enables will provide an ideal setting for a new class of business applications called service-oriented business applications. By using service-oriented business applications, SOAs can, in turn, use Web services so that business processes can occur in real time. This will be a boon for enterprises that want integration with business partners to be easier and faster."

Dralasoft Workflow 3.0 capitalizes on its SOA capability by enabling business units and/or trading partners to integrate common workflow technology into any major production situation. Document management, task management, claims processing, e-commerce, and supply chain management are just some of the ways in which Workflow 3.0 can save time, manpower, and cost in distributed environments.

"Dralasoft Workflow 3.0 carries significant benefits for the next wave of business process collaboration," said Richard Rogers, Vice President of Business Operations for Dralasoft, Inc. "With Web services just beginning to fuse applications and information in new and exciting ways, companies will soon be looking for ways to optimize all kinds of business procedures. Workflow 3.0 is fully capable of coordinating and leading the charge."

Web Forms Support

Also new to Workflow 3.0 is a new process for creating web forms, the class of online interface that includes order forms, claims documents, employee benefits information, and other fill-in-the-blank data entry. In the past, designers wishing to add a form to a BPM routine had to build the form outside the application, then map it to Workflow Engine. With Workflow 3.0, designers can now describe the form within Workflow Studio, after which the module automatically creates and maps the form to the engine.

Another major improvement to Workflow in version 3.0 is enhanced scalability through the use of replication and clustering techniques. By supporting greater scalability across a wide range of business processes, Workflow 3.0 can handle a greater number of users and a more sophisticated level of BPM than ever before.

Comprehensive BPM Solution

Dralasoft creates standards-based BPM/workflow technology that reduces the complexity and costs of integrating business processes into applications and frameworks. It consists of:

- **Workflow Engine**. An optimized runtime Java component providing the capabilities needed in a mission-critical production environment. It offers caching, thread-pooling, persistence, clustering, load balancing, and notification. The Engine is a scalable component with the ability to be deployed on multiple servers as a cluster.
- **Workflow Studio**. A visual design environment for developing workflows by dragging and dropping predefined tasks. Due to its flexibility and intuitive interface, the Studio can be used by programmers and business analysts alike. The Studio is customizable to enable integration into existing applications via XML.
- **Workflow Manager**. Provides monitoring and management services to support mission-critical deployments, including isolating bottlenecks in workflows, gathering and analyzing statistics, and reporting.

Best of Show at AIIM 2004

Dralasoft Workflow won "Best BPM/Workflow Product" honors at the second annual AIIM E-DOC Magazine 2004 Best of Show Awards in New York City. The award, presented during a special industry reception March 9 during the AIIM 2004 Conference and Expo, recognizes currently available products that provide exceptional functionality, efficiency, and return on investment for users. The AIIM E-DOC Magazine 2004 Best of AIIM Awards were judged by a panel of 20 industry experts comprised of users, analysts, and consultants.

Dralasoft Workflow is employed by companies ranging from startups to world-class enterprises such as Xerox, Agile Software, diCarta, General Dynamics, Northrop Grumman, Sears, Sony, System Access, University of California, and Xythos. ∎

For more information about Dralasoft Workflow, visit www.dralasoft.com or email info@dralasoft.com

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Middleware for the Masses

NetZyme Enterprise Version 6 offers "any-to-any" middleware connectivity at an affordable price

Once upon a time, middleware meant the laborious process of building customized interfaces between applications. Message hubs that sat at the center of the infrastructure replaced these "spaghetti networks" of point-to-point connections. Messages would be routed to the hub from various systems, their format and structure transformed and relayed to the receiving applications or networks. In the early days of such products, extensive programming was required. However, as technology has matured Enterprise Application Integration (EAI) suites have eliminated much of the middleware tedium.

Problem solved? Not quite. While such EAI solutions allowed enterprises to upgrade their existing infrastructure while retaining legacy systems, they had several major drawbacks. The price tag on middleware suites from the likes of IBM and Candle, for example, often run into the hundreds of thousands of dollars. Such products typically focused on specific legacy platforms or a limited number of applications. In a heterogeneous environment, therefore, several types of middleware might be required to hook up mainframes and other legacy platforms to more modern infrastructures.

Enter NetZyme® Enterprise by Creative Science Systems, Inc. of Campbell, CA. Unlike other middleware products that require the installation of massive programs and databases, NetZyme Enterprise fits in just around 1 MB of space and provides complete interoperability between all versions of Java and ANSI C languages.

This means any-to-any connectivity – any data, language, platform, protocol, or device. It can also operate on any version of Windows, any flavor of UNIX and Linux, mainframes (AS/400, S/390 and RS/6000), mobile platforms (Palm VII and PocketPC), and all other platforms supporting Java.

Currency trading firm Forex Capital Markets (FXCM), for example, utilizes NetZyme to provide system-wide integration across its Internet-based foreign exchange dealing system. FXCM needed a solution that worked in real time with very complex databases and which could scale up without losing performance during a move from a traditional middleware environment to NetZyme. Every month, between 50,000 and 100,000 trades are now successfully executed. FXCM clients can trade without having to worry about slow execution, freezing, and server crashes that are linked to Java-based systems during heavy trading times.

"During testing, NetZyme outperformed the other middleware products and we are very pleased with the results," said Marc Prosser, Chief Marketing Officer for FXCM.

NetZyme® Enterprise Contents

E-Commerce Necessity

Like FXCM, many companies are realizing that if they continue to tolerate isolated systems, they risk losing their competitive advantage. The trend, therefore, is towards the creation of systems and networks that can interface seamlessly with branch offices and partners around the globe.

"Expanding e-commerce depends on the quality of an integrated infrastructure," said Kimberly Knickle, an analyst with AMR Research. "Information islands prevent many organizations from serving their customers and competing more effectively and that is where EAI comes in."

According to IT market research firm Meta Group, however, the 2,000 largest companies in the world each use an average of 49 business applications. As a result, as much as 35 percent of a company's IT budget can be absorbed by application integration. Integration itself would be relatively straightforward if applications conformed to the same set of standards and used the same operating protocols, platforms, languages, and devices. But they typically don't.

NetZyme solves this problem by offering platform-independent, enterprise-grade, integration middleware that fully supports a wide range of platforms. This has recently been expanded to include Mac OS X (both in Java and C/C++), QUALCOMM's BREW system, UMB (Universal Messaging Bus), Web services, SSL/TLS, Palm OS®, Microsoft Pocket PC®, and other PDA platforms. It includes IDE/GUI for rapid development and it can be used to design and manage any .NET application.

NetZyme Enterprise Integration Middleware Suite reduces integration effort with non-intrusive transformation of aging system-dependent programs into distributed applications. In spite of its extremely small footprint, NetZyme maintains large load capacity per CPU. It is capable of very fast client-server roundtrip through the database and has a rapid developer learning curve.

"Our new version NetZyme Enterprise for .NET has full functionality of SSL to enhance secure transactions as well as our existing authentication and authorization security mechanism," said Jacob Dreyband, CEO of Creative Science Systems. "Also we have extended our wireless functionality to HandSpring, Pocket PC, and Palm OS support."

Modern middleware products such as NetZyme are finally beginning to demonstrate a similar level of maturity to other aspects of technology. In some cases, these tools have matured to the point where they represent a relatively small download, a price tag that is affordable for small and mid-sized businesses, and an integration timeline that means days rather than months or years. ∎

Zero G:
Reinvent the Wheel or Buy a Proven Solution

Framing a New Decision with the Old Criteria

Since the Industrial Revolution made mass production a mass proposition, the recurring question of whether to buy or to build the technology of the day has remained almost identical. Is it better to buy pre-built technology, or develop it yourself from scratch? Even a casual observer can tell you that the debate is no closer to resolution today than it was a hundred years ago.

This question is even more challenging when the decision involves buying or building advanced technology such as software installation and deployment tools. With deployment tools, while each software developer is likely to view the decision-making criteria differently, the make-or-break issue is always the same: your product's first impression—the installation—is a crucial moment for the success of both you and your users.

Regardless of whether you decide to buy or build a software deployment solution, your company will have to successfully frame the criteria for selection. Despite the complexity of the technology, this is not as difficult as it may sound.

Framing the Decision

To remain competitive, companies must stay on the cutting edge of evolving technologies and changing business needs. This is especially true with a software deployment solution.

But you're likely to raise a few eyebrows among software developers if you tell them that their decision to buy or build a software deployment tool is not much different than it was when Farmer John bought a wagon wheel.

Yet the buy-or-build decision typically incorporates factors that are generally consistent. It boils down to time-to-market, cost savings, core competencies, and achieving a custom fit. By focusing on this framework, you can ensure that your software acquisition remains aligned with your business needs.

Roland Racko, a veteran software consultant and writer, explained in a recent head-to-head evaluation of the top three installers that successful deployment always starts with selecting the right solution. InstallAnywhere from Zero G Software came out on top by a wide margin. It's not so difficult to understand how Racko came to his conclusions when you consider the framework of a traditional buy-or-build decision (see Table 1).

When each factor is taken into account, the advantages of purchasing InstallAnywhere are compelling. Beyond significant advantages in regard to real cost, InstallAnywhere offers important benefits in terms of time-to-market and allows software developers to focus on their core mission. It is only in terms of custom fit that there is generally less distinction, since InstallAnywhere can create customized installers that are virtually indistinguishable from homegrown solutions.

Time-to-Market

Building your own deployment solution always means longer time to market. To that end, time-to-market is often the first and most important factor that a company considers when making the buy-or-build decision. If time-to-market is a concern in your development process—and it most likely is—purchasing InstallAnywhere will yield results faster than building from scratch.

Cost Savings

What are the costs associated with buying versus building? Does the benefit of building justify the cost, especially when a mature solution such as InstallAnywhere is available? No one knows for certain, since no value measure can be one-size-fits-all.

With most companies the dollar value can easily be measured by the cost of development. But companies usually underestimate the maintenance costs of internally developed solutions. A software developer must dedicate tens of thousands of dollars more for ongoing maintenance and development than it would if it were to buy InstallAnywhere out-of-the-box.

Core Competencies

The choice to build often entails more 'building' than one may realize. Zero G has spent more than 100 man-years of combined product development effort delivering InstallAnywhere. It can be an unpleasant surprise to learn that you, too, will dedicate thousands of man-hours to your development pursuit—unfortunately, most companies don't realize this until they are beyond the point of return. The less you want to build a core competency in deployment technologies, the more likely you are to buy InstallAnywhere.

Custom Fit

In the past, getting a custom fit meant being trapped between unlimited flexibility at high cost, and narrower flexibility at lower cost. This is no longer the case since InstallAnywhere builds installers that are totally integrated for standard or custom configurations, and is perfect for multi-component suites. Unless you are gaining a competitive advantage by building your own deployment solution, you should not endeavor to build your own installation software. ■

Factor	Build	InstallAnywhere
Time-to-Market	1 to 2 months, minimum	30 minutes or less, average
Cost Savings	Build = $34,000+ Maintain = $20,000+ (Based on avg. developer's salary of $100k/yr.)	Enterprise Edition = $4,490 (Includes support & upgrades)
Core Competency	Software development	Software deployment (> 100 man-years experience)
Custom Fit	Highest level of integration	Customizable, Adaptable

Table 1 Build vs. InstallAnywhere
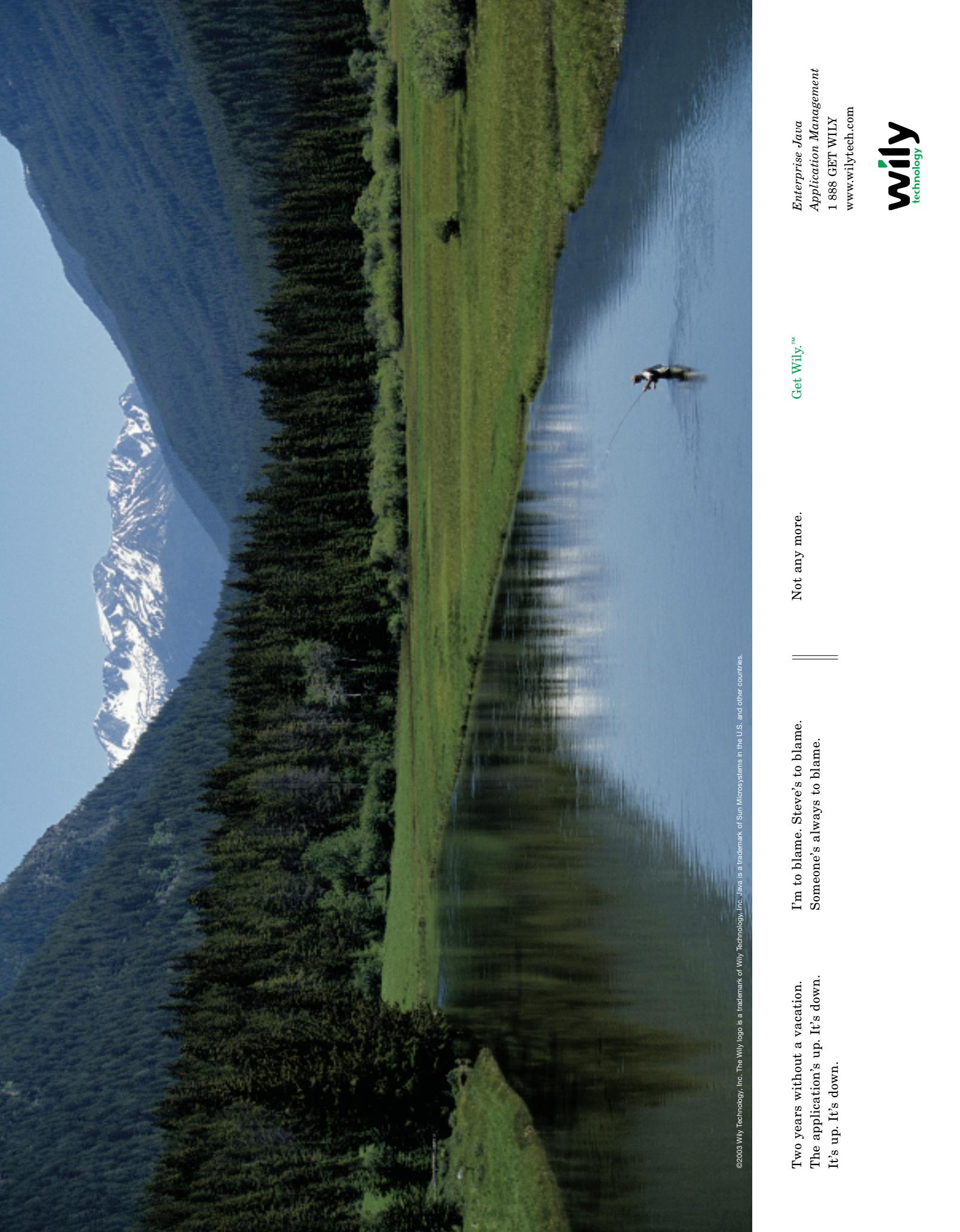
Two years without a vacation.
The application's up. It's down.
It's up. It's down.

I'm to blame. Steve's to blame.
Someone's always to blame.

Not any more.

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Wily Technology:

Communicating the Benefits of Application Management to Senior Management

If you are reading this Solutions Guide, you are most likely someone directly involved in developing, designing, or managing online applications. So, for you, the needs for J2EE application management tools may fall into the "preaching to the choir" category. You live with J2EE applications, understand their complexity, and appreciate just how hard a job it is to keep important online applications available and high performing.

Wily Application Complexity/Criticality Curve

Copyright 2003, Wily Technology, Inc.
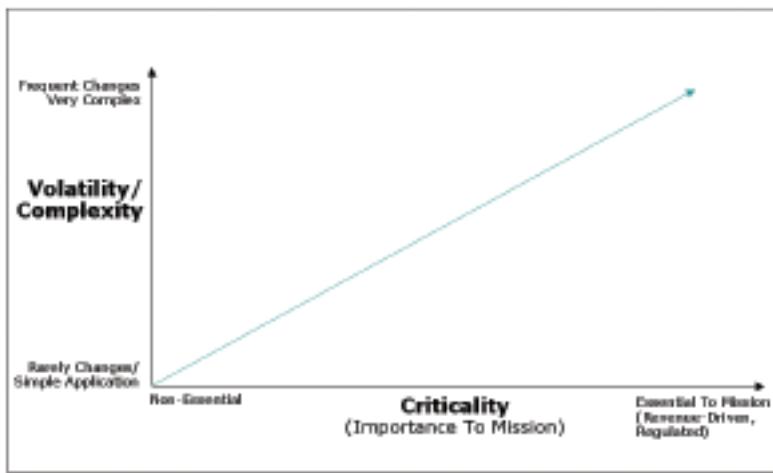
You also recognize the need for specialized tools which can monitor your applications 24x7 and give you the visibility inside the application needed to rapidly diagnose problems.

However, to purchase and use these tools you need to secure the budget and approval of senior IT managers. You need to understand and communicate the benefits which will accrue to all of IT and to the line of business as well.

To communicate the need for application management tools, prepare a presentation which covers the following points.

1. Assess the Need for Management. You probably have many online or shared infrastructure applications which you believe need to be managed. Don't forget major internal and vendor-facing applications. To understand and communicate the scope of the challenge you face, Wily suggests a tool called the Complexity/Criticality Curve (see graph). Plot your applications on this chart. Once completed, this chart illustrates that your team is managing a portfolio of applications of varying criticality and complexity. If applications are complex, your team needs specialized J2EE tools which

provide monitoring visibility into all of the components which make up the application. As applications become more critical, your team needs to monitor them 24x7 in production so they do not impact revenue or customer satisfaction. Frankly (and this is heresy from a management software vendor), not all of your applications need to be monitored and managed. There will always be some which are neither critical nor particularly complex. Plan to manage these last. Important note: Several Wily customers have pointed out that applications are not static – they migrate from less complex/less critical to more complex/more critical over time. Why is this? Consider an example. Your team writes a new app and you do a pilot rollout. The pilot is successful, so you do a larger rollout (making it more critical.) Users like the app so much that you add more functionality (thus adding to its complexity.) And so it goes. The point is that plotting your applications on this curve should be done periodically to re-assess the complexity and criticality of the portfolio.

2. Compute the Risks your Organization Faces. Savvy IT teams know that an application is more than an assemblage of servlets, EJBs, connectors and servers. It is a vital element in the organization's strategy to serve customers, to sell products, to efficiently manage a supply chain, to make employees more productive. When applications fail, they are not just IT's problem. They impact your organizations business goals. A comprehensive application management process, backed up with specialized management tools, will significantly improve availability and performance. The risks your organization faces will be reduced. According to the 2003 Wily Benchmark Survey, average availability was only 88%. Wily customers reported average availability in the range of 96%. Ask the application "owner" to describe to your team the business model they had in mind when funds were budgeted in the first place. Goals may be expressed in revenue, customers served, orders placed per hour, bond trades per day, whatever. Take those goals and express them in terms of risks. For example, if an application was designed to generate revenue, it will be relatively easy to compute the cost of a day's downtime. Repeat this for the other applications in your portfolio. Even internal applications have risks attached to them in terms of inability to serve customers, delays in processing orders, etc. Other risks your organization faces include lost IT productivity, employee attrition, and excess hardware capacity. Wily offers a free set of ROI tools on its website, www.wilytech.com, to assist you in this step.

If you communicate your results to senior IT management, you will have accomplished several things. You will have improved your team's knowledge of your application portfolio. You will markedly improve your credibility within your organization. Finally you will likely achieve the management endorsement you need to find the tools your team needs to end the blame games and regain control of your applications. ∎

The POWER of
Interactive Information
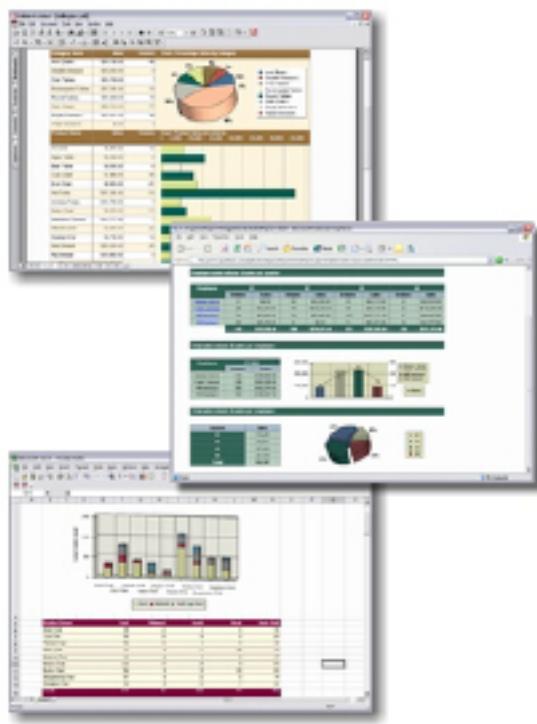
Your users demand to see data in more than just an HTML table. Using EspressReport you can give them interactive, actionable information in the format they desire.

Easily create sophisticaed reports with detailed charts, multiple tables, and drillable data. Users can view reports as HTML, DHTML, PDF, Excel and RTF with zero client.

Designed to leverage your application infrastructure EspressReport embedds fully within your J2EE application server and quickly integates with applications, JSPs and portals.

Built-in ad-hoc reporting capabilities allow your users to create queries and reports themselves, freeing development resources.

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- ✔ Build reports using database, XML, text, or Java object/EJB data with extensive parameter support.

- ✔ Plot data in over 30 2D and 3D charts.

- ✔ Fully integrate reports into your applications using the extensive Java APIs.

- ✔ Provide end-to-end user and data security within reports.

- ✔ Schedule reports with archiving and email delivery.

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Quadbase:
The Right Reporting Solution

The explosive growth of Web technologies, and the resultant glut of new information, has fundamentally changed the way in which data is presented and delivered. Companies that have rushed to embrace new technologies now find that users expect Web applications to be vehicles for high-value, up-to-the-minute business information as well.

At the same time, many developers are still hand-coding an HTML presentation layer for Web applications. This one-off approach can be very inefficient, time-consuming, and allows for little or no code re-use.

Many different solutions to this problem exist, but there are still pitfalls present when choosing a solution for information presentation and delivery. A good tool can improve developer productivity, but the prohibitive costs of some solutions can make it difficult to quickly realize any real ROI. Other tools may have enough features to cover the initial requirements of a project, but as requirements and users grow, they may no longer be able to provide the required functionality.

It's clear that choosing the right reporting solution is an imperative. Quadbase Systems offers tools with the right balance of features, performance, and price to fit nearly every reporting requirement. See below how Quadbase solutions EspressReport and EspressReport ES address the key aspects/requirements for Web reporting.

Flexible Presentation

Basic reporting presentations may be as simple as a formatted HTML. Generally, most users have reporting requirements that extend far beyond this. Requirements can vary both in terms of preferred output, and report layout itself. EspressReport can easily handle these requirements. In addition to HTML tables, EspressReport can generate reports in highly formatted DHTML, print quality PDF, Excel spreadsheets, Rich text files, and XML and CSV data dumps. EspressReport's flexible interface makes it easy for you to configure a variety of different layouts. Reports can be constructed using multiple tables, with built-in, interactive drill-down capabilities. The Report Designer interface provides an easy-to-use, visual tool to build reports.

Data Source Integration

The most basic level of data access for reporting solutions is to directly query a database. However, many application models separate the data access layer from business logic. Having a reporting tool make a connection to the database in these scenarios can be redundant. In addition, legacy or application data may be returned as XML. EspressReport can read and integrate data from all these sources. For standard applications it can handle the Database connection and queries. Data can be retrieved from Java objects, or EJBs, or using connection pools to leverage existing application infrastructure. XML data in any form can also be queried. Extensive parameterization is built into the data source features allowing you to easily secure and dynamically filter report data.

Extensive Data Visualization

One of the most important components of a data presentation layer is often overlooked. Nothing conveys information better than a well-designed chart or graph. However, many reporting solutions only offer limited charting support. EspressReport offers a huge feature set for charts. You can plot data in over 30 different 2D and 3D chart types, plus build many different combination/composite charts. Powerful analysis features include trending, normal curves, and control lines/areas. Need to add some dynamic graphs to existing Web pages? EspressReport can be configured to stream images directly to existing Web content.

Performance/Scalability

Most people expect a certain level of performance and scalability built in to any solution, but EspressReport takes this further. EspressReport can generate reports significantly faster than many other reporting tools. Powerful memory optimization features allow users to handle large amounts of data. EspressReport also grows with your reporting requirements. You can embed EspressReport's API classes into applications, servlets, and JSPs for dynamic report generation, and move up to EspressReport ES, which supports user/group end-to-end security, remote administration, and advanced scheduling and archiving.

Ad-Hoc Reporting and Analysis

One of the best ways to improve developer productivity is to have users create their own reports and queries. EspressReport provides a number of features that allow you to extend ad-hoc capabilities to your users. The data view interface allows you to create local views that insulate users from database complexity when creating queries. The Report Designer interface can be loaded remotely and customized programmatically. The QuickDesigner, included in EspressReport ES, allows users to build reports and queries using a thin-client browser interface. ∎

For more information, visit
www.quadbase.com

ClearNova:
Application Development
Simplified & Accelerated

Productivity Gained By Using ThinkCAP
As Demonstrated With The Pet Store Application
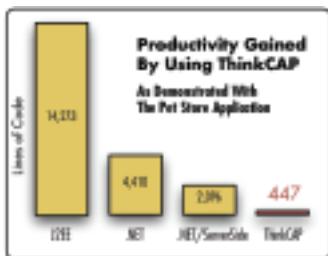
Application Development: The Need to Do Better

Developing robust business applications is expensive. The costs are represented in various ways:

- labor-intensive development that relies on highly skilled programmers
- length of time to deployment
- difficulty in maintenance and upgrades
- scarcity of skilled programmers
- inability to meet the needs of the business in a timely manner

Too often, applications are complex, brittle, and monolithic…and enormously expensive to build and maintain.

There is a better approach to application development. ClearNova's ThinkCAP offers a faster, easier way to produce business applications that meet schedule, cost, and skill constraints. ThinkCAP is focused on one thing: to simplify and accelerate the development and maintenance of web-based business applications. It produces applications that are robust, reliable, and roll out in less than half the time.

Lowering the Bar to J2EE Use

J2EE is powerful and versatile but also complex. And although it can deliver reliability, scalability, and security, sometimes those benefits are achieved slowly and at high cost. For all its capabilities, J2EE has suffered from a lack of highly productive environments. Tools exist for writing low-level code and objects—but they aren't designed for business applications where presentation and data flow are critical—and often dynamic.

ThinkCAP extends the power of J2EE by making it widely accessible. ThinkCAP visual workbench provides easy-to-use, extensible data-aware components that can be used and configured easily and tied to data, objects, or XML. ThinkCAP helps with developing pages, page flows, forms, data views, queries, charts and graphs, and much more. Instead of writing plumbing code, ThinkCAP lets developers concentrate on functionality. With ThinkCAP, you don't need to be a J2EE expert to create a business application.

TieredRAD™: Productivity Tools for the Entire Development Team

Traditional J2EE application development relies almost exclusively on programmers working in a code-centric environment. These traditional environments exclude the experts with a lower level of J2EE knowledge but a higher level of business awareness and visual development experience.

ThinkCAP's TieredRAD approach, however, is one of empowerment, not exclusion—of increasing productivity and shortening development time by matching tools to people, and people to

tasks. TieredRAD provides the appropriate tools and levels of RAD support for everyone contributing to application development.

ThinkCAP supports J2EE programmers with object-relational mapping, service assembly of web services & EJBs, server object creation, and a bundled copy of Eclipse (any tool is supported however). Business developers use advanced visual designers, Smart Data Binding, and event-driven coding. Content owners have integrated content management features.

Since team members use tools that are designed for their specific skills, they can work faster, with fewer errors. And because they work concurrently, the applications are built faster and more reliably.

Productivity and Reusable Components

ThinkCAP includes a powerful set of integrated frameworks for constructing web applications and portals. It delivers a wide array of ready-to-use business and portal components, data-aware visual controls, connectors for data access, and management utilities. Assembling applications from components is simpler and over twice as fast as writing code. Using pre-built, pre-tested components also reduces overall project risk. Pluggable, reusable ThinkCAP components are available at every level of application development. Developers can easily add their own components and make them available to the entire project team.

The Proof Is in the Application

Using ThinkCAP, ClearNova recreated the functionality of the Java Pet Store application in 447 lines of code—barely 25 percent of Microsoft .NET's best effort—and dramatically lower than other J2EE environments.

It's easy to claim that ThinkCAP is fast, productive, and scalable to the enterprise, but real world applications built with ThinkCAP and in use today prove it.

Carlson Wagonlit Government Travel needed a J2EE thin-client application to replace its existing Oracle Forms application. Estimates for code-centric development exceeded one year and a team of almost 20 developers. With ThinkCAP, Carlson went from design to completion in under three months using a team of eight people. Carlson was then awarded a ten-year contract to provide travel services to 23 government agencies.

ThinkCAP: Focused on Business Applications

The benefits of ThinkCAP are many, but the key point is ThinkCAP's single point of focus: to simplify and accelerate the development and maintenance of web-based applications. ThinkCAP is field-proven—it reduces project risk, leverages organizational skills, lowers the cost of development and maintenance, and dramatically shortens project timelines. ∎

"ThinkCAP is a breakthrough technology that allows us to leverage a practical mix of J2EE RAD capabilities with significant component functionality right out of the box. This technology empowers our people with the ability to quickly deliver scalable, reliable enterprise solutions without the need to battle many of the complexities normally associated with such efforts."

—Steve Brown
Senior VP and CIO, Carlson Companies

"A major aspect of ThinkCAP's power lies in its rapid development capabilities while providing a scalable, reliable environment based on industry standard technologies. We could not have provided the flexibility and functionality to Home Depot in the time we had without it."

—Sam Murthy,
President, NetServ

› WIRELESS TECHNOLOGIES

Making Money From The Mobile Revolution

by Bill Ray

A leap into the future

> *"The killer application for a mobile phone is the ability to make phone calls"*

Mobile phones are the success story of the last five years. While budgets are cut across the IT industry and companies are increasingly looking to do more with what they've got, mobile technologies continue to buck the trend and investment in wireless infrastructure and devices increases year-on-year.

The mobile phone occupies a unique place in wireless. It replaces nothing but is genuinely a new device the likes of which have never been seen before. Today's cellular systems are only 20 years old, while the technology to create handsets as fashion accessories has only been realized in the last few years. The initial cost of handsets led network operators to heavily subsidize the cost, on the understanding that they would make the money back on calls. This was intended to be only a temporary measure, but lit's proving rather less temporary than envisioned! The first network to remove the subsidy will see its customers taking advantage of number portability real fast, while working together to all remove the subsidy at the same time would be anticompetitive.

The Killer Identified

Let's be clear on one thing: the killer application for a mobile phone is the ability to make phone calls. The reason someone walks into a shop to buy a phone is so they can make calls on it. Everything else might be nice, and might make them choose one brand over another, but the reason they buy is voice calls. While data services and messaging get all the attention, it's still voice services that make the deal. Even the most data-centric network operator will get at least 80% of their income from basic voice service.

Even better than basic voice, and providing a significant proportion of that 80% figure, is roaming. Walk outside the area your network covers and suddenly you understand how they can afford a $200 subsidy on your handset! Roaming charges are a rip-off, for what they offer, but are one of the avenues open to the networks to recoup that huge subsidy on the handsets.

Second to voice comes text services. Originally introduced to the GSM service as an afterthought for sending network information to subscribers, it took years to get both the penetration of devices and acceptance by a critical mass of customers – to get the explosion of usage seen worldwide. Both of these conditions have come to pass in the U.S. in the last year, and we can expect a similar exponential growth in text services here, along with the revenue opportunities that come with it.

Multimedia messages are a logical extension of text messaging, including the ability to send pictures, sounds, and video. It remains to be seen if multimedia messages will strike the same chord text did; while volumes have been significant, the penetration of multimedia-capable devices makes message-volume comparisons impossible.

While customers like texting each other, there is significant income from messaging when it's tied into premium services. The ability to use text services as a back-channel for TV, radio and printed media, not to mention as an Internet micro-payment system, relies on a reliable cross-network charging system of the type recently available in the U.S. TV shows like "American Idol" allow viewers to vote for their preferred act, generating significant income. It won't be long before it's possible to finance an entire TV show from the income from viewer voting, as we've already seen in Europe with "Big Brother." But it isn't just the networks that stand to gain from this ability to charge customers small amounts for messages: companies are springing up offering an unimaginable range of services, all paid for by text.

Aside from the obvious share-price systems, and adult services, there are many other ways to make money from text. It isn't just about the provision of information; many European Web sites are already using text messages as a micro-payment system to charge for their content. Visitors to such Web sites must send a premium-rate message, the response to which is a password that can then be used to log on to the site. In this way the mobile phone becomes much more than a communications device, fulfilling its role as a secure mobile wallet with nothing more complicated than an SMS message.

Calling the Enterprise

Business users, on the other hand, have very different requirements for a mobile telephone, and it's worth taking a moment to consider just what makes the enterprise so different before we start to look at how and where they are spending their money.

One of the biggest problems that enterprises will face in the next few years is just keeping up with the technology. A device like the Mda II, a PocketPC device being offered by T-Mobile, will have a life of only about 18 months. After that time it will be supplanted by the "next big thing," which is fine for consumers who will just upgrade to the next device when their contract allows, but enterprise customers are in real danger of just having approved a device for company-wide deployment only to find it's been withdrawn! As consumers demand faster

simplicity and power of the Blackberry. As devices conforming to the Open Mobile Alliance E-Mail Notification Service standard start to appear we will see this kind of service becoming a standard feature on all handsets offered in the enterprise market.

Of course, e-mail isn't the only service enterprise customers are interested in. There's a great deal of information on corporate servers that is useful to the employee on the move. The availability of databases, synchronization techniques, and advanced development environments has led to numerous vertical applications addressing needs as diverse as car repossession and crop-yield monitoring. With this comes the development offourth-generation development environments such as Visual Basic and its derivatives.

when you log on you're shown a list of people you know along with their current status. With the next generation of handsets you'll be able to glance at your address book to see not only what your colleague's number is, but also what they're doing! When you change the phone profile everyone who knows you see that you're unavailable.

Of course, for all this to work you'll need to be registered with your network, and they will maintain this presence information for you, but what happens when you want to change networks? You can take your phone number with you, that's mandated by the FCC, but you will also have an identity on the presence system, and the ability to take that with you is not yet guaranteed. You can be sure that if the networks see a way to make it harder to switch they will take advantage of it.

"... the killer application for a mobile phone is the ability to make phone calls"

refresh cycles for products, the enterprise needs some stability to allow time for procurement and deployment processes to be followed.

The products and services wanted by the enterprise customer also differ radically from the consumer. While consumers want simple billing concepts that take place right on the mobile phone screen: "Downloading this ringtone will cost you 1.50USD"; the enterprise user doesn't need to be constantly reminded how much everything costs, and will be much happier with a central billing system.

The most important difference between the enterprise user and the consumer, from a technical point of view, is that the enterprise user will have access to their own company servers and is most likely to see the advanced mobile terminal as a way of getting access to those servers. This is easily demonstrated by considering mobile e-mail, and more specifically, the RIM Blackberry product. This is a product that does nothing but allow enterprise customers to access just one of the servers in their office, and its success demonstrates the importance of contact with these servers.

The markets are awash with remote mail solutions at the moment, though none offer the

The Future Of Mobility

Many companies are working on video services, both narrowcast over mobile networks and broadcast using other available frequencies. Early services have been hampered by lack of quality, making even trials of TV-on-a-phone difficult. Handsets with analog TV tuners built in are starting to provide feedback that users are interested in watching TV on their phones, although it remains to be seen if they are willing to pay for it.

Instant Messaging (IM) certainly has content, though the revenue model dips into negativity. Networks are enjoying income from text messaging and launching a service that provides a cheaper alternative would seem counterintuitive. But with their networks offering IP connectivity and their handsets featuring open programming environments like Java, if they don't offer IM software then someone else will. IM will become a must-have feature on handsets within the next 12 months, and the networks will just have to take the hit on their profits.

But with IM comes "presence", where the server can tell other people your current status. Anyone who's used an IM service knows that

You Say You Want a Revolution?

Presence services will change the way people think about phone calls; making wireless communications much more like speaking face-to-face. Once presence is established new services, like video calling and VoIP, become possible

Yet again, the networks are being asked to take a short-term loss: introducing IM services in competition to their current text messaging, with the assurance of longer-term profits from enhanced services made possible through presence. With profits from other services to make up the difference, the networks should be willing to make a leap of faith and presence-enable our future. ∎

Bill Ray is editor-in-chief of Wireless Business & Technology *magazine, and has been developing wireless applications for over 20 years on just about every platform available. Heavily involved in Java since its release, he developed some of the first cryptography applications for Java and was a founder of JCP Computer Services, a company later sold to Sun Microsystems.*
bill@sys-con.com

> ### HUMANIZING TECHNOLOGY

Taking the Stress Out of IT

by Peter Varhol

There's more to IT than building applications and keeping the systems running

IT operations, in whatever form they take, are in a unique position in that they are rarely noticed until they fail to perform. Malfunctions, whether they are within or beyond your control, are highly visible and often critical, and typically must be fixed immediately.

The reactive nature of IT management, and the increasing importance of IT development and operations to the enterprise, means that bending the will of technology to business and operations inherently involves long and often-irregular hours, dealings with both senior management and line-level employees, and making things work when it doesn't seem possible. And the answer is never allowed to be "No."

And that's not all. With complex problems that often seem to defy rational solutions, short deadlines, and frequently not enough people and equipment to meet the ever-growing needs of the user community and the business, today's demands placed on IT managers can make the role highly stressful, no matter where it is.

Stress and accompanying depression in the workplace are now the second most disabling illness for workers after heart disease, according to a 2002 survey conducted by the International Labor Organization. Recognizing work-related stress, and learning how to cope with it, will make you feel better, make your body healthier, and make you work and live more effectively. In short, it will improve all aspects of your life, not only during work, but also during leisure.

Identifying Stress in Work Life

Stress occurs when you don't feel you have control over events in your life. Because of their nature, IT careers are particularly susceptible to ongoing stress because many of the activities are reactive and involve technologies or user actions that can't be controlled directly. Even if you plan your department's strategies and tactics meticulously, the unexpected has a way of injecting itself into reality. And the consequences of failure can be measured in lost productivity by users, or lost business for the enterprise.

The short-term symptoms of stress include faster heartbeat, increased sweating, cold hands and feet, feelings of nausea, rapid breathing, and tense muscles. These symptoms might be the result of a specific stressful event or brief period of work demands. Over the longer term, work-related stress can manifest itself in difficulty in sleeping, stomach irritation, decreased interest in your work, and irritability toward others around you. Of the two types of reactions, the latter is the more serious, because stressful symptoms that persist can make you less effective and engaging in both work and personal activities, and will cause physical harm if left untreated.

Stress is a natural reaction by your body to events or activities that your unconscious finds threatening or challenging. It's a protection mechanism, grounded in physiology or evolution, that enables your body to prepare to fight or run away from a physical threat. That was fine in the distant past, when threats were usually physical and short-lived, but is a more problematic response to the more emotional and intellectual threats that we typically face today.

In small doses, stress can be a positive force. It keeps us focused and engaged in challenging projects, and enables us to grow professionally and personally. A positive reaction to stress is what lets us make the push needed to finish a critical project on time. Without occasional stress, we might find our work mundane and boring, and not be able to give it our best effort. And when we complete a project under stress, we typically enjoy a sense of accomplishment in overcoming a challenge and growing emotionally and professionally.

The problem arises when stress becomes regular or chronic. During periods of stress, the body releases adrenaline, which constricts peripheral blood vessels and increases heart and breathing rates, preparing the body for a spurt of exertion. When this reaction occurs daily, or continually over a period of days or weeks, it physically weakens parts of the body, and both physically and mentally tires you out. Over a longer period, your personal "weak link" can cause physical problems. It could be your heart, stomach, blood pressure, or some other physiological response, depending on your health and your body's unique response to stress. There's no single response common to everyone, making it difficult for individuals to identify a physical symptom that's clearly a stress problem

Stress can come from several sources. You may be approaching a major system launch and feeling unprepared, or face a difficult project deadline over the next several weeks. It may be as simple as having an airline flight canceled when you expected to get home in time for an important personal engagement. These are examples of short-term stress, which all of us face many times during our lives. Note that some of these sources of stress may not be within our control, so any physical or emotional response can't possibly provide a solution.

Coping with Stress

It's easier to deal with stress when you're younger, and your body is stronger and better able to withstand the physical mistreatment that often results. This is one reason why start-up companies tend to attract younger employees; the hours are long and the pressure to deliver immediate results gives younger software or systems professionals an advantage in these environments. While that doesn't mean that IT managers in their 40s and 50s can't make effective workers in startup companies, they almost certainly have to practice strategies to manage stress levels.

Which raises the question of just how an IT manager can manage and even reduce the stress that accompanies our modern work life. A number of people are successful in doing so, and live healthy while working in highly stressful jobs. It's possible to overcome stress through insight into both your work life and your body's normal functioning.

Possibly the best thing you can do to manage your stress is to take actions that put you in better control of the factors in your work life that cause stress. One of the biggest causes of stress is the feeling of helplessness over day-to-day events that impacts how we work. This means you have to first identify the events in your work life that cause you stress because you seem unable to control them. Identifying stress means taking a close and objective look at every event and activity during the workday, and analyzing your approach and outlook to each.

Much of your outlook depends on how you respond to these events. Stress is greatest if you perceive that you have no control over the immediate and often conflicting demands in your work. Your inability to respond to these demands means that you internalize your natural responses, which the body interprets as stress.

If, on the other hand, you have some way to control the events around you, or even if you perceive that you do, your stress levels will almost certainly decline. One way you might do this is to establish procedures for yourself on how to handle different categories of demand. This provides you with a set way of reacting to events without even having to think about them. For example, you might often get urgent requests for new features on a deployed application. Rather than feeling the weight of each request as it arrives, you could establish a process whereby these requests are routed through others who are in a position to evaluate and prioritize such requests, so that you can place them in the context of their importance.

Long-term stress can also result from your inability to perform a job at a satisfactory level. IT professionals are often hesitant to admit this, even to themselves, because of their inherent belief that every problem has a solution. But there are work roles that are simply out of our reach, yet we occasionally find ourselves in those roles. This could happen when you're first promoted to a management role, or if you're given a tough assignment using technologies in which you have no background.

A typical reaction to performance stress is a listlessness at work and home, and a lack of desire to go to work in the morning. You may retreat into your office and reduce contact with your colleagues. If you find yourself in this position, you should seek assistance from your colleagues, managers, or human resources department, for training to better perform your job, or for off-loading some tasks to enable you to focus on what you're best able to do. Admitting you have limitations is difficult to do, but being honest with yourself and those around you will prevent more serious problems down the road.

Working with Stress

Those most successful at dealing with stress make extensive contingency plans that anticipate disruptive issues. You can't stop the production server's hard disk from crashing, for example, but a vigorous backup regimen, combined with written procedures in the case of failure, can make such an event simply a matter of routine. Taking some time up front to think through everything that can happen, assess the risks involved, and set down the contingencies is pure stress insurance. If you can't do it by yourself, form a staff committee and charge them with contingency planning.

Regular exercise is another excellent way to combat stress. Exercise helps in a number of ways. First, over time it improves your general health by strengthening many of the parts of the body that might be susceptible to failure under stress. Second, it provides a safe and healthy physical outlet for a buildup of stress. In psychology, a phenomenon known as transference describes the tendency of individuals suffering stress in one aspect of their lives to take it out on an innocent party in an unrelated part of their lives. Exercise provides a way of releasing stress outside of work that doesn't harm others.

Jogging is a common way of relieving work stress. Weights, team sports, aerobics, and t'ai chi are frequently practiced, often through company-sponsored venues. Your company may have athletic facilities on-site, or may offer a discount at a local gym. Take advantage of these benefits, and join those of your colleagues who already engage in a workout strategy before work, during lunch, or after work. If you want to completely leave your job behind as you exercise, either join a health club or get exercise gear for your home.

Some people turn to alcohol or drugs as a way to relieve stress. While these solutions may seem to provide immediate relief from the short-term symptoms of stress, they simply substitute one problem for another, more serious one. The root causes of your stress don't go away, yet you're doing yourself greater mental and physical harm, and possibly hurting those around you. In these cases, it's time to seek the help of others, starting with your physician.

Above all, if dealing with stress by yourself is unrealistic or hasn't worked for you, you shouldn't be afraid to ask for assistance from your managers or from health care professionals. While the causes of workplace stress may be beyond your ability to fix, others may be able to address these issues, or to provide methods to enable you to better deal with the underlying stress. Because we tend to invest so much of our personalities in our work, we view stress as a personal failure, when it's really simply a problem to be solved.

Summary

Long-term, work-related stress makes life difficult for you and those around you. Living under the umbrella of tension and frayed nerves is not only mentally but also physically hard on you. Recognizing your reactions to stress enables you to change your reactions to stress or your ways of dealing with it. It will make you better at your job, and more important, better at the game of life. ■

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> ## ENTERPRISE JAVA

Java at a Crossroads

A crisis of complexity, productivity, and standards
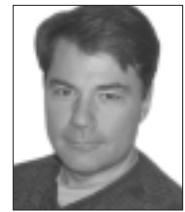
by Steve Benfield

>> *Java and J2EE are at a crossroads – facing issues such as complexity and vendor lock-in. Where can you turn for the the productivity, performance, and ROI you've come to expect?*

Having entered the mainstream and taken hold in roughly 70% of enterprises, Java is the clear winner when it comes to enterprise server architecture. As a unifying force for middleware API standardization and an aggregator of competition against Microsoft, it has also been a spectacular success.

Today Java faces several major issues, either real or perceived.

- *Complexity:* Java is perceived by most people to be very complex, too complex for developing certain types of applications.
- *Development issues:* Adoption by late majority developers and a shift from systems programmers to business developers.
- *Lack of productivity:* Microsoft is throwing around a lot of FUD (Fear, Uncertainty, and Doubt) and claiming that J2EE is inherently nonproductive.
- *Increasing vendor lock-in:* J2EE vendors are implementing proprietary frameworks that run only their own application servers.

Is J2EE Too Complex?

Let's look at the first issue, complexity. There are several ways to look at complexity: the number of APIs, the number of methods in those APIs, the XML files needed to deploy a system, the level of abstraction of the APIs, and so on. A simplified way of looking at complexity is looking at the size of the specification itself, shown in Figure 1. At roughly 1,730 pages, the J2EE 1.4 specification is three times as large as J2EE 1.3. It has clearly grown in complexity as it encompasses Web services, EJB changes, XML, and so on.

A robust infrastructure for building enterprise applications in a portable, scalable, reliable, and secure way must be complex. So, yes, J2EE is complex – but by necessity. Microsoft .NET is also complex – it has many "standards"
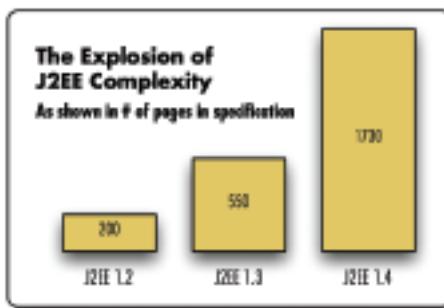

Figure 1: Complexity in terms of size

for enterprise applications and has thousands of methods available to developers. When people say .NET isn't as complex as J2EE, what they really mean is that .NET has a highly visual development environment, Visual Studio, that hides much of this complexity from developers. What Java has lacked a highly productive environment for building applications.

The Changing Face of Java Development

To this end, every major J2EE vendor is working on tooling that makes it easier to build J2EE applications. However, I suggest that these organizations are primarily building tools that make it easier to write lower-level J2EE code and are missing the needs of the fastest growing segment of the marketplace.

In a February 2004 report on the changing nature of the Java development community, Gartner Group reports that over the next few years, the majority of Java developers will be those who value productivity and ROI over technical purity of solutions. Historically the Java development community has been dominated by architects and experienced systems-level developers whose primary focus is in building a lasting infrastructure. The newer developers using Java are concerned with getting applications built quickly and easily – I call this group business developers. Table 1 shows some of the differences between these two groups.

The chorus of complaints about J2EE complexity has been growing steadily for the past few years. As more and more business developers join the ranks of Java developers, their frustration with a lack of highly productive environments emerge as attacks on J2EE complexity.

	Systems Programmers	**Business Developers**
Tools	IDEs, code editors	Visual designers, code generation
Focus	Reusable business logic; enterprise infrastructure	Business applications and user interface
Previous Experience	C, C++, Smalltalk, Unix development,	PowerBuilder, Visual Basic, Oracle Forms, RPG, COBOL
Framework Preference	'I will find best-of-breed open source tools and frameworks and integrate them for our needs. Give me a good code editor and I'm ready to go.'	'I want something that is already integrated, tested, and ready to go – and I want visual tools to make it faster and easier. Give me point and click and I'm ready to go.'
Standards	'I want 100% pure standards and an open source approach.	'I'm willing to accept a degree of proprietary technology for productivity.'

Table 1: Systems programmers vs business developers

Tools Make the Productivity Difference

A double-edged sword in the Java world is its diversity of tools. There are many to choose from, each with a different focus and different area of strength. The proliferation of tools makes it harder for organizations to choose a tool and can lead to mismatches between the tool and developer skill and focus. Likewise, since no single tool dominates the Java market, it's easy for Microsoft to attack only J2EE itself – and not the individual tools.

BEA's WebLogic Workshop, IBM's WSAD, Eclipse, Compuware's OptimalJ, and ClearNova's ThinkCAP all address the problem of developer productivity and represent a productivity layer we call J2EZ. Each has a different approach geared toward different developer audiences.

The BEA and IBM products appeal to J2EE developers who want to make low-level J2EE coding easier; to use these products, a good bit of J2EE knowledge is still required. Since these environments only build code that runs on their individual application servers, this approach works if you've made the strategic decision to go with BEA or IBM to the exclusion of others – and you have sufficient J2EE developer resources available.

OptimalJ and IBM's Rational product lines are geared toward architects and designers who want a model-driven approach to the development of their applications – regardless of actual language choice. These require an up-front investment in the full analysis and design of the applications in question. The biggest payback is in the automation of building core business logic and business rules.

ClearNova's ThinkCAP appeals to organizations that desire a rapid time-to-market using business developer skills and J2EE programmer skills. The highest productivity comes in areas such as application flow, page development and design, data binding of visual elements to underlying relational or nonrelational data sources or objects – all the areas of an application that tend to be fluid and subject to rapid changes.

A common way of measuring the productivity of various tools and development environments is the Java Pet Store application. Originally built as a way to demonstrate various features of J2EE, it has turned into a way for vendors to demonstrate the productivity of their environments. Microsoft made a lot of noise in the marketplace last year trying to demonstrate the productivity of .NET over Java by showing that the Pet Store only took 4,410 lines of code in .NET versus 14,273 in J2EE. Microsoft's contention was that .NET was more productive than J2EE. The test was an invalid one because the original Pet Store had

never been designed to minimize lines of code and was a way to demonstrate various J2EE best practices. Microsoft took the battle one step further and received third-party validation of .NET's productivity from the Middleware Company (owners of the popular TheServerSide.com Web site). My contention is that both .NET and J2EE are complex and that the only difference is in tooling. Given the right tools and frameworks, development effort can be drastically reduced. In our tests at ClearNova, we were able to build the Pet Store in under 500 lines of code (see Figure 2). However, had ThinkCAP been used to build pure middle-tier logic or an underlying Web services infrastructure, we would not have fared well at all because our tooling focuses on business applications. In that case OptimalJ or Rational tooling would have excelled. No single tool benefits all developers, and in the Java world, the diversity of tools means that organizations can match them to developer skills.

The Vendor Lock-in Myth

One major reason organizations go with J2EE is to avoid vendor lock-in. However, for most enterprises, there is clear lock-in with the servers and tools in question. For example, both IBM and BEA have productivity environments that require the use of their own application servers. Gartner believes that by the end of the decade, more than 40% of the APIs delivered by major application server vendors will be proprietary and only 60% will be pure J2EE compliant.

As the J2EE application server itself becomes more commoditized, vendors are looking for ways to differentiate themselves from alternatives and to provide barriers to customers who want to move to other servers. In the Java world, there is a process for introducing changes to J2EE called the Java Community Process (JCP). Currently there are more than 200 possible standards (JSRs) flowing (flowing slowly, that is) through the JCP. Major vendors such as IBM and BEA have begun to bypass the JCP and announce joint standards initiatives to

Figure 2: Productivity gains with ThinkCAP

get a competitive jump on possible competition and to drastically shorten the time needed to come up with the standards that will benefit customers.

The SQLization of J2EE

We've already seen this trend in the database market. In the early '90s a lot of attention was focused on ANSI Standard SQL and how each database implemented it. Developers were told to write only to the SQL standard and to avoid vendor-specific extensions. This attitude lasted for a few years but was abandoned as it became clearer and clearer that to really get performance from the database, proprietary extensions such as stored procedures, database triggers, and PL/SQL, etc., were needed. Today most developers couldn't tell you what the latest version of the SQL standard is.

The same thing is happening in the Java world. Over the next few years, as major J2EE vendors build proprietary APIs in and around their application servers, we will see the "J2EE" brand becoming less important. Changes will occur to J2EE, but they won't be drastic. J2EE will become a major part of the enterprise architecture solution, but it won't be the focal point that it is today.

Conclusion

J2EE and .NET are both very complex architectures – and they have to be. Tools and frameworks are what make the difference when it comes to productivity. There are a variety of tools and frameworks on the market, each suitable for different project types, developer skill sets, and levels of architectural control. According to Gartner, organizations will have to have at least two major tools for both the J2EE programmer and the business developer – and one size does not fit all. Focus on core J2EE and avoiding vendor lock-in at all costs is going away. Application server vendors are differentiating their products with proprietary APIs and features that extend J2EE. We saw this shift in the database world in the '90s and the focus in the J2EE world increasingly will be productivity, performance, and ROI with project and tool decisions driven by business necessity rather than architectural purity. ∎

About the Author

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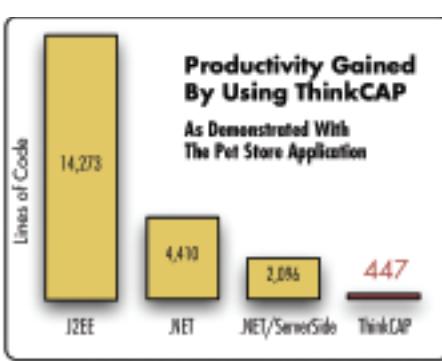
> **ON-DEMAND COMPUTING**

The Future of On-Demand Platforms

by Adam Gross

The past is prelude to a new generation

>> *If the past is any guide, with the help of on-demand platforms the next 10 years promise to change the way we manage and integrate information as much as the previous 10 have changed how we distribute it.*

The story of corporate information technology (IT) is a very dynamic one. Like business itself, the 40-plus year history of this central corporate function is one of change, impacting the nature of the enterprise with a force often second only to that exerted by government. In the past 10 years, despite exaggerated spending and expectations, changes in IT and core computing technologies have assumed new prominence as they transitioned their relationship with business from a supporting to a central one, and transformed the role of IT from enabler to end game.

This short history is defined by four major periods, each corresponding to the rise and adoption of a new enterprise architecture: mainframe, mini, client/server, and most recently Web/application server. Each shift has had profound implications for both enterprises and the technology companies that equip them. As much as these shifts in enterprise architecture created opportunities for hardware and software vendors, the real benefits have accrued to the companies able to exploit these changes within their business practices. From back-office functions to deep customer touch points, enterprises that have evolved their business processes using innovative technologies have been consistently and significantly rewarded.

It is in the context of such constant evolution that IT professionals regularly ask, "What is the next big thing?" What set of technologies – and resulting enterprise architecture changes – will provide the opportunities for innovation and advantage that previous shifts have generated? Answering the question is complicated by the fact that even established architectural shifts are rarely consistently characterized or identified until well after their adoption has become common. If given latitude in the specific terms and features used to describe the coming changes, however, most new technologies can be said to align with a new model that is forming the fifth generation of enterprise computing – service-oriented architectures (SOAs) and on-demand computing.

Service-Oriented and On-Demand Computing

The influence of the Internet on enterprise computing has been profound, creating among other things a new, highly productive model for creating applications in the form of application servers and Web browsers.

The standards-based nature of this model, combined with the ubiquity of IP and HTTP among and between enterprises, and the commoditization of communication, introduced additional opportunities by eliminating the requirement of physical proximity between an application and its users. This change has been so profound that a surprising number of applications we now interact with – as business users or consumers – reside not on our desktops, or even in our server rooms, but in geographically

anonymous locations across the Internet. This trend – and the expansion of the enterprise architecture across the firewall – form the foundation of the SOA.

Internet standards are important not only in creating "geographic" independence, but also in uncoupling hardware and software dependencies that have traditionally constrained application architectures. The notion of applications bound to a particular operating system or piece of hardware is increasingly antiquated, and the independence implicit in adhering to standards is rapidly changing not only how systems are used, but also how they are integrated and managed. Such systems now operate within well-defined boundaries, typically defined by HTTP and HTML, that ensure compatibility and interoperability.

The union of these two related proprieties – physical (geographic) and logical (platform) independence – forms the defining characteristic of this fifth wave, the transformation of systems into services. And while individual service-style applications have already brought benefits to most enterprises, the real promise is in the collection of like-minded systems to form complete enterprise business functions. It is this future that is described by service-oriented architectures and on-demand computing.

Enterprise Applications

Like enterprise architectures, enterprise applications and software have a surprisingly dynamic history. For many years, enterprise applications were the output of development
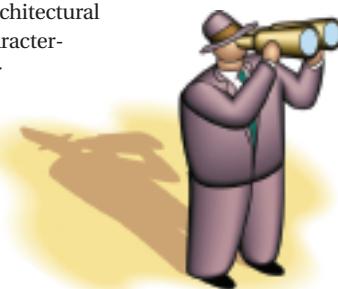
tools and programs, and not a distinct piece of software that could be purchased pre-made. In this model, typically described as client/server and popularized in the late '80s, innovation focused on software engineering practices, tools to promote reuse, and other developer productivity enhancements. Automating or enhancing a business process through IT was very much an application-development effort; while strategic gains were possible, they were typically costly and hard won.

When packaged enterprise applications came onto the scene at the start of the last decade, it was easy to accept the huge amount of effort needed to implement and customize these solutions. The only point of reference was the effort required to build the application from scratch. As enterprise software evolved, this tension between "built to spec" and "prepackaged" – and the resulting trade-offs in business fit and functionality – played out in countless IT organizations.

In the late '90s, the notion of a multimillion-dollar "moon shot" project was easy to conceive, and was advocated as the state-of-the-art in strategic IT. Most who embarked on such initiatives quickly became masters of negotiating the balance between customization and cost. Of the projects that were successfully completed, many started to collapse under their own complexity, or worse, were simply ignored by end users. By the end of a decade that popularized packaged enterprise applications, it was clear that the balance between custom and prebuilt was tilted too far towards complexity and not closely enough to success.

Given this experience, it's no coincidence that the first and most successful on-demand systems appeared in the enterprise application arena, and specifically around CRM. Companies in need of successful and predictable enterprise applications benefited enormously from the rapid deployment advantages of this new application service provider (ASP) model. The adoption and growth in this area has proven that this is one of the most successful new technologies in recent memory, with almost all vendors conceding that ASP solutions will be at least part of their product mix. This was viewed as a "quick fix" alternative to their software-only counterparts by some, however, and questions lingered about how these new applications would fit with the rest of the enterprise architecture and provide the integration and extensibility required by larger organizations. Of particular concern was addressing these key requirements while retaining the benefits of simplicity and speed that made on-demand
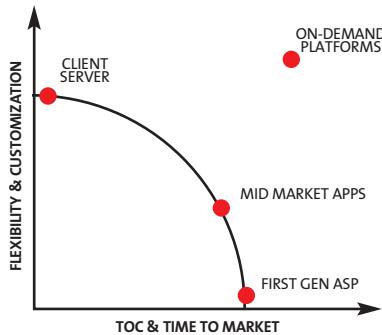

Figure 1: Enterprise application trade-offs

successful in the first place. Fortunately, through the maturity of SOAs, and on-demand computing itself, an answer is now available.

SOAs and Changes in Application Development

In looking at the tension between complexity and success in enterprise applications, what quickly becomes clear is the need to better balance the separate worlds of application development and ASPs (see Figure 1). If successful, the elusive promise of customized, well-integrated, and highly successful enterprise applications can probably be achieved. What's needed is the "missing link" between these dominant but disparate modes of enterprise applications. The new questions are: What would such a link look like in order to avoid the burdensome complexity of the past and leverage the promise of SOAs? And, what architectural and technical principles should inform this link; how should these capabilities be segmented from other elements of enterprise IT?

In considering how to meet this challenge, a few simple requirements standout. First, to facilitate customization and integration, what is required at the core is a platform, one free from the complexity of traditional operating systems or application development tools. Much of that complexity can easily be shed, as the purpose (and second characteristic) of such a platform is to support complex, multiuser, enterprise business processes. This new platform must leverage the attributes of geographic and platform independence implicit in the benefits of SOAs, and in the process address the key requirement of integrating and working with the current mix of databases, application servers, portal frameworks, and the like that inhabit the current enterprise architecture.

These requirements describe a new "on-demand platform" that represents the missing link between the customization and integration capabilities of enterprise software and the economic and adoption advantages of ASPs.

On-Demand Platforms

At their core, on-demand platforms combine the control of traditional custom application development with the benefits of utility-style application delivery. While the nature and technical implementation of custom development using on-demand platforms is different from that of traditional software, it exists as part of a long tradition of simplifying IT by providing higher-level abstractions around common programming tasks and architectural concepts.

Though the first application of on-demand platforms supports next-generation application service providers and other online services, it is expected that their reach will extend to a variety of enterprise applications. So how and where can on-demand platforms be expected to thrive? Three attributes describe and define these new platforms, making it easier to see where they have appeared and where they will be useful.

- *Service-oriented:* A key requirement for on-demand platforms is that they are geographically and technically independent of other systems, providing interfaces only as network services. While a platform may leverage vendor-specific capabilities in implementing its own capabilities, these dependencies are not reflected in any of the public interfaces. Implementation details should remain opaque to any user or connected application.
- *Abstracted:* An on-demand platform provides deep customization and modification capability without requiring changes to the platform itself, enabling a high degree of flexibility in meeting specific business requirements. Implicit in this capability is a level of abstraction between the public interface of the platform and the private implementation that powers it, analogous to that of a Java or .NET Virtual Machine. This "virtualization" capability typically applies to both the data model/schema used in the platform, and the management of business process logic and other code. The latter is a central requirement as "sandboxing" such code or otherwise constraining the programmatic functions available prevents malicious and poorly developed code from impacting other users or the platform itself.
- *Complete:* Beyond providing simple customization capabilities, an on-demand platform provides a complete "application stack," including the four types of programmability present in any application platform: an API for application access, data model and schema customization, business logic control, and the ability to modify and create user interfaces (see Figure 2). Together, these four

› ON-DEMAND COMPUTING

components provide the ability to extend and create any application within the domain on which the on-demand platform is focused.

On-Demand Platforms in the Market

Just as many of the first application servers were only identifiable as such retrospectively, by looking at the history of Internet applications you can see the beginning of on-demand platforms in applications used today.

Consider the unlikely example of myYahoo!, the popular Web portal home page. While modest by today's standards, the ability to customize a Web site – both in function and user interface – was a significant advancement when it was introduced in 1996. Users could "program" the site by selecting news categories and other items of interest, with the platform returning a personalized site. A customized myYahoo! page is a far cry from a completely user-defined application, but add some additional capabilities around schema customization and business logic control and you can see the beginnings of application development as a service. Fast forward to present day, and look at what a site – and platform – like Amazon provides – extensibility in the form of highly attributed products, customization in the form of personal stores, and perhaps most important, a fully featured API. While you can dismiss these capabilities as consumer focused, and not relevant to the requirements or rigor of enterprise applications, it is worth noting that the application
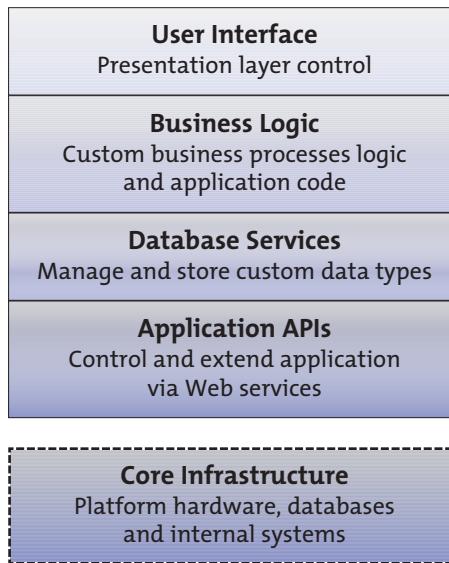

Figure 2: On-demand platform stack

user interface capabilities. With those four components sforce represents a complete application development "stack," meeting a key requirement of an on-demand platform, and opening the door to the creation of a variety of new enterprise applications that enjoy the same benefits offered today by salesforce.com.

On-Demand Platforms in the Future

While the on-demand platforms described so far are all Web sites or otherwise externally managed applications, the advantages in the reduced costs and complexity of this

full set of components that comprise an application – not just a provisioning system or database server – will need to work together to enable these advantages. When they do, the data center will become home to a de facto on-demand platform.

Surprisingly, many of the same forces are in play on the desktop – many familiar desktop operating systems and applications may adopt characteristics similar to those of on-demand platforms. With its commitment to .NET, Microsoft has stated that in the future desktop applications will be run on a virtual machine (the .NET runtime, or CLR) rather than directly atop the operating system. Combined with the schema malleability of the database-centric WinFS, the next generation file system at the core of company's next version of Windows, many of the requirements of an on-demand platform will be met. Equally as interesting is the company's related "Indigo" Web services stack, which will allow for more functional interaction with other services, most of which will probably be provided from on-demand platforms like Amazon or those emerging in the corporate data center.

The Past as Prologue

The future envisioned by on-demand platforms echoes that hinted at 30 years ago by the early proponents of distributed computing. While that future was poorly rendered in the technologies of their day, the abundance of bandwidth, processing power, and storage that form the core ingredients of computing have reached the critical mass necessary to support

"The notion of applications bound to a particular operating system or piece of hardware is increasingly antiquated"

server model that dominates IT application development arose relatively quickly from very similar roots.

Just as the first app servers didn't come from the application tools vendors, and instead came from leading-edge Web sites, the first on-demand platforms are emerging from leaders in the on-demand application space. Sforce, the platform that powers salesforce.com's CRM applications, was the first to meet the criteria outlined above to become a true on-demand platform, offering control and extensibility via Web services APIs, customizable schema, user-defined business logic, and presentation and

approach are compelling enough to bring them into the data center – and ultimately even the desktop.

A key change in the corporate data center – being pursued by all the major vendors with considerable effort and attention – is the move towards "virtualization" and "utility computing" touched on earlier. Each of these efforts, in the form of Sun's N1 or Oracle's Grid database efforts, describes only a layer, or part, of the technologies set necessary to delivery and application. At some point, in order to realize the data center nirvana of being able to scale and dynamically adapt systems in real time, the

the high level of abstraction true on-demand applications require. The result will bring a proliferation of sophisticated application capabilities – once reserved for the most advanced enterprises – to companies of all classes, and ultimately, even consumers. ■

About the Author

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SAP Developer Network

A collaborative online community

SDN.SAP.COM

L ast fall, SAP launched the SAP Developer Network (SDN), a collaborative online community of developers, implementers, and administrators who work with SAP NetWeaver and SAP xApps packaged composite applications. The response to the SDN has been overwhelmingly positive.

The SAP Developer Network is extremely important for IT engineers new to SAP, mainly because SAP NetWeaver opens up new opportunities for JAVA and .Net programmers to work inside SAP systems and integrate much more easily between systems. For example, current J2EE experts can come to SDN, download the Eclipse-based JAVA IDE and J2EE application server, get code samples and tutorials and learn how they can use all their existing JAVA skills inside SAP systems today. If they have any questions or run into any issues, all the SAP product experts are available to discuss things and lend a helping hand in the discussion forums.

The SDN Web site serves as a central online resource that allows members to gain easy access to deep technical resources and experts within the SAP ecosystem. The site is open to everyone, regardless of whether you're an SAP customer, partner or newcomer who needs to work with SAP technology.

SDN is built entirely on SAP NetWeaver technologies (the company's open technology platform) that is based on the SAP Enterprise Portal, and features the collaboration capabilities of SAP Knowledge Management. If you really want to see what SAP NetWeaver can do, just check out SDN's features.

The site offers: Technical articles, web-based training, code samples, evaluation systems, discussion forums and great weblogs from community experts.

The SAP Developer Network gives techies at SAP customers and partners unprecedented access to valuable technical resources both inside and outside SAP, enabling them to speed through implementations and realize a quicker return on investment.

SAP has built SDN for all the SAP technologists around the world, but it's you, its users, who will make the community robust and tremendously helpful for each other. Your feedback and suggestions are fundamental to the success of the community, and SAP is willing to explore any type of enhancements or additional features to make the community the single best source for technical information and SAP expertise.

Please stop by the community at SDN.SAP.COM and get registered — it's free. Then check out all the great resources available to help you be more productive in your job. Share some of your knowledge with others in this community to help them out, too. And tell your colleagues, so that they can get connected and share the benefits as well. ■

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> **SOA**

The Evolution of B2B in a Web Services World

What can you do now to meet your long-term goals?   by Paul Lipton

≫*Is a comprehensive, highly flexible service-oriented architecture in your future? Only if the assortment of mission-critical Web services you're deploying now is highly manageable.*

The use of Web services as a simple means of enabling two companies to do business together in an automated fashion is now common. Web services can provide a low-cost path to distributed application interoperability. Often, that's all that's required by IT organizations when short-term problems or opportunities arise. However, enterprises with more clearly articulated long-term goals are beginning to recognize the value of using Web services as the foundation for building a service-oriented architecture (SOA).

Today, many IT leaders agree that an SOA is an essential approach to solving the many challenges facing them today. At an abstract level, many of these challenges could be expressed as the need for IT to contribute more to the business at a time of increasing change and globalization. In short, the mandate is to move IT from being cost-centric to being a revenue and opportunity center. SOAs enable the necessary alignment between business goals and technology by making automated business processes more valuable and dynamic – able to adjust to changing business conditions and to collaborate with trusted partners and suppliers, customers, and regulatory agencies.

Service-oriented architectures will increase the value of automated business processes by extending them beyond organizational borders as Web services. Given cost and time-to-market constraints, many organizations will choose to concentrate their efforts on services that contribute to core business functions while outsourcing the less-critical or more-obscure func-

tions. To use a simple example, a chain of restaurants might develop its own services to control mission-critical food orders from a partner's Web services (an important part of the restaurant business). But, they may utilize an outside geographic Web service such as that provided by Microsoft's MapPoint to provide good driving directions on their Web site since geographic expertise is not likely to be a core competency in their IT organization.

How can IT ensure that the intricate mesh of Web services supporting a service-oriented architecture will work well? You cannot build a robust SOA on a foundation of unmanaged Web services. Any architecture – from mainframe to client/server to n-tier to service-oriented – requires visibility and control into the key processes and entities that constitute that environment. For service-oriented architectures this need for visibility and control occurs at two distinct levels: the infrastructure level and the message level.

For any Web service hosted within an enterprise, it is unquestionably important for the IT operations staff to have an understanding of the underlying infrastructure that supports that Web service. At the heart of every Web service is the business logic it encapsulates. That business logic is in turn supported by a wide range of hardware (routers, network cards, hard drives, etc.) and software (Web servers, application servers, databases, byte-code virtual machines, etc.) that must all function properly for the Web service to work. Thus, in order to identify the underlying cause of Web service disruptions (perform true root-cause analysis) as well as to measure and control how infrastructure hardware and software affect the Web service, traditional enterprise management of the underlying infrastructure continues to be an absolute necessity.

But, because Web services are primarily about an entirely new technology layer and the business messages that are exchanged at that layer rather than underlying infrastructure and

business logic per se, new types of Web services management solutions must also be made available. This new generation of Web services–specific management software must function at a logical level above traditional IT infrastructure management, and yet must still be deeply integrated with existing infrastructure management so that both levels of management can correlate and share information about their corresponding responsibilities in the SOA.

Integration between these two distinct levels of SOA management, infrastructure and Web services, will make it easier for a company to build a reliable and scalable SOA. In my opinion, CA has been very sensitive to this. We designed our new Web services management solution, Unicenter WSDM (Web Services Distributed Management), with the SOA in mind. While it can be deployed in a standalone fashion suitable for more narrowly focused Web service deployments, it can also be deployed with our enterprise infrastructure management solutions, providing integrated support for both levels of the SOA. Other leading management and security vendors are likely to follow suit with similar approaches.

In the meantime, the best approach to developing automated business processes that span multiple domains continues to be a policy that emphasizes incremental deployment of secure and manageable Web services to address short-term tactical issues while staying fixed on the long-term goal of a comprehensive SOA. Web service deployments that lack manageability are unlikely to address any goals. ∎

About the Author
Paul Lipton is a senior architect and technology strategist in the Office of the CTO at CA. He has participated in standards organizations such as W3C and OASIS, is a highly sought-after author and speaker, and is an authority on diverse topics including Web services, Java, .NET, On-Demand computing, and wireless. paul.lipton@ca.com

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When you need quick solutions for time-critical projects, vast quantities of technical information from thousands of sources are within easy reach. But getting the right answer is often like finding the proverbial needle in a haystack. Information on message boards, news groups, and the Web at large is readily available, but it is not consistently reliable. Trade publications and vendors provide a limited range of answers. Technical books, while dependable, can take lots of time to weed through — assuming you have the right book.

There's a better way. A recent study by The Ridge Group of Princeton, New Jersey found that, when programmers and other IT professionals need information, electronic reference library (ERL) services have a clear advantage. The group compared one ERL, Safari® Tech Books Online (available through the O'Reilly Network Safari® Bookshelf), to other information resources and concluded that the service delivers savings of approximately 24 times its cost.

Unlike an online bookstore, or static e-books, an ERL is a repository of programming and IT books that allows you to search multiple books simultaneously to find and extract information. You can read books cover-to-cover online or, more likely, jump to the exact page you need. You can cut and paste code directly, to save time and eliminate programming errors. And to find information, you can browse books by category, or locate specific books quickly by searching by ISBN, author, title, publisher, or publication date.

Why ERLs Are Better: The Safari Advantage

The Ridge Group study is a real eye opener. The group found that, without an ERL, the typical technology professional spends an average of 7+ hours per week — or more than 31 hours per month — looking for answers, researching issues, and helping colleagues do the same. The drain on personal productivity translated to millions of dollars per year, but that was just the beginning. There was also the cost of re-working projects due to picking up erroneous code, and the impact on others waiting for someone to complete their work. And, when programmers turned to colleagues for help, two or more people were taken offline to solve one issue.

Subscribers to Safari had a different story. When asked how the ERL affected their ability to research solutions or find code, users reported that Safari saved them an average of 13.5 hours per month, or just over 4 labor-weeks per year — nearly half the amount of time lost by those who didn't subscribe to the service.

Safari is a joint venture between two leading technology publishers, O'Reilly & Associates and The Pearson Technology Group (whose imprints include such well-known names as Addison-Wesley Professional, Cisco Press, Peachpit Press, Prentice Hall PTR, Sams, and Que). Among the subscribers interviewed, 86% stated that Safari helped them become better prepared to handle new projects that involved new technologies, while a full 66% acknowledged that because Safari is accurate, they spent less time on re-work.

Sun and America Online Agree

Along with its own analysis, The Ridge Group cited similar results from Sun Microsystems' SunLibrary and America Online, which also conducted tests with Safari subscribers. According to one systems engineer at America Online, "Google and other search engines come back with more noise than I want. I have to wade through all that information, which takes a lot of time. Safari is much more relevant and targeted to the information that I am after."

Because Safari is publisher-backed, the service gets first-hand access to the latest from O'Reilly and The Pearson Technology Group, along with content from other publishers such as Microsoft Press. Currently, Safari offers more than 2000 technical titles. Subscribers can search through all those books onscreen, or download PDF copies of selected chapters.

"I was asked to make a Web site for my company, and I needed lots of HTML, DHTML, CSS, and JavaScript information and samples," noted one study participant. "With Safari, I got answers in seconds with the search function. Not to mention the benefits of being able to copy and paste code." ■

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