

Oracle Database 10g
Eases Admin Woes

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Most Tech Topics

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the Browser to Beat



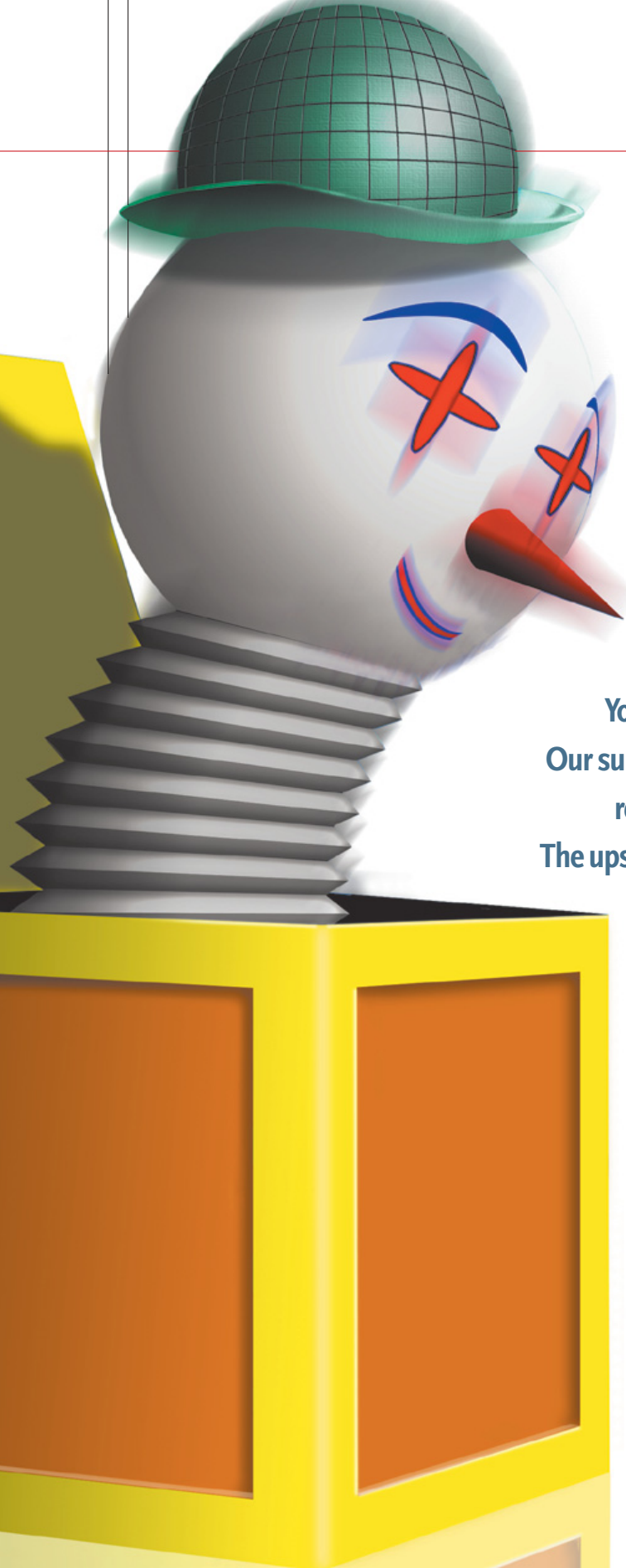
ERP

Don't Laugh.
Our Research
Report shows
that spending is
strong, users are
pleased, and more
people than ever
are putting their
hands on ERP
p44

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ERP

You could say ERP is back — except it never left. Our survey gets the skinny on what informed readers really think about this core enterprise software. The upshot: They're determined to make the best of it

YOU WOULD THINK ERP SOFTWARE had been packed up in a box and shoved in a dark corner somewhere. Analysts say it consumes roughly one quarter of the average enterprise software budget. Yet hardly anyone talks about ERP anymore — not since the big bang of the '90s, when most large enterprises spent many millions of dollars to roll out sprawling, complex ERP systems, in part to modernize for Y2K.

Just when you least expect it, up pop those three little letters again. Recently, AMR Research released its ERP Application

BY ERIC KNORR | ILLUSTRATION BY
CAROL AND MIKE WERNER

Springs Eternal

Spending Report, 2003-2004; it predicts that the number of enterprise managers planning to upgrade or buy new ERP licenses will increase slightly in 2004, the first such rise in three years. These numbers apply to ERP vendors' home turf of core financials, order entry, logistics, manufacturing, human resources, and purchasing, but not to CRM, business intelligence, or other ancillary modules. At the same time, to modernize their products, top ERP vendors now incorporate XML, Web services, and Java to foster easier customization and improve integration with the rest of the enterprise.

To get the real story on ERP, we went where InfoWorld Test Center analysts can't go — into the heads of our readers to find out what they like, what they don't like, and how Oracle, PeopleSoft, SAP, and other vendors measure up. Our survey results show customers who aren't exactly thrilled with their ERP systems but who show little inclination to replace them. And most surprising: Readers seem to be exploiting Web services to expand the reach of ERP in their organizations.

An Adorable Beast?

During the Internet boom, ERP got no respect. Compared with sleek Web apps, ERP programs seemed inflexible, overpriced, and mired in client-

server deployment hell. To top it off, elaborate modifications wrought by big consultancies often incurred charges even greater than the multi-million-dollar ERP licensing fees. Disaster stories abounded.

But now that the dust has settled — and ERP systems have largely migrated from client/server to Web-based technologies — satisfaction with ERP among *InfoWorld* readers stacks up pretty well. Sixty-five percent of respondents to the 2004 InfoWorld ERP Survey say they would be likely to choose the same vendor, while a mere 6 percent complain they're not at all satisfied (29 percent are neutral). Jim Shepherd, vice president of research at AMR Research and co-author of its

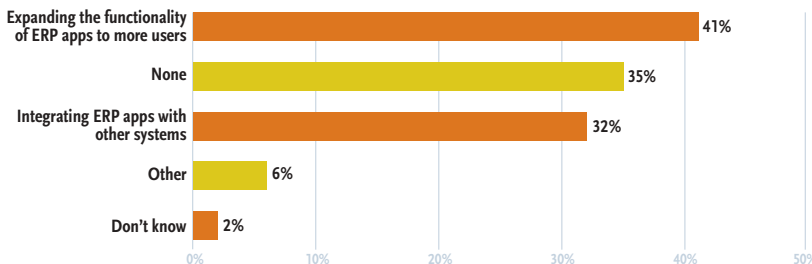
recent ERP report, believes ERP's drawbacks have always been overblown and that recent product improvements have made deployment and maintenance simpler.

"These products have gotten much, much easier to implement," Shepherd says. "The amount of intellectual property and tools built around these products to help a user through configuration and implementation has expanded dramatically."

On the other hand, only 23 percent of respondents say they are very satisfied with their ERP implementation, which suggests the absence of a viable alternative. Who wants to rip and replace core applications and relive the tremendous disruption and expense of another

What Role Has Web Services Played in Your ERP Implementation?

A majority of survey respondents say they plan to use Web services to integrate ERP with other systems or to extend ERP's reach to more users.



NOTE: 268 respondents; multiple answers allowed
SOURCE: 2004 INFOWORLD ERP SURVEY

Almost 65 percent of survey respondents say they would be likely to choose the same vendor again.

big bang? Actually, many of our readers might, if they could escape high ERP licensing fees. In answer to a question we asked out of curiosity, a stunning 53 percent of respondents say they would consider an open source alternative to their current ERP system. The catch: No such system exists.

Meanwhile, in the real world, when we asked readers which vendors they had chosen to supply their ERP software, Oracle, PeopleSoft, and SAP got the most mentions. Applications from SAP earned the most “functions well” ratings in all but the human resources category (see results for additional modules at infoworld.com/1121). A whopping 69 percent of survey respondents think SAP’s core financials function well, awarding it nearly 20 points more than nearest competitor Oracle. SAP’s manufacturing application also enjoys a similar lead.

PeopleSoft’s customers seem just as pleased as SAP’s; the company was in a statistical tie with SAP in readers’ overall satisfaction with their ERP vendor. A year into a PeopleSoft implementation, Craig Hunter, director of information technology for the City of North Vancouver, British Columbia, offers this testimonial: “It’s already gotten us payback. We’ve installed it in house, and we didn’t need a ton of consultants.” He also notes his IT group made a conscious decision to modify PeopleSoft as little as possible.

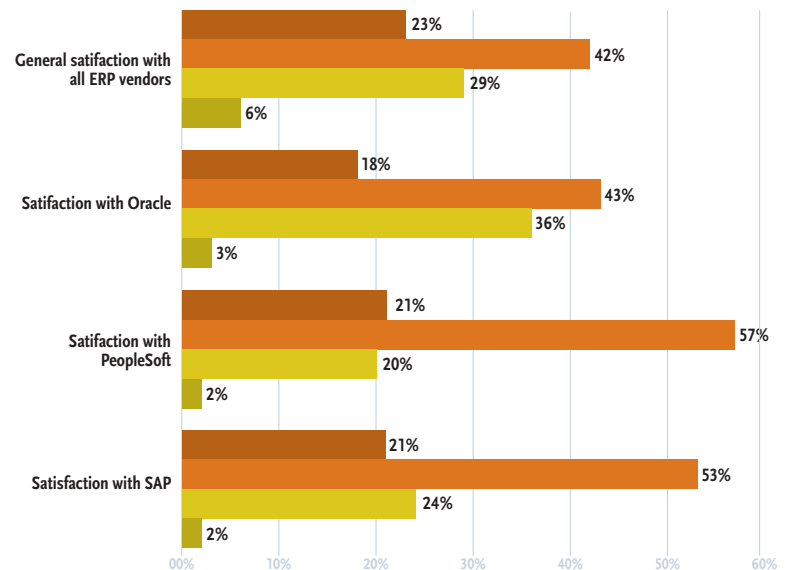
Buy Vs. Butcher

In eschewing customization, Hunter falls on one side of a chronic dilemma during ERP implementation. An anonymous survey respondent succinctly described it as “the decision to change business process to conform to the ERP or to change the ERP to conform to the business process.” For any-

How Satisfied Are You With Your ERP Vendor?

The majority of survey respondents report being at least moderately happy with their ERP vendor.

- Very – I would choose the same vendor again
- Somewhat – I would likely choose the same vendor again
- Neutral – I would shop around
- Not at all – no way would I choose the same vendor again



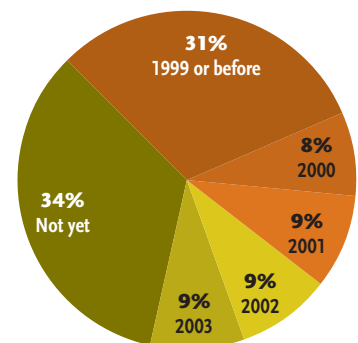
NOTE: Of 268 total respondents; 61 reported using Oracle; 70 reported using PeopleSoft; and 67 reported using SAP. Due to small sample sizes for some of the vendors measured, the data included here may not be a statistically accurate representation of the market as a whole.

one who has gotten his or her hands dirty with ERP, that decision sums up the implementation challenge.

Hunter offers a cautionary tale to illustrate the hazards of stretching an ERP system to fit existing business processes: “The City of Vancouver had a horrendous install when they tried to do SAP. They tried to make it like their old systems. Well, their old systems had been butchered and bastardized for 20-odd years.” According to Hunter, those in charge didn’t want employees to notice any changes in procedure, so they twisted the SAP software into submission, inviting disaster. “They issued a whole bunch of paychecks with zero dollars on

When Was Your ERP Implementation Completed?

Since ERP’s big bang of the 1990s, few companies say they’ve completed an implementation, possibly because of ongoing upgrades.



NOTE: 268 respondents
SOURCE: 2004 INFO WORLD ERP SURVEY

them right before Christmas,” he says. “And people noticed.”

Typically, such Rube Goldberg farces involve consultants, and although none of the survey respondents flamed their ERP vendors, a few had choice words for consultancies. A reaction against consulting excesses, along with a dose of cost-cutting, may underlie a general trend toward insourcing rather than outsourcing. In our survey, three times as many readers said their IT staff’s responsibility for directly maintaining ERP applications would increase rather than decrease during the next 12 months.

Consultants also make a convenient scapegoat. AMR’s Shepherd says the culprit may be a lack of commitment to the idea of packaged software. “Often, what we find is that the consultants are battling hard to try and convince the companies to change their business processes to fit the product better, and they just can’t get them to do it,” he says. “They’re battling hard [because] they know who’s going to be held to blame.” Shepherd observes that one of the good things about implementing an ERP system is the opportunity for enterprises to rethink and rationalize business processes across the organization.

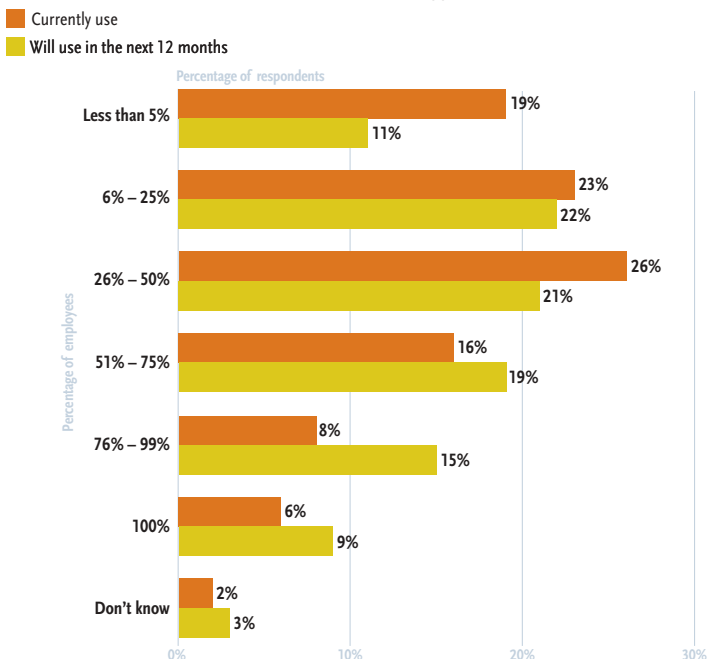
The other side of the coin is that some changes are inevitable. Jeff Loewer, vice president of planning and information technology at Sonnax, an automatic transmission manufacturer, remembers the functional-requirements phase well. “We found ourselves falling back on our processes and falling back on customizations,” he says. “A lot of good intentions tend to fall by the wayside when you’re in the heat of it.”

The Upgrade Treadmill

The great risk of customization is that upgrades shatter already jiggered sys-

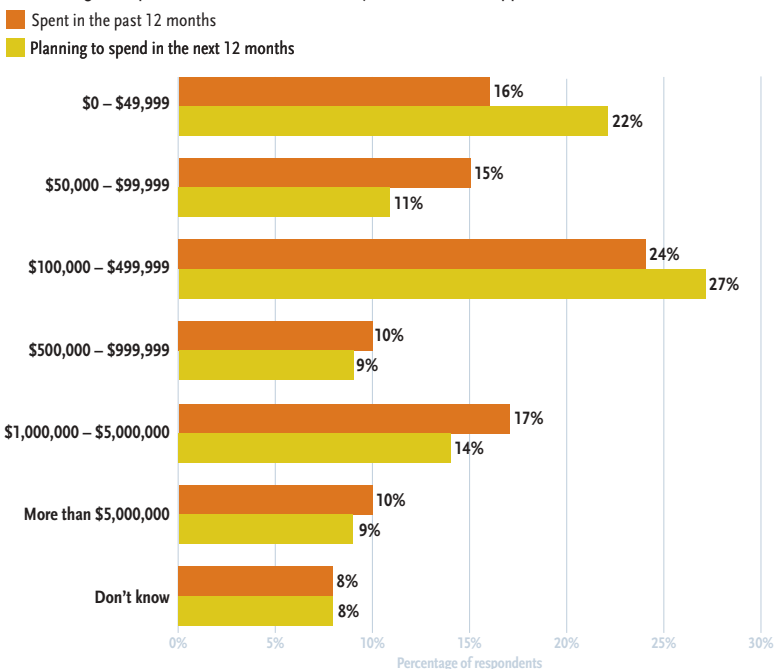
How Many Employees Use Your ERP Applications?

Readers show determination to extend the reach of ERP applications to more users.



What Is Your Budget for Your ERP Applications?

Little change is expected in the amount of money devoted to ERP applications.



NOTE: 268 respondents
 SOURCE: 2004 INFOWORLD ERP SURVEY

‘An ERP implementation seems like it’s 75 percent culture and 25 percent technology.’

— Jeff Loewer, Sonnax

tems. In February 2001, at Oracle AppsWorld in New Orleans, Larry Ellison admonished customers not to modify the Oracle 11i E-Business Suite at all for just this reason. He was lambasted — and he ultimately backed down — but he had a point.

As North Vancouver’s Hunter puts it, “You can sit there and turn [the] PeopleSoft [ERP software] upside down and sideways and say, ‘Now, make it do what I asked it to do.’ But then, next upgrade — poof — it takes four years.”

That may explain why, when asked when they completed their ERP implementation, most respondents answered either “1999 or before” or “not yet completed.” You may have an ERP system in place, but you’re never done implementing.

Patrick Harris, IT director at Sealing Devices, a seal and gasket manufacturer, describes the complexity of deploy-

ing a single patch in one module of Oracle’s E-Business Suite. “Well, it’s a big integrated system,” he says. “You look at this patch and you find out what is prerequisite. So you install the prerequisite and then you learn ... that affects the accounts-receivable application. So now I have to upgrade accounts receivable. But I can’t upgrade that, because if I upgrade that, then I have to upgrade order management. It turns out to be this huge project just to get this one bug fixed.”

Such interdependencies aren’t exclusive to Oracle’s suite. “We’ve already encountered issues where you really have to upgrade the whole PeopleSoft suite at the same time,” Hunter complains. “If you upgrade general ledger and not accounts payable, you find issues with that, so you end up just saying you’re going to upgrade the suite at the same time, which then compounds the whole testing issue. You can’t keep it isolated. They say you can, but, realistically, you can’t.”

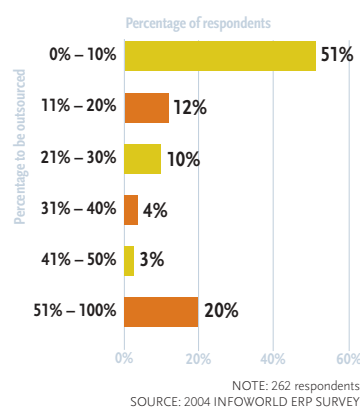
Toward Service-Oriented ERP

The only real way to solve the upgrade problem is to crack ERP applications — and their custom modifications — into discrete components that use standards-based interfaces. Upgrade one component or even a group of them and, with luck, you won’t break anything else.

“The idea that you really need to componentize the functionality, separate the logic from the process from the application, is something that isn’t just good computer science, it’s good business, too,” says Joshua Greenbaum, an analyst at Enterprise Applications Consulting. “Without a doubt, that is where the market is going,” he says and adds that this massive overhaul of architecture, although underway, will take years.

How Much of Your ERP Apps’ Maintenance Will Be Outsourced in the Next Year?

80 percent of survey respondents estimated that less than half of their ERP applications’ maintenance would be outsourced.

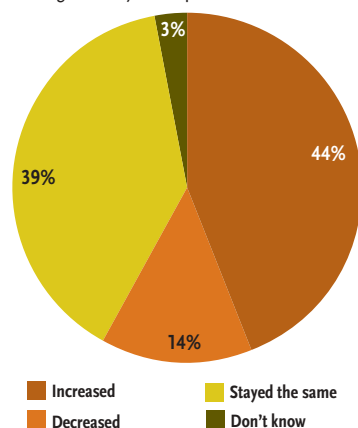


In the interim, all of the top three ERP vendors have released application servers that may someday provide the underpinnings for a fully component-based ERP. But today they manifest themselves mainly as souped-up integration servers and development platforms. SAP’s NetWeaver, which Greenbaum calls “representative of the future of enterprise software,” provides the most prominent example. The NetWeaver platform has two run-time engines: one J2EE compatible and one as a container for apps written in SAP’s ABAP (Advanced Business Application Programming) development language.

Oracle and PeopleSoft now also come with application servers, all of which embrace Web services standards and best practices. Despite how new the Web services push still is, most of the survey respondents say that this technology has played some role in their ERP application implementations. Thirty-two percent say the purpose is

How Has Your IT Staff’s Responsibility for Maintaining ERP Apps Changed Over the Last Year?

In-house ERP application maintenance rose significantly in the past 12 months.



NOTE: 262 respondents
SOURCE: 2004 INFO WORLD ERP SURVEY

integrating ERP apps with other enterprise systems. And 41 percent say they're using Web services to expand the functionality of ERP apps to a greater number of users, which makes sense given our readers' prediction that more employees will use ERP apps in the next 12 months.

Return of the Monolith

Discrete business logic components and Web services everywhere may be the bright future of ERP. But today, AMR's Shepherd sees another, more immediate trend toward consolidation, not just among ERP vendors but within large companies that want to merge many ERP systems into one.

"They can't have 22 copies of SAP out around the world, each one implemented differently with different options turned on," Shepherd explains. "They want to have common processes; they want to have global visibility."

Companies now crave a single global accounting function, Shepherd says, with global visibility and common processes. Other business drivers include global cash management, global credit management, a more unified view of customers, and global purchasing leverage in procurement.

Consolidation is driving ERP to far-flung places where it never took root before. Remote offices that used low-end accounting systems may suddenly be faced with the prospect of an ERP deployment, even if that runs roughshod over products that were working just fine. Inevitably, the old lessons will apply.

"It's an implementation that affects every level of the company, every level of the organization," says Sonnax's Loewer. "An ERP implementation seems like it's 75 percent culture and 25 percent technology." 🐼

In the Trenches With an SAP Developer

DJ ADAMS WRYLRY REFERS TO HIMSELF AS "A DOG'S BODY." HE SAYS, "I DO ANYTHING THAT NEEDS DOING, REALLY."

A senior technical architect who maintains an SAP R3 installation for a large British DVD manufacturer, Adams has 17 years of experience working with SAP software — and a candid perspective on how the software giant's products have evolved and what it's like to work in a software ghetto so poorly understood from the outside.

As a developer, Adams has what he calls a "love-love-hate" relationship with SAP's ABAP (Advanced Business Application Programming) language. "I can't slag it off too much because I've grown up with it," he says, "and it has grown up with me. You learn to live with its quirks and its warts."

Adams observes that, today, there's everything but the kitchen sink in the ABAP language. "So in that respect, it's a fairly ugly language," he says. "I think anybody who has grown up with Java or with Perl or C++ and saw ABAP for the first time would throw their hands up in horror and say, 'What sort of language is this? This is a ... Frankenstein of a language!' " Yet Adams has learned to appreciate ABAP's charms, particularly what he calls the "beautiful" object implementation in the new version for the NetWeaver platform.

'I can't slag it off too much because I've grown up with it, and it has grown up with me.'

— DJ Adams

NetWeaver, along with SAP's shift toward open standards, has earned Adams' admiration. But staying abreast of new SAP features and technologies is a full-time job. "What SAP does, in my opinion, is they have this machine gun, and they load it up with developers and fire that machine gun willy-nilly in a 180-degree arc, and whichever developers stick, they go in that direction," he proffers. "They have so many technologies and initiatives and directions that go in opposite directions and all of a sudden converge."

Although Adams claims he actually enjoys the challenge of keeping up, he's less enthusiastic about the verbose way SAP documents its technology. "I used to be an IBM mainframe hacker," he says. "I loved those days of going to an IBM documentation room, which had rows and rows of documentation 10 feet high. At the time, somebody said IBM was the biggest publisher in the world. I could believe it. But I think SAP is really going for the crown."

Nonetheless, Adams says, if there's a key to working with SAP's vast portfolio of enterprise software, it's "read, read, read, and then read some more. It does pay in the end. SAP is renowned for having a really bad Web site. It's hugely difficult to find anything. Well, persevere, because there are nuggets of information out there that make all the difference."

— E.K.

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General Business Industries

- 01. Defense Contractor / Aerospace
- 02. Retail
- 03. Wholesale / Distribution (non-computer)
- 04. Pharmaceutical / Medical / Dental / Healthcare
- 05. Financial Services / Banking
- 06. Insurance / Real Estate / Legal
- 07. Transportation / Utilities
- 08. Media (print / electronic)
- 09. Communication Carriers (telecomm, data comm., TV / cable)
- 10. Construction / Architecture / Engineering
- 11. Manufacturing & Process Industries (other than computer-related)
- 12. Research / Development

Technology Providers

- 13. Managed Service Provider / Business Service Provider
- 14. Technology Service Provider (ISP / ASP / MSP, etc.)
- 15. Computer / Network Consultant
- 16. Systems or Network Integrator
- 17. VAR / VAD
- 18. Technology Manufacturer (hardware, software, peripherals, etc.)
- 19. Technology - Related Retailer / Wholesaler / Distributor
- 20. Government: federal (including military)
- 21. Government: state or local
- 22. Education
- 98. Other _____ (Please specify)

Government / Education

2 WHAT IS YOUR PRIMARY JOB TITLE? (PLEASE CHECK ONLY ONE):

IT / Technology Professionals

- 01. Chief Technology Officer (CTO)
- 02. Chief Information Officer (CIO)
- 03. Chief Security Officer (CSO)
- 04. Vice President (including SVP, EVP, etc.)
- 05. Director
- 06. Manager / Supervisor
- 07. Engineer
- 08. Systems Analyst / Programmer / Architect
- 09. Consultant / Integrator
- 10. Developer
- 11. IT Staff
- 12. Other IT Professional _____ (Please specify)

Corporate / Business Management

- 13. CEO, COO, President, Owner
- 14. CFO, Controller, Treasurer
- 15. Vice President (including SVP, EVP, etc.)
- 16. Director
- 17. Manager / Supervisor
- 18. Other Business Management Title _____ (Please specify)

- 98. Other Title _____ (Please specify)

3 PLEASE INDICATE YOUR JOB FUNCTION(S)? (PLEASE CHECK ALL THAT APPLY):

IT / Technology Functions

- 01. Executive
- 02. Department Management - IT
- 03. Research and Development Management
- 04. Systems / Network Management
- 05. Management of Enterprise Applications (CRM, ERP, SCM, etc.)
- 06. Applications Development
- 07. Consultant / Integrator
- 08. Other IT Department Management _____ (Please describe)
- 09. Other IT - Staff _____ (Please describe)

Corporate / Business Functions

- 10. Executive
- 11. Department Management - Business
- 12. Financial / Accounting Management
- 13. Research and Development Management
- 14. Sales / Marketing Management
- 15. Other Department Management
- 16. Other Department Staff _____ (Please describe)
- 98. Other _____ (Please describe)

4 HOW MANY PEOPLE ARE EMPLOYED AT THIS ORGANIZATION, INCLUDING ALL OF ITS BRANCHES, DIVISIONS AND SUBSIDIARIES? (PLEASE CHECK ONE ONLY):

- 01. 20,000 or more
- 02. 10,000 - 19,999
- 03. 5,000 - 9,999
- 04. 1,000 - 4,999
- 05. 500 - 999
- 06. 100 - 499
- 07. 50 - 99
- 08. Less than 49

5 OVER THE COURSE OF ONE YEAR, DO YOU BUY, SPECIFY, RECOMMEND, OR APPROVE THE PURCHASE OF THE FOLLOWING PRODUCTS OR SERVICES WORTH:

* CONSULTANTS: PLEASE INCLUDE WHAT YOU RECOMMEND FOR YOUR CLIENTS AS WELL AS WHAT YOU BUY FOR YOUR OWN BUSINESS, IF APPLICABLE. IF YOU CANNOT DISTINGUISH BETWEEN THIS AND OTHER LOCATIONS, PUT RESPONSE IN THE FIRST COLUMN.

- | | | |
|----------------------------------|--------------------------------|----------------------------|
| 01. \$100 million or more | 06. \$5,000,000 to \$9,999,999 | 11. \$100,000 to \$399,999 |
| 02. \$50,000,000 to \$99,999,999 | 07. \$2,500,000 to \$4,999,999 | 12. \$50,000 to \$99,999 |
| 03. \$30,000,000 to \$49,999,999 | 08. \$1,000,000 to \$2,499,999 | 13. Less than \$49,999 |
| 04. \$20,000,000 to \$29,999,999 | 09. \$600,000 to \$999,999 | 14. None |
| 05. \$10,000,000 to \$19,999,999 | 10. \$400,000 to \$599,999 | |

Product category	For this location: (write code in box)	For other locations: (write code in box)
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Networking / Telecom (including servers)	<input type="text"/>	<input type="text"/>
Internet / Intranet / Extranet	<input type="text"/>	<input type="text"/>
Security	<input type="text"/>	<input type="text"/>
Storage	<input type="text"/>	<input type="text"/>
Peripheral equipment	<input type="text"/>	<input type="text"/>
Software	<input type="text"/>	<input type="text"/>
Service / Support	<input type="text"/>	<input type="text"/>

Please answer the questions on the following page. 

6 PLEASE TELL US YOUR INVOLVEMENT WITH YOUR COMPANY'S STRATEGIC TECHNOLOGY INITIATIVES (PLEASE CHECK ALL THAT APPLY):

- 01. Integrate Technology with company goals
- 02. Define Architecture
- 03. Choose Technology Platforms
- 04. Develop Technology Integration Strategy
- 05. Test, pilot, implement emerging technologies
- 06. Scalability Planning
- 07. Build, Run Web Services
- 08. Internet / Network Infrastructure
- 09. Customer Relationship Management
- 10. External Partnership Management
- 11. Budgeting
- 12. Recruitment & Retention
- 13. Other _____ (Please describe)
- 99. None of the above

9 ARE YOU INVOLVED IN BUYING, SPECIFYING, RECOMMENDING OR APPROVING THE FOLLOWING TECHNOLOGY SERVICES? (PLEASE CHECK ALL THAT APPLY):

- 01. Technology Services
- 02. Systems / Application Integration
- 03. E-Business / Internet / Intranet / Extranet
- 04. Application Development
- 05. Application Hosting (ASP)
- 06. Web Hosting
- 07. Web Development
- 08. Security
- 09. Storage
- 10. Content Delivery Networks
- 11. Disaster Recovery / Business Continuity
- 12. Outsourcing
- 13. Utility Computing Services
- 14. Telecommunications
- 15. Call Center / IT Services
- 16. Consulting
- 17. Other Technology Services

7 ARE YOU INVOLVED IN BUYING, SPECIFYING, RECOMMENDING OR APPROVING THE FOLLOWING SOFTWARE? (PLEASE CHECK ALL THAT APPLY):

- 01. Enterprise / E-Business Applications
 - 02. Customer Relationship Management (CRM / eCRM)
 - 03. Enterprise Resource Planning (ERP)
 - 04. Supply Chain / Procurement
 - 05. Business Process Management
 - 06. Business Intelligence / Data Mining
 - 07. Knowledge Management
 - 08. Portals
 - 09. Collaborative Applications / Groupware
 - 10. Project Management
 - 11. Financial / Payroll / Billing
 - 12. E-business / E-commerce
 - 13. Database Management Systems (DBMS)
 - 14. Data Warehouse
 - 15. Manufacturing
 - 16. Asset Management / Software Distribution
 - 17. Performance / Application Management
 - 18. Streaming Media
 - 19. Other Enterprise / E-Business Applications
- 20. Integration Software
 - 21. Web Services
 - 22. Web Services Orchestration
 - 23. Application Servers
 - 24. Enterprise Application Integration (EAI) / Middleware
 - 25. Business Process Management
 - 26. Legacy Application Integration Tools
 - 27. Other Integration Software
- 28. Application Development
 - 29. Application Development Tools
 - 30. Application Servers
 - 31. Web services
 - 32. Java / J2EE
 - 33. XML
 - 34. .NET
 - 35. Testing Tools
 - 36. Other Application Development Software

10 ARE YOU INVOLVED IN BUYING, SPECIFYING, RECOMMENDING OR APPROVING THE FOLLOWING PRODUCTS OR TECHNOLOGIES? (PLEASE CHECK ALL THAT APPLY):

- 01. Networking
 - 02. LANs (Local Area Networks)
 - 03. WANs (Wide Area Networks)
 - 04. Switches / Routers / Hubs
 - 05. Caching / Load Balancing
 - 06. Grid / Utility Computing
 - 07. E-mail
 - 08. Instant Messaging / Peer-to-Peer
 - 09. Content Delivery Networks
 - 10. Network and Systems Management
 - 11. Traffic Monitoring and Analysis
 - 12. QoS (Quality of Service)
 - 13. VoIP (Voice over IP)
 - 14. Telecommunications
 - 15. IP Telephony
 - 16. Wireless
 - 17. Remote Access
 - 18. Web / Video Conferencing
 - 19. Other Networking
- 20. Storage
 - 21. High-end / Enterprise Class Storage
 - 22. Network Attached Storage (NAS)
 - 23. Storage Area Networks (SANs)
 - 24. Storage Management Software
 - 25. IP Storage
 - 26. Direct Attached Storage (DAS)
 - 27. Storage Blades
 - 28. Storage Backup (Tape, Disk, Optical, RAID)
 - 29. Removable / Portable Storage
 - 30. Disaster Recovery
 - 31. Other Storage
- 32. Security
 - 33. Anti-Virus / Content Filtering
 - 34. Firewall
 - 35. VPN (Virtual Private Network)
 - 36. Identity Management / Authentication
 - 37. Intrusion Detection
 - 38. Encryption
 - 39. Other Security
- 40. Internet / Intranet / Extranet
 - 41. Web Servers
 - 42. Web Development / Authoring Tools
 - 43. Web Performance Management / Monitoring Software
 - 44. Content Management / Document Management
 - 45. Content Delivery Networks
 - 46. Internet Software
 - 47. Other Internet / Intranet / Extranet

8 ARE YOU INVOLVED IN BUYING, SPECIFYING, RECOMMENDING OR APPROVING THE FOLLOWING HARDWARE? (PLEASE CHECK ALL THAT APPLY):

- 01. Hardware
 - 02. Mainframes
 - 03. NT / Windows 2000 / .NET Servers
 - 04. Unix Servers
 - 05. Linux Servers
 - 06. Blade Servers
 - 07. PCs / Workstations
 - 08. Notebooks / Laptops
 - 09. PDAs / Handhelds / Pocket PC / Wireless Devices
 - 10. Other Hardware
- 11. Peripherals
 - 12. Laser Printers
 - 13. Inkjet Printers
 - 14. Monitors
 - 15. Flat Panel Displays
 - 16. UPS (Uninterruptible Power Supply)
 - 17. Network Copiers
 - 18. Other Peripherals

11 WHICH OF THE FOLLOWING OPERATING SYSTEMS ARE IN USE OR PLANNED FOR USE AT THIS LOCATION? (PLEASE CHECK ALL THAT APPLY):

- 01. Windows XP
- 02. Windows 2000
- 03. Windows NT
- 04. Windows 95/98
- 05. Windows CE
- 06. Mac OS (Macintosh)
- 07. Solaris
- 08. UNIX
- 09. Linux
- 10. MVS, VMS, ESA
- 11. VM
- 12. OS 400
- 13. Netware
- 14. Palm OS
- 15. Other OS

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