

COMPUTERWORLD'S
7th annual
SKILLS SURVEY

The e-commerce explosion is causing a critical shortage of application developers, Web developers and object programmers, which IT managers say will be the focus of their hiring and training efforts in the coming year. By Leslie Goff

AFTER SEARCHING three months for a Visual Basic (VB) developer, Paul Coyle, chief technology officer at The CCS Cos. in Newton, Mass., thought he'd finally hit pay dirt.

The candidate matched all of Coyle's criteria: he had three years' real experience with VB, a college degree (from Hanover, N.H.-based Dartmouth College) and experience with report writers, which was a big plus because Coyle has a significant data warehouse project coming up.

Coyle interviewed the candidate late on a Tuesday afternoon in October and made his move early the next morning. He called to offer the job at a salary that was \$5,000 more than the candidate had requested.

But another company had beaten Coyle to the punch, extending an even

higher offer earlier the same morning. CCS's position, which opened in June, was still unfilled at the end of October.

"We chose Visual Basic as our development tool because it's relatively easy to learn, and we hoped that by going with it vs. C++ or another language, we would be able to find the talent we need," Coyle says. "But anyone who has Visual Basic [experience] has their pick of positions."

Coyle's difficulty in filling the VB position illustrates the extent to which application development skills will drive IT recruitment and training next year. In fact, according to *Computerworld's* 7th Annual Technology Skills Survey, which was conducted in the past three months, 70% of the 307 IT managers responding report that next year they'll hire or train staff in programming languages, Web development tools and object-oriented tools.

E-business initiatives such as sup-

plier-facing extranets, customer-facing Web-based applications and collaboration on industry exchanges and marketplaces top IT agendas for next year. Hand in hand with those efforts are the related pieces of supply-chain management and customer relationship management (CRM) systems such as data warehouses and knowledge management applications (see story below).

To get the job done, companies are either building applications from scratch or hustling to customize packaged solutions. That's pushing IT managers to seek application developers, data architects, database developers and administrators, as well as workers with expertise in data warehousing and data mining.

"In the e-commerce space, everything is brand new, and there's no base to work off of, so there's a disproportionate amount of development work that needs to be done. Everyone's starting from scratch," says Ken Surdan, vice president of technology at Send.com, an online high-end gift-giving service in Waltham, Mass. "Either you're customizing packaged software or you're building it yourself. Even if you're customizing, you still have a lot of development work early in the life cycle."

The Skills Survey reveals that 12% of IT shops expect to hire or retrain staff for CRM systems, 18% for data warehousing and data mining, 28% for e-commerce applications development, 30% for Internet applications development and 10% for enterprise

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The Skills

Business Demands Drive IT Demands

As companies move to capture their share of both the business-to-business and business-to-consumer pie, as well as to control costs and get a better grip on their internal data, critical applications development and customization projects are driving IT skills requirements.

IT budgets for e-commerce applications will increase IT budgets by an average of 5% next year, according to an October report by AMR Research Inc. in Boston. AMR projects that spending on applications next year will range from 17% to 27% of the total IT budget among manufacturers in all segments, and from 13% to 21%

among services companies.

Across all industries, e-commerce applications will grab 25% of the applications budget. CRM will take 14% and supply-chain management will account for 10%. Enterprise resource planning systems will continue to lead applications spending next year with 32% of the budget, but it's projected to drop to 29% by 2002, while e-commerce will jump to 20%.

These forecasts are consistent with the IT priorities set for next year by a diverse array of companies contacted by *Computerworld*.

Send.com plans to use its attention to "more

sophisticated Web techniques like personalization, more aggressive merchandising functionality and an emphasis on integrating CRM concepts into the organization," says Ken Surdan, vice president of technology. He says he needs application developers and hybrid database developers and administrators skilled with Microsoft tools such as Component Object Model objects, Active Server Pages and SQL Server, as well as JavaScript.

W Corp. in Greensboro, N.C., is proceeding with an SAP implementation across various divisions. A retail box-space system that will fit into SAP and other systems to assist with sales, mar-



Takin' It To the Web

Debbie Lynch (far left) has spent just over nine years in IT at Harrah's Entertainment Inc. in Memphis as a graphic designer working on brochures, presentations, T-shirts and logos. Last year, she decided to move into the Internet/intranet arena, where Harrah's is working on some key development initiatives.

To reach her goal, Lynch, whose new title is Web developer, spent 15 days in formal classroom training this year. She started with HTML and Microsoft FrontPage training and rounded that out with JavaScript courses. Now she's enrolled in the Certified Internet Webmaster certification program developed by ProsoftTraining.com in Austin, Texas. She says the program is helping build her confidence in her new skills.

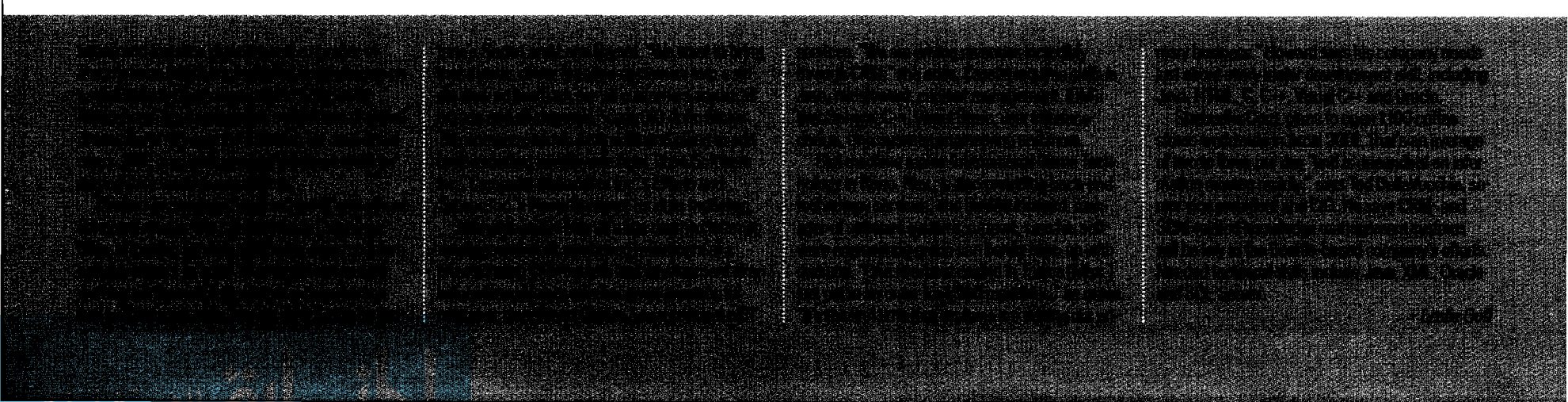
Pursuing the certification also helps solidify Lynch's transition within the organization, says **Eileen Cassini** (immediate left), vice president of IT services at Harrah's: "We encouraged her to get certified because she has grown up with us; the certification gives her credibility." In conjunction with her formal training, Lynch was a key contributor to the Sept. 29 relaunch of Harrahs.com. The new Web site, which will continue to be upgraded over the coming months, will feature online reservations, account tracking for members of the Harrah's Total Rewards program, online games and more. Designed to be more customer-service oriented, it's a significant step up from the previous Web site, which was essentially an online brochure.

"With the way Web technology is growing, it's a roller coaster that I want to be on," says Lynch, who's now working on a number of intranet projects, including a corporate procurement Web site. Next she's planning to add Macromedia Inc.'s Flash development tool to her growing skill set. "I'm learning something new daily, and I know it's not going away tomorrow - 10 years down the line, the Web will still be evolving, and I can evolve along with it," says Lynch.

- Leslie Goff

TAMARA REYNOLDS

That Thrill



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resource planning systems.

As Coyle found, available development talent for these projects remains so scarce and competition is so fierce that many companies are pinning their hopes on training to resolve skills gaps, aid recruitment efforts and — especially — to deter attrition. With the supply-and-demand gap showing no signs of closing, reducing turnover is critical, IT hiring managers say.

IDC in Framingham, Mass., projects that 60% of IT recruiting in 2002 will be because of replacement hiring. In total, IT staff attrition is projected to cost U.S. companies \$7.6 billion that year. In light of statistics like those, retraining IT professionals isn't just a good idea; it's a financial imperative.

"[Retooling] is incredibly important to creating the right environment. It gets you out of those recruiting problems," says Eileen Cassini, vice presi-

dent of IT services at Harrah's Entertainment Inc. in Memphis. The company, which has ranked in the top five on *Computerworld's* annual listing of the 100 Best Places to Work in IT for the past two years, keeps IT turnover at between 5% and 8% per year, in part because of an emphasis on training, Cassini says.

"We take staff through a regular retooling and move them into new areas to give them a long career here without becoming redundant," she says. "You get great efficiencies from people who have been with you for a while."

Both smaller and larger companies are employing various strategies to retrain IT staff. Coyle notes that everyone on his IT staff will be sent for a minimum of 10 days' formal training next year. Harrah's has adopted an internal consulting model that allows IT staff to try new projects for a short period of time to verify whether they'd

like to pursue retraining in a given area, Cassini says.

At VF Corp., a Greensboro, N.C.-based apparel manufacturer, IT workers who maintain legacy applications are being retrained in small groups in SAP AG's Advanced Business Application Programming language, says Tim Lambeth, vice president of global processes. "We don't have time to send them away for training in big numbers, but we do intend to give our own people the opportunity to pick up these new skills," Lambeth says, adding that he has budgeted \$1 million for IT training next year.

International Game Technology Inc. (IGT), a casino games and technology developer, is also counting on retooling to help ease its recruiting burden next year. When the Reno, Nev.-based company transitions its IT infrastructure from the AS/400 system to Windows 2000 next year, it will hang on to

The Most Wanted Skills for 2001

IT managers rank the following as the technology skills they will be most looking in the coming year to hire or train internally for:

Web Development Skills	% OF COMPANIES WITH SKILL NOW	% OF COMPANIES TRAINING FOR NEXT YEAR	% OF COMPANIES HIRING FOR NEXT YEAR
Java	48	38	39
XML	37	45	37
HTML	71	41	37
Active Server Pages	48	40	37
Visual Basic	61	36	33
Language Skills			
Java	48	36	36
C++	45	21	26
C	42	14	20
Cobol	34	8	10
Development Tool Skills			
Microsoft Visual Basic	56	31	26
Oracle Developer 2000	29	17	20
Visual C++	30	16	17
PowerBuilder	20	8	10
Networking Skills			
TCP/IP	80	35	35
IPX	37	7	6
SNA	27	8	6
DBMS/RDBMS Skills			
Oracle	49	31	34
Microsoft SQL Server	54	34	25
Microsoft Access	65	21	12
DB2	28	11	10
Sybase Adaptive Server	12	4	6

Operating Systems Skills	% OF COMPANIES WITH SKILL NOW	% OF COMPANIES TRAINING FOR NEXT YEAR	% OF COMPANIES HIRING FOR NEXT YEAR
Windows NT/2000	79	43	37
Solaris	32	11	18
Linux	32	16	11
HP-UX	24	6	11
Other Unix	28	11	9
Internetworking Skills			
Routing	57	22	12
Gigabit Ethernet	31	19	10
Ethernet switching	56	17	8
10 Base-T switching	48	10	6
LAN Skills			
Microsoft NT Server	71	31	22
Ethernet	64	19	10
HTTP	48	14	10
Novell NetWare	41	10	6
Office, E-mail & Groupware Skills			
Microsoft Exchange	52	26	21
Lotus Notes	23	17	7
Novell GroupWise	14	4	2
cc:Mail	15	2	2
Enterprise Application Skills			
Oracle	31	21	19
SAP	14	7	8
PeopleSoft	15	7	7
Siebel	8	6	5
J.D. Edwards	7	2	3
Systems Software & Support Skills			
Internet application development	50	31	30
E-commerce app. development	36	27	28
Web server administration	53	25	23
Project management	57	28	20
Data warehousing & data mining	33	23	18

its RPG developers by moving them from the corporate IT department to the software engineering group.

With Silicon Valley only a few hours away, DeWitt Howard, manager of software systems support, says he has ample recruiting and retention problems. IGT's annual turnover rate is 18%; most developers depart for the lure of the San Francisco area.

Moreover, Howard and the corporate IT director sometimes find themselves competing for the same small pool of talent. Consequently, they have an agreement not to cherry pick each other's staffs.

IGT, which makes the popular slot machines Double Diamond, Wild Cherry, and Red, White and Blue, has expanded into providing Internet-enabled systems that automate back-end machine functionality such as hopper management and pay systems. In just the past two years, sales have

grown from \$85 million to more than \$1 billion, and the software engineering group is struggling to keep pace with the demand, Howard notes.

"We usually introduce five to 15 new games in a year; this year, we introduced 105," he explains.

Games developed by the company in the future will be built on an IP stack with the back-end monitoring systems provided over the Internet.

Howard says he'll gladly absorb and retrain IT's 20 RPG developers, and they can have their pick of development languages to learn: Java, HTML, C, C++, Visual C++ or Oracle. Those who decide to pursue firmware design will be enrolled in a two-year intensive program at the Oregon Institute of Technology. Others will take local university courses. Each staff member will receive a minimum of three weeks of training.

Coyle says that in the end, he will

rely on training to fill his VB developer position. Early last month, he extended an offer to a tech-support specialist who had been working in a call center. While she didn't have the hands-on VB experience that CCS needs, she had completed a formal VB course and had been supporting Microsoft Access, another tool that CCS will be using as it moves forward with its data warehouse plans. Coyle says he'll send her for additional VB training, and he adds that she'll learn on the job.

Coyle's 25-person IT shop is small compared with others in and around Boston, one of the most competitive IT job markets in the country. He says he typically has a hard time drawing candidates and an even more difficult time keeping them: Of the eight people he hired this year, four were replacements. If he gets two years from his new VB recruit, Coyle says, he'll be satisfied. ▀



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**EILEEN CASSINI,
VICE PRESIDENT OF IT SERVICES,
HARRAH'S ENTERTAINMENT INC.**

Top Dollars for Top Skills

Having the right technology skills can certainly pay off. According to IT managers, they're willing to pay the following salary premiums (additional pay for having a certain skill) for the following skills:

Web Development Skills	% OF SALARY PREMIUM PAID TO STAFFERS	% OF SALARY PREMIUM PAID TO CONTRACTORS AND CONSULTANTS
Java Server Pages	19	12
XML	15	15
Java	15	15
JavaBeans	15	16
Active Server Pages	14	18
Language Skills		
Java	15	12
C	13	6
C++	11	9
Cobol	10	11
Development Tool Skills		
Oracle Developer 2000	17	17
Visual C++	13	15
Microsoft Visual Basic	11	9
PowerBuilder	4	14
Networking Skills		
TCP/IP	15	12
IPX	14	8
SNA	13	8
DBMS/RDBMS Skills		
Oracle	17	17
Microsoft SQL Server	15	8
DB2	13	11
Microsoft Access	11	3
Sybase Adaptive Server	9	15

■ Note: Computerworld conducted its annual skills survey in September-November of this year, both by mail and online survey questionnaire. Approximately 307 companies, employing some 12,300 IT workers, participated.

Operating Systems Skills	% OF SALARY PREMIUM PAID TO STAFFERS	% OF SALARY PREMIUM PAID TO CONTRACTORS AND CONSULTANTS
OS/2	17	17
Windows NT/2000	17	14
HP-UX	13	8
Other Unix	13	9
Linux	12	17
Internetworking Skills		
Routing	18	14
Gigabit Ethernet	17	9
10 Base-T switching	15	4
Ethernet switching	14	6
LAN Skills		
Microsoft NT Server	16	13
HTTP	15	6
Novell NetWare	14	15
Ethernet	12	7
Office, E-mail & Groupware Skills		
cc:Mail	24	24
Microsoft Exchange	16	10
Lotus Notes	12	17
Novell GroupWise	9	14
Enterprise Application Skills		
Baan	19	23
Oracle	17	20
J.D. Edwards	15	20
SAP	15	14
Lawson	13	21
Systems Software & Support Skills		
Network development	20	9
E-commerce application development	18	24
Security	18	21
Directories	18	16
Internet application development	17	17