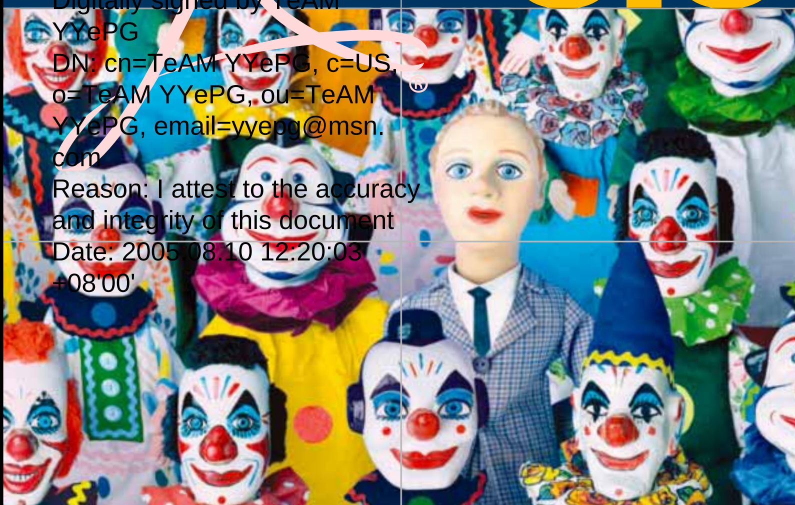
Strategies for
IT Business Leaders

August 2005
Number 56

ZIFF DAVIS

CIO INSIGHT



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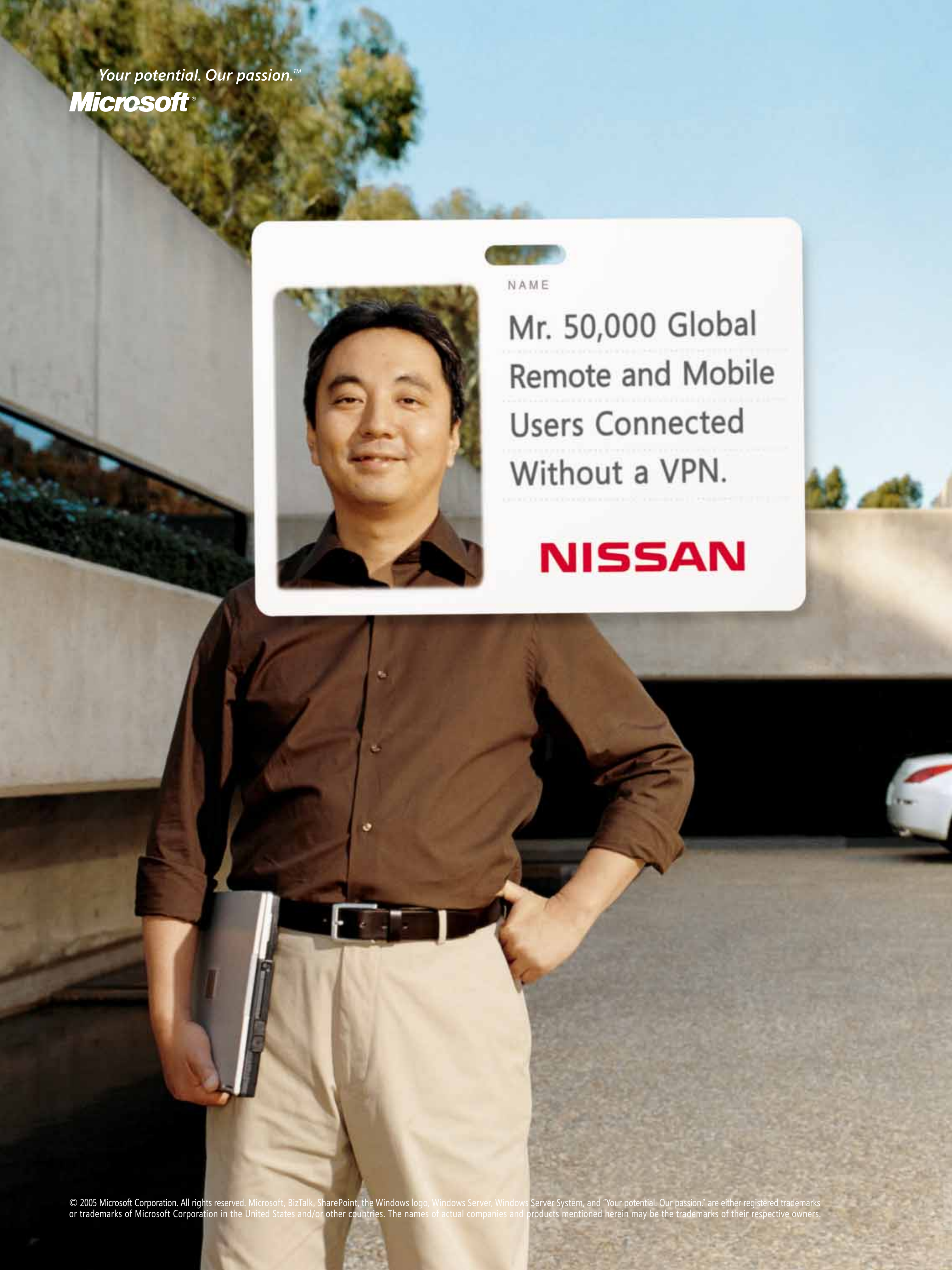
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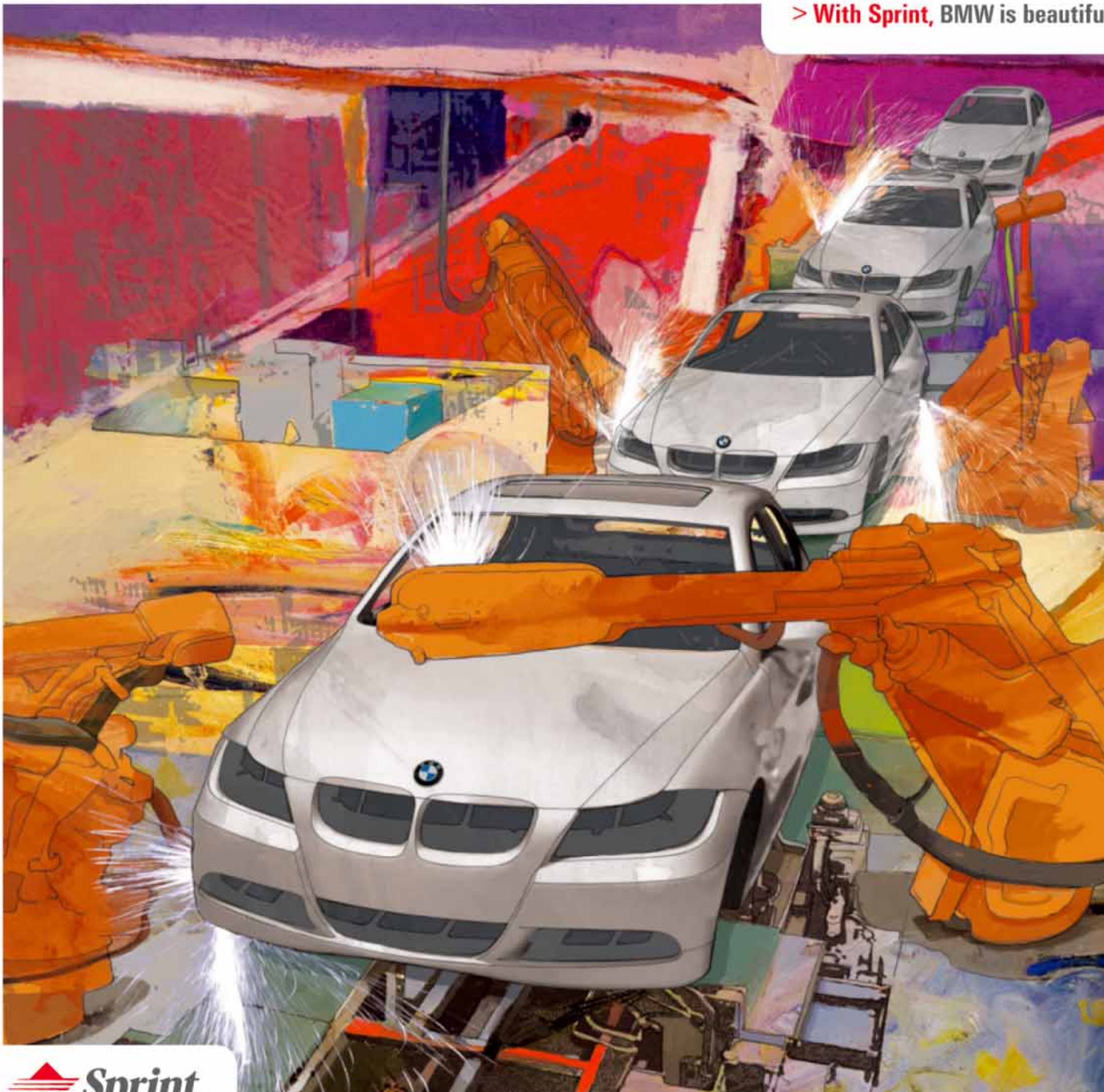

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"It was the most complex set of initiatives that I've seen a company take on."

John Polizzi
CIO, Blockbuster Inc.
SEE CASE STUDY, PAGE 51

PHOTOGRAPH BY COLIN HAWKINS / GETTY IMAGES

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26% of CIOs say their companies don't know precisely how much they spend on wireless and communications services. SEE RESEARCH, PAGE 61

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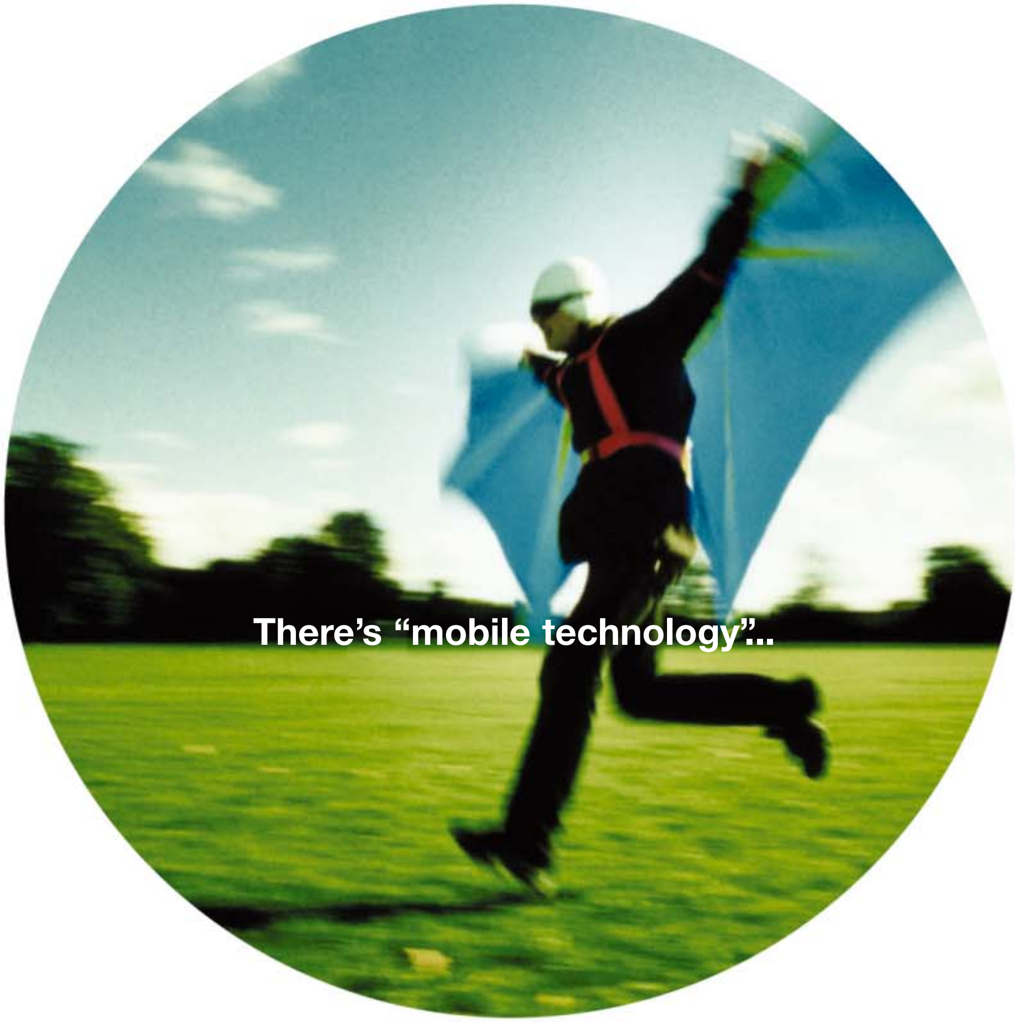
TOPICS

COMPANIES | PEOPLE

"You have to make it easy for knowledge workers to do what you want them to do."

Thomas Davenport
Professor of Information Technology and Management, Babson College

SEE PAGE 32



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Editorial

How to Manage Smart People

A CONFESSION: I AM A KNOWLEDGE WORKER. THAT MEANS, according to Babson College professor Thomas Davenport, whom we interview in this issue, that I "create, package, distribute and apply knowledge" (see page 32). And it puts me among a growing army of workers that Davenport estimates is already between a quarter and a third of the U.S. workforce. Like most knowledge workers, I'm given a lot of leeway in how I do my job. I'm not on a clock, nobody is counting keystrokes (I think) as I write and edit stories and send e-mails to other writers or sources, and my performance is judged primarily through admittedly subjective criteria. That also goes for how I manage the people who work for me.

The essential question Davenport raises is one that's near and dear to the hearts of anyone who, like me, is both a knowledge worker and a manager of knowledge workers: Can the performance of knowledge workers be improved by more carefully managing them, more consistently and objectively measuring their performance, and more intelligently using technology to help them do their jobs? Davenport says yes, while admitting the lack of evidence to support his thesis. But I have reservations.

The problem is with the nature of knowledge work. As Davenport points out, how do you control processes, 90 percent of which take place in someone's head? It's much easier to manage and reengineer physical processes than mental processes. Add to that the fact that every knowledge worker, like all workers, goes about his or her work differently, and no amount of process management would seem to be able to take all those differences into account.

But that doesn't mean knowledge workers can't be managed at all. In a column in the April 2003 issue of *CIO Insight,* John Parkinson discussed the problem of Power Programmers, or 10x programmers—called that because their performance was an order of magnitude better than the average. Everyone knows knowledge workers like that—super-capable and, well, just better at what they do. But Parkinson pointed out an even more important aspect of such workers: "My best managers know how to get the most out of their Power Programmers, without overtaxing the less talented people. Project managers who went strictly by the book never got the same level of performance—and usually lost their Power Programmers pretty fast."

Given the nature of knowledge work, managing knowledge workers is bound to be a delicate operation. Have you had success in systematically improving their performance? We'd like to hear your story. Please write us at editors@cioinsight-ziffdavis.com. —EDWARD BAKER

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CIO INSIGHT

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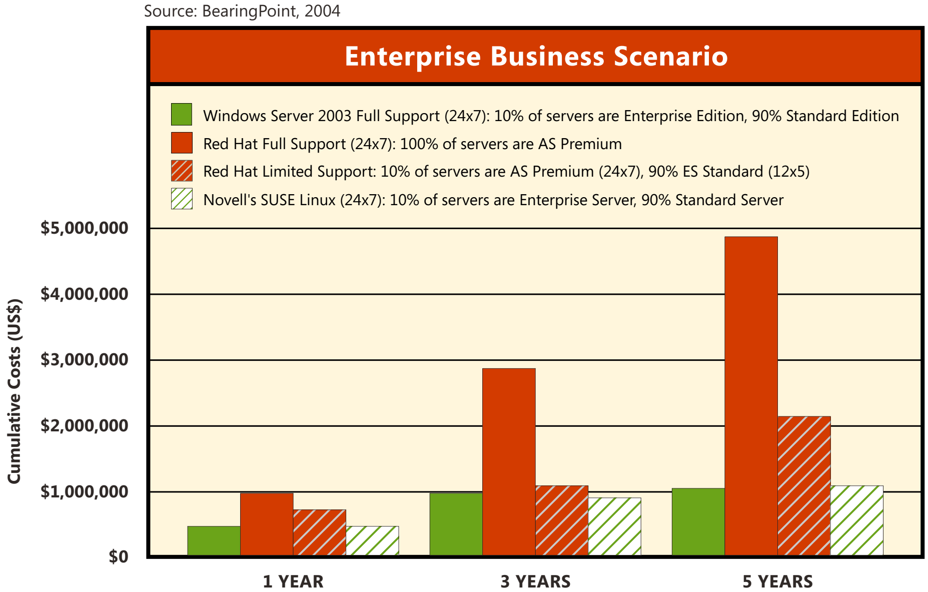
HAVE A GUT FEEL FOR THE ACQUISITION COSTS OF LINUX VS. WINDOWS? HERE'S A DETAILED ANALYSIS.

Microsoft

Source: BearingPoint, 2004



A recent study of licensing and support costs conducted by BearingPoint, a leading independent consulting firm, found that these acquisition costs for Windows Server™ 2003 are comparable to Red Hat Enterprise Linux or Novell's SUSE Linux Enterprise Server "despite the common perception that Linux is free or very inexpensive." However, if you require full 24x7 phone support on all servers, licensing and support for Windows Server 2003 can cost up to 73% less than Red Hat Enterprise Linux* over five years.

For the full study, visit **microsoft.com/getthefacts**

Microsoft® Windows Server System™

***Red Hat Full Support (24x7) estimates based on case where 100% of servers are Enterprise Linux AS Premium. Red Hat Limited Support estimates are based on case where 10% of servers are Enterprise Linux AS Premium (24x7 phone support) and 90% are Enterprise Linux ES Standard subscriptions (9 a.m.–9 p.m. EST M–F phone support). Windows Server estimates are based on case where 10% of servers are Windows Server 2003 Enterprise Edition and 90% are Windows Server 2003 Standard Edition (24x7 phone support on all). This study was commissioned by Microsoft.**

Letters

“Instead of focusing on improving corporate performance and growing the U.S. economy, as in the mid- to late 1990s, we’re focusing on the dual threats of foreign terrorism and gay marriage. ”

PRIORITIZE AND INNOVATE

Re: “Cultural Innovation” (June 2005). Edward Baker wrote, “Thanks to its entrepreneurial spirit, its scientific and technical know-how, and its ability and willingness to finance innovation efficiently, the U.S. will continue to be a powerful source of innovation for years to come.” That is a strong statement to make about a country whose public school system is profoundly and continuously underfunded; whose vocational education system is nonexistent, when not in utter disarray; and whose federal deficit is some $500 billion and growing!

Since 2000, we’ve starved our present economic, education and healthcare systems—ostensibly to protect our future ones. American R&D funding is down so much because of the current national agenda, and yet we’re actually deluding ourselves into believing that technology will make up for the profound lack of money and attitude essential to innovation leadership.

With regard to innovation, the world is indeed becoming “flat,” as detailed in Thomas Friedman’s new book, *The World Is Flat*. Our academic institutions are turning out just some 70,000 engineers a year because of inadequate education funding, starting with our public elementary school system.

We cannot continue to promote outsourcing while we leave two-thirds of our children behind in schools that are underfunded, with teacher shortages and dilapidated facilities. We’re deluding ourselves when we continue to outsource our “potential opportunity”-laden processes just because they aren’t “revenue-generating.” Indeed, if they aren’t, then we must be innovative and find a way to make them so—or junk them altogether.

Instead of focusing on improving corporate performance and growing the U.S. economy, as in the mid- to late 1990s, we’re focusing on the dual threats of foreign terrorism and gay marriage. We’re outsourcing every process (and eliminating the related jobs) that doesn’t produce real shareholder value. That’s why so many American workers are underemployed, or feel underpaid, undervalued and overworked. It’s no wonder they have little time to innovate in the workplace.

J.C. Conrad
Sr. Business Financial Analyst
Advanced Systems Dynamics, LLP
Tucson, Ariz.

Is it that the U.S. is too hesitant—or just that we look before we leap?

There have been periods when we started from the rear, only to win the race or pull to the front, because we were more apt to pace ourselves and focus on achieving the victory. I remember in the 1980s when the news, and the business/political leaders of our country, claimed the Japanese economy was going to crush ours because their business techniques and principals were far superior to ours. Where are they now?

Rather than trust in blind faith when it comes to forking over their hard-earned money for technology, Americans need proof positive. After all, it took us 30 years to finally decide that a telephone could be a benefit to business. Not only that, but once we do adopt a technology standard, or realize that it is critical to our well-being, we are more likely to take it to the nth degree than any other nation.

Andy Laverdiere, Jr.
IT/Communications Manager
John W. Kennedy Co. Inc.
East Providence, R.I.

Re: Australia’s technological advantage over the U.S.—thanks for the laugh. We’ve got an office in Sydney and I’ve spent a few months Down Under. To this very day, we are still paying a flat rate plus a charge per kilo character for our Internet usage. Can you imagine your ISP asking for a per-character charge?

I also see that Mr. Rothfeder bemoaned the fact that we poor Americans were missing out on . . . what could it be? Better health? Improved education? An efficient mass-transit system? Cleaner air? No! More marketing campaigns!

Now there’s a divide we should be ashamed of, for surely no country has ever beaten us in commercialism. So while we pay our $20 for all-you-can-surf Internet, wishing we could cut that electronic-check gap with Australia, let’s forget about pushing for more scientists and engineers. Come on, corporate America. Let’s have some Save American Marketing scholarships. Because what good is technology if somebody doesn’t tell you what to do with it?

Matthew Bentley
Operations Manager
Elan-Polo, Inc.
Nashville, Tenn.

continues on page 16


The best view in the city, the country, the world.
At one time, DHL had a data center in every country in which it operated. The result was a massive collection of small IT networks—without a mission control. With the help of HP Services and HP OpenView software, hundreds of data centers became three. By consolidating, DHL is now better able to share information, implement IT changes globally and "see" their entire network from a single point of control. Now, change never goes unnoticed. For more on HP's Consolidation Solutions, visit hp.com/info/consolidation
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Letters CONTINUED

I have read with some interest your recent issues on globalization and innovation. It appears the consensus is that management is unwilling and the talent pool is unable. I suggest that both of these ideas are a bit off the mark.

First, upper management may be willing to grow the business and may be actively seeking talent. Most senior executives I've met are quite willing to be challenged. They prefer to work with other overachievers and highly competent people. But when it comes to middle and junior managers, there's a different story entirely.

There is a huge effort on the part of some managers to not hire competent, talented people since, well, that new person might have some really good ideas, be extremely well-qualified, bright, and could take "my" job. If the new person is not fully competent, not interested in learning and advancement, or is physically overseas, the risk to "my" job is lessened. So these folks would rather not hire the best people; mediocrity is safer. This has a crippling effect on both innovation and on the development of a strong workforce in the U.S. The result is nothing less than the creation and promotion of a "dumbed-down" workforce.

Second, the talent pool in the U.S. is excellent. But the screeners in many HR departments and at many recruiting firms are frequently junior-level clerks who compare resumes with checklists. If the item on the checklist is not on the resume, that person is dubbed "not qualified" for the position. Even the best recruiters cannot submit candidates because there's an item missing from the checklist and the HR clerk (or manager) at the client is adamant about that one item. So the senior executives are led to believe that the company cannot find qualified candidates in the U.S. and must look elsewhere.

The best developers and innovators I've met "didn't know" what they were doing most of the time. They knew what they didn't know and they knew how to learn. Unfortunately, these skills are completely and totally disregarded by many recruiters, HR departments and managers today. It's too much trouble to evaluate people; it's much easier to compare checklists.

All too often, highly qualified, talented people are being rejected out of hand merely because someone, somewhere, insisted on a particular software package or a particular release version and didn't stop to consider that a person's ability to think, learn, invent and adapt to the needs of the business might just be a tad more important than whether or not they have worked with version 2.0 or 2.5.

Theresa M. Morgan
President
Wudang Research Association
Delray Beach, Fla.

Please send letters to **editors@cioinsight-ziffdavis.com**. *All letters to the editor become the property of* CIO Insight. *Letters may be edited for space requirements.*

Books

Get It Done

WHAT A CONCEPT. A SHORT, TIGHTLY FOCUSED, well-reasoned book on one specific topic—in this case, getting people with different skills to work together toward a common goal—geared for senior managers who don't have a moment to waste.

This book is part of a series put out by the Duke University executive education program, and perhaps the best thing it does is recognize that, first and foremost, teams are created to accomplish something. Yes, you need to know how to get the best out of each participant. Yes, you want team members to work well both internally and with the external groups they come in contact with. But the most important goal is accomplishing a task efficiently and well.

Building Effective Teams: Leading From the Center
By Duke Corporate Education
DEARBORN TRADE PUBLISHING, AUGUST 2005
112 PAGES, $16.95

The natural tendency when advocating something new is to argue that everything ever written before on the subject is wrong. Not so here. The unnamed authors begin by assuming you have a handle on the fundamentals: You know what needs to be accomplished, you can choose the right people and resources for the team, and you know how to manage all the relationships involved, while developing clear goals and priorities.

Then they turn their attention to explaining the "three factors that will force additional complexity" to the job of creating and leading a team:

- The speed at which teams have to form and produce results.
- The distance that can separate members.
- The blurred boundaries of membership and accountability.

The advice for dealing with each is specific and helpful.

Consider the problems that occur when your team members are not all in one place: Distance complicates everything. Not only does it decrease "the spontaneity of interaction," according to the authors, but "having most members [in one place] while one or more are distributed elsewhere has the potential to create two-tier membership." Those not in the central location may feel less involved, so they are less likely to give the project their best efforts.

The solution? Lots of one-on-one conversations with those not in the home office; encouraging individual and small group interactions among the team members themselves; and getting the group together informally, as well as formally, to spur interaction and deal with minor internal conflicts immediately. "A downside of not being there physically is there is a greater opportunity to ignore misunderstandings and let issues fester," they write. "It is also more challenging to resolve conflicts remotely. So plan ahead instead of fighting fires."

The benefits of following the commonsense advice offered here are easy to understand. It is not simply that you will have put together a well-functioning team. That should be the price of entry. The value comes when you have a team that is efficient and has a chance to accomplish something. The more you can increase the odds of that happening, the less the chance that you are going to find yourself outsourced.

PAUL B. BROWN *is the author of numerous business books, including* The Rules, *which will be published by Doubleday this fall. Please send questions and comments on this article to* **editors@cioinsight-ziffdavis.com.**

SHORT TAKES

Consulting Mastery: How the Best Make the Biggest Difference
By Keith Merron
BERRETT-KOEHLER, JULY 2005
265 PAGES, $34.95

Although it is obviously written for consultants, this book poses a basic question to the senior managers who hire them: What exactly do you want a consultant to do? Merron, the founder of the Avista Consulting Group, argues that you have a fundamental decision to make. A consultant can either solve a specific problem, or can help you reform your entire department/organization so there is wholesale change. Not surprisingly, he argues for the latter option, but there are numerous instances when having a consultant solve only a specific task would be of enormous help. There is greater benefit to be derived from knowing specifically, and in great detail, what you want a consultant to do. Unfortunately, that is not a task you can delegate to a consultant.

Beating the System: Using Creativity to Outsmart Bureaucracies
By Russell L. Ackoff and Sheldon Rovin
BERRETTT-KOEHLER, JULY 2005
175 PAGES, $14.95

Who better to teach ways to defeat "the system" than the people who taught how to construct t it in the first place? Ackoff and Rovin, retired Wharton School professors, provide a humorous account of various ways of either thwarting or circumventing bureaucrats. (The three options of choice: embarrass them, sap their budgets or make their work lives more difficult.) But the real benefit to reading this book is to make sure your organization is not subjecting your customers to needless bureaucratic hassles.

Beta.

EXPERT VOICE **JOHN WILSON**

The Technology of Teaching

Education IT finds itself at the intersection of business and politics.

John Wilson is the executive director of the National Education Association, the 2.7 million-strong teachers union based in Washington, D.C. And as of Sept. 1, he will become the chairman of the Partnership for 21st Century Skills, a consortium of technology companies working to create methods of teaching the skills needed by the American workforce of the future. As such, he is in the thick of the effort to transform how public schools use information technology for both instruction and administration. *CIO Insight* chatted with Wilson recently about the state of IT in the nation's schools, and its critical importance in a rapidly globalizing world.

CIO INSIGHT: What's the current state of IT in the public schools?

WILSON: We've got a long way to go to be state of the art. The federal government seems to have lost interest. In fact, the only funding available for education technology coming out of the federal budget was deleted by the Bush administration. That was very disappointing. Still, we've done a good job of wiring the schools for Internet access. Unfortunately, while there are some islands of excellence in the schools, there is a substantial difference between the affluent schools and poor schools of America.

What would state of the art look like?

We believe every child should have a laptop computer they can take home. That's the basic tool. It's like having a textbook. In addition, a lot of schools need technology for special-needs students, especially for blind students and students with reading disabilities.

Is the technology industry doing a good job supporting public education?

I think it wants to. Companies such as Dell, Microsoft, Intel, Apple Computer and SAP have really stepped up to the plate and tried to position themselves as advocates for education technology and strengthening public schools. It's not just good business for them; they also understand that the kind of worker they need in the future must have the appropriate skills.

What's holding schools back?

Here's an example. In South Dakota, the governor wired all the public schools. Then the NEA partnered with a company called EdVision to create 21st-century assessment tools, which allowed teachers to test students on what they had been taught, and get the results in six seconds. That allowed teachers to organize their classrooms into those who mastered the subject, those who needed remedial help and those who hadn't gotten the help. The assessment process truly drove instruction.

The irony of the plan was that the federal government declared that the program didn't meet the testing standards of "No Child Left Behind." But a lot of the school systems in the state kept the program anyway, because it was so effective, while adding what I call the 19th-century way of assessment—multiple-choice questions, bubble sheets and the rest. Not only do students need training to prepare them for the world of tomorrow; bureaucrats do too. —*Edward Baker*

PHOTOGRAPH BY DAVID DEAL

ANALYSIS

Quality in Greater Quantity

Software makers confront their imperfections.

IT'S NO SECRET THAT POOR SOFTWARE QUALITY IS A CONtinually nagging issue for CIOs. But just how bad is it? The Standish Group recently estimated that low-quality software costs the U.S. economy $60 billion each year. And Gartner Inc. claims that 80 percent of unplanned downtime in the enterprise is caused by software application and production errors, which can cost as much as $100,000 per hour.

$60 BILLION
Annual cost of bad software in the U.S.
SOURCE: THE STANDISH GROUP

With this in mind, the BPM Forum created the Software Economics Council this past June. SECO's leadership committee includes executives from a number of software firms, including EDS Corp., IBM Corp., Novell Inc., Oracle Corp., SAP AG and Mercury Interactive Corp. "As the software industry moves into adulthood, it has come to a point where we have to be much more serious about quality and engineering," says Shirish Netke, chief strategy officer at Aztec Software Inc., and chairman of SECO's leadership committee. "To do that, players in the ecosystem have to come together and start talking about how to address customer demands."

And those demands are steep. According to a study conducted by the BPM Forum, 77 percent of companies say they are dependent, or extremely dependent, on the performance of their business software applications, and 63 percent say business software is an important part of how companies capture emerging opportunities in the marketplace.

What is actually being done to improve software quality? Netke says software firms are working on several approaches, including better quality assurance methods that will encourage more collaboration between developers and testers. In addition, new tools help software developers automatically test for bugs. "If you can automate that testing process, it makes your release cycles far more predictable," and software more reliable, Netke says.

Netke adds that despite the recent figures released by the Standish Group, software quality has improved over the past few years. "Quality awareness has gone up dramatically," he says. "We no longer are in the situation where a software company says, 'Here's the software, take it or leave it.' Now they're saying, 'Our responsibility is to address the business needs of our customers.' That's quite a change from ten years ago."

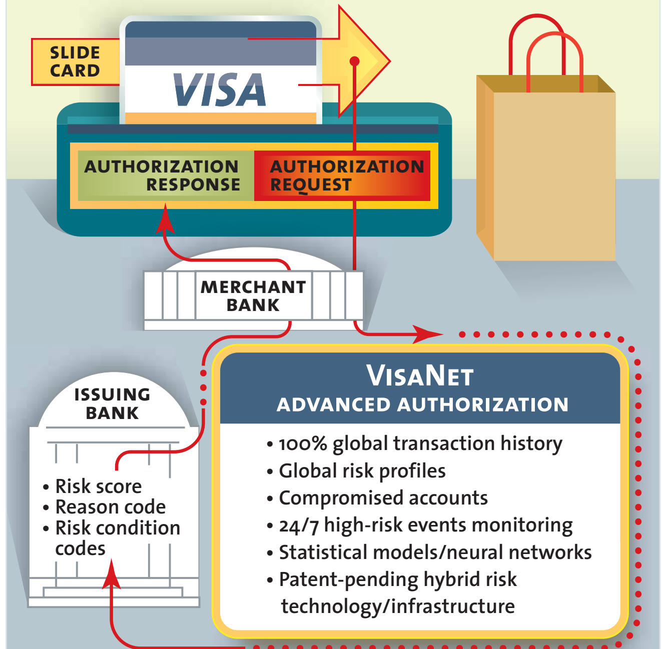
The SECO leadership committee, which will meet through conference calls every few months, held its first meeting in June to establish its agenda, which it will announce at the end of the summer. The group will publish a newsletter and white papers, and will also host Webinars.

—Debra D'Agostino

FRAUD PREVENTION

Instant Investigation

Visa's new Advanced Authorization process evaluates each credit card transaction against 150 terabytes of historical transaction data to better predict fraud. A risk score is assigned to each transaction and transmitted to the issuing bank, which responds with clear instructions back to the merchant. The entire process takes just 1.5 seconds.



SOURCE: VISA INTERNATIONAL SERVICE ASSN.

MINI CASE

The Flight of the Pringle

SURE THEY TASTE GREAT, BUT HAVE YOU EVER CONsidered the aerodynamics of a Pringles chip? Tom Lange has. As director of modeling and simulation at Procter & Gamble Co., it's Lange's job to use finite element analysis to predict what something will smell like, whether a bottle will break, and if a Pringles chip will take flight. "We break things into a million little parts and then write simple math equations about how each little part affects the other parts," says Lange, who is responsible for the economic, as well as structural, analysis of different materials.

His latest challenge was to analyze airflow around the unique double-saddle design of Pringles chips. "Air flow over Pringles has some very unusual behavior," says Lange. "It sheds vortices and creates lift that causes the chip to be unstable." In English that means the chips will fly off the conveyer belt if production is throttled up. Though he won't say what modifications they made, "we were able to speed things up," says Lange, who adds, "I have the coolest job."

—Dan Briody

INFOGRAPHIC BY JEAN TUTTLE

RULES AND REGS

DeSOXification

Sarbanes-Oxley coauthor among its latest critics.

ADD ANOTHER POWERFUL VOICE TO THE GROWING CHORUS of Sarbanes-Oxley critics: Congressman Michael Oxley. In early July, the coauthor of the controversial legislation spoke at the annual conference of the International Corporate Governance Network, in London, where he admitted that some SOX reforms are "excessive" and said that "if I had another crack at it, I would have provided a bit more flexibility for small and medium-size companies." Earlier this year, in April, Oxley spoke before a meeting of the House Financial Services Committee to discuss the much criticized law. "I think too many times we, as policymakers, pass legislation only to see it totally misinterpreted at the regulatory level, much to our disgust," he said.

Such comments are a change of pace for the Ohio congressman, who had, until recently, defended both Sarbanes-Oxley and the Securities and Exchange Commission's enforcement of it. But pointing fingers at enforcement agencies for overzealous misinterpretation isn't entirely fair, says John Berlau, a fellow at the Competitive Enterprise Institute, a Washington, D.C.-based think tank that has called upon Congress to repeal the law. Politicians write vaguely worded laws, so that when enforcement agencies try to interpret them, "Congress can claim, 'Oh, we didn't write that!'" says Berlau. "It's easy to blame the bureaucrats."

While Oxley's comments may strengthen the resolve of those who wish to see reforms, Berlau is quick to note that "acknowledging that there are problems is only the first step." He adds that SOX should be put through the same congressional reviews as the U.S.A. Patriot Act. In fact, two bills have already been introduced to Congress, one calling for the repeal of Section 404.

That doesn't seem likely. At the London conference, Oxley expressed doubts that companies would see relief anytime soon: "Congress will not revisit this issue," he said. "The SEC reform [on smaller companies] is not going to happen either." *—Debra D'Agostino*

CIO INSIGHT ASKS

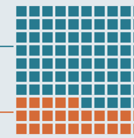
Optimists Club

CIOs still feel there's a bright future for the IT profession, and for IT graduates of U.S. universities. Of course, CIOs have good reason to feel optimistic: By virtue of their position, they are among the best paid and most successful people in the field.

I would encourage my college-age children to enter the IT profession.

AGREE 75%

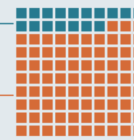
DISAGREE 25%



IT graduates in India and China are better trained and more capable than IT graduates from U.S. colleges.

AGREE 17%

DISAGREE 83%



SOURCE: *CIO INSIGHT*, JUNE–AUGUST 2005. N=187, 186

THE NUMBERS

Computers in Classrooms

48.3 million

The number of students enrolled in U.S. public schools.
SOURCE: NATIONAL CENTER FOR EDUCATION STATISTICS, FALL 2005 PROJECTION

14.1 million

The number of computers available for classroom use in U.S. public schools. SOURCE: STATISTICAL ABSTRACT OF THE UNITED STATES, 2004

81%

The percentage of computers in U.S. public schools that use Windows operating systems. SOURCE: MARKET DATA RETRIEVAL, 2005

$5 billion

The estimated overall technology budget for U.S. public schools in the 2004–05 school year, including hardware, software, outside services and staff support. SOURCE: MARKET DATA RETRIEVAL, 2005

WHAT'S NEXT? POKER ROBOTS

Know When to Hold 'em, Know When to Reboot 'em

Poker-playing "robot" goes all in against human.

MOVE OVER, DEEP BLUE. THERE'S some new artificial intelligence in town, looking to raise the stakes. The World Poker Robot Championship 2005, which took place at Binion's Gambling Hall & Hotel in Las Vegas, a stone's throw from the human World Series of Poker, pitted six poker-playing software applications, or "robots," against each other in No-Limit Texas Hold'em. GoldenPalace.net put up the prize of $100,000, and poker robot expert Ken Mages screened the "players." Beginning on July 12, the robots played eight four-hour sessions of poker against each other, with breaks to allow the programmers to check and make adjustments to their robots' poker faces. "It was difficult to find six worthy competitors," Mages says. "The poker robot-creating community is very small, and the good poker robot-creating community is even smaller." Pokerprobot, created by Hilton Givens of Lafayette, Ind., emerged victorious on July 14. Two days later, Givens's Pokerprobot went head to head with Phil "The Unabomber" Laak, a professional, human poker player. Alas, Pokerprobot was undone in just 300 hands by Laak.

—Sheena Mohan

Taking the Mobile Enterprise to the NEXT LEVEL

Permission-based communications, powered by second-generation IP, will enable enterprises to mobilize and collaborate like never before.

In This Section

SIEMENS

Global network of innovation

It's 2005: Do you know where your employees are? For an increasing number of companies, the answer to that question is "wherever business takes them."

Today's enterprises are no longer constrained by the four walls that constitute "corporate headquarters." According to market researcher IDC, two-thirds of the U.S. workforce will be considered mobile by next year. In-Stat MDR forecasts that by 2008, the population of remote and/or mobile employees will increase to 105 million, or more than 72 percent of workers.

Growing almost as fast as the population is the number of different types of mobile workers. Within any enterprise today, you'll likely find telecommuters and "road warriors" (executives, sales and marketing, or field and logistics personnel), alongside newer types of mobile employees, including "day extenders" and "corridor cruisers."

BENEFITS OF 2gIP COMMUNICATIONS

For the business:

- Allows CIOs to explore different deployment options for company's communications needs
- Lower TCO through voice/data convergence
- Lower operational costs through use of integrated applications
- Reduced hardware requirements on the server side for certain applications (VoIP, for example)
- Provides holistic approach to security, enhanced by encryption and identity management
- Helps streamline workflows by empowering companies to communications-enable different business processes
- Optimized conferencing tools can replace business travel

For the user:

- Eliminate unwanted interruptions and unproductive actions by intelligently filtering communications
- Access to real-time presence information helps decisions get made faster
- Initiate ad-hoc conferencing/collaboration sessions without pre-arranging separate audio or videoconferencing bridges
- Participate in conferencing sessions quickly and easily via a variety of mobile devices

Day extenders are typically found in the office, but leverage technology tools—including notebook and handheld PCs, wireless wide-area networks (WWAN) and virtual private networks (VPN)—to work at home after hours or to make the most out of a long commute. Corridor cruisers spend many hours in meetings or traveling from office to office, utilizing wireless local area networks (WLAN) that allow them to stay connected while in the conference room, cafeteria, hallway or branch office.

The tools that these employees are using to stay productive while on the go are proliferating:

- According to a survey by Forrester Research, 60 percent of enterprises will upgrade or deploy wireless LANs this year.
- The META Group (recently acquired by Gartner, Inc.) predicts that by 2006, 40 percent of workers will use notebook PCs—nearly as many as those using desktops (45 percent).
- IDC says that in the first quarter of this year, the worldwide converged mobile device market achieved its third consecutive quarter of year-over-year growth exceeding 100 percent.
- Gartner predicts that by the end of 2008, wireless e-mail will be a built-in application on all smartphones.

These increases in numbers and diversity of the mobile workforce are not at all surprising, given the benefits of mobility. Study after study has shown that mobility can help corporations increase productivity and flexibility, respond more quickly to customers, close sales faster, and react to new business opportunities ahead of the competition. Workers can improve the balance between work life and home life, which may, in turn, increase their level of job satisfaction. Dr. Neville Meyers, a teleworking researcher from the Queensland University of Technology who's studied teleworking in Australia, the U.S. and Europe for the past decade, estimates that working from home increases productivity by 30 percent.

Regardless of their location, methods of connectivity or devices used, today's workers have one very important thing in common—the need to communicate effectively. This need becomes even more critical for enterprises whose decision-making processes rely upon teams rather than individuals. If these teams cannot communicate in a timely and efficacious manner no matter where their individual members reside, the company's ability to be competitive will ultimately suffer.

Given the growing number of technology tools available to aid communicating on the go—notebooks, cellular phones, converged mobile devices, WLANs and WWANs, residential broadband, VPNs and Web mail, softphones and voice over IP or wireless LAN—you'd think the communications bases would be covered. But remember, we said *effectively*.

[Phone] Tag, You're It

With all due respect to the incredible advances that have been made in mobile device technology over the past decade, communications on the go are still fraught with challenges and frustrations that impede productivity and delay decision-making. Surprisingly, for all the progress we've made, our communications today, in many cases, are even more inefficient than they were in the pre-voicemail days of the "while you were out" message pads.

Think about what happened the last time you needed to get in touch with a busy traveling executive, whose opinion was needed to close a deal, finalize a contract or make a new hire. It's likely that you:

- Called his office phone; left a message
- Called his assistant; left a message
- Called his mobile phone; left a message
- Sent a text message
- Fired off a "You there? Hellooooo!" instant message
- Last-ditch effort—called his home phone and personal cell; left messages on both (no, you won't be popular on Monday morning)
- Last-last-ditch effort—walked around the office in a panic, shouting, "Does anyone know how to reach John?" (okay, so you're not particularly popular right now, either)

Guess what? You just used 10 different devices or applications, almost as many network services, and likely half an hour or more of your time. You've accomplished nothing, and disturbed half the office to boot.

But most importantly, *the decision still hasn't been made*.

Communications Frustrations

To say that this communications landscape is fragmented is perhaps the understatement of the century. And unfortunately, communicating in this fashion wastes time and hinders productivity in more ways and for more people than you might think.

Consider first the number of actual devices involved. Each has its own interface, associated application and learning curve. Some must be synchronized; many don't work together. Devices must be deployed, tracked, managed, updated and secured by the IT department. Many of these tools are redundant, and create islands and silos of communications that may drive frustrations and enable time-wasting behaviors, rather than streamlining processes and increasing productivity (you know, the reasons why you bought them in the first place).

Make no mistake—employees are frustrated. According to a survey of 1,700 knowledge workers in the U.S. conducted by communications firm Penn, Schoen & Berland Associates on behalf of Siemens, workers' top communication complaints include:

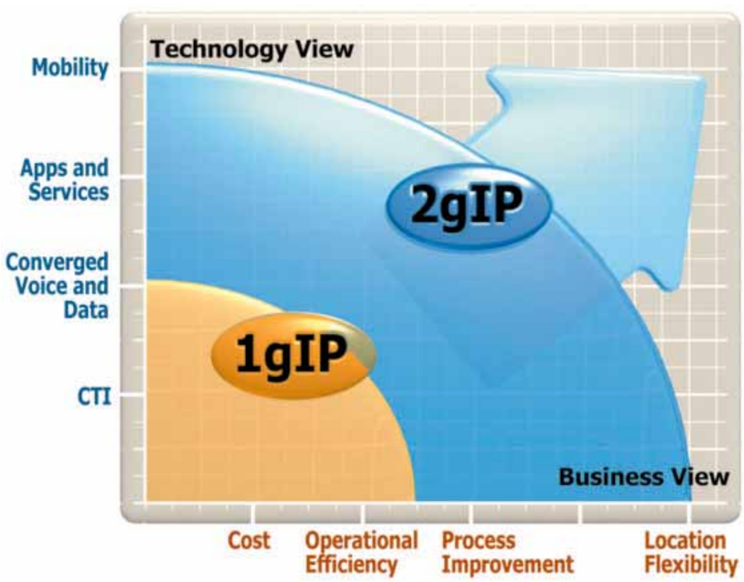
- Must leave multiple messages in different places when seeking immediate responses (67 percent)
- Delayed decisions because colleagues fail to respond in a timely manner (65 percent)

TOP 5 MYTHS OF PRESENCE-ENABLED COLLABORATION TOOLS

1. **They're not ready for prime time.**
   a. **Reality:** The SIP standard was defined by the IETF in 1999 and ratified in 2002. Siemens launched the HiPath OpenScape Collaboration Suite in 2003. A recent Nemertes Research study says that 57 percent of organizations plan to embed presence throughout their organizations within the next three years; 21 percent say they are working on the process right now.
2. **The learning curve is too high.**
   a. **Reality:** As Siemens learned in its internal OpenScape trials with its own employees, many were already familiar with instant messaging, a key presence interface, as well as conferencing tools like Live Meeting and WebEX.
3. **Presence-based applications can't be deployed without VoIP.**
   a. **Reality:** It doesn't really matter what type of voice device(s) and infrastructure is in place. Presence can be tracked and real-time communication established with any device, regardless of whether that device is a circuit-switched phone, IP phone, cell phone, PC, PDA or other device.
4. **Presence is just another information overload intrusion.**
   a. **Reality:** Newer presence tools provide permission-based controls that enable users to selectively and automatically tune out distractions while, at the same time, being immediately available for critical communications.
5. **It's just another IT or telecom project.**
   a. **Reality:** Senior line of business support is required to ensure entire team commitment to the presence way of collaboration. Functional areas must be identified, with the help of human resource managers. Division leaders must explore their own business processes to ensure they are linked. Team members must be taught how to stop messaging and start collaborating—working with others on a more real-time basis to achieve mutually identified goals. Presence has much more to offer when it's deployed with an understanding of each organization's unique business processes and how those processes contribute to the bottom line.

- Inability to locate or communicate with colleagues (59 percent)
- Malfunctions while traveling or working remotely (56 percent)
- Inability to access timely and accurate information (51 percent)
- Inability to respond to a missed client call in a timely manner (48 percent)
- Lack of synchronization among various communication tools (43 percent)

SECOND-GENERATION IP DELIVERS VALUE



SIP'S MAIN FUNCTIONS

- Locates people for communication sessions
- Lets participants negotiate call features (e.g., video stream)
- Provides a mechanism for call management (e.g., adding participants)
- Allows for changing features during a session

It's easy to see how these challenges can sap productivity at a time when intense global competition requires every company to maximize the effectiveness of its resources. The bottom line is that the time has come to unite the islands and silos of communications under one roof—a single domain that delivers a unified, consistent experience to every user, whether stationary or mobile.

Powered by 2gIP

Unified communications is not a new idea—the concept has been evolving for years as IP telephony solutions have advanced. Early unified messaging systems effectively consolidated all types of messages into a single inbox. These systems were typically deployed over first-generation IP (1gIP) communications networks.

1gIP networks are premises based like traditional point-to-point voice networks, but use a distributed architecture in which specific regions are served by their own node. The objective was to deploy a cost-effective infrastructure that integrated both voice and data functionality over an IP network.

We are now entering the era of second-generation IP (2gIP) communications in the enterprise. 2gIP networks allow corporations to deploy communications capabilities to thousands of users across an entire continent from a single, centralized data center. More importantly, 2gIP enables enterprises to create business value by deploying standards-based communications applications and services that drive process improvements (both for the business and the individual user), increase location flexibility and enhance worker mobility.

One of the key enablers behind 2gIP is SIP, or Session Initiation Protocol. Resembling its ubiquitous cousin protocols, the Web's HTTP and e-mail's SMTP, SIP establishes communication sessions over IP networks. Those sessions can include voice, data, video and other media types, exchanged between two or more users, who can be talking or watching with any number of devices: PC, PDA, mobile phone, Wi-Fi notebook, or voice over IP phone. SIP also supports call forwarding and time-of-day routing based on geographic location of the person being called, as well as user authentication, redirect and registration services.

One of SIP's most powerful functions is its ability to track down call participants, even as they roam about or change devices. A SIP session typically employs these components:

- **User agents** are the end-user devices, which can be PCs, PDAs, mobile phones, VoIP phones, etc. The user agent client software starts the message session, and the user agent server responds. Requests can be sent through any transport protocol, such as UDP or TCP.
- **Registrar servers** contain the locations of all user agents in a domain. These database servers fetch and send the IP addresses of session participants to the SIP proxy server.
- **Proxy servers** handle session requests from user agents and then query the registrar server for the addresses of participants. The server forwards the session invitation directly to the participant user agent (or to another proxy server if the participant is in a different domain).
- **Redirect servers** enable proxy servers to send session invitations to external domains.

Because SIP is built on open standards, developers can easily create applications or additional services using common languages such as Java. Siemens, one of the pioneer adopters of SIP, offers a range of products that implement the protocol, from user devices such as the optiPoint SIP clients to the HiPath real-time IP communications systems.

Using a carrier-class, SIP-compliant server as the underpinnings of the 2gIP network, corporations can create unified communications domains in which users enjoy a consistent experience across their work, travel and home lives.

What does all of this mean for today's enterprise? Analyst Irwin Lazar, in a report published by the Burton Group, said: "The Session Initiation Protocol (SIP) is rapidly becoming the basis for unifying all enterprise real-time communications systems into a common, standards-based framework both within and across enterprise boundaries."

All Together Now

Siemens' technological framework for developing this single communications domain is called LifeWorks. Under this domain, users can synchronize, integrate and manage communications regardless of network (cellular, PSTN, VPN, WAN), device (notebook, handheld, mobile phone), application (e-mail, CRM, Web conference) or location (hotel room, home office, main campus).

Importantly, users have a great deal of control over their environment—and thus avoid communications "tag" scenarios—because it is:

- **Permission based:** Employees may filter inbound communications, so that they control who may reach them, when, and on which device or application.
- **Presence enabled:** The communications system knows where a worker is currently located, and how best to reach him based on that location.
- **Process integrated:** Communications are integrated with back-office processes and applications that drive the enterprise.

The permission-based aspect of this framework is perhaps most important from the user perspective, because it allows them to take charge of modes of communications that they use to connect with colleagues, business partners and friends and family. Within a 2gIP world, users can establish their own set of checks and balances that functions much like the systems they put in place in the 1gIP world to quell the communications onslaught, like using caller ID on a cell phone or an assistant to screen phone calls.

In fact, second-generation IP communications offer a whole host of benefits for the business as well as its employees on multiple fronts. Let's examine each.

2gIP Business Advantages

The business benefits of second-generation IP communications can extend from the back office to the corner office and beyond. First, 2gIP systems enable CIOs to explore different options for the company's communications needs. In the past, the only choices available to CIOs were to purchase their own equipment (CPE) or opt for Centrex service delivered by their telecommunications provider. Today, CIOs can choose to purchase and deploy communications services through managed service providers or systems integrators, thereby minimizing capital expenditures.

2gIP systems may also help large enterprises to lower cost of ownership through voice-data convergence. Siemens estimates that by migrating distributed 1gIP systems to data center-based, on-demand 2gIP infrastructures (either owned or managed), large enterprises with 25,000 or more users and upwards of 198 locations may lower TCO by about 15 percent. Firms currently in the process of upgrading PBX equipment to IP stand to gain the most by considering the move to 2gIP within a managed data center environment. Siemens estimates cost savings for a large enterprise within this scenario to be about 25 percent.

Operational costs may also be lowered through the use of integrated applications. Having one platform that covers messaging,

USING A CARRIER-CLASS, SIP-COMPLIANT SERVER AS THE UNDERPINNINGS OF THE 2GIP NETWORK, CORPORATIONS CAN CREATE UNIFIED COMMUNICATIONS DOMAINS IN WHICH USERS ENJOY A CONSISTENT EXPERIENCE ACROSS THEIR WORK, TRAVEL AND HOME LIVES.

audio and videoconferencing, directory services, calendaring, and so forth, is less expensive to manage than standalone platforms for each individual application. Corporations also don't need rack upon rack of servers in the data center to support 2gIP, which may lower operational costs further. In fact, typical Siemens voice over IP installations require just one or a few industry-standard servers.

Second-generation IP also takes a new, holistic approach to security—welcome news to today's security-conscious organizations. Because all communications functions reside under a single domain within the 2gIP world, secure access to them—both inside and outside corporate headquarters—can be controlled using tools like encryption and identity management, among others.

Finally, 2gIP can help corporations streamline workflow by allowing them to communications-enable various business processes. For example, a company could deploy voice-enabled CRM or ERP applications to speed and improve communications with customers and partners, or roll out rich-media conferencing capabilities to enhance B2B supplier relationships. And these same tools used within the company's "four walls" by specific workgroups can help to increase the efficiency of team collaboration, speed up internal decision-making processes and ultimately improve time to market.

User Benefits

2gIP communications and associated applications offer many tangible personal productivity-type benefits for the workers who use them. Notably,

INSIDE SIEMENS HIPATH OPENSCAPE

Siemens HiPath OpenScape is based on the Microsoft Office Live Communications Server, a real-time collaboration platform that integrates with the Microsoft Office System and Microsoft Windows Server System products and services. It operates by establishing a link between existing communications tools—telephone, IM, e-mail, voicemail, SMS, conferencing, Web collaboration—and data resources and applications like Office. Via a single interface, users can access unified messaging, workgroup presence status, multimedia conferencing, shared documents and other functions.

Major features and functions of the system include:

- The **Communications Broker** provides access to all communication resources. The user defines his or her own rules for communication processes. Via multimodal access across all currently available devices, networks and interfaces, the user has access to virtually all functions within the communications environment.
- The **Personal Productivity Application** provides unified control of all devices and networks. The **Personal Portal** acts as a front end, so all communications resources can be used via a single access point.
- The **Presence Manager** provides information on the presence and availability of team members. **Personal Profiles** enable users to define accessibility in terms of time, situation, means and content.
- The **Self-Service Feature** handles contacts and information forwarding when users aren't available. Authorized callers are greeted by a personal message, and have access to certain information or to the user's diary, where they can enter appointments.
- The **Workgroup Collaboration Application** enables workgroups to communicate in real time, or to call up current information in document form on the **Workgroup Portal**. Employees use **Click-to-Conference** to start a conference without advance set up, call-in numbers and passwords or e-mails.
- With **Conference View**, participants can see who is online and view documents at any time. Saving of shared data takes place in real time or later as preferred, while the version of attached documents is continuously updated.

Benefits

Benefits of the HiPath OpenScape system include:

- **Efficient setup of group communication:** Users select colleagues that should participate in their phone or multimedia conference, and then start it up with a mouse click.
- **Document and participant administration:** A document list is provided during conferences, so participants can share information easily. Conference status and management show the conference's start time and the current number of participants, while a missing participants window displays the invited individuals that have not yet logged on.
- **Prevents unwanted interruptions while enabling access to information for authorized colleagues:** Users control who can contact them, when and how. During a meeting, for example, only certain callers may be put through, while others may obtain a document that's been left for them or leave a message.
- **Communications tasks can be accomplished in one step.** Presence information tells users how best to reach colleagues in real time. During conferences, participants don't need to start up additional applications or wait for files to be e-mailed back and forth in order to share additional materials.

2gIP-enabled suites like Siemens HiPath OpenScape—by supporting presence-based, real-time communications—allow workers to:

- Eliminate unwanted interruptions and unproductive actions by intelligently filtering communications
- Communicate with colleagues, workgroups and others in the manner that's most beneficial and effective at any given time
- Initiate ad-hoc conferencing/collaboration sessions without pre-arranging separate audio or videoconferencing bridges
- Participate in conferencing sessions via a variety of mobile devices
- Access groupware and conferencing services quickly and easily while mobile
- Enable access to certain information for authorized parties ("self-service")

In other words, employees not only regain control of their communications, they also acquire many new capabilities that can help them to eliminate frustrations and be more productive.

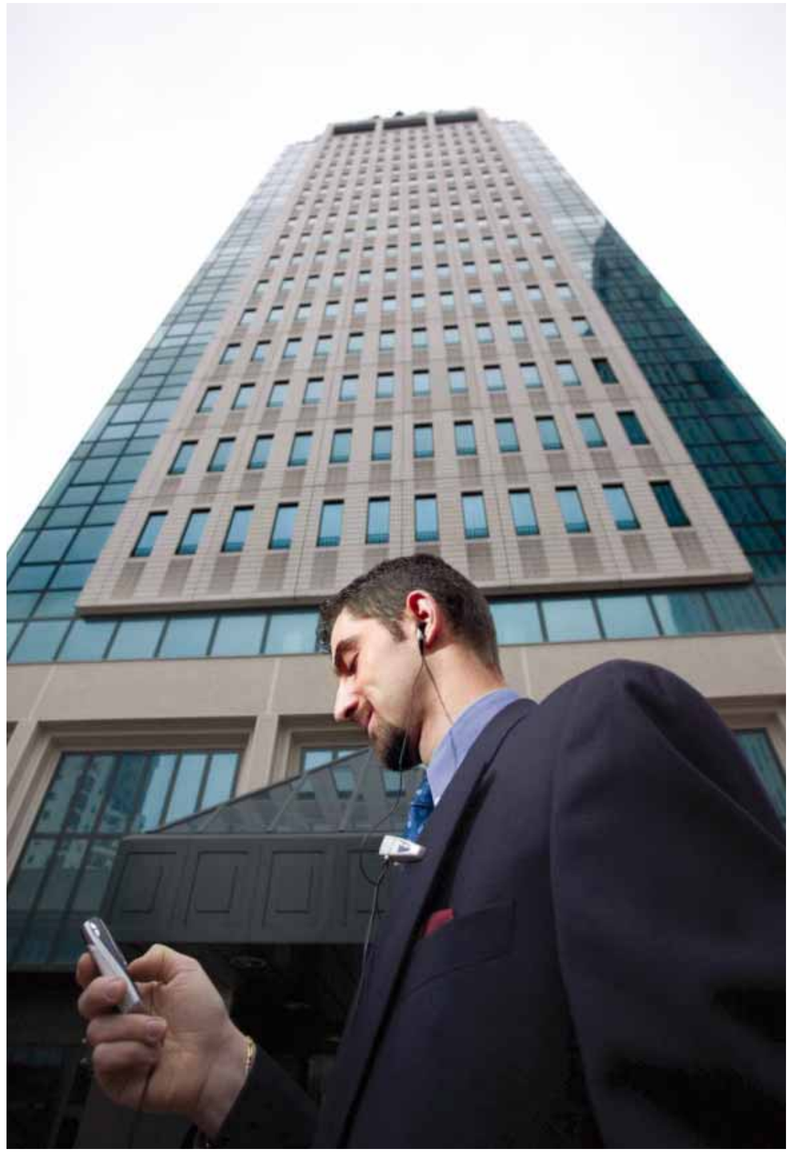
LifeWorks in Action

HiPath OpenScape is just part of Siemens' portfolio of solutions designed to help enterprises meet their communications needs today and tomorrow. To see how just some of these solutions work together to help corporations streamline communications, improve productivity and speed up decision-making processes, let's follow a busy marketing executive through a typical day—enhanced by LifeWorks.

More and more people today, particularly busy executives, are finding that the line between "work life" and "home life" is becoming harder to distinguish. With the proper tools in place, however, available time may be used much more productively, and with Siemens' solutions, under rules set up by the user.

Our marketing executive, for example, may choose to begin his workday while still at home. Permission-based communication enabled by HiPath OpenScape allows him to make himself accessible by integrating his home phone and television, so that caller ID information and video appears on the television in his den. If an overseas colleague needs to reach him to help resolve an issue before the end of her day, she knows that she can reach the executive via phone.

Siemens' solutions also allow this executive to be more productive while sitting in his carpool on



the way to work. Using High Speed Downlink Packet Access (HSDPA) connectivity, he can work in the car on his notebook PC as if he were sitting at his desk in the office—scheduling conferences, viewing documents or answering e-mails. HSDPA is an evolution of 3G UMTS cellular aimed specifically at high-speed data access for the mobile market. With HSDPA, data download speeds of up to 14.4 megabits per second cay be reached. This rate far outpaces all competing standards, including 1xEV-DV (4.8Mbps), UMTS (2Mbps), EDGE (384 kilobits per second) and GPRS (128Kbps).

Once he arrives at the office, our executive can change his presence status in his HiPath OpenScape Personal Portal so that only a select few coworkers and important clients may reach him. This combination of tools and technologies allows the executive to control inbound communications to suit his location and desired level of availability, and to transform once-unproductive downtime into productive work time. Now, it's much more likely that he'll be able to leave early to attend his daughter's field hockey game.

Calling All Mobile Enterprises

The benefits of mobility may no longer be underestimated by those corporations that wish to stay a step ahead of their competition. Yet attacking the problem with a myriad of portable, connected devices isn't the answer. As many companies have found, throwing hardware at the problem creates islands and silos of ineffective communications, not to mention an enormous management issue for the IT department.

Effective team communications—the lifeblood of global enterprise business today—is the first step that must be taken down the path towards a workable mobile strategy that can increase business value and competitive edge. Only Siemens offers an end-to-end, 2gIP communications solution that is presence-enabled, permission-based and process-integrated—and surrounded by a secure, mobility-enabled framework that doesn't force companies to work within boundaries. With tangible benefits for CIOs, users and enterprises alike, this unified communications domain allows corporations to reap the rewards of true enterprise mobility. ◆

SIP, SOAP, SALT? SIMPLE!

Enabling Unified Communications with Industry Standards

As with many other technology tools, the reason why HiPath OpenScape and other 2gIP communications solutions from Siemens and its partners work seamlessly together is adherence to open industry standards. The major multimedia collaboration standards (defined below) help to deliver multifunctional platforms comprised of many disparate voice and data devices and applications. In the future, these standards will enable integration with even more applications, further enhancing the value of the system as a whole.

SIP: Session Initiation Protocol. Enables communication between different devices. SIP is a media-independent protocol for the administration of communication events.

SOAP: Simple Object Access Protocol. Facilitates data exchange between communications systems and solutions for messaging, directories and CRM. SOAP messages are independent of any operating system or protocol, and may be transported using a number of different Internet protocols including SMTP, MIME and HTTP.

SIMPLE: SIP for Instant Messaging and Presence Leveraging Extensions. Complements real-time communications solutions via network participant presence information and instant messaging. SIMPLE is a step towards bringing standardization to instant messaging.

SALT/VXML: Speech Application Language Tags/Voice Extensible Markup Language. Enables user-friendly interaction with computer systems via voice-recognition technology (using a voice browser and/or the telephone instead of a traditional browser that uses HTML in combination with a keyboard and mouse).

RESOURCES

Events:

Gartner ITxpo
Orlando, Florida
October 16-21, 2005
www.gartner.com/2_events/symposium/2005/sym15.jsp

Internet Telephony Conference & Expo
Los Angeles, California
October 23-27, 2005
www.tmcnet.com/itexpo/ca05/

CeBIT
Hannover, Germany
March 9-15, 2006
www.cebit.de

VoiceCon
Orlando, Florida
March 6-9, 2006
www.bcr.com/voicecon/spring/index.php

Siemens Communications Webinars
http://communications.usa.siemens.com/about/webinar.html

Online Resources

For access to the following white papers, visit:
http://enterprise.usa.siemens.com/go/whitepapers

- The Big Communications Picture
- Presence-Aware Communications
- LifeWorks—Unified Domains Unified User Experiences
- Real-Time Communications Meets Real-Time Information
- HiPath Real-Time IP Systems

STRONG SIGNALS **JOHN PARKINSON**

Bit by Bit

Information overload is outstripping our ability to develop new storage technologies. What's a poor CIO to do?

"The Information Revolution is over—information won." —Thomas Pearson, *Quality Progress*

ONE OF MY FAVORITE TECHNOLOGY TREND LINES derives from work originally done by researchers at IBM in the 1980s. They looked at the fundamental data storage efficiency equation—how many physical atoms does it take to reliably store a single data bit? Back in the early days of computing, a punch card stored 80 bytes of data encoded in EBCDIC (remember that?). So a card stored 640 bits using a very large number of atoms—about 10 to the 20th power atoms per bit.

By the 1970s, we had progressed to magnetic tapes and the early hard-disk storage technologies, and we were doing much better. Magnetically stored bits took only about 10 million atoms each. By calculating the storage ratio for a range of devices, the IBM research group predicted that the atoms-per-bit ratio would follow an approximately exponential improvement trend (which looks like a straight line if you use an exponential scale for the ratio) for about the next 50 years.

Today, we are tracking pretty well to their prediction—and are down to around 10,000 atoms per bit with SDLT tape and the latest high-density disk drives. The trend line reaches 1:1 around 2018 or 2020, by which time we will need nanomanufacturing processes and exotic materials to make this level of storage density work reliably, especially for long-term storage and archival retrieval media, which must preserve stored data for decades or centuries.

What's equally interesting is to contrast the radical improvements in storage density with the equally radical growth in storage demand. As more and more business and consumer devices get digital capability, and more and more previously analog content becomes digital in origination or through conversion, storage demand is exploding. In business, government and personal life, first-world economies, and their organizations and consumers, are creating and storing new digital content in ever increasing amounts, and keeping it for longer and longer periods. There are even efforts underway to systematically organize the increasingly digital record of our society's history: Did you know that, since 1950, over 16,000 different (and generally incompatible) storage formats have been defined and used for digital content? We now have enough calibrated growth data to predict the lower end of the volume of storage that will be needed for at least a couple of decades into the future.

> **Even if every atom of the earth were able to store a single bit, we still wouldn't have enough atoms to meet the projected storage demand by 2018.**

Now for the bad news. Well before we get to 1:1 atoms per bit, we will need more atoms than are likely to be available if we want to store everything we will be creating and keeping. In fact, even if every atom of the earth were available to store a single bit, we still wouldn't have enough atoms to meet the projected storage demand by 2018. That's scary.

So let's look at what's going on here, and at what we might be able to do about it.

First off, we can try to reduce the unplanned or unconscious duplication of stored content. As storage costs have declined, we have generally gotten sloppy about efficient storage schemes—sometimes deliberately. We keep backup copies

ILLUSTRATION BY JOHN KASCHT

(at least some of us do) of much of our information because we know that the technology isn't perfect and that we sometimes make mistakes that wipe out essential data. Often we keep several backups. We're all going to have to get more disciplined about this—because, soon, we just won't have enough storage space available.

Second, we tend to keep complete copies of all intermediate stages of work in process—for example, versions of a final document so that we can go back and see how the end state was achieved. Keeping only what's changed would cut down on the storage requirements for this and many other kinds of audit trails considerably, although we (and the technologies we use) will need new habits and capabilities to work this way easily and effectively.

Third, we often send complete copies of information to a lot of people, rather than just storing the information once and sending only a link to where it is stored. This is another habit we are going to have to break, and it will be helped by the steady increase in persistent network connectivity. After all, the multiple-copies habit is really a legacy of an earlier age of connectivity deployment when we or others we worked with were often offline and needed to have frequently refreshed local copies of everything to enable us to keep on working.

In the long run, there are only two options—store less, or find a way to get beyond the one-atom-per-bit ratio.

Fourth, we can devise better ways of finding what we have stored. A large part of the total storage demand is associated with "meta information" rather than the information itself. We consume these additional bits for a variety of reasons, including reliable provenance, rights management and security, but a lot of the extra bits are there just to help us find and retrieve things. A great deal of attention is being paid to this problem right now, without dramatic progress, but things are steadily getting better.

Fifth, we can give up some fidelity in our information and replace the original with a "compressed" version—something we already do when we store images as JPEG files and video material as MPEGs. If the information type has the right "domain characteristics," we can use "loss-less" compression techniques (think ZIP files or the Apple loss-less codec for music) to reduce the stored information size. When we do this we trade storage volume for codec compute cycles, and compute cycles are a less scarce resource than stored bits. The problem with a loss-less codec is that, over all data instances, as many stored items get larger as get smaller, so our systems will have to be smart enough to optimize on the fly.

Apply all of these strategies rigorously, and we can eliminate quite a lot of duplicated content—maybe as much as 40 percent, if my cursory analysis of organizations for which I have good data is a guide. Reduce duplication too far, however, and you eventually run a risk of information loss when critical elements, or their links, are damaged by technology failures, or just by entropy. You might never actually lose a bit, but if you can't find it when you need it, it might as well have been destroyed.

For both enterprises and people, this is an area of technology strategy and practice that's going to require a lot more medium- to long-term planning and attention, and eventually much better automation. We are going to have to develop and adhere to better policies about information lifecycle management—and even then we will only be deferring the problem. The closer we get to a digital real-time record, be it the real-time enterprise, comprehensive security surveillance or the aggregation of public Webcams, the tougher the storage demands will become, and the sooner we will run out of space. In the long run, there are only two options—store less, or find a way to get beyond the one-atom-per-bit ratio.

As challenging as it is, the second option may be the easier of the two. Reality is connected together in ways that may let us store information about real time "holographically"—sort of a combination 3D Zip file with a time dimension folded into it. And we may be able to go inside atoms and use subatomic structures as the fundamental unit of storage. I hope so, because I don't see us giving up storing everything we can any time soon—overloaded or not.

JOHN PARKINSON *has been a business and technology consultant for over 20 years, advising many of the world's leading companies on the issues associated with the effective use of business automation. His next column will appear in October. Please send comments on this column to* **editors@cioinsight-ziffdavis.com.**

SYNCHRONICITY **MARIANNE BROADBENT**

Learning from Experience

Are you using your international experiences, and your people, to help rework your business processes? You should be.

OKAY, SO YOU'RE AN EXECUTIVE AT A LARGE CORporation with operations around the world. How "developed" are you, really? To what extent are you learning from the integration of technology in everyday experiences around the globe? Have you looked recently at how your colleagues in other parts of the world are applying technologies effectively? And have you attempted to integrate those approaches into how you do business at home? Why does it seem so hard for many U.S. companies to really "see" and integrate those experiences.

I travel more than most people, which I see as a wonderful privilege. And I continue to be amazed by how few companies take advantage of the experience and expertise of their people around the world as input into their technology strategies. I don't mean "IT strategy" in a narrow sense, but rather how these companies innovate and improve their customer offerings by drawing on the rich experiences of employees in the countries in which they operate.

I sometimes find myself suggesting to the executives of companies for which I consult that they should look at what their Italian or Brazilian or Canadian staff is doing, because it might really help boost their competitiveness, their productivity, or their responsiveness to customers. The various opportunities and different ways of deploying technologies are often occurring right before our eyes. Too often, however, we can't see the trees for the forest.

At the risk of annoying a significant number of readers, I would like to share some experiences from outside the U.S. that involve the integration of technology into everyday life. The technologies underlying these examples are usually relatively stable and applied to standard processes—or what my Gartner colleague Mark McDonald refers to as "persistent business needs."

Let's start with Australia, my home country. When I call a cab from my house, the dispatcher knows where I am calling from, provided that I have called from there at least once before. The booking is completed through a simple voice-recognition process. I answer a series of questions—"How many passengers?" "Are you ready now?"—and the cab is dispatched. The cab driver has received no verbal instructions; instead, global positioning systems are used to dispatch the nearest cab.

> I continue to be amazed by how few companies take advantage of the experience and expertise of their people around the world as input into their technology strategies.

It is always a jolt when taking a cab in the U.S. to remember that you usually need cash. Even on some parts of the West Coast, where you can pay by credit card, the drivers still use old-fashioned paper forms. All cabs in Australia take credit cards, and this is done using a point-of-sale machine like those used in supermarkets. It's been this way for at least seven years.

Bank payment systems are another fascinating area. A few months ago, a business colleague received payments from two U.S. clients in the form of a paper check. This meant someone had to actually visit a bank to cash it. How very tedious. He had to explain to his U.S. clients how to do direct transfers to the bank account—instructions which were printed on the invoice but which had been ignored. In fact, the whole use of checks in the U.S. continues to baffle me. Few

ILLUSTRATION BY JOHN KASCHT

other developed countries generate the amount of paper in payments as the U.S. does.

And let's not leave out mobile phones. Advertisements in the U.S. for mobile phones offering one phone number in a variety of countries are a real source of amusement for visitors from most parts of Europe and Asia. I, for one, could not have done my job over the past eight years if I hadn't had a single worldwide number.

When entering Australia, I use "Smart Gates." As a frequent traveler, I had the option of having my facial image scanned and stored for easy recognition. Now I just go to the Smart Gate machine, put my machine-readable passport number on the screen and look straight ahead. When the machine recognizes me, the gates open and I walk through. No questions, no explanations, no small talk, no queuing. I also used to have an INSPASS for entry to the U.S., which involved giving the U.S. immigration service my fingerprints. That option, however, was only sporadically available after Sept. 11, and then it was eliminated altogether. Reports in the past several weeks indicate that U.S. and Australian authorities are now working on whether they can read the microchips in each other's electronic passports.

It is about efficiently fishing for knowledge in a global pool, harnessing that knowledge for innovation, and then harvesting its value for its stakeholders.

When I drive on the CityLink toll road from the airport into Melbourne, where I live, my CityLink Access pass debits my account, which is linked to my credit card. But I keep driving at 65 mph. I don't slow down at all. To do so would cause a major accident, as there are no toll booths, just cameras overhead to catch my number plate if the debit isn't recorded. The result is a much smoother flow of traffic. Companies that run toll roads in different parts of Australia now recognize each other's systems, and the same technology is being deployed elsewhere in the world.

Well-known, standard technologies being applied to mainstream business processes. How many similar examples have you encountered from amongst your executives around the world? How has it changed what you do? Have you tried to integrate such experiences into how your organization uses technology?

One company that does this consistently is Citigroup, which is headquartered in the U.S. What's important is that Citigroup's growth was not predicated on a large domestic base. It was always an internationally focused financial services firm. In the 1990s, Citibank used its expertise in Singapore as a base for the consolidation of data centers. More recently, in the development of an Asian credit card, Citibank did not take the approach of either transplanting U.S. experience or developing the card solely from their Asian experiences. Rather, they looked more widely, taking what they had learned from around the world and using it as input to shape the Asian product.

Yves Doz, a professor at INSEAD, the international business school based outside Paris, refers to "metanationals." To the metanational company, globalization is not about taking home-country know-how to other national markets around the globe. It is about efficiently fishing for knowledge in a global pool, harnessing that knowledge for innovation, and then harvesting its value for its stakeholders. Often, executives at these metanational companies have lived and worked in different parts of the world, and they are invariably curious as to why developments in one place are not being applied elsewhere.

Yes, sometimes cultural and political considerations need to be taken into account. In countries where there is an expectation of face-to-face contact to complete a customer process, for example, innovation can be slower. And it is harder for countries to be metanationals when they have a large domestic customer base, as is often the case with U.S. companies. You are more likely to see metanationals emerge from midsize and smaller countries in Europe and Asia, where growth from their domestic base alone may be insufficient.

The next time you travel, focus on what your colleagues in other locations are doing differently. Is it a better way to get work done? A better way to serve customers? How are they doing it? How can you integrate their experiences into your technology strategy and execution? What benefits are you really delivering thanks to the international spread of your business and the range of capabilities of your people and technologies?

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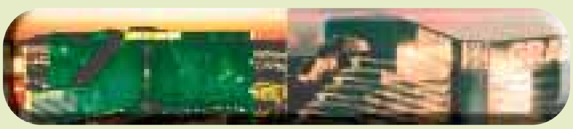

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EXPERT VOICES | THOMAS DAVENPORT

THINK SMART, WORK SMARTER

Knowledge workers could perform much better if we only knew how to manage them, says Thomas Davenport. His suggestion: Don't treat them the all same, and measure them tactfully.

THEY DON'T LIKE TO BE TOLD WHAT TO DO. They enjoy more autonomy than other workers. Much of their work is invisible and hard to measure, because it goes on inside their heads or outside the office. They are a growing part of the U.S. workforce, and their skills are hard to replace.

They're knowledge workers, and they are performing well below their potential because companies still don't know how to manage them, says Thomas Davenport, professor of information technology and management at Babson College, in Wellesley, Mass., and director of research for Babson's executive education program. "Knowledge workers are going to be the primary force determining which economies are successful and which aren't," he says. "They are the key source of growth in most organizations. New products and services, new approaches to marketing, new business models—all these come from knowledge workers. So if you want your economy to grow, your knowledge workers had better be doing a good job."

Yet after studying more than 100 companies and 600 individual knowledge workers, Davenport has come to the conclusion that the old dictum of hiring smart people and leaving them alone isn't the best way to get the most out of knowledge workers. As he writes in his latest book, *Thinking for a Living: How to Get Better Performance and Results from Knowledge Workers* (Harvard Business School Press, July 2005), although knowledge workers "can't be managed in the traditional sense of the word, you can intervene, but you can't do it in a heavy-handed, hierarchical way."

Executive Editor Allan Alter has followed Davenport's career from his days as a pioneering thinker on business process reengineering and knowledge management. He met with Davenport in his office at Babson College's School of Executive Education in order to learn how managers, and CIOs in particular, can improve the performance of this critical segment of the workforce. An edited version of their discussion follows.

PHOTOGRAPHY BY JASON GROW

CIO INSIGHT: How do you define knowledge workers?

DAVENPORT: People whose primary job is to do something with knowledge: to create it, distribute it, apply it. Most of the time they also have a high degree of education or expertise. They include anywhere from a quarter to a third of the workforce, but not everyone who uses knowledge. If you are digging ditches, you may have some knowledge on the job, but it's not the primary purpose of what you do.

If we don't measure knowledge work, why do you think there's room to improve knowledge worker productivity and performance?

It's a pretty well-informed hunch. People improve processes all the time; they just haven't done it with knowledge-work processes as much. It's an extrapolation of the same logic in other work, that processes can be improved. Here is one number that indicates performance and productivity can be improved: IDC found that 1,000 knowledge workers can lose as much as $6 million a year just searching for nonexistent data, or repeating work that has already been done. Is it possible every knowledge worker is working to his or her potential? It's possible, but unlikely. We can get a lot better at improving their performance.

"What most organizations do is hire smart people and leave them alone. But once they're hired we don't do a lot to improve their performance."

Are companies doing a good job of managing and improving the performance of knowledge workers?

They're not. What most organizations do is HSPALTA: Hire smart people and leave them alone. We've spent a lot of effort recruiting knowledge workers and assessing how capable they might be before we hire them. But once they're hired we don't do a lot to improve their performance. Process improvement has mostly been for other workers: transactional workers, manufacturing workers, people in call centers. All the serious approaches to improving work have largely escaped knowledge work. We let knowledge workers get away with saying there's no process to their work, that every day is different. We don't measure much of anything about knowledge work.

Why aren't more companies getting better performance from knowledge workers?

One of the problems is we treat all knowledge workers alike. Obviously it's more convenient and efficient to impose the same solution on everybody. Certainly in IT, broadly speaking, we try to. It's troublesome if everyone wants different software and computing environments, so we create common environments. But people work in different ways.

And politically, we don't want to admit that some knowledge workers are better than others, and that some might deserve different office environments and technologies. We don't mind treating the C-suite differently—why not our most productive knowledge workers? These are the people determining the future of your company.

Companies have spent billions on IT to help knowledge workers. Why aren't our knowledge workers getting more from all these investments?

Most people feel more productive, and in part they are. But we spend a huge amount of time futzing around with stuff. Most organizations have no training or education on how to use these tools effectively in their work. Call somebody in a big organization and say, "Transfer me to your colleague Bruce down in accounting," and 90 percent of people will say, "Gee, I'm not really sure I remember how to transfer. Here's Bruce's number just in case." We've had call transfer capabilities for 40 years in organizations. Why can we still not use them? The same thing is true of all these other devices—laptops, desktops, PDAs, cell phones.

Even when people are trained on knowledge-oriented applications, such as Excel, PowerPoint, CAD or CRM, the training focuses on how the


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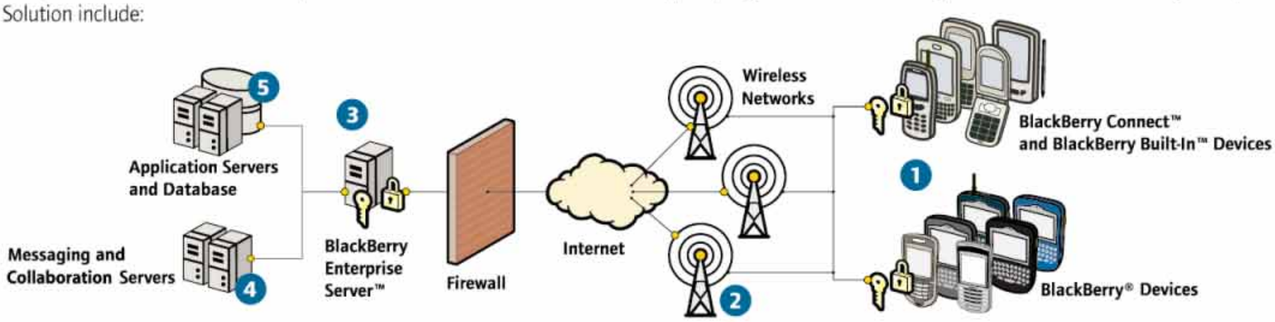

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–Ipsos-Reid, Analyzing the Return on Investment of a BlackBerry Deployment, 2004

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–Randal Wilson, Assistant Vice President of IT, Essex Investments

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–Greg Martin, Technology Manager, Royal Caribbean International and Celebrity Cruises

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software package works, not on how it fits into the context of the job. The vast majority of organizations that implemented CRM didn't really help their salespeople figure out how to use the system effectively to help them sell better. It's one of the reasons CRM has had the problems it has had. People were not comfortable using it with the customer around. And there weren't any good examples of how salespeople did their work, so a lot of CRM systems were not effective at all.

"We have to target a specific job. And the best way is to use technology to bake the knowledge into the job."

Why hasn't knowledge management helped more in the effort to improve knowledge-worker performance and productivity?

Knowledge management was an early attempt to intervene in knowledge work. For the most part, it wasn't particularly successful, because we didn't look closely at how knowledge workers did their work. We tried to be too broad in our focus.

Most organizations simply created one big repository for all knowledge and all workers. The only way we can get people to use knowledge on the job is to understand how they do their jobs, and then figure out some way to inject knowledge into the course of their day-to-day work, not make it a separate thing you have to consult when you need knowledge.

We have to be much more targeted in approaching knowledge management. We have to target a specific job. And the best way is to use technology to bake the knowledge into the job.

One example I'm fond of—I wish I could find a lot more—is Partners HealthCare System, an organization of Harvard teaching hospitals in the Boston area. As with a lot of jobs, there's just too much knowledge for a Partners physician to master. About 260,000 articles are added to the biomedical literature every year. So every time a doctor orders a test, a drug or a referral, the order-entry system checks it out and asks if it's consistent with best medical practice. The system might come back and say, "Sorry doc, but that's the wrong drug for this setting, according to the Partners drug therapy committee."

It takes a key work activity and injects knowledge into the process without the doctor having to go look things up. This works extremely well. It's reduced adverse drug events, as they call drug mistakes, by 55 percent. It's also resulted in fewer medical errors, fewer malpractice suits, and much faster response in terms of introducing new knowledge to doctors.

How do you get physicians to prescribe a new drug? You put it into the system, and it says that the Lipitor you had to take twice a day is now available in a once-a-day version. Doctors might not know about it if they had to master that knowledge individually.

How do we improve knowledge worker performance?

There ought to be a lot more experiments. We have experiments now, but we don't measure anything, so we don't learn anything. If we say we're going to put people in cubicles to improve communication, then we ought to at least measure some subjective aspects of communication before and after. We ought to see if cubicles work well with a small group before we put a whole company into them.

What is the most radical change that's needed in the management of knowledge workers?

We need to start focusing much more on job-specific knowledge and information environments, at least from an IT perspective. That's why I'm so fond of the Partners Healthcare example. Another example is Capital One, where they're creating an information and knowledge environment for people who design credit card offers. Their credit card analysts, who do 30,000 experiments a year on what works in getting responses to credit card solicitations, figure out what rate they should offer for a particular customer segment, and decide what the attributes of the product are going to be, who's most likely to pay off their bills, and so forth. They won't share much, but the idea is that when they design a new offering, the system tells them that blue envelopes don't work for this audience, or the optimum interest rate for balance transfers for that audience is 1 percent over prime. It allows the analysts to learn from the vast amount of experimentation that Capital One has done.

Capital One applies some of the same experimental approaches to technology. Do their knowledge systems really work? Does it improve productivity? Does it improve communication? All the things that people talk about but never really measure.

Designing these knowledge environments for knowledge workers is expensive and hard to do. But if we're serious about making knowledge workers more productive, we're going to have to focus on particular jobs and sometimes even particular individuals.

There are a whole range of possibilities for differentiating knowledge workers so that we don't treat them all the same. I don't think you should use any one segmentation approach, but the one I like best is a 2-by-2 matrix that's based on how much collaboration is involved in the job, and how much expertise is involved in the job. Intel has five or six categories that differentiate knowledge workers on the basis of mobility and how aggressively they adopt technology. There are "cube captains" who don't move around much, and "nomads" who move around a lot and need portable technology. Some involve factory workers and others who don't have a lot of personal technology available.

This sounds as if it's the company's job to tell knowledge workers what works. Don't knowledge workers prefer to learn from one another?
Maybe. I think a good learning program for knowledge workers would combine classroom learning and learning at their workstations. What we all want is just-in-time learning, where when we have a problem we'll click on a learning program and it'll tell us how to address that problem. But it's hard to do and we're a long way from it.

Knowledge workers have a lot of power, and you don't want to impose things on them they don't want to do, because they don't like to be told what to do. They may put up with it for a while, but eventually they'll look for a job that gives them the autonomy they think they deserve. Besides, managers can't easily enforce an order when work takes place in people's heads. You have to make it easy for knowledge workers to do what you want them to do.

But some organizations are starting to mandate the use of productivity tools. Historically, pharmaceutical companies have asked scientists to use electronic lab notebooks, but never made it a requirement. Hence, they had no way to ensure that lab results were collected in a similar way across the organization. Infinity Pharmaceuticals, a company in Cambridge, Mass., has made using an electronic lab notebook a condition of employment.

You'd stand out if you didn't answer your electronic mail or voice mail messages today—it's semi-mandatory. We might as well make it a little more mandatory and help people use the stuff more effectively.

You've been using words like measure, process, mandating.
With a light touch.

Mandating with a light touch sounds like something of a contradiction in terms.
We have a choice here. We can get more productive with our knowledge work or we can lose our jobs. There are other parts of the world where people are very serious about being more productive, and are doing it for a lot less money than we charge. Twice as many Indian software providers are certified at level 5 on the Capability Maturity Model as U.S. companies. People should realize that unless they do knowledge work better, they're not going to be doing it at all.

I have yet to meet a knowledge worker who isn't interested in making him or herself better. Knowledge workers take pride in what they do, and they want to be productive. And no one likes drudgery. Most of the interventions involve getting rid of work no one likes to do anyway. Ask people, "What do you think can be done to the job?" When you redesign knowledge work processes, it's got to be much more participative than it was in these top-down reengineering efforts. People have to see what the benefit is to them.

> "People should realize that unless they do knowledge work better, they're not going to be doing it at all."

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Latina
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&GARDEN
S

The marketer's dream of one-to-one Web personalization has morphed into the more practical reality of "generic personalization." But the rewards are better.

By Edward Cone

THE PERSONA NEXT DOOR

ANDREW PETERSON KNOWS PRETTY MUCH EVERYTHING THERE IS TO KNOW ABOUT a select group of customers at Sovereign Bank. "We have their age, location and education level," he says. "We know their personality types." In fact, Peterson, vice president for the Internet and emerging technology at Sovereign, a Philadelphia-based financial services company with $59 billion in assets, even has access to photos and psychographic profiles on each one of the customers.

Peterson knows, for instance, about the stresses on Anna C., a single mom with too much to do and not enough time to do it in. He's up on the latest news from Robert and Holly, a young married couple who are working hard to build a stable financial future. And he keeps tabs on Yin, a fun-loving student at Brown University, and on Richard and Debra, who have kids in college and are looking for ways to maintain their affluent lifestyle into retirement. "We know their relationships with Sovereign and with the Internet, what they want from the site and how we can help them reach their goals," says Peterson. "And we use that knowledge to tailor the functionality and content of our site."

ILLUSTRATION BY ROBERT MEGANCK

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[5]General product availability of IBM TotalStorage DS4300 Express is expected to be 6/17/05. [6]EXP710 expansion unit is not included in the price. MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers for storage capacity are given in native mode followed by capacity using data compression technology. IBM, eServer, POWER5, OpenPower, IBM Express Servers and Storage, DB2, POWER and IBM TotalStorage are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries. Linux is a registered trademark of Linus Torvalds in the United States and other countries. Linear Tape-Open, LTO, and Ultrium are trademarks of Certance, HP and IBM in the U.S. and other countries. Other company, product, and service names may be trademarks or service marks of others.

Sovereign, it seems, has realized the long-promised goal of personalized marketing, establishing one-to-one relationships with its customers over the Web. Except it's all unreal. None of these customers exist. They are characters, called personas (the marketing trade's term of art for such imaginary people), created by Sovereign and marketing firm Agency.com Ltd., in order to make the bank's Web sites more accessible and productive for actual people—and more profitable for the company.

Each persona is a stand-in for some segment of Sovereign's customer base, a composite drawn from hours of research and carefully crafted to create what Peterson calls "an empathetic view of the customer." Products likely to appeal to an established family like Richard and Debra's, for example, are pitched and positioned differently than the starter accounts that are more suitable for Yin, the college student. "Decisions on imagery, fonts, language and navigation are geared to those particular individuals," says Peterson.

These personas are key tools in a sophisticated kind of market segmentation that makes use of the Web's depth and breadth to refine the customer experience. But the approach is a far cry from the kind of personalization touted just a few years ago by software vendors and consultants—and pursued by companies to the tune of hundreds of millions of dollars. The next big thing in personalization is less, well, personal than yesterday's overhyped one-to-one methods. But this time it seems to work.

HOW IT WAS MEANT TO BE

In the beginning, there was Amazon.com Inc., and it was really good at crunching customer data to sell more products. "They have been at it for a long time, accumulating a lot of data," says Harley Manning, an analyst at Forrester Research Inc. "They don't talk about what they do, because that's their competitive advantage." But personalization's second act has been a

Imaginary Journey

If you really want to get to know people, travel with them. That's true for imaginary people, too, says Adam Lavelle, vice president of corporate strategy at Agency.com Ltd., where the stories devised for personas that the firm creates are growing ever more complex and dynamic. "We are mapping out the journey the customer takes," says Lavelle. To figure out how personas might act in a given situation during a visit to a Web site, designers break their journeys down into specific steps, doing primary research, such as observing actual customers with video as they go to the bank, in an effort to draw their characters more accurately.

The sites are supposed to have some sense of how best to interact with different types of real customers. When, for instance, should the site offer a live chat with a mortgage specialist—and when should the site shut up? "The idea is to test, learn and apply, so that the persona has the right experiences—the ones that are like a real person's," says Lavelle.

Personas are evolving to better model human behavior. A couple of years ago, the backstory on a persona might have included a rudimentary biography and general personality traits. Now many persona files are more like a movie treatment, with sophisticated scenario servers from vendors such as ATG Inc. used to drive the action. Lavelle says the persona profiles are "living documents" that change and grow with experience. "They have to be realistic and empathetic, so that senior executives think they are like the real people who are going to use the sites," he explains.

But as their stories get more complicated, personas will reach a limit of individuation beyond which the return on investment may dwindle. When shopping online, human behavior is not a unique fingerprint, and the cost-effective way to market for the foreseeable future is to predict and drive the actions of relatively large groups of people. "We want to avoid too many personas, trying to be all things to all people," Lavelle says, adding that, however lifelike personas may become in the future, the concept remains a stretch for many marketers today, who, he says, are "more comfortable with demographics than behavior." —*E.C.*

long time coming. "Ten years later, every conversation about personalization still comes back to Amazon," says Rob Cosinuke, president of Digitas Boston, an office of the national marketing firm Digitas LLC. "What does that tell you about the state of the market?"

Amazon, with its huge investment in technology and an enormous customer database to mine, turns out to be a model that few companies can successfully emulate. "That kind of personalization is the highest fruit on the tree," says Matthew Berk, a former research director at Jupiter Research whose 2003 report, "Beyond the Personalization Myth: Cost Effective Alternatives to Influence Intent," helped quell the personalization hype.

Hype had been in plentiful supply. "There was a giddy, Internet bubble interest in personalization," says Manning. For a while it was a feature everyone had to have." But that vision of personalized marketing, first popularized in the 1993 book, *The One to One Future: Building Relationships One Customer at a Time,* by Don Peppers and Martha Rogers—and pushed by software companies such as BroadVision Inc., Epiphany Inc. and Blue Martini Software Inc.—was not for everyone. "It was a beautiful conceptual framework, but you can't go to the run-of-the-mill business and make it work," says Berk. "When this started, even companies that were able to do personalization to some degree didn't know how to measure their results. Nobody really knew what was going on. We didn't understand online behavior."

Berk, who went on to found Open List Inc., which tracks customer preferences by doing targeted searches for the restaurant and hospitality industry, remains skeptical of one-to-one personalization for most companies. "Unless you are Amazon, it's a silly thing to fantasize about," he says. "It is incredibly valuable, but only at scale. For 90 percent of all other folks doing business on the Web, it is a fantasy." There are better ways to spend your money, he says. "When

Persona-fication

Name **ERNEST**

Demographics

AGE 45
ETHNICITY White
FAMILY STATUS Married with kids
OCCUPATION Call center manager
INCOME $60,000
GEOGRAPHY Dallas, Tex.
EDUCATION High school
DEBT $2,950 credit card debt

Psychographics

FINANCIAL STAGE College planning
MONEY PERSONALITY Achiever

Account Specifics

TIME IN PLAN 10 years
ACCOUNT BALANCE $50,000
LEVEL OF CONTRIBUTION 8%
RISK TOLERANCE Growth
NEED TO REBALANCE Yes
PROGRESS TO GOAL Not on track

Motivation

Wants benefits of tax-deferred savings.
Wants to feel like he's involved in making financial decisions.

Barriers

Does not feel confident he understands his investment choices.
Conservative investor; he could take more risk.

Values

Hard work. Loyalty. Family.

Personality

Responsible. Committed. Cautious. Family-oriented. Down-to-earth. Tends to be more introverted.

Pet Peeves

Doesn't like overly talkative people, especially when it takes them a long time to get to the point.
Annoyed when he's not given all the facts.
Hates it when pressured to make rush decisions on the spot.

Hobbies

Fishing, coaching soccer, barbecuing.

Favorite movie star

Humphrey Bogart

Favorite show

The Sopranos

Favorite Indulgence

Cigars

Personal Background

Ernest and his wife, Cathy, have two kids: Alison, their 9-year-old daughter, and Michael, their 6-year-old son. Family is the most important thing to Ernest.

At the same time, he feels like his siblings resent him for the middle-class life he's achieved. He grew up in a low-income family, and so concepts of planning for retirement and long-term savings were seen as a luxury, not a given.

Ernest has always been motivated by people who have earned their way in life. He doesn't seek advice from others very often—he prides himself on being able to rely on his own judgment—but he watches closely how others go about making decisions, and the subsequent results of those decisions.

Financial Situation

Ernest is determined to learn more about investing, but he finds it requires a lot of work. He wishes there were a simple way to learn about investment concepts, and to use what he's learned to manage his own money.

SOURCE: JOHN HANCOCK RETIREMENT PLAN SERVICES; AVENUE A RAZORFISH you line up all of the possible investments to make in order to help a business do better on the Web, personalization is last on the list. You don't need the complicated things."

The result: Setting out to really know your individual customers, and then guiding them to buy more stuff by building their personal preferences into the online shopping experience, has gone out of style. Says Manning, "We still ain't there."

"I don't need to know everything about you, and I don't need a huge investment to tell me a lot of the things I do want to know."

—**Rhiannon Rail,** director of participant marketing, John Hancock Retirement Plan Services

Recently, Forrester has been seeing an upsurge in client interest in some less ambitious but more productive methods of personalization. Says Rhiannon Rail, director of participant marketing for John Hancock Retirement Plan Services, which used personas to redesign its retirement benefit Web site: "Initially, we looked at Amazon and said, 'Hey, that's where we want to get to.' But when we realized the volume of data needed, we decided that we didn't want to get into that kind of data-management business. You can get there if you get the data, but the cost can be prohibitive."

UNREAL CUSTOMERS

Personas—nobody seems to use the Latin plural, personae—are one way of creating what Rail oxymoronically describes as "generic personalization." John Hancock, which last year merged with Canadian financial services firm Manulife Financial Corp., built its retirement planning Web site around three personas. "What we are doing is marketing to personalities," she says. "When you talk about 401Ks and retirement, that is an emotional subject. A site needs to be somewhat personalized to be relevant and get customers engaged."

To prepare its personas, John Hancock worked with specialized researchers, including a demographer and the marketing firm Razorfish (now Avenue A Razorfish). The researchers talked to actual customers about what retirement planning meant to them. They found that people in differing financial situations often approach the planning process in different ways, but tailoring the Web experience to a user's wealth was not the way to go. Instead, the site is designed to meet the emotional needs of three different personality types, personified by characters named Rozi, David and Ernest. "Rozi is looking for guidance, but she wants to arrive at her own conclusions," Rail says. David, on the other hand, wants the answers spoon-fed to him, and Ernest (who enjoys cigars, watches *The Sopranos,* and thinks his siblings resent his financial success) likes to dig for his own information. "We developed the site with three levels of interaction to meet the learning styles and comfort levels of individuals," says Rail.

All customers see the same basic content when they come to the John Hancock site, but their experiences may diverge as they click for more details. In effect, users personalize their own sessions. This kind of transaction-based personalization, in which the conduct of a customer during a particular interaction with the company influences the remainder of that session, is another key element of current personalization strategy. Readers of the *Wall Street Journal*'s online edition, for example, might be shown particular ads based on the sites from which they clicked to the newspaper. A mortgage company ad, for instance, might appear for viewers who have linked from a real estate or lending site.

"People are using personalization to make each session better, based not on what you bought last month but what you are looking at now," says Rich LaFauci, a senior vice president at Digitas New York. This technique doesn't require sophisticated tools such as collaborative filtering to mine clues about customer interests from the context of a session, and then guide customer behavior and experience accordingly. "Session context personalization has a good effort-to-benefit ratio," says LaFauci. "It requires no effort from the consumer, and a much smaller investment in technology than a big database."

At Sovereign, the focus is on increasing the amount of self-service by each customer during a visit to the site. That might mean transferring money, changing an address, or switching from one account type to another. Like personas, self-service helps the bank anticipate customer needs, says Marianne Doran-Collins, senior vice president and director of online and affinity banking at Sovereign. Data gleaned from these transactions gives the company more information about real-life customer behavior. "It lets us build out our view of what they are likely to do online," she says.

Sounds neat, right? So did the first round of personalization. Does any of this stuff actually work? Rail says there is evidence that suggests the John Hancock site has become more effective since its personafied redesign was launched in 2003. John Hancock customers use the site much more frequently than the industry average, according to survey data provided by the company, and 84 percent of those who come to the site try out John Hancock's Internet planning tools (versus an industry average of 49 percent). Repeat visits to the

At last, someone who really understands me

Personalization at most Web sites today is the equivalent of knowing someone well enough to wave to them on the street, says Jeff Flemings, senior vice president for account planning at online marketing firm Digitas. Future sites will know customers much better, he says—and may even begin to understand them.


Jeff Flemings

CIO Insight: What does the user experience look like in five years when a customer goes to a company Web site?

Flemings: The bar will be raised in terms of what personalization implies. The site itself will be more personal to the individual user. There will be more real-time personalization, so that the site changes in reaction to the things a customer is doing. Maybe the site will even be able to learn in real time. And sites will be organized more around the user, and less around what the company wants to push.

What about Amazon-style recommendations, based on customer history?

That's the other important track, and I hope that it will be the norm. It will require a lot of investment in technology, and mastering of complexity. We have to treat people as if we know them while the technology catches up, and that means we will continue to rely on replicas of personalization. Suggestions for where the online customer might go next on a site will be very important. There is a paradox of choice, where online customers are overwhelmed and you have to help each one through the offerings. Marketing will become more of a service, and marketers will have to formulate insights instead of just repeating what they know about you.

How will that happen at sites that don't get high volumes of repeat traffic?

One way is to enlist customers in a personal relationship with the brand. People don't buy a new truck every week, but GMC is already trying to bring them to its site much more frequently than the usual purchase cycle. The company is publishing content that isn't really truck related, but that appeals to GMC buyers who are interested in things like home improvement. The idea is to create an emotional relationship.

Don't investments in personalization chase diminishing returns when marketers have limited information on their customers?

That's one reason to pursue deeper relationships. There will be more options for customizing a purchase, but that has to be balanced against the need for navigation through choices. People expect unique options, but most of them end up behaving in predictable ways. If five configurations account for 80 percent of sales, you design that into the site. *—E.C.*

site more than doubled after the redesign.

All the while, John Hancock is accumulating information on actual customers who visit the site. Marketing to individual customers remains an aspiration for many companies, and incremental strategies, such as personas and self-tailored sessions, are also ways of moving toward that goal. "Most of the time, especially in the first meeting online, or through a toll-free number, you don't have the data you need to make it personally relevant," Rail says. "We tell our customers that the more we know, the more we can improve their experience. People are more willing to cooperate when you set expectations up front."

Says Digitas's Cosinuke: "Before you can create an individual experience for each customer, you need to make it worthwhile for the customers to share their information with you. Most companies are not doing that."

True personalization is still far off for most companies—and not everyone thinks it is even worth pursuing.

WHY GET PERSONAL?

One problem with personalization is that it is extremely complex to do well. Even basic technologies such as databases have to be scaled to enormous proportions, and the actual crunching of data to yield useful results gets complicated in a hurry. "It is trivially easy on the tech side to let people do things that are absolutely fatal," says Manning. "Creating lots of rules for dynamic content delivery and management is a nightmare. Four rules are more than twice as complicated to manage as two rules, and we saw projects with hundreds of rules. You have to set up some pretty complex sets of algorithms to manage that, some serious programming intelligence, and that is well beyond what was built into personalization systems."

Many customers aren't interested in playing along. "With one-to-one personalization, it is very difficult to service customers, and very easy to aggravate them," says Sovereign's Doran-Collins. A lot of people resent and resist corporate efforts to learn more about them. It's a common problem for Web marketers. "We do large-scale surveys of Internet users, and they say time and again that they lie online," says Manning. "Reason No. 1: They don't want to be marketed to. That's why databases are full of users named Donald Duck and Mr. Fantastic and Mickey Mouse."

Privacy and trust issues are limiting factors on personalization with John Hancock customers, too, says Rail. "I don't need to know everything about you, and I don't need a huge investment to tell me a lot of the things I do want to know," she adds. Companies that interact repeatedly with customers over time can begin to personalize offerings for them in a mutually beneficial way, says LaFauci. "Supermarket couponing, where they print a coupon specific to you based on a set of transactions, is effective," he says. "But most companies are not in a position to have access to that kind of data to be effective, much less cost-effective."

Peppers, coauthor of the seminal book on personalization and a consultant on customer relationship management, says the death of one-to-one marketing should not be exaggerated. "There was artificiality and market hype, and then rationalization in the market," he says. "But we are on a course of no return in terms of increasing personalization. It's not for every product or business—yet look at the way banks personalize services for their most valuable customers. The question is, how to routinize some of that to make it standard for all customers."

But Manning is more skeptical. "The premise of personalization is that the system is smart enough to know what this person wants, to anticipate her needs and push things to her without action on her part. That's a fallacy. The system is not going to be that smart."

Please send questions and comments on this article to editors@cioinsight-ziffdavis.com.

RESOURCES

Web sites

www-marketing.wharton.upenn.edu
The Wharton School's online repository of marketing research, including current papers

www.MarketingProfs.com
Frequently updated Web site about marketing tools and strategy, founded by former Stanford professor Allen Weiss

John Polizzi
CIO, Blockbuster Inc.

PHOTOGRAPHY BY CHARLES FORD

MOVIE MOGULS

Blockbuster hits some bumps on the road to digital Hollywood.

By Janet Rae-Dupree

Though it may be hard to believe, there was a time when bright blue-and-yellow Blockbuster signs did not grace every strip mall and service road in the U.S. But like Starbucks and Wal-Mart, Blockbuster has become a fixture in towns big and small, seemingly overnight. In the 20 years since its founding in 1985, Blockbuster Inc. has opened 9,100 stores in 25 countries. During that time, it has rented millions of movies, and pushed the owners of countless mom-and-pop video stores into early retirement. Blockbuster has also become the conduit of choice for major Hollywood studios looking to move their hits into the home.

For the most part, when any new technology threatened the $6 billion Dallas-based juggernaut's business model, it coolly assimilated it and capitalized on the change. When the popularity of the DVD quickly overtook VHS, Blockbuster simply dumped most of its aging videocassettes and happily embraced the slimmer, cheaper, more durable optical discs. Thanks in large part to Blockbuster's switch, DVDs have mushroomed, from 22 percent of the home video entertainment market in 2000, to more than 90 percent today. Some experts predict Blockbuster will discard its entire tape inventory within the next two years.

But DVDs brought about some other, less welcome, changes for Blockbuster. The inexpensive nature of DVDs—the studios priced them around $20 at wholesale, as opposed to the $80 they were charging for VHS "rental-priced" cassettes—brought about a fundamental change in the dynamics of the movie rental business. Consumers were suddenly able to buy movies at a reasonable retail price soon after they had become available for rental. And about five years ago, that's exactly what they started doing. That struck at the heart of the $6.8 billion video rental market, of which Blockbuster holds a 40 percent share. Then, in 1998, a pesky dot-com by the name of Netflix Inc. appeared on the scene, proposing to mail DVDs to customers, thus saving them the expense of late fees, and the hassle of a trip to the local Blockbuster.

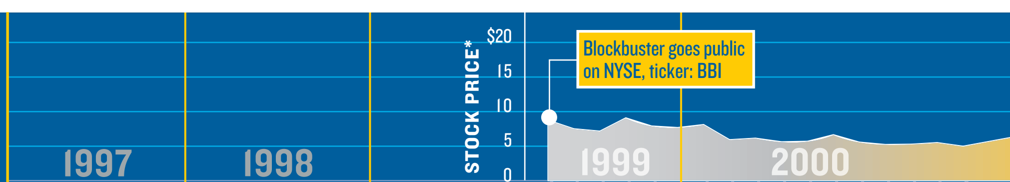
Blockbuster's financials began a roller-coaster ride and the stock price plummeted from a high of more than $18 in 2002, to less than $10 today. Last year, the company declared a $1.2 billion loss, thanks in part to a costly spin-off from former parent company, Viacom Inc. All of this drew the interest of the infamous corporate raider Carl Icahn, who snatched up shares on the cheap, ultimately acquiring 9 percent of the company, and earning himself a seat on the board this past May. He has been publicly butting heads with CEO John Antioco, insisting that Blockbuster should tread water and reap the profits from its dominant position in a mature, possibly dying, industry rather than investing in high-risk technologies such as online rentals.

But Antioco has remained steadfast in his belief that online rentals are the only growth segment in an otherwise shrinking industry. Kagan Research LLC says online rental revenues jumped from virtually nothing when Netflix started in 1998, to $522 million in 2004. The analyst firm expects the industry to grow to $931 million by the end of this year, and to $2.9 billion in 2009.

And so, by late 2003, Blockbuster executives were feverishly putting the final touches on some major competitive restructuring, most of which would roll out in 2004.

Rental Roller Coaster

Since the late 1990s Blockbuster has seen its share of growth. But recent uncertainty over the future of its rental business has investors running scared.



March 1997 DVDs first come to market.

1998 Reed Hastings creates Netflix after paying Blockbuster $40 in late fees on a single movie.

Late 1998 Blockbuster begins renting DVD movies.

Mid 1999 First digital video recorders (DVRs) introduced by TiVo and RePlay TV.

2000 DVDs represent 22% of the unit sales in the home video entertainment market.

Antioco earmarked tens of millions of dollars for several key initiatives to revitalize the core rental business and create new revenue: Online rentals, an in-store monthly subscription service called Movie Pass, a video game subscription service called Game Pass, a movie and games trading program, and the still controversial "No More Late Fees" effort.

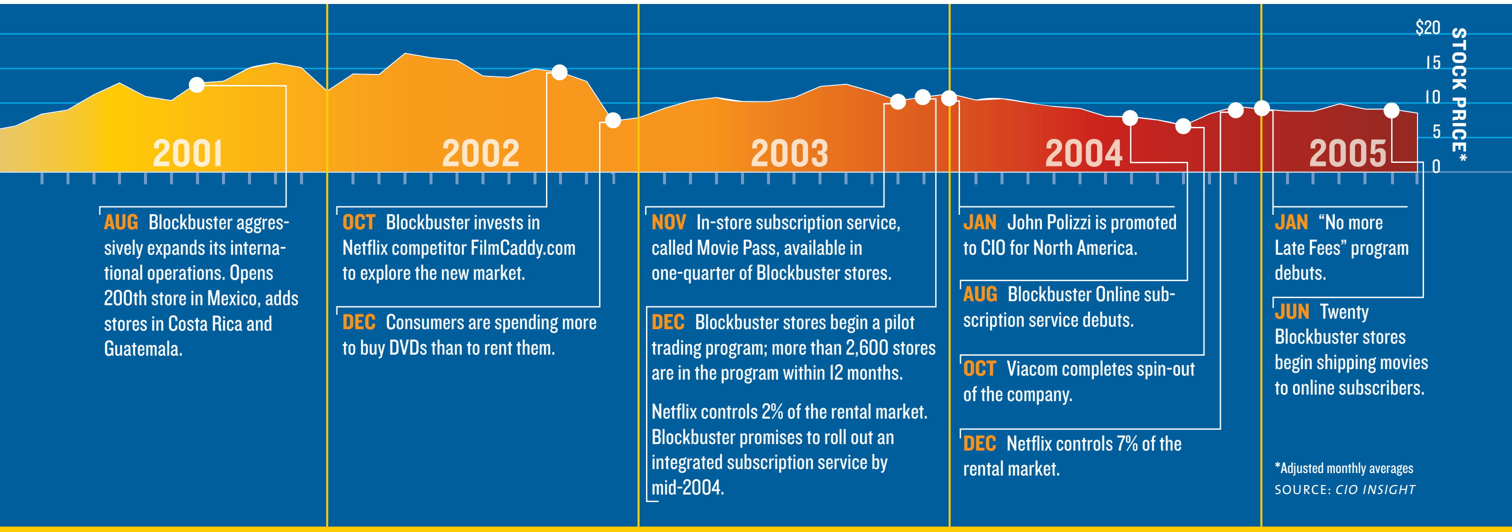
Some of the new programs mimicked those of Blockbuster's competitors, some were entirely new business models, and some were pure marketing shtick. But coming along for the ride on each and every one was CIO John Polizzi and Blockbuster's IT department. The metamorphosis Blockbuster underwent in 2004 touched every part of IT, and it is a process that continues today. "It was a monster year," recalls Polizzi, a 30-year veteran of the IT business. "It was the most complex set of initiatives that I've seen a company take on. There was no shortage of things to do."

The Netflix Effect

Blockbuster doesn't publicly break out the cost of individual IT efforts, although a $100 million jump in capital expenditures from 2003 to 2004—even factoring in the cost of 160 new stores—indicates the overall restructuring effort has been huge. Among the biggest expenses has been Blockbuster's head-to-head response to Netflix. After initially pooh-poohing the lack of immediacy and spontaneity in renting movies from an online subscription service, Blockbuster rapidly learned how to sing the online subscription hallelujah chorus. Netflix's market share jumped from 2 percent in 2003 to 7 percent in 2004. And the Internet upstart already has more than three million subscribers and expects to hit four million by the end of this year. Blockbuster had just under one million online rental subscribers at last count and hopes to be up to two million by early 2006.

Rather than trying to build an online mirror of its physical stores, Blockbuster instead established a separate online division in new offices situated about two blocks from its Dallas headquarters. That was a huge gamble, notes Frank Paci, executive vice president of finance and accounting, strategic planning and development. "The online business was a financial leap of faith, as opposed to the in-store initiatives, where we could try it out in a couple places and then change the system as needed," he says. "With online, we had to build the system before we had any customers for it. And you can't just try it out. The moment you're online, somebody in Alaska and somebody in Florida can use it."

That meant developing an entirely new business model inside Blockbuster's existing one, Polizzi notes, not just writing a new set of applications. At the outset, Blockbuster had




HOW CAN WE MAKE SURE INNOVATION DOESN'T HAPPEN ONLY IN R&D?
HOW DO WE CREATE NEW VALUE WITHOUT CREATING COMPLICATIONS?
HOW COULD WE TURN VOLATILITY INTO AN ASSET?
IBM

THINKING OUT LOUD | JOHN POLIZZI

Turning Technology From Threat to Promise

With half a dozen major IT projects going simultaneously in 2004, you would think that Blockbuster Inc. CIO John Polizzi could use a breather. Instead, the IT efforts last year may have energized a faltering company, making even some of the most pessimistic industry analysts take notice, and increasing the pace for 2005. Blockbuster, it seems, will not passively accept the judgment that it is at the head of a "mature," read that "fading away," industry.

CIO Insight: What made 2004 so pivotal for Blockbuster?

Polizzi: We had major consumer proposition changes. We also separated from our primary shareholder, Viacom. There was no shortage of things to do and accomplish last year, although in reality the separation from Viacom, from an IT perspective, was relatively straightforward. We were really the only retail store in the company. There wasn't a lot of integration of systems.

But any one of the other initiatives is extremely complicated. We were constantly peeling the onion. The more we got into things, the more we realized that there was complexity in everything we wanted to do.

You did much of the work using outside consultants such as Accenture and Infosys. Why?

We've had a good business relationship with Accenture. They've been able to quickly ramp up resources and skill sets that in a normal situation you wouldn't want to carry as overhead. The need to be able to extend your resource capability quickly with strong, skilled and competent people is critical.

How are you continuing the push in 2005?

About a month or so ago we integrated our first set of stores with our online business. You, as an online customer, won't even know it's going on. We are allowing our stores to fulfill orders from our online customers. And the advantage of that is twofold—one is for the customer in that by using stores we can get product to the customer faster. Second, it allows us to optimize our inventory.

But don't the strict limits that studios set on individual movies get in the way?

There are separate contracts for online and in-store. We have the studios' requirements factored into the integration. Operationally, we know each store's inventory so we can allocate online orders right to the appropriate store. We have 4,500 stores in the U.S. that we can use to augment our 30 distribution centers. We're using 20 stores to test the program right now and we have a ramp-up plan in place to grow it.

With a program of this size and complexity, we have to understand the operational complexity inside the store as well as managing the inventory and understanding the accounting. Once we get to 100 or so stores we'll decide how quickly we're going to grow it.

Do you plan to let online subscription customers pick up their online orders directly at a store to achieve same-day service?

Our CEO has been pretty open about our direction being toward a fully integrated business. Service and time to the customer is very critical. I don't think there's a limit to what we can do to leverage the capability and convenience of the stores. We are formulating what our next integration activities will be. We all work closely together. The days of doing things in the store without considering online, and vice versa, rapidly went away last year. —*J.D.*

roughly 100 IT people devoted to the effort, both from within the company and from outside IT consultancy Accenture. "Now we're building our own internal capability to support the business," says Polizzi. Blockbuster also has contracted with India-based Infosys for both onshore and offshore IT help.

Why bring in outside IT resources? "Typically, when you start something new like this, you don't know what you don't know," Paci says. "You anticipate that there will be things you didn't anticipate and you need the flexibility to deal with that."

Such rapid expansion requires easy access to top IT people, Polizzi adds. "The need to be able to extend your resource capability quickly with strong, skilled and competent people is critical," he says. "Infosys right now provides mostly onshore resources, but we're working with them with the idea that we'll eventually move some of it offshore."

A key part of taking down Netflix will be figuring how best to leverage the existing 4,500 stores in Blockbuster's domestic network. Rather than relying solely on its 30 distribution centers scattered around the country—Netflix has 35—Blockbuster has created pilot programs in which store clerks can use the slow retailing hours between 10 a.m. and 4 p.m. to prepare and ship out online orders. And online subscribers can use two coupons each month to get free 7-day and new-release rentals at any Blockbuster store.

"They have a chance to eat Netflix's lunch," says Michael Pachter, a senior research analyst at Wedbush Morgan Securities in Los Angeles. With each store operating as a distribution center, he notes, Blockbuster will be able to wield one or two orders of magnitude more inventory than Netflix. "WebVan was going to put grocery stores out of business and eToys was going to put toy stores out of business. But you like to touch the tomatoes and try the pants on. People want to browse through a physical store. That constituency isn't ever going away."

For those who like to browse the store every time they're in the market for a movie, Blockbuster created an entirely separate, in-store subscription service it calls Movie Pass, which allows renters to pay a monthly fee to keep a set number of movies from an individual store for as long as they want. While it would seem logical to let in-store subscription customers transact with Blockbuster Online, and vice versa, the complexities of revenue recognition and inventory management make that impossible. "If a member is paying, say, $25 per month to rent X number of movies, we need to allocate that monthly fee per movie in order to pay the studios," Paci explains. "That means we need to know which inventory it came from and who paid what for the rental."

Compounding the pain that the new online venture caused for IT was Blockbuster's massive, and nearly disastrous, "No More Late Fees" program, launched in January 2005. The drastic change to their business model gambled $250 to $300 million in annual late-fee revenue in hopes of attracting wayward customers back to the stores. It worked . . . sort of. The program has increased in-store rentals, though Blockbuster isn't saying by how much. But those customers who failed to read the fine print howled with outrage when they found the full retail price of a movie on their credit card invoices. As it turned out, "no more late fees" did not mean "no more due dates." Blockbuster records a rented movie as a sale if the customer keeps it more than seven days. If the movie is returned within 30 days, the price of the movie is credited back to the customer's account—less a $1.25 restocking fee. Keep the movie more than a month, and it's yours permanently.

Swamped with complaints, several state attorneys general filed false advertising claims against Blockbuster. All but one of those claims was dismissed after Blockbuster began a multimedia advertising campaign to clarify the program's details. But the false advertising claims weren't the

COMPANY PROFILE

Company
Blockbuster Inc.

Corporate Headquarters
Dallas

CIO
John Polizzi

Revenues
$6.1 billion
(trailing 12 months)

EBITDA
$1.42 billion (ttm)

Stock Price
$8.35 (July 22, 2005)

52 week high-low
$6.50–$13.95

No More Late Fees initiative's only missteps. The IT department had its share of trouble persuading the stores' on-site servers to recognize the new rules; daily inventory management and sales transactions are handled at each store by a roughly ten-year-old Digital Equipment Corp. Alpha server.

"When customer service representatives are standing in front of you at the registers, the business rules are all driven off that DEC server," Polizzi says. "We had to deploy the rules in such a way that if the U.K. isn't using No More Late Fees, which they aren't, they can continue to run their business with late fees. And when Canada decided to join No More Late Fees in February, we had to be ready to transition and support that business as well."

Behind the scenes, IT needed to keep an eye on how the myriad changes were affecting inventory, rental volume and sales. "We were out in the stores doing a soft launch of the No More Late Fees program, without advertising, on Dec. 27, which is memorable for me because it's my wife's birthday," Polizzi says. "It was a very interesting holiday season last year."

Adding to the complications of that holiday season was Blockbuster's new in-store DVD trading program, quietly rolled out in more than 2,600 stores last year and expected to be in 1,600 more by the end of this year. The idea is to let customers bring in used movies they no longer want and walk out with others. Sounds simple enough. Turns out, however, that many states require such a trading program to adhere to the same regulations required for pawnshops—an entity for which every state has slightly different laws. "You have to be a certain age to trade, you have to keep records of who is trading what, and how often, in case there's an attempt to traffic in stolen goods, and all of that is taking place at the same time you're developing an entirely new category of inventory," Polizzi says. "When you go through 50 states, and 25 countries and 9,100 stores globally, understanding all those variables, and making it effective for the people who have to account for the supply chain, is a key part of what we have do through IT."

"The online business was a financial leap of faith. . . . We had to build the system before we had any customers for it."

—Frank Paci, executive vice president of finance and strategic planning, Blockbuster Inc.

Rounding out Polizzi's year from hell was Blockbuster's push into an entirely new rental market: video games. As each new gaming console has come out, players increasingly have been loathe to plunk down $50 to $75 to buy a game that they have never tried before. With at least three new game consoles coming out in the next 18 months, Blockbuster sees a potentially, well, blockbuster revenue opportunity. By some measures, video game rentals and retail combined already represent nearly 20 percent of Blockbuster's business. But analysts already see plenty of potential pitfalls. "Some Blockbuster video game departments seem to do very well, while others don't at all. It's very mixed right now," says Dennis McAlpine, managing director of media and entertainment consultancy McAlpine Associates LLC, in Scarsdale, N.Y.

In their traditional video rental space, Blockbuster has two decades of data about what inventory needs to be located where in order to make the most money. Without the same kind of detailed data in the games space, and little experience determining which selection will be a hit and which a dud, "you can end up with a lot of bad inventory if you buy at the wrong time," McAlpine warns. IT is confident its systems can quickly collect the data needed to avoid that trap, and Blockbuster is confident that

Seamless Mobility, No Strings Attached

Picture this: A doctor gets a call as he's leaving the clinic. The call travels across the building's WiFi network to his PDA. As he exits the building, gets in his car and drives beyond the range of the WiFi system, the call switches without interruption to his cellular network. Ten miles later, he gets an instant message that the patient's MRI is ready and he'd better see it right away. He pulls over, uses his PDA to access the radiology department's server and views the multimegabyte MRI file. He connects to a secure database and calls up the patient's medical record. He hops onto the Web to check a journal article he read regarding the patient's illness, watches a video clip that explains a new treatment, then e-mails that material to the head nurse on duty. He IMs his wife to say he'll be home late.

That's a typical scenario in a world of seamless wireless mobility. Sound far-fetched? The elements are emerging. Dual-mode handsets that switch between GSM/General Packet Radio Service and WiFi networks on the fly, for example. And gateways that negotiate the handoff between wireless LANs and GSM networks have been demonstrated. But these solutions are limited to specific services, products or locations. IP-based technologies are enabling greater mobility, but they are still evolving and do not yet provide the consistently high data rates that sophisticated applications require. The doctor in our scenario would never try viewing an MRI over one of today's wireless networks.

Glimpses of the wireless future are enticing. With 3G networks now operating in the U.S., some mobile users are getting a taste of what lies ahead. But 3G coverage is currently very limited, speeds are inconsistent, and competing technologies make it difficult for businesses to decide which products and services to adopt.

Researchers, standards bodies and technology vendors are focusing on the next evolutionary phase of IP networks, "Beyond 3G." B3G networks promise anytime, anywhere connections, broadband speeds, and lower data transmission costs. Location services will ensure that messages reach recipients regardless of device or network. Built-in intelligence will send data through the most efficient transport medium; short text messages would take a low-speed route, large files would take multi-megabit channels.

This all depends on key technology breakthroughs. The biggest challenge remains developing an architecture that enables interoperability between multiple types of networks. Leading telecom equipment vendors have made progress, developing access points that support a variety of technologies, such as GSM, UMTS, WLAN and EDGE.

Centralized billing, government regulations and spectrum allocation will also have to be resolved. Carriers will eventually interconnect to enable seamless wireless access between networks. Experts predict that B3G-type capabilities and Multimedia IP systems won't be widespread until 2010, or maybe later. But many of the benefits will materialize sooner.

To quote physicist Niels Bohr, "Prediction is very difficult, especially if it's about the future." But it's safe to bet that wireless technology will continue to evolve at a rapid pace to meet the needs of business users. Voice, data, video, e-mail, text messaging, available on one device, delivered automatically and transparently at the lowest cost, without interruption, without regard to location – that's the future.

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the new Game Pass subscription model—which, for $19.95 per month, allows renters to keep any one game indefinitely—will explode as new consoles hit the market.

The Next Frontier

Now that 2004 has drawn to a close, and plans for 2005—which include expansion of the trading and Game Pass subscription programs—have been set in motion, Blockbuster is busy eyeing the technologies that will become a priority in 2006. As an example of how quickly a new technology can affect, and threaten, Blockbuster's business, consider the words of CFO Larry Zine, who, last February, said of video-on-demand, "We don't think the economics work well right now." Then, during the company's annual call with analysts and investors the following month, Blockbuster announced that it had launched successful trials of video-on-demand in both the U.K. and the U.S., and that it plans to start its own VOD service through Blockbuster Online next year. Meanwhile, Netflix will be rolling out its own service for downloading movies from the Internet later this year.

Blockbuster still has the brand recognition and the marketing muscle to become a big player in video-on-demand, should the markets move in that direction. "VOD is the ultimate impulse decision," says Jennifer Illes, a research assistant at Harvard Business School who has co-authored a series of case studies about Blockbuster's transition. "Coupled with TiVo (or any brand of digital video recorder) it's the ultimate threat. There's been so much speculation about VOD being just around the corner, and it's not totally here yet, but with those two together you have the ability to get any movie you want at any time.

That could be to Blockbuster's advantage, though, if the company can make its mark in the new technology even as its traditional business model fades away—something that even Carl Icahn expects it to do. That could explain why CEO Antioco is so determined to take advantage of each new business opportunity. If VOD is a potential Blockbuster-killer, like Netflix before it, he wants to keep the Blockbuster brand at the forefront of VOD'S adoption so that the company can replace any rental revenues lost to the new technology.

Yet others scoff at the idea of VOD taking so much as a nibble from either the rental or sale markets in DVDs. "VOD is a joke," says analyst Pachter. "The studios know it doesn't make economic sense to allow VOD at the same time as rental. Pixar Animation [shares] blew up because they only shipped 20 million copies of *The Incredibles*. What if they had no DVD sales at all? Literally 50 percent of studio profits come from DVD sales. The studios recognize the need for that gap, the window, between DVD release for rental and sales, and either pay-per-view or VOD."

The technology isn't even ready for prime time, Pachter warns. "You can't have dedicated bandwidth for 40,000 movies on demand all the time, which means you'll never get the same selection you get at the video store." Besides, he says, a number of U.S. households don't even have computers, much less broadband access. "It's not going to be a threat for at least ten years and it's foolish to look beyond that."

Perhaps. But Illes notes that the studios have two opposing views of the new technology. "They're very dependent on Blockbuster because home video rental is a huge chunk of their revenues," she says. "But Blockbuster is the middleman. If they could somehow get rid of them, then VOD could be extremely lucrative for the studios. Whether VOD is an ultimate threat for Blockbuster is dependent on how the studios end up handling their release windows."

And, of course, on how nimbly Blockbuster rolls with the changes.

JANET RAE-DUPREE, *the technology editor for the Silicon Valley Business Journal, has covered technology and science in Silicon Valley for a number of publications, including* BusinessWeek *and the* San Jose Mercury News. *Please send comments and questions on this story to* editors@cioinsight-ziffdavis.com.

RESOURCES

Books

The Making of a Blockbuster: How Wayne Huizenga Built a Sports and Entertainment Empire from Trash, Grit, and Videotape
By Gail DeGeorge
Wiley, 1995

Blockbuster Inc. & Technological Substitution: The Internet Changes the Game
By Peter J. Coughlan and Jennifer Illes
Harvard Business School Press, 2003

Mobility Moves From Productivity to Strategy

Pedestrians gabbing on cell phones and office workers checking their PDAs are as much a part of the street scene today as traffic signs. But mobile and wireless technologies are no longer just a convenience; for most companies they have become a necessity. In this month's survey, 83 percent of the 357 IT executives who responded said their IT departments support mobile technology. And of those, 72 percent said mobility is essential to their business strategy.

Mobile phones, laptops and PDAs began as personal communication and productivity devices, but today, along with wireless networks, they are now tools for improving business efficiency and customer service. Our survey found that advancing business processes, not personal productivity, is the most important business goal companies seek through mobile devices. A 2004 study by consultants A.T. Kearney Inc. put it this way: "Wireless networks have left home and gone to work. . . . CIOs across a range of business sectors have seized the opportunities provided by wireless technologies to dramatically change how their operations operate."

Consider two organizations in the healthcare industry that have adopted mobile technology to enhance service and efficiency. Saint Luke's Health System, a group of nine hospitals based in the Kansas City, Mo., region, is opening an all-digital, wireless-networked hospital in Lee's Summit, Mo., in February 2006. By connecting to the hospital's wireless network, says John Wade, Saint Luke's vice president and CIO, doctors and nurses will have access to medical records and digitized images on most kinds of wireless mobile devices. And by replacing bar-coded bracelets with RFID tags, staff will always know where patients are. This, he claims, will allow them to provide better care and use their time more effectively. "It's very inefficient for physicians to come to Saint Luke's and look for a patient on the ninth floor, only to find they've gone down to the X-ray department. And why are we subjecting our nurses to ▶

60%
of IT departments supporting mobile technology will increase mobility spending in the next 12 months.

81%
of these IT departments support PDAs.

50%
say they capture and analyze data more accurately thanks to mobile technology.

42%
say use of mobile technology has made their company less secure than one year ago.

58%
say billing for wireless service is an ongoing problem.

those kinds of inefficiencies?" asks Wade.

Meanwhile, Scot Nattrass, director of operations at OTN, a $3 billion distributor of oncology medications and supplies in South San Francisco, Calif., says, "Mobility is essential. We believe in being a high-touch company." By making company information—financial reports, productivity reports and more—available online through the company intranet, "we're trying to take away the need to be in the office, so our executives can go out and press the flesh," Nattrass adds.

An assortment of mobile devices also helps OTN's field service agents support customers while on the road. The company supplies oncologists with computerized cabinets to store the medications and supplies they purchase. These cabinets track and manage inventory for OTN's customers, and automatically reorder supplies when inventory falls below a certain level. When customers want to change inventory levels or order supplies they've never ordered before, they contact the OTN field service staff, who then remotely connect to the appropriate cabinet and adjust its system. With mobile technology, a dozen field service staff can support 1,200 cabinets.

Why are mobile technologies becoming part and parcel of business operations now? It's a combination of costs, capability and culture, according to Ellen Daley, principal analyst for Forrester Research Inc. in Cambridge, Mass. Wireless LANs, handhelds and WiFi hot spots have become cheap, ubiquitous and capable. Software platforms offered by vendors such as IBM Corp., Oracle Corp. and Sybase Inc. can now provide corporate data-to-mobile wireless devices. Perhaps most important, both executives and employees have already embraced mobile technology. "The pressure is coming from two directions: from executives who adopted wireless e-mail, and from the lowest level employees who bought a Palm or a wireless access point from Staples" for their homes, Daley says.

These developments make it possible for strategy-minded companies to obtain business benefits from mobile technology that go beyond improved communication or responsiveness to customers. Most respondents to our survey who use mobile technology are obtaining those benefits, but IT executives at companies where mobility is essential to business strategy are twice as likely to say they can also capture and

"We're trying to take away the need to be in the office, so our executives can go out and press the flesh."

—Scot Nattrass, director of operations, OTN

analyze data more effectively, reduce cycle times and improve analytics, invoicing and inventory management. To achieve these benefits, however, companies must integrate their mobile devices and applications with other enterprise systems—the issue, after ensuring security, that presents the most difficulty to companies which use these technologies.

The inability to integrate wireless PDAs with an inventory tracking system led to an RFID snafu at a Prada designer clothing store in Manhattan that is cited in the A.T. Kearney report. An RFID-based application was meant to let staff use PDAs to check store inventory and to allow customers to do the same via touch-screen computers in dressing rooms. The dressing room system also was designed to display information about the clothing customers were trying on. But staff members abandoned the often unreliable PDAs when they were too busy with customers, and the dressing room systems frequently broke down. "Even when the PDAs worked, sales information was slow to reach the inventory system, leading to false positives," according to the report. Mobile technology opens many new possibilities for inventive CIOs, but as with any technology, innovation provides no value without execution. —*Allan Alter*

FINDING 1 At most companies, mobile technology is need-to-have, not nice-to-have.

Four out of five companies officially support a mobile workforce. That's no surprise, given how widely mobile phones and PDAs are used in sales. What's more significant is that 72 percent of companies that support mobile capabilities regard them as an essential part of their business strategy. Given the importance and near ubiquity of mobile devices, it's no wonder mobility spending is expected to increase at 62 percent of companies where mobility is strategic.

1.1 Does your IT department officially support a mobile workforce? N=355

	total	less than $100 million	$100 – $999 million	$1 billion or more
Yes	83%	80%	81%	90%
No	17	20	19	10

The figure is lowest in education, at 68% of respondents.

1.2 If so, is employee mobility via mobile devices an essential component of your company's overall business strategy? N=294

	total	less than $100 million	$100 – $999 million	$1 billion or more
Yes	72%	66%	74%	78%
No	28	34	26	22

1.3 What percent of your total IT budget does your company devote specifically to mobile technologies, infrastructure and support? N=271

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Mean	9.3	10.9	5.5

The mean is highest in education (10.9%) and lowest in non-computer manufacturing (4.8%).

1.4 How do you expect that to change over the next 12 months? N=271

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Increase	60%	62%	56%
Decrease	3	3	1
Remain the same	37	35	43

FINDING 2 Over half of all employees are now equipped with mobile devices at companies that formally support these technologies.

Nearly every IT organization provides mobile technology support for knowledge workers or professionals such as managers, doctors or salespeople, but over a third also support mobile non-professionals such as warehouse workers. Support includes not only mobile devices but also wireless access to corporate databases at firms where mobility is stategic. Is the support worthwhile? The answer is uniformly yes, with the exception of some companies that provide support for non-professionals.

2.1 Which types of mobile workers does your IT department support? N=293

	total	less than $100 million	$100 – $999 million	$1 billion or more
Knowledge workers and professionals*	97%	96%	96%	100%
Non-professional workers*	37	25	45	40

44% of companies where mobility is integral to strategy support non-professional workers, more than twice as many as their non-strategic counterparts, at 19%.

2.2 What percent of your total workforce is made up of personnel who are equipped with mobile technologies? N=284,235

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Knowledge workers and professionals	37%	40%	29%
Non-professional workers	18	22	7

Only 31% of knowledge workers at mid-sized companies are equiped with mobile technologies.

*Examples of knowledge workers and professionals include senior executives, managers, sales reps, consultants, and doctors; non-professional workers include but are not limited to drivers, service technicians, store associates and warehouse personnel.

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2.3 Our workforce requires wireless access to corporate data systems *(percent responding "strongly agree or agree").* N=272

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Knowledge workers and professionals	84%	88%	74%
Non-professional workers	76	82	40

2.4 The business benefits my company receives from deploying mobile devices are worth the cost and hassle *(percent responding "strongly agree or agree").* N=273,100

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Knowledge workers and professionals	95%	96%	91%
Non-professional workers	91	95	67

This is an improvement from our April 2003 survey, where just 74% said the business benefits of mobility are worth the headaches.

FINDING 3

Many more IT organizations now support cell phones, PDAs, wireless LANs and WiFi. All mobile devices and wireless services, except for dial-up, saw increased support since our 2003 mobility survey. All are widely used today except for packet data networks and proprietary mobile terminals. However, which devices are supported varies greatly depending on whether the workers are professionals or non-professionals. The latter are far less likely to use laptops, PDAs and smart phones, or to have access to high-speed services like DSL or 2.5/3G wireless. Is that because they have less of a need for high-speed access, or because budgets don't support it?

3.1 Which types of mobile devices does your IT department support? N=283

	2003	2005	2005: knowledge workers and professionals	2005: non-professional workers
Laptop/notebook/tablet computers	97%	98%	98%	63%
Cell phones	67	89	89	81
PDAs (with or without wireless access)	52	81	82	44
Smart phones (wireless phones with browsers, Internet access, organizer applications, etc.)	36	65	66	23
Pagers	—	48	46	44
Industrial or proprietary terminals	11	17	12	31
Other	—	7	6	7

59% of health-care organizations support pagers.

3.2 Which communications services does your IT department support? N≥100

	2003	2005	2005: knowledge workers and professionals	2005: non-professional workers
DSL/Cable modem	66%	79%	80%	49%
Wireless LAN	30	71	71	54
Cellular service for data transfer	n/a	66	65	54
Dial-up	91	64	64	50
WiFi 802.11 "hot spots"	25	58	59	40
2.5/3G Wireless	11	48	49	28
Packet data networks	14	24	22	19
Other	5	2	1	3

FINDING 4 **Improving business processes, rather than personal productivity, is the main reason companies support mobility.** The desire to stay in touch via phone and e-mail while on the move, and simple gadget-envy, has sold many a PDA, laptop and cell phone. But CIOs are looking for business benefits from mobility, and getting them in the form of improved processes. Nearly all say mobile devices have improved communication, collaboration and responsiveness to customers. But at the 72 percent of companies where mobility is an integral part of strategy, respondents are also much more likely to use mobility to improve data capture and analysis, reduce cycle times, and improve inventory management.

4.1 Which is the most important business goal your company hopes to advance by equipping *knowledge workers and professionals* with mobile devices? N=271

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Improving our business processes (speed, flexibility, agility)	57%	61%	47%
Increasing personal productivity	33	30	41
Increasing revenues	6	6	7
Reducing costs	4	4	5

4.2 Which is the most important business goal your company hopes to advance by equipping *non-professional workers* with mobile devices? N=100

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Improving our business processes (speed, flexibility, agility)	61%	64%	47%
Increasing personal productivity	24	25	20
Increasing revenues	4	4	7
Reducing costs	11	8	27

4.3 What benefits does your company receive by providing employees of all types with mobility technologies? N=277

	total	mobility is essential to business strategy	mobility is not essential to business strategy
Improved communication or collaboration among employees	87%	88%	83%
Increased responsiveness to customers	84	86	81
Improved communication or collaboration with suppliers and partners	58	60	53
More accurate, effective data capture/analysis	50	59	27
Reduced cycle times	46	52	32
Improved analytics	37	44	19
Faster and more accurate invoicing	29	34	14
Improved inventory management	23	27	14
Other	3	3	3

In 2003, only 72% cited improved communication between employees, 42% cited improved communication with suppliers, and 37% cited more effective data capture/analysis.

How the survey was done: *CIO Insight* editors designed the 2005 Mobility Survey together with Equation Research, LLC (www.equationresearch.com), an Estes Park, Colo.-based supplier of custom research services. IT executives gathered from Ziff Davis Media publication lists were invited to participate in the study by e-mail. The questions were posted on a password-protected Web site, and 357 qualified respondents (136 from companies with revenues in calendar 2004 below $100 million, 140 from companies with revenues between $100 million and $999 million, and 81 from companies with revenues of $1 billion or more) replied from May 24 to June 10, 2005. Of the respondents, 65 percent were CIOs or CTOs, and the rest held titles of vice president, senior vice president or executive vice president of IT.

FINDING 5 **Security, integration and billing problems are the three biggest problems facing IT executives regarding mobility.** Security is the top challenge (for more on security, see Finding 6), but integration can be almost as tough; it is cited by 56 percent of companies whose main goal is to improve business processes rather than personal productivity. Cost is more likely to be a concern for large corporations, as well as companies who have problems managing multiple vendors. Inappropriate use and spending on mobile devices are not major worries for most CIOs. Nor is reliability: Just 18 percent say mobile devices and services are less reliable than expected.

5.1 What are the three biggest difficulties your IT department faces in executing its mobility strategy? N=191

	total	less than $100 million	$100 – $999 million	$1 billion or more
Securing corporate information and systems	58%	63%	53%	60%
Integrating mobile technologies and applications with other enterprise systems	51	50	53	48
Supporting many different kinds of devices	38	32	38	44
Containing telecom costs	31	23	32	40
Lack of industry standards (for devices, software and communications services)	27	26	24	33
Limiting the use of unauthorized or unsupported devices	22	26	22	19
Controlling personal use of corporate assets by employees	20	23	21	17
Justifying mobile investments	20	21	22	19
Training users	18	19	21	13

Respondents are 15 points more likely to cite controlling telecom costs if they are among the 37% who believe they use too many carriers.

5.2 The complexity and accuracy of the bills we receive for our wireless service usage is an ongoing problem. N=271

	total	less than $100 million	$100 – $999 million	$1 billion or more
Agree	58%	47%	64%	63%
Disagree	42	53	36	37

5.3 My company knows precisely how much it spends each year on mobile devices and communications services. N=187

	total	less than $100 million	$100 – $999 million	$1 billion or more
Agree	74%	80%	71%	70%
Disagree	26	20	29	30

81% of CIOs say their companies know, but just 56% of other IT other executives agree.

FINDING 6 **Four out of ten IT executives believe their company is less secure thanks to mobile technologies.** Theft or loss is cited as a problem by 35 percent, and these IT executives are somewhat more likely to cite problems with viruses, unauthorized access and theft or corruption of data as well. Although viruses are the most frequently cited problem, few are inoculating PDAs and mobile phones against them. So far, concern about mobile security seems to outpace the number of security incidents, but unless more companies take security precautions with their mobile devices, that won't remain the case.

6.1 Our use of mobile technologies has made our company less secure than it was one year ago. N=268

	total	less than $100 million	$100 – $999 million	$1 billion or more
Agree	42%	47%	42%	35%
Disagree	58	53	58	65

6.2 Which security problems have resulted from the company's use of mobile devices and/or wireless networks during the past 12 months?

N=270

	total	mobile technologies have made us less secure	mobile technologies have not made us less secure
None	53%	41%	63%
Viruses or worms on mobile device	31	40	25
Unauthorized network access	16	25	10
Theft or corruption of corporate data	14	19	10
Other	3	4	3

6.3 Which of these steps has your company taken to improve mobile and wireless security?

N=268

	total	less than $100 million	$100 – $999 million	$1 billion or more
Allow only the IT department to configure remote-access client software	71%	73%	72%	67%
Require VPNs for internal access	71	64	75	74
Require a password to use mobile devices	66	62	63	75
Mandate the use of personal firewalls	55	59	48	62
Ban employees from connecting personal devices to the corporate network	49	43	48	57
Monitor wireless connections for suspicious activity	49	43	46	59
Ban employees from installing or deleting programs that run on mobile devices	40	32	42	46
Install anti-virus software on cell phones and PDAs	22	20	21	28
Other	3	4	5	0

In 2003, 85% used VPNs and 62% used personal firewalls to secure networks against intrusion from misuse of mobile computers and devices.

FINDING 7 **Wireless communications technologies will be in use at four out of five companies.** More than half of our respondents use wireless messaging, universal cell phones, Wi-Fi and even Bluetooth. However, just 7 percent plan to replace all desk phones with mobile phones in the next two years. Other mobile technologies, such as RFID tags, are being adopted more slowly. However, more than half the respondents in the target industries for this technology, such as retail and manufacturing, already use or plan to adopt RFID tags.

7.1 Which of the following technologies are you currently using or have plans to use during the next 12 months?

N≥238

	currently using	plan to use	not using and no plans to use
Wireless messaging	59%	22%	19%
Cell phones that work in the U.S. and in Europe or elsewhere	59	12	30
WiFi hot spots	56	24	21
Bluetooth	55	19	25
Wireless audio/video streaming	19	31	50
Speech recognition for use with mobile devices	16	28	56
Location "aware" services	12	34	54
WiMax	7	39	54
RFID tags	5	36	60

About 52% of healthcare, manufacturing and retail respondents say they are using or plan to use RFID tags.

STRATEGIC TECHNOLOGY
COMPLIANCE

A ROCK AND A HARD PLACE

Sarbanes-Oxley compliance costs spiraled out of control in the first year—can technology help? **By Debra D'Agostino**

PROBLEM

Compliance has been a moving target, and costs have piled up early and often.

It was January 2004, and Bob Travatello, CIO of Blue Rhino Corp., the largest independent supplier of propane gas cylinder exchange for backyard grills in the U.S., was feeling upbeat as he chatted with *CIO Insight* about his company's aggressive dive into compliance with the Sarbanes-Oxley Act of 2002 ("Better Safe Than Sorry," *CIO Insight,* February 2004).

With the deadline looming six months ahead, the Winston-Salem, N.C.-based company had substantially slowed its business processes in order to make compliance a top priority. Travatello was confident, even cocky, about his company's preparedness. Because it had acted quickly after the law was passed, he said, Blue Rhino was well on its way to compliance and expected no negative financial impact on the business. "I'm not sure that every company is taking it as seriously as we are," he said.

Fast forward about 18 months and Travatello is considerably less cheery. A lack of clarity around the scope of the law has led to massive overspending at virtually every publicly traded company in the U.S. And Blue Rhino, now a division of Overland, Kan.-based Ferrellgas Partners Ltd., has spent the past six months in the testing and remediation phase of its Sarbanes-Oxley efforts—far longer than the company expected. Travatello is sick to death of auditors. "I see them in my sleep now," he says.

On top of that, the hope that SOX compliance would somehow result in a more efficient operation throughout the company has gone by the boards. "I thought SOX was going to help us, but it's only hurt our bottom line," Travatello says. Although he can't disclose actual figures, Ferrellgas's 2004 annual report is very telling. Net earnings dropped to $28.6 million from $56.7 million in 2003, and its stock price is down slightly since April 2004, when Blue Rhino was acquired. Though the slump can't be attributed entirely to SOX costs, "I don't think I can look a shareholder in the face and say the amount of money we've spent [on SOX] was worth it," Travatello says.

Of course, complaining about federal regulation is corporate America's national pastime. And there are, in fact, examples of companies that have seen business benefits to Sarbanes-Oxley compliance above and beyond avoiding jail. As painful as it's been, SOX does seem to have some upside.

Companies are reporting that their efforts have helped them weed out fraud, improve security and optimize business practices. Even Travatello admits that having to slow down business processes forces the company to think harder about the risks it is taking. "We trust our people, but on some projects that deal with major systems, it's good to have different sets of eyes. And we feel better that we are doing the right thing," he says.

The one thing all companies agree on is the need to reduce the costs of compliance. Companies have two choices when it comes to their second year of compliance, and neither is pretty: They can continue to rely on their audit teams, or they can look to the already strapped IT department to buy software that effectively manages compliance. Both options can lead to enormous cost overruns if not managed properly. The question is, which is the lesser of two evils?

"IT is the only way to bring these costs down," says Bob Tillman, director of public affairs for ARMA International, a trade group in Lenexa, Kan., for records managers. "You can't have auditors with their green eyeshades going over every line." But software vendors have their own drawbacks, says Ted Frank, who leads the Open Compliance and Ethics Group's Technology Council and is also president of Axentis Inc. in Warrensville Heights, Ohio, which offers hosted SOX solutions. "Everywhere you turn, there's another compliance solution. It's terribly confusing."

80%

The percentage of companies that, by 2006, will employ a Chief Compliance Officer.

SOURCE: GARTNER INC.

ASK YOUR CHIEF COMPLIANCE OFFICER:

Have we overcomplied with SOX?

ASK YOUR CFO:

What is the breakdown of our compliance costs?

ASK YOUR COO:

Have we seen any measurable benefits that can be attributed to SOX compliance?

COSTS

Overspending is the norm, leaving lots of room for improvement.

The cost of complying with Sarbanes-Oxley in 2004 was roughly 30 percent higher than companies estimated. But a high compliance bill is nothing new for U.S. companies, many of which already adhere to a slew of regulations. According to a 2001 U.S. government report entitled "The Impact of Regulatory Costs on Small Firms," companies spent roughly $800 billion annually on federal compliance issues before Sarbanes-Oxley was even drafted.

So why weren't companies better prepared for the new law? "It implies that proper auditing wasn't really being done before," says Lane Leskela, an analyst at Gartner Inc. "If auditors had been doing significant deep audits for the past few years instead of merely genuflecting over the numbers, would we have seen this escalation of costs for SOX? We have a huge gap in the willingness to enforce a lot of the laws already on the books." That, of course, is the very problem that Sarbanes-Oxley is meant to solve.

Compounding the catch-up costs is the fact that the Securities and Exchange Commission has provided little leadership over exactly what the scope of SOX should be, and as a result, "the audit firms have jumped in and decided what they want," says Tillman of ARMA. "The CEO doesn't want to go to jail, so he says, 'Pay the auditor.' It's a recipe for disaster." Because internal and external audit teams have different definitions of compliance—and methodologies for achieving it—a costly and time-consuming tug-of-war ensues. "Auditor A does it one way, auditor B does it another, and they will never admit the other is right, because then the billable hours go down," says Blue Rhino's Travatello.

According to Financial Executives International, an association for accounting and finance professionals, companies spent more than half of the money that went toward SOX on auditors—$2 million on average. Gartner estimates that audit fees are up as much as 35 percent from a year ago.

As it turns out, those who sat back and waited to see how SOX would develop have fared better—and spent less—than those, like Blue Rhino, that charged ahead. "In retrospect, the minimalist approach at the onset of SOX was more acceptable than we thought it would be," admits John Hagerty, a vice president at AMR Research.

ASK YOUR INTERNAL AUDIT TEAM:

Why weren't we better prepared for SOX and how can we fix it?


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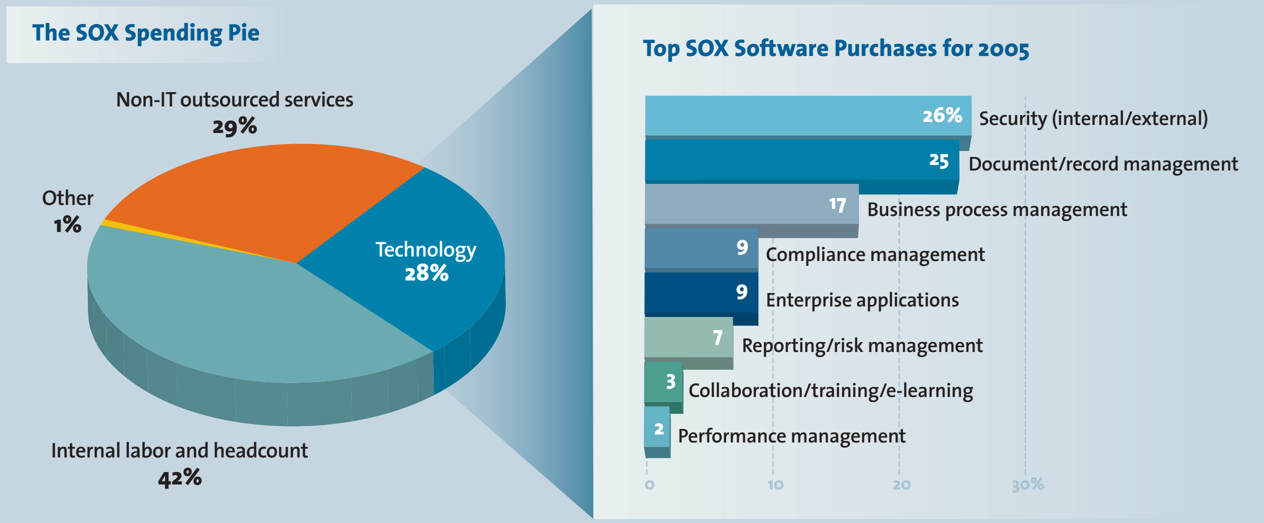
WHERE DID THE MONEY GO?

Companies spend the largest chunk of their SOX budgets on internal costs, including employee overtime and internal audit. A much smaller slice is devoted to technology.



SOURCE: AMR RESEARCH INC., 2005

TELL YOUR EXECUTIVE TEAM:

The cost of SOX compliance will gradually ease over time, but not this year.

ASK YOUR CHIEF COMPLIANCE OFFICER:

How have we narrowed the scope of our SOX efforts?

TECHNOLOGY

IT can help mitigate costs; so can some common sense.

Many companies that were focused on meeting the primary requirements for compliance haven't even begun to think about incorporating SOX into their ongoing business processes. Yet that was the goal at Irving, Texas-based Kimberly-Clark Corp., the $15 billion health and hygiene products manufacturer, when it installed automated control testing software from Virsa Systems Inc. The software automates a key portion of the SOX effort—testing the controls to make sure they work properly, says Jayne Gibbon, team leader of the North America security support team for Kimberly-Clark.

Virsa's tool helps automatically check processes to ensure that the segregation-of-duties portion of Section 404 of Sarbanes-Oxley is being met. "For example, the most common segregation-of-duties issue you want to prevent is that you don't want someone to do purchasing who also does receiving. So you can configure a rule that outlines that conflict and run your population of users against it to see if there are any issues." Gibbon estimates the software saves roughly 40 hours of staff time annually for each of its 120 locations—which translates into hundreds of thousands of dollars. "But I think that's an understatement," she says. "You couldn't humanly perform this; it's too convoluted."

At Volt Information Sciences Inc, a $1.9 billion, New York City-based global provider of staffing and telecom services , CFO James Groberg agrees that technology is key for compliance. "You need a software application that will let you store the documentation, the testing and everything that goes with it in a manner that makes it easily available to your outside auditors, but also lets your own people search that database quickly and make alterations to your controls as needed." According to its 2004 annual report, the company spent $400,000 just on external SOX-related costs, and Groberg expects that new software will significantly cut costs going forward. "Certainly our costs will come down," he says. "They'd better." The software,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from OpenPages Inc., starts at roughly $65,000 for 25 users.

Gartner's Leskela warns companies to stop relying so heavily on outside parties for guidance. Auditors are in no hurry to be automated out of existence. "Don't listen to the deceptive advice of auditors," he says. "Everyone has their own agenda. Get rid of these people. They are taking up space and providing no value." According to a former internal auditor who spoke on the condition of anonymity, "Audit firms don't want you to buy your own software. They want to manage this process from the cradle to the grave, and they have developed their own in-house tools that they let their clients use—for a fee."

Keep in mind, though, that software vendors have just as much interest in making money off your Sarbanes-Oxley woes and are flooding the market with products that may or may not be of any value to you, as Travatello can attest. "We could have done it in Microsoft Word and stored it somewhere special, and it would have been the same bang for the buck," he says.

41%

The percentage of companies that have a specific budget allocated for compliance.

SOURCE: AMR RESEARCH INC.

ASK YOUR CHIEF COMPLIANCE OFFICER:

How much of our SOX efforts are overseen by internal audit?

TELL YOUR EXECUTIVE TEAM:

We need to make SOX part of our ongoing business processes.

ASK YOUR IT TEAM:

How can technology further automate our compliance efforts?

VALUE

Use the investment in SOX to weed out fraud and optimize business processes.

Analysts say it will take at least another year or two before companies can expect to see significant reductions in their SOX investments. Until then, says Frank of the Open Compliance and Ethics Group, "The fundamental question is: If you're going to make this investment anyway, how do you do it so it reaches some broader corporate objective?"

Though it is difficult to find concrete examples of companies leveraging the investment in SOX to achieve some greater business benefit, analysts say companies are often able to optimize the business processes they've documented.

One manufacturing company, for example, used the information it had gathered through its SOX documentation process to evaluate the performance of each of its plants. The company discovered that while most plants had a product rejection rate of 5 percent, one plant's rate was as high as 15 percent. Further investigation revealed that the problem was not mechanical—employees were stealing products off the line and selling them on the black market.

SOX supporters say examples like this prove the need for Sarbanes-Oxley. Controls at many companies have been lax for decades, a trend that led to the corporate fiascos like Enron, WorldCom, et al. But Gartner's Leskela, who readily admits that SOX has tightened up corporate controls, isn't so sure that it has improved investor confidence. "I don't think SOX has done anything to restore confidence in the market; that's not clear at all," he says.

For smaller companies like Blue Rhino, the impact that high compliance costs can have on shareholder value can be more threatening than an SEC investigation, says Travatello, "Say a stockholder is looking to invest some money. He sees that Company A's shares went up 20 percent per year but didn't pass SOX, while Company B's stock dropped but passed with flying colors. What's the better value for him? I don't have confidence that the SEC can pull this off properly for everyone. The bottom line is that a couple of jerks at Enron have screwed up the whole world."

ASK YOUR CHIEF RISK OFFICER:

What are the consequences of overspending on SOX?

ASK YOUR CHIEF STRATEGIST:

How can we use the information we have already gathered to improve business processes?

ASK YOUR CFO:

Do our shareholders care about our compliance efforts?

Please send questions or comments on this story to editors@cioinsight-ziffdavis.com.

FACT SHEET

COMPLIANCE

Companies are spending an average of $4 million each year on their SOX compliance efforts, with minimal returns. Emerging software is one way to ease the pain.

COST-EFFECTIVE COMPLIANCE DEPENDS ON:

- **Organizational support:** Compliance officers, compliance committees and internal auditor functions will be essential to doing business. Without the assignment of responsibility, there can be no real compliance.
- **Process control methodology:** Using open, accessible and peer-reviewed frameworks for risk management and different kinds of control—whether inside or outside the IT organization—will make compliance regimes more transparent to outsiders.
- **Content control:** The only indisputable trail of evidence—of right practice or wrongdoing—comes through the electronic and paper records that companies keep. 99.9 percent of companies need to work on this area of compliance management.

SOURCE: GARTNER INC.

40%
THE PORTION OF COMPANIES' COMPLIANCE BUDGETS THAT WILL GO TO SOX IN 2005.
SOURCE: AMR RESEARCH INC.

COMPLIANCE TECHNOLOGIES TO CONSIDER:

- Management tools such as automated control testing and workflow.
- Identity and authentication tools for change management and segregation of duties.
- Content management software for records and e-mail archiving.

SEVEN "SIMPLE" STEPS OF EFFECTIVE COMPLIANCE:

STEP 1	**ESTABLISH** the scope of the compliance effort. *Pitfall: Not adequately delineating lines of responsibility.*
STEP 2	**ASSIGN** employees to specific compliance-related tasks. *Pitfall: "But I already have a day job!"*
STEP 3	**SCREEN** personnel to ensure job functions don't overlap. *Pitfall: Personnel screening not connected to program goals.*
STEP 4	**COMMUNICATE** and train employees on good compliance practices. *Pitfall: Lack of an auditable training record.*
STEP 5	**MONITOR** ongoing compliance efforts and consider improvements. *Pitfall: Risk assessment disconnected from business goals.*
STEP 6	**ENFORCE** corporate policies and rules around compliance. *Pitfall: Belief that reporting and oversight is enough.*
STEP 7	**PREVENT** policy breaches through monitoring and enforcement. *Pitfall: Lack of attention to prevention and anticipation.*

SOURCE: GARTNER INC.

Resources

WEB SITES

www.ietf.org
Web site of the Internet Engineering Task Force

www.oceg.org
Web site of the Open Compliance and Ethics Group

www.pcaob.org
Web site of the Public Company Accounting Oversight Board

BOOKS

Beyond Sarbanes-Oxley Compliance: Effective Enterprise Risk Management
By Anne M. Marchetti
Wiley, June 2005

Sarbanes-Oxley Ongoing Compliance: Beyond Year One With Governance
By Javier F. Kuong
Management Advisory Publications, June 2005

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www.axentis.com

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www.approva.net

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Executive Briefs

Strong Signals: Bit by Bit
By John Parkinson, *page 25*

At the present rate of innovation, by 2020 or so, technologists should be able to store one bit of information in one atom. But demand for storage space is growing at least as quickly; in fact, even if every atom of the earth were able to store one bit, notes columnist John Parkinson, we still wouldn't have enough atoms to meet the demand projected by 2020. That means both enterprises and people are going to have to develop better long-term strategies for information lifecycle management. Among them: keeping less, compressing more, and automating the whole process.

Synchronicity: Learning from Experience
By Marianne Broadbent, *page 29*

Why, asks columnist Marianne Broadbent, is it so hard for executives at many U.S. companies to integrate what they learn from their people around the world into their IT strategies? Broadbent believes there is much to be learned by drawing on the rich experiences of employees overseas—about how to innovate and to improve customer offerings in every country in which they operate. The goal is to learn to look around at the everyday use of technology worldwide, think about how those ideas might be applied at home, and then work to turn those ideas into greater business value.

Expert Voices: Thomas Davenport
With Allan Alter, *page 32*

Knowledge workers—people who create, distribute or apply knowledge—are performing well below their potential, says Thomas Davenport, professor of information technology and management at Babson College. That's in part because while companies work hard at assessing knowledge workers before hiring them, they do little to help them improve their performance or use the IT resources given to them. In this interview with Executive Editor Allan Alter, Davenport suggests creating job-specific information systems that provide the information knowledge workers need while they do their jobs, and finding ways to measure the performance of knowledge workers that are actually helpful, not annoying.

Trends: Web Marketing
By Edward Cone, *page 40*

The well-hyped promise of one-to-one marketing through detailed personalization of Web sites is but a distant memory now. But clever marketers haven't given up on the Web's promise. The latest innovation involves creating "personas": imaginary demographic and psychological portraits of a variety of segments of a company's customer base that allows marketers and Web designers to target customer-oriented Web sites to those segments. The results? Companies report greater use of their Web sites and greater use of the tools available to customers. Meanwhile, companies can collect even more detailed information on their Web site visitors.

Case Study: Blockbuster Inc.
By Janet Rae-Dupree, *page 51*

Under attack from competitors and shareholders alike, Blockbuster is betting big on a series of initiatives intended to breathe life into its dying rental business. A new online subscription service, designed to go up against Netflix, is the lynchpin of a four-pronged strategy that also includes a DVD trade-in program, video game rentals, and the ever-controversial "No More Late Fees" campaign. All of which means that it's been a whirlwind first year for newly named CIO John Polizzi, who has had to keep up with the IT demands of this rapidly changing market, says business writer Janet Rae-Dupree.

Research: Mobility
By Allan Alter, *page 61*

Mobile and wireless technologies are no longer just a convenience; for 72 percent of the companies that support mobile technology, they have become a strategic necessity. According to the 357 IT executives who responded to this month's survey, improving business processes, not personal productivity, is the most important business goal of mobile devices. IT executives at companies where mobility is essential to business strategy are now using wireless devices and services to capture and analyze data more effectively, reduce cycle times and improve analytics, invoicing and inventory management. Unfortunately, over 40 percent of IT executives say mobile technologies have also made their company less secure than it was a year ago.

Strategic Technology: Compliance
By Debra D'Agostino, *page 71*

As painful as it has been for virtually every public company to comply with Sarbanes-Oxley, there are some early indications that the widely reviled reform legislation is actually working. Companies are tightening up their financial controls and even weeding out fraud. The problem is that it costs too darn much. In year two of the SOX saga, the focus is on reducing the costs of compliance and accepting the process as just another cost of doing business. Companies have two less-than-compelling choices when it comes to easing the pain, notes reporter Debra D'Agostino: auditors or software vendors.

Ad Index

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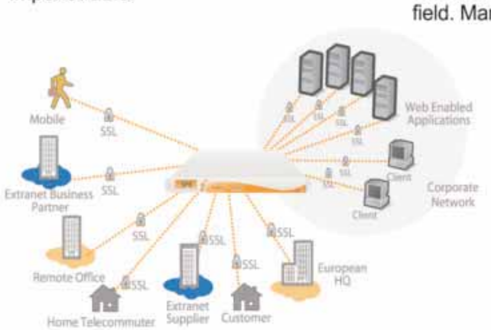
SSL VPN: Full Access with Maximum Security

Today, all types of workers, from mobile executives to physicians to truck drivers, are benefiting from the ability to access and transmit business-critical data literally from the palms of their hands. However, these productivity benefits aren't without risks, with mobility comes the critical challenge of security. Dangers emanate from network access environments IT cannot control: those with a non-technical background, those that access the network from home, from hackers with malicious intent, viruses that spread unintentionally or otherwise, and technology that itself is not always impenetrable.



Increasingly, companies are turning to Secure Sockets Layer Virtual Private Networks (SSL VPNs) to provide a full range of global access while ensuring maximum security. Unlike traditional IPSec VPNs, SSL is a higher-layer, application-independent security protocol. Since it is already included in the browser, no additional client software is required, enabling anytime, anywhere access from any device - providing access to applications when they are most needed.

With SSL VPN technology, salespeople can download corporate customer relationship management data from the field. Manufacturing plant managers can track inventory and place orders before supplies reach critically low levels. Doctors can transmit authorization for a prescription from the bedside of a patient. Shop floor managers can place on-the-spot orders.

SSL VPN's global access capabilities are proving to be an impressive solution for secure network access. Recent Frost & Sullivan research reveals that the market is ramping up quickly, with significant growth rates expected over the next two years. The key considerations when evaluating SSL VPN products as a global access solution are encryption, access control management, authentication, identity management, interoperability, application support, scalability, end-user experience, endpoint security and total cost of ownership.

In today's growing SSL VPN market, it's easy to become overwhelmed by the wide range of solutions available. So when selecting an SSL VPN solution, remember to evaluate both business and technology benefits.

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How well do you know your customers?

Most companies collect reams of data on their customers. Then they analyze and mine that data for the nuggets it can reveal. But not every company is good at using the information they gather wisely, or at executing on strategies that let them profit from that knowledge. What marketer wouldn't want to be able to tailor marketing messages to the narrow group of customers most receptive to hearing it? Finding the right face in the crowd, rather than preaching to the masses, has long been the goal of information technology tools that allow personalized messaging. For most companies, that prize remains elusive, but it doesn't make the promise any less attractive.

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