

# Transforming Your Enterprise

Main Edition Spring 2008

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Get the most out of collaborative networks

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A lifecycle security strategy is essential



Technology for better  
business outcomes





ALTERNATIVE THINKING ABOUT VIRTUALIZATION:

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# Transforming Your Enterprise

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**Cover:** Bob Edwards, Vice President of Systems Operations, Continental Airlines



## More than the sum

Nigel Ball, VP Marketing,  
Technology Solutions Group, Americas

The enterprise is a complex mix of people, systems, processes and objectives. The point is to get it all working together. Much of this edition of *Transforming Your Enterprise* is devoted to different ways of understanding and managing large systems and initiatives so they add value and create strategic advantage for the business.

Sometimes the solution lies outside, as when Continental Airlines chose HP to run its global technology refresh (page 6). Maybe it's closer to home, using formal collaboration tools to ensure that people engaged in a large enterprise program collaborate productively (page 2). Or the synergy can be a combination of internal and external: read about how three technology heavy hitters have pooled their resources to offer a better way to update application infrastructure (page 16).

There's more, of course. Want to know how to turn insight into action (page 22) or ease storage management by virtualizing (page 24)? Do you need a cost effective way to store and protect tier two and three data (page 26)? The tips and tactics are all here, brought to you by industry insiders.

The right people, the most logical processes and the best systems are essential to keep you in the game. When you know how to put them together—that's when the whole truly becomes more than the sum of the parts.

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\* **Page 14** — Data Center Institute Press Release, May 1, 2006.

\* **Page 16** — "Pressure Point Index Pulse: Applications Modernisation," Penn, Schoen & Berland Associates, January 2008.

\* **Page 23** — IDC, "Gaining Business Value and ROI with HP Insight Control," Doc. #210479, February 2008.

\* **Page 25** — "Competitive Testing of Common Administrative Tasks: HP StorageWorks EVA4400 vs. EMC CLARiON CX3-10," February 2008.

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# Strategies

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04



## Getting the most out of collaborative networks

The Global Collaboration Toolkit brings clarity to the process of collaborating by applying a formal methodology and service.

When you're managing large enterprise programs that require collaboration across departments, organizations and even countries, it's natural to get bogged down by tasks and scheduling. And when things aren't going right, it's just as easy to start laying blame.

But have you ever considered that the lack of success may have less to do with task management and more to do with how well people are collaborating in the first place?

"What we've found is that poor inter-group collaboration is one of the major roadblocks to successful IT transformations," says Michael Cerreto, HP Consulting and Integration. "What it comes down to is that people are not managing the fundamental processes that need to be in place in order for groups to work well together."

What's missing, says Cerreto, is the "bigger picture" of the broader collaborative network. In addition to tracking whether or not deliverables are met and schedules are adhered to, managers also need to put processes in place to monitor how the group as a whole is making decisions, resolving conflicts and sharing information, among other things.

Part of the difficulty is simply human nature. "People are tribal by nature, so we're comfortable operating as members of smaller groups or teams," he notes. "Our familiarity is around team building versus collaborative stakeholder building so we don't always fully understand our role in the context of a larger, more complex collaboration."

To provide organizations with a structured approach for improving global relationships, whether across enterprises, regions or countries, HP has partnered with Aperian Global to help Aperian develop the Global Collaboration Toolkit. The formal methodology and



service enables organizations to assess the level of program collaboration among stakeholders, and puts all participants on record as members of one large network whose association is critical to the program's success.

"It's a process that brings everybody together to say these are the priorities, let's be clear on common goals, and let's move forward from here while looking at the way we communicate and relate to one another," says Pamela Leri, Aperian Global's Director, Global Business Transformation.

Using a customizable, on-line assessment, the HP Global Collaboration Toolkit measures 52 collaboration factors designed to indicate strengths, weaknesses and priority issues to address, and identify gaps in perception. The resulting data forms the basis for making improvements moving forward and, according to Leri, the next steps can be anything from developing protocols for communicating by e-mail and teleconference, to creating standard processes for raising issues and concerns, to clarifying the rewards and metrics that will be used to measure the collaboration's progress.

While some gaps are obvious—like those related to work function or culture—others are more subtle. For example, one large global IT organization uncovered strong gaps in perception between employees who had been with the company over a long period versus those who were recently hired. A global healthcare business that relies on partners in the U.S., China and Europe discovered that the partners in China were receiving conflicting messages and were therefore finding it difficult to prioritize work.

"What we find is that collaborative networks need to come up with some shared understanding of how they will communicate," says Leri. "We often bring some

assumptions into our work life about what appropriate behavior is, and when you're working cross-organizationally or cross-functionally or with external partners, those assumptions may not be shared."

Ideally the Toolkit should be applied at the start-up of a collaborative network and then used as a tool to track ongoing progress. In Leri's experience, however, most companies don't realize they have a collaboration problem until they're already feeling pain.

"Many of the people we work with feel as if they've been drop kicked from unconscious incompetence to conscience incompetence," she notes, alluding to one company that had its "Aha!" moment when it realized information that shouldn't have been shared outside the collaborative network was actually getting out. "For others, it's about time. It's taking too much time for groups to work together smoothly, so they start to look for a tool to facilitate the process," she says.

In huge organizations with multiple collaborative partnerships, taking the time to apply the Toolkit and gather stakeholder input is often all that's required to move relationships forward, she adds. "One of our clients went from having a reputation as being one of the most difficult companies to work with to being told that they're now the easiest," says Leri. "And using the Global Collaboration Toolkit, they have the metrics to prove it."

To learn more about the Global Collaboration Toolkit and its accompanying four-step process for establishing and improving collaboration among stakeholder groups, see Adaptive IT Leadership Development Program at: [www.hp.com/go/transform](http://www.hp.com/go/transform). To share your opinion with Michael Cerreto, [www.hp.com/go/transform8](http://www.hp.com/go/transform8)



## Baby steps

### **Migrating to Unified Communications requires evolutionary—not revolutionary—thinking.**

Most enterprise communications infrastructures are pretty complicated. They are voice, messaging and network systems that have grown organically over the course of years, and under the stewardship of different managers, each solving past business and technical problems.

So when it comes time to think about changing all of it, how eager would you be to proceed? That gnawing feeling in your gut is what's been holding back the burgeoning field of Unified Communications.

The light at the end of the tunnel is certainly bright enough. Unified Communications would allow your employees to collaborate with unprecedented efficiency, reachable on any device, anywhere. The system would know not only where they are, but the best way to reach them at any given time, and allow teams to easily form and work together. And they'll do it while saving your company a lot of money in travel, long distance charges and user support.

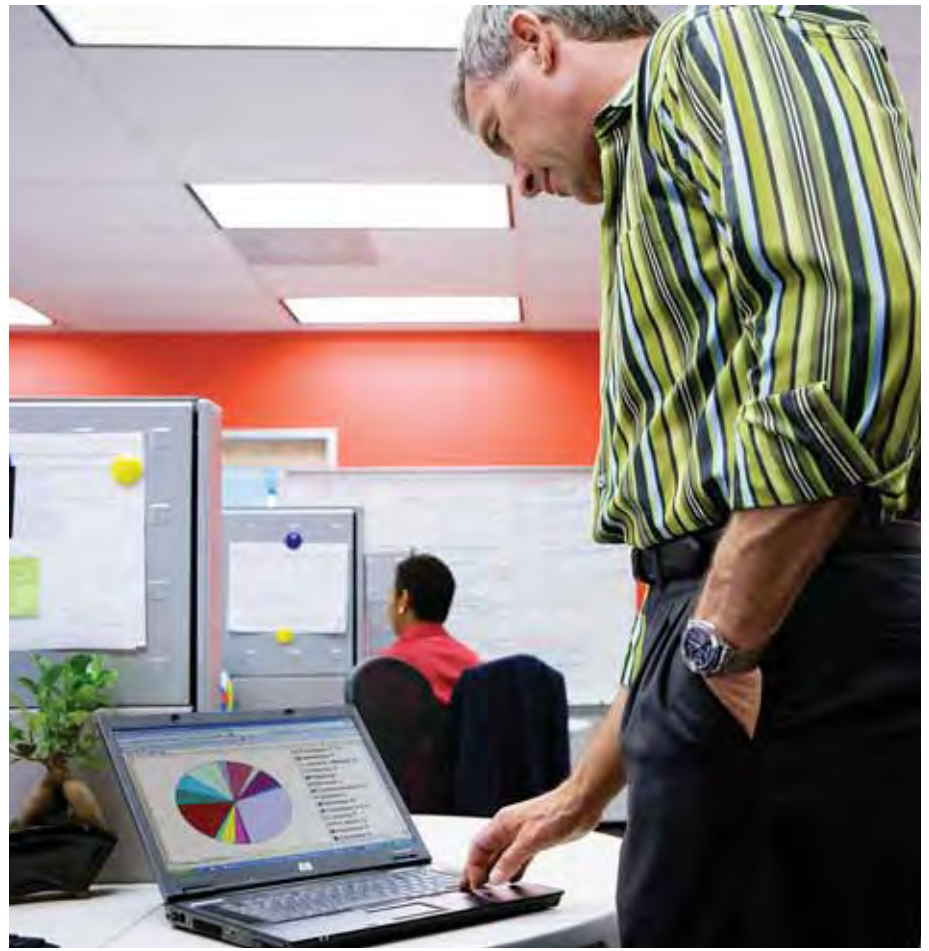
But from a nuts-and-bolts perspective, Unified Communications means bringing together email, conferencing, voice, fax, video and wireless technologies.

In other words, there's probably no system in place today that Unified Communications wouldn't change—and potentially disrupt.

For companies that have PBX technology running the phone system, Unified Communications can seem especially daunting. Standards for interfacing a PBX with messaging and other IT products are subject to vendor interpretation, so a solution must be integrated carefully. And because voice is such an important technology for businesses, there's no tolerance for failure.

George Stiglich is the Unified Communications Leader for HP Services. He's preaching the lessons learned from pioneers taking the communication modernization journey. "Unified Communications is not a 'rip and replace,'" he says. "It's a journey made up of carefully planned technology upgrades to existing legacy infrastructure."

Those upgrades need to take all your employees into consideration, but not all at the same time. After all, does every member of your staff require the benefits of instant



collaboration? “Unified Communications can’t benefit groups that don’t need to collaborate,” Stiglich says. “You put it where it needs to be, with a community of interest that tends to collaborate: mobile groups, remote workers, technical and managerial. While road warriors benefit from Unified Communications quickly, those who always sit in offices and have limited contacts beyond their co-workers tend not to.”

Stiglich also notes that none of HP’s customers have fully migrated to Unified Communications. “There’s no fixed path for the journey to Unified Communications,” he says. “You generally have some elements that you can step into, from planning, to instant messaging, to conferencing and video. All our customers are moving to Unified Communications, but from different directions.”

Many companies find that planning and executing a migration to Unified Communications is no easy task. But HP has the expertise, with over 20 years’ experience in the public and enterprise communications business. The company also has the advantage of a strong relationship with Microsoft, Cisco and other industry leaders paving the way with key pieces of technology.

Why is now the right time to move to Unified Communications? “We have hundreds of customers around the world, for which we’ve planned, implemented and serviced their messaging, voice and network solutions,” Stiglich says. “Our sweet spot is integration around Microsoft with existing

PBX infrastructure, especially Cisco.”

The journey to Unified Communications begins with education, and HP provides workshops that help companies assess the field, and then select what they need. From there, companies can tap HP’s expertise by choosing a technical assessment: what technologies would be required to reach your company’s goal? For a more in-depth perspective on what Unified Communications would mean for your company, you can select a business consulting package, where experienced HP consultants would take a three-to-six week look at your business processes and deliver a balanced recommendation for implementing the first steps of your Unified Communications journey.

Finally, HP can set up a fully functional “proof of concept,” a limited-scale system that would demonstrate the system’s efficacy, and integrate into legacy elements. This could occur in either HP facilities or on your premises.

The net result of HP’s process is a path to Unified Communications that not only occurs at your pace and direction, but does so without disruption to the vital services that you’re using today. From baby steps, you’ll be charging ahead to a more collaborative future.

To learn about HP Services including workshops, assessments, consulting and proof of concepts, and to request contact by a representative, see Unified Communications at: [www.hp.com/go/transform](http://www.hp.com/go/transform)

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# Experiences

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**eDiscovery delivers IT productivity gains 09**

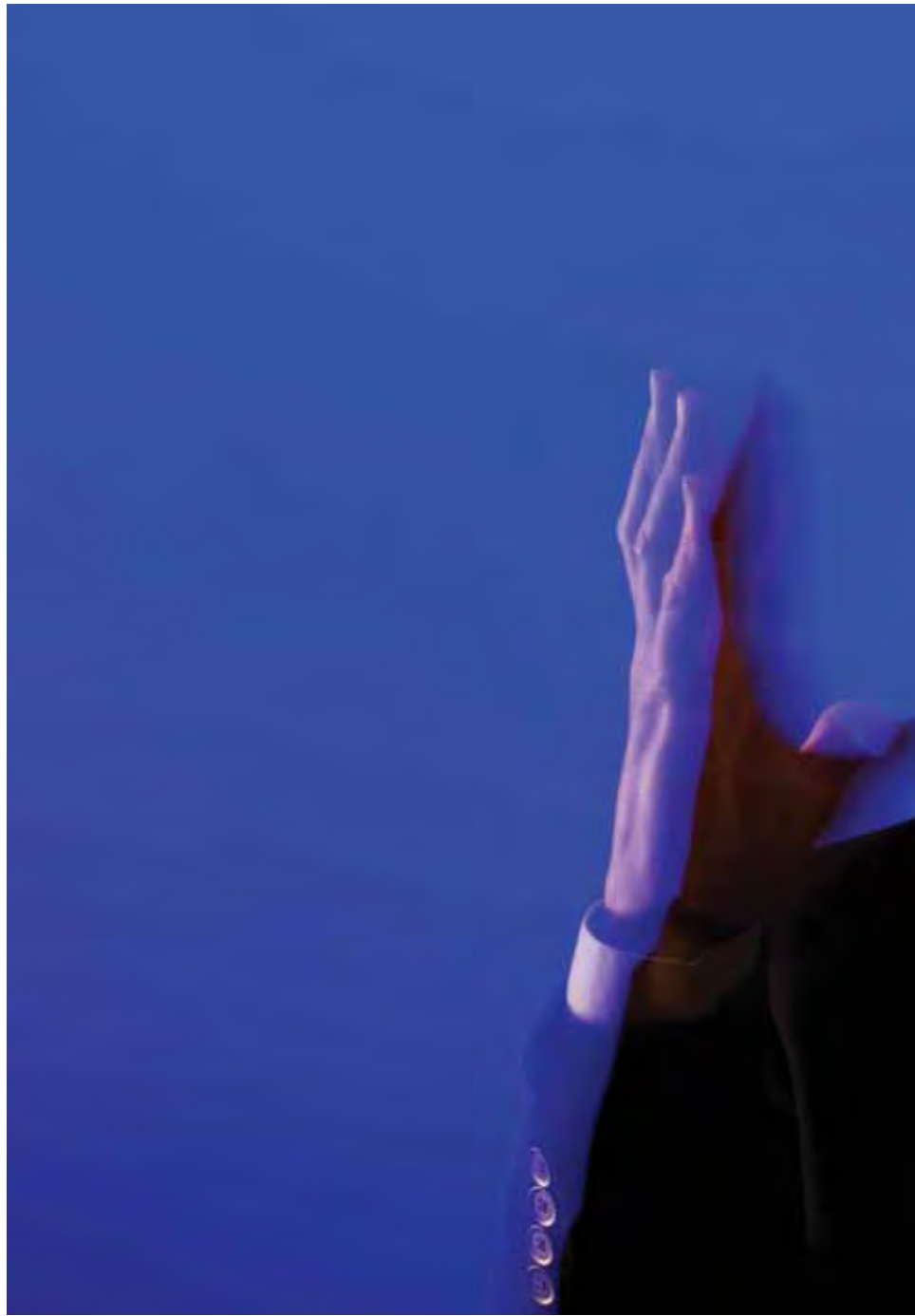
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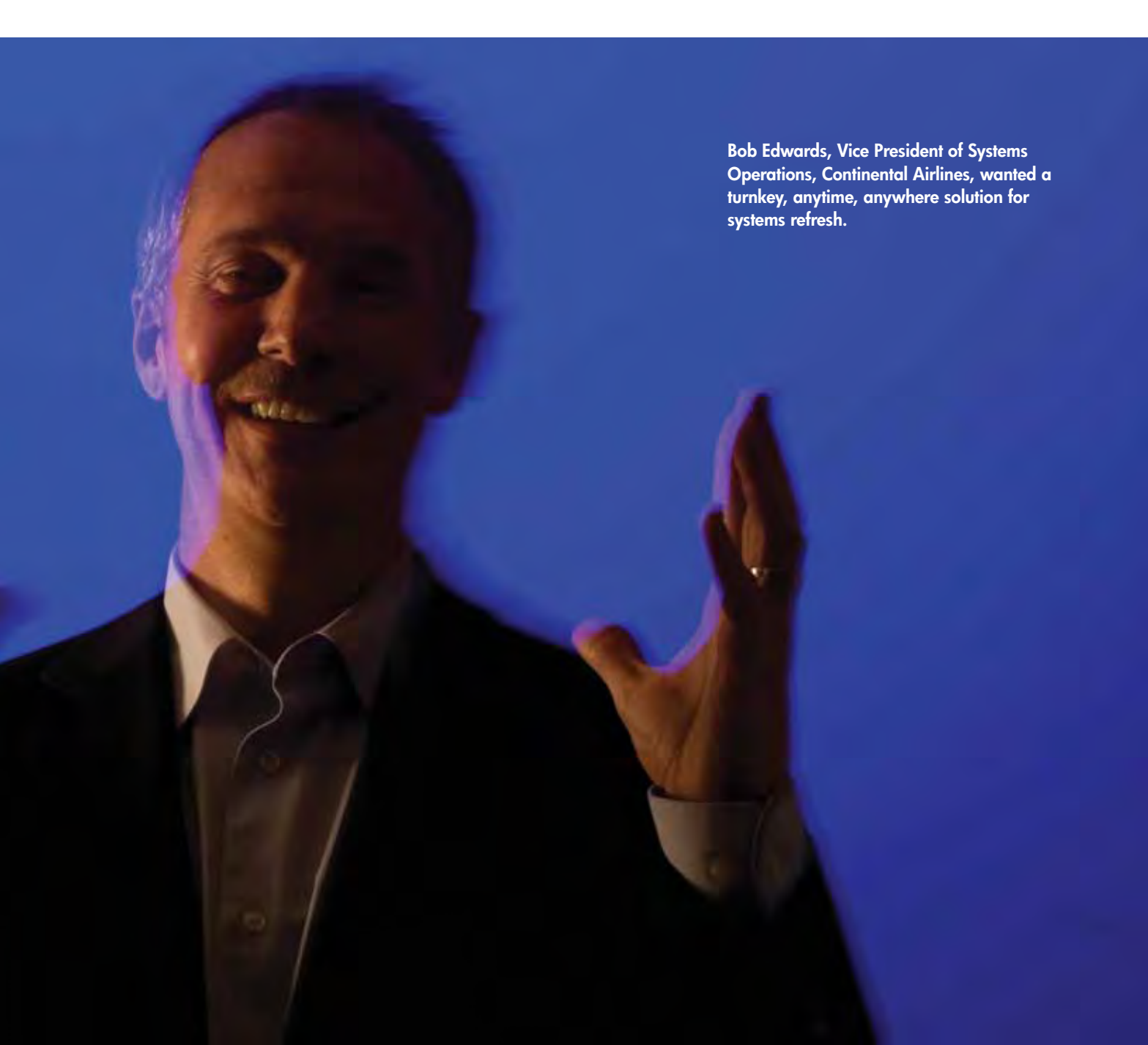


## Teamwork for two

Continental Airlines and HP leverage their collaborative strengths to manage the airline's worldwide technology refresh operation.

An airline is a sprawling, complex enterprise that runs to very tight margins. Unpredictable weather can play havoc with the operation of hundreds of flights, volatile fuel prices change the profit picture hourly, competition is intense and the regulatory burden is massive. Spread those challenges over dozens of different countries with their different languages, cultures and approaches to business, and the complexity multiplies.

Small wonder that information technology plays a vital role in maintaining operations at



**Bob Edwards, Vice President of Systems Operations, Continental Airlines, wanted a turnkey, anytime, anywhere solution for systems refresh.**

Continental Airlines, the fifth-largest airline in the world. Continental operates more than 2,900 flights every day to 144 domestic and 139 international destinations throughout the Americas, Europe and Asia.

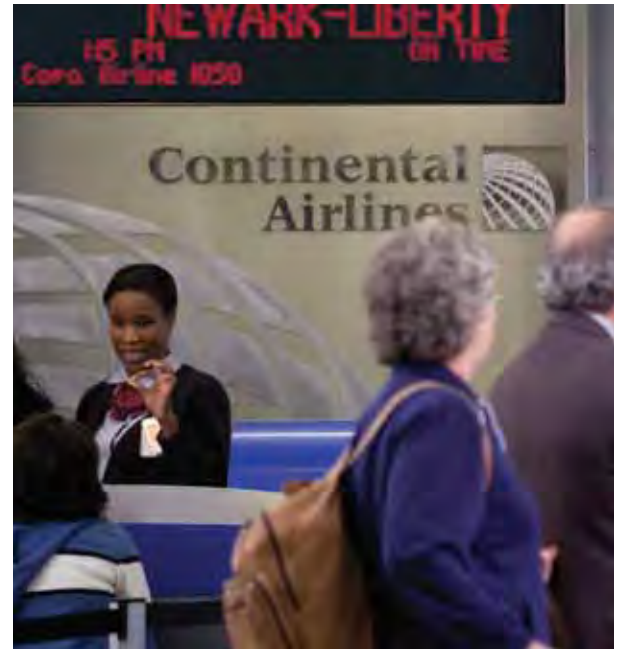
For years, Continental's managed technology services were all handled by a single supplier. To enhance competition, reduce costs and improve agility, Bob Edwards, Continental's Vice President of Systems Operations, decided in 2006 to engage multiple suppliers.

### Terms of engagement

Edwards hired a consultant with experience in arranging outsourcing deals and knowledge of the supplier landscape. With the consultant's input the

managed services to be tendered out were split into seven categories. While the categories were arranged as much as possible to allow small suppliers to bid alongside large ones, Edwards' preference was to choose suppliers who, although they might be awarded only one category, were capable of competing in several categories. That way Continental doesn't get locked into a supplier relationship. And for their part, incumbent suppliers understand that their customer always has an alternative.

HP had the full-spectrum capabilities Edwards was looking for, and he was already familiar with the company as Continental's long-time prime technology provider. The airline relies on HP server blades, having standardized on ProLiant BL460c and BL480c models for



its data centers and non-blade ProLiant servers for remote locations. The environment is rounded out by almost a dozen HP BladeSystem c7000 enclosures populated with BL460s, 60 quad-core and 40 dual-core HP BladeSystem p-class blades, and a mix of HP StorageWorks Enterprise Virtual Arrays with a total capacity of about 160 terabytes. Continental also looks to HP for all of its PCs and laptops.

At the same time the managed services RFP was issued in 2006, a new “bucket” of services—Technology Services and Technology Managed Services—was drawn up by Continental to provide for the staging and implementation of the airline’s PCs, servers, network equipment and UPSs worldwide. As Continental’s hardware platform of choice, HP was the logical selection to provide these services, which embrace 281 airport sites, including hubs (major airports where the airline runs extended operations such as maintenance), and corporate headquarters. The contract involves implementing new systems, plus the associated consulting, imaging and staging that is required.

“We combined the system refresh hardware component with the services,” Edwards says. “That way we get a turnkey solution so that our systems are refreshed on an ongoing basis, whether it’s in a major center here in the U.S. or a ticket counter anywhere in the world.”

### The HP close-up

Continental always looks for suppliers whose corporate culture is a good fit. “If you’re going to have conflict with suppliers, you’re looking for failure,” Edwards says. The collaborative approach proved itself once the contract was awarded. “There was a real give and take while developing the statement of work and defining what HP was going to do for us in the professional services arena. Their service team did an excellent job, suggesting some modifications, other ways of

doing things. It was more than Continental coming in and saying ‘here’s what we want you to do—so what’s the price?’”

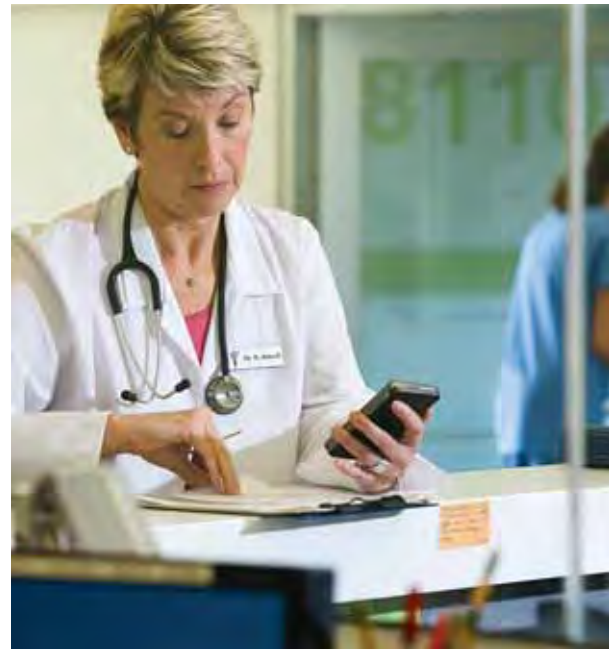
Edwards also attended the HP IT Forum, where he was able to hear HP’s IT staff describing how they run the company’s internal IT organization. “I got some real insights into HP, beyond the service delivery organization and account management teams,” he says. “It was very powerful.”

The best practices frameworks of the two companies are very similar. This was another major factor in Continental’s decision: Edwards notes that the similarity means that the managed services work can be entirely managed by HP. That in turn helps Continental to look at its system refresh processes holistically.

In the past the airline’s own staff would complete all of the work at one site before moving on to the next. HP’s best practices approach allows parallel work to take place at multiple sites, an important advantage when airport authorities have final say over the type and timing of all work. Edwards says that Continental can now plan more efficiently, with a single unified work schedule for all sites.

“The choice of HP for the technology refresh was made due to the depth that HP has, their standardized processes and methodology for deployments of this kind,” Edwards says. “Because of the way we operate at hundreds of airports around the world, HP’s breadth made it a good fit. It’s proving to be a natural extension of our partnership and a choice selection for multi-sourcing IT Services.”

For information on HP Services, the HP BladeSystem and special offers including free books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)



## eDiscovery delivers IT productivity gains

In the healthcare field, huge amounts of data can pose a serious challenge for IT infrastructure. At Roswell Park Cancer Institute, a leading cancer care and research facility, productivity and growth were increasingly being held back by a legacy storage solution. For Roswell's IT managers, the HP Integrated Archive Platform (IAP) was the best medicine for worsening capacity, performance and risk headaches.

"Previously, we only archived email for 30 days," says Joanne Ruh, Roswell's Vice President of IT. "But keeping 30 days of email for the entire organization was a massive drain on our storage capacity. To combat the performance issues, we stored archives on hard drives, which created risk because corporate documents were fragmented from the organization."

With HP IAP, Roswell now has integrated index, search and policy management software built on HP ProLiant servers and StorageWorks storage. The standards-built, factory-integrated platform delivers storage, server, eDiscovery and compliance capabilities in a single, highly scalable, integrated archiving solution, enabling the company to automate the storing and indexing of information and consolidate email, document, print stream and database information in one common, centralized location.

eDiscovery enables litigators and labor relations professionals to take ownership of searching for email files, freeing IT from a time-consuming and arduous task. In addition, using the HP IAP's comprehensive and flexible retention management capabilities, Roswell is positioning itself to avoid fines by extending its retention policies to comply with mandates relating to corporate documents.

"We get a lot of requests for emails in relation to lawsuits, potential lawsuits or claims on the organization," says Ruh. "With a 30-day retention policy, we often couldn't satisfy the search request. If we could access the files, it would take an hour to open the mailbox and then days to read through the content. So even in those cases, depending on our other priorities, we couldn't honor a lot of the requests, which made our dealings with legal somewhat tenuous. Now, with information stored on the HP IAP, access to information takes only seconds."

The IAP captures any message that passes through Exchange and stores it in a WORM on disk format; it is protected even if a user tries to delete it. Every user has search capabilities to find specific information within his/her individual mailbox stores, but otherwise, the solution is transparent to the organization. Super users, including litigators and labor relations professionals, can be granted special access to scan across the entire organization.

"We were spending IT money and time to help to disprove an accusation," says Kevin Kimball, Director, System Applications for Roswell. "IT is now officially out of the business of searching email and content for litigation purposes. Legal has the technology it needs, and we have the freedom to direct our productivity toward tasks with higher business value."

For information on the HP Integrated Archive Platform and special offers including free business and technical books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)

# A stitch ahead of time

## Global interconnect manufacturer uses HP Integrity servers for its SAP landscape.

Sometimes the infrastructure doesn't have to be broken to be ready for a fix. Molex Incorporated, a major international supplier of electronic, electrical and fiber-optic interconnect products, found that out about a year ago. Faced with the impending commercial end of life of the company's HP PA-RISC architecture and a scheduled technology lease replacement, IT managers had to make a decision. What would they replace it with?

Things were going well. The PA-RISC servers running HP-UX were reliable and meeting tough uptime goals. Version 4.7 of SAP's ERP software, housed at company headquarters in Lisle, Illinois, was taking care of business for the system's 9000 users. The single-instance implementation has a global profile, supporting some 59 plants and manufacturing sites in 19 countries. Of the 9000-strong user base, fully 3000 are likely to be on the system at once during peak periods—a tough goal for any infrastructure to meet.

"We're very conscious of the performance of the system, and we try to be proactive about that," says Dave Hubert, Manager, SAP Business System. This means tracking metrics such as CPU utilization, system load and response times, while also analyzing reports generated by the SAP system itself. "We also get subjective feedback from the user community," Hubert says. "We put all of these elements together with our own plans going forward."

The infrastructure was doing the job expected of it, but Molex IT staff knew that it wouldn't last forever. "We were approaching the limits of the HP PA-RISC servers we had in place," says Shaun Kirkman, Manager, UNIX Systems. "Also, we've committed to staying current with SAP, and we had to start thinking about moving to SAP ERP version 6.0." CPU utilization growth stats indicated that the company was reaching the limits of its infrastructure. And the company was facing a Unicode upgrade to its four-terabyte database in advance of its planned switch to SAP ERP 6.0.

Molex had tested HP Integrity servers based on the Itanium architecture earlier in 2006, and were familiar with this successor to PA-RISC. They considered competing systems, but the logic of HP Integrity

servers based on the Intel® and Itanium® processor proved persuasive. "We felt Itanium would get us through the increased utilization levels, with the Unicode variable thrown in and the upgrade to ERP 6.0," says Hubert. "We had all those to think about at one time and we wanted to have it all transparent to the user community."

"One factor was the ease of the migration," says Clayton Hinkle, Manager, SAP Basis/DBA. "With competing systems we would have had to do a full export-import of the database, which would have been a real challenge. With the HP Integrity platform, we didn't have to do a major migration from HP's PA-RISC platform, as the Oracle® database is binary-compatible."

A mixed environment, with live systems undergoing conversion from one architecture to another: sounds like a recipe for disaster. How are those tough uptime goals holding up?

"We just had a record good year," Kirkman says. "We exceeded the uptime to schedule for the ERP production environment in the last fiscal year with a mix of both HP PA-RISC and Itanium servers." Ninety-five percent of the company is now connected with the centralized SAP system, and Molex is finding that the ability to conduct all its data exchange through the ERP program is a huge competitive advantage.

"We've had no problems," says Hubert. "We continue to maintain our performance levels while increasing the load on the system." Although SAP transaction levels have reached 2.5 million dialog steps a day, the response time per request is unchanged.

Future plans include leveraging the added functionality of SAP ERP 6.0. The manager and employee self-service applications are of special interest. These applications give employees and managers access to portals where they can independently complete a range of tasks. Managers can perform budget and staffing functions, while employees can access expense management, training programs and more. "We have to do things very quickly," says Hinkle. "With our SAP R/3 installation we have a good response time, and the performance of the HP Integrity servers helps us to turn things around faster for the business and attain our goals."

For information on HP Integrity Servers and special offers including free business and technical books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)

# HP Integrity keeps up with rapid growth

## With production environments doubling in size every year, new systems—and a new mindset—were priorities for Priority Health.

What do you do when you're facing unprecedented organic and acquisition growth to ensure that IT remains a business enabler? The same thing that Ed Kosten, Manager of Infrastructure Engineering at Priority Health, did. Stick with what you know, but make sure to take advantage of advanced capability and functionality.

"My goal is to maintain consistency for the organization, regardless of how growth is impacting the infrastructure," says Kosten. "It's IT's job to deliver the service levels that users expect and to achieve stellar application availability. Staying with HP and upgrading to the HP Integrity platform allowed us to do that."

Priority Health's Oracle® database platform supports mission-critical business applications. The environment consists of custom applications, financials, database processing and Web sites, making unwavering performance and continuous availability critical priorities.

The company delivers IT services out of its two primary data centers. In addition to improving the performance of the Oracle database, integrating blades into the data center helped Kosten overcome space issues. In his view, having a smaller server makes sense from a cost perspective, as it reduces demand for memory, capacity and resources.

Priority Health is also currently investigating how to make the most of its HP Integrity blade environment from a power perspective. Kosten sees significant opportunities for savings and efficiencies in power and cooling, which is a critical priority for the organization.

"We know the move has been successful because of the lack of feedback from the user community," says Kosten. "But going beyond that, adopting HP Integrity has facilitated continuity in our IT approach. We're able to use technology consistently as a direct business enabler by being efficient and supporting the business in its aggressive progression."

Kosten credits HP with its ability to understand Priority

Health's business and deliver solutions that support it. Historically, the company has been a HP shop, relying on servers, storage, the HP-UX operating system, virtual machines and several other solutions to maximize its environment. Kosten highlights Priority Health's solid history with HP and the advantages of having a single point of contact for IT hardware, services and support.

"When we were considering the replacement of our HP 9000 environment, staying with HP and upgrading to HP Integrity was a natural progression. It was very important to us to maintain the service we were used to, so we didn't really look beyond HP for the solution," says Kosten.

The new infrastructure is helping to change the dynamics between IT and the business it serves. In the past, most initiatives were driven out of IT, with little input and understanding from the business. Now the business is beginning to see the value that IT delivers and how technology can further support the business.

"We're definitely moving away from a break/fix mentality toward being a true enabler of the business," says Kosten. "With the new infrastructure, the business is seeing the value in enhanced performance, reliability and availability. So it gains confidence that we can support both organic and acquisition growth as the business expands its geographies, product portfolio and market penetration."

Priority Health's 2007 acquisition of Care Choices from Trinity Health is an excellent example. Care Choices had no IT essence of its own, so Priority Health had to absorb the fulfillment into its own infrastructure.

With no data, no history and no direct correlation to apply to the environment, there was little in the way of standards typically associated with capacity planning. So Priority Health's infrastructure had to be ready for anything.

"To help the business transition smoothly from a technology perspective in instances such as the one we experienced with the acquisition of Trinity Health's Care Choices, we need to be prepared. And our HP infrastructure gives us the confidence that we can handle anything the business throws at us," says Kosten.

For information on HP Integrity Servers and special offers including free business and technical books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)

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## The big picture

Data center transformation is more than a matter of technology: it's a question of getting people, processes and strategy right, and finding partners who cover it all.

Acquiring new IT systems and applications is a normal part of doing business. But if the process is poorly controlled, it can create serious problems in the data center. As disparate technologies are thrown into the mix, it becomes harder to connect systems and more and more capacity goes unused. Eventually it becomes difficult to add new systems, and infrastructure becomes a hindrance rather than an enabler.

"It's not just about servers or storage or virtualization," says Barry O'Connell, Director of HP Data Center Transformation Services. "It's about the whole thing, either because of 'technology sprawl' or because the governance processes are broken." When that happens, he says, "No one controls what's coming in or how the data center sets standards."

Competitive conditions also place increasing strain on the data center. Costs have to be minimized. Business continuity is increasingly important as customers demand 'always-on' access to services. Relocation can be required to exploit better pricing for space, lower energy costs, better transportation or telecommunications, or more readily available technology skills. And every enterprise seeks to automate as many processes as possible, so skilled data center staff can work on service improvement.

### Mastering the mix

"There's a lifecycle customers go through in data center transformation," says O'Connell. "HP can help at any stage, if they're starting with a blank sheet of paper, if they've done the strategy work and need help designing the new data center, or if they've done all that and just need help with the heavy lifting—implementing solutions, reconfiguring hardware, even moving the boxes."



HP's perspective has been broadened by the company's own data center transformation. The three-year process embraces data center consolidation, platform consolidation and standardization, and large increases in processing power, storage capacity and network bandwidth. HP has consolidated 85 global data centers into three data center pairs, reduced business technology operational spending to two percent of revenue, cut energy consumption by about 60 percent, and halved networking costs. But the real transformation has come in enabling faster worldwide application deployment and integration of new acquisitions, increasing responsiveness to changing demands, improving quality of service and boosting business continuity and security.

In addition to applying what it has learned within its own data centers, HP recently unveiled HP Critical Facility (see article on page 14), Data Center Consolidation, and Virtualization services. The new services enable customers to optimize the use of energy and space resources, offer transition support for the data center consolidation process, and guide them in creating virtual infrastructures.

## The big switch

The full extent of what a data center transformation can do was demonstrated when Canada-based Mitel Networks, a global leader in Voice Over IP (VOIP) business communications, had to change to stay ahead of a rapidly changing market and to evolve from a traditional private branch exchange (PBX) telecommunications equipment manufacturer. Moreover the looming acquisition of Inter-Tel, a provider of PBX and key telephone systems, was going to more than double the size of the company, promising extra strain if systems weren't flexible enough to scale quickly while still delivering essential services.

Even without these changes, Mitel's infrastructure was increasingly a drag on the business. It took six weeks to deliver more processing or capacity for critical applications. The relationship between business and IT was strained due to IT's slow response times and limited capabilities. And capacity utilization was a huge problem.

"When we acquired servers, we would buy extra capacity to handle expected future growth," says David Grant, Mitel's Data Center Manager. "Initially, that extra capacity would sit unused. At the end of the box's life cycle, we'd ramp down usage again, so once again the server's capacity would be underutilized. We were essentially wasting computing resources."

Mitel's strategy: consolidate the data center by reducing server count, and at the same time adopt a virtualized infrastructure. Mitel partnered with HP Services, consolidating from 12 servers to two—and halving the number of processors in the boxes. Mitel also moved to a virtualized environment, adopting HP StorageWorks Enterprise Virtual Arrays (EVAs).

The new architecture has reduced annual operating expenses by \$300,000 while reducing staff demand by almost one third. The HP Virtual Server Environment enables Mitel to cut software licensing costs, but the company was also able to add several new services without needing new servers. IT governance is now backed up by end-to-end visibility over new services delivered in the virtualized environment.

It all adds up to a company that's now well positioned for the Inter-Tel acquisition. "We're going to be consolidating and integrating the two companies' infrastructures, essentially transforming our data centers," Grant says. "It's the vision we had for our architecture: to be able to handle explosive growth whether through acquisition or increased sales."

"We have services that will help no matter what a customer's entry point is," says John Aiken, HP Data Center Transformation Practice Principal. "We can tell where customers are and what part of the stack is going to give them the biggest return in the short term, but also ensure it's part of a longer-term vision that transforms what they have today to a next-generation data center."

For information on HP Data Center Transformation Services including the HP and Mitel transformations, and special offers including free business and technical books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)

# Building data centers for the future

HP adds critical facilities planning and design to build the data centers of tomorrow.



Corporate data centers, the heart of a business's IT capabilities, are expected to see increased strains in the coming years as power limits and a shrinking talent pool bring about risks, retrofits and relocations.

According to AFCOM's Data Center Institute (DCI), by 2010 most data centers will need to relocate or outsource at least some of their applications. Similarly, the organization has predicted that between 2006 and 2011 more than 90 percent of all companies will have had operations halted by power failures. All the while, the DCI notes, the number of senior level technicians and management data center professionals will have shrunk by 2015 to a mere 65 percent of 2006 levels.\*

Recognizing the challenges businesses will face in striving to avoid service disruptions and keep data centers running efficiently, HP in November 2007 announced it was expanding its data center services capabilities through the acquisition of EYP Mission Critical Facilities (EYP MCF), a consulting company specializing in strategic technology planning, design and operations support for large-scale data centers.

"Data centers have become the central nervous system of corporate and public sector organizations, and they are in crisis," says Rick Einhorn, President and Chief Marketing Officer of EYP MCF.

Einhorn notes that most data centers that were built

before 2001 are now either obsolete or at risk of becoming so, as new technologies tax existing infrastructures and federal regulations require strict redundancy and backup.

Einhorn says four fundamental considerations must go into the planning and design of 21st century data centers: operational continuity, lifecycle costs, environmental impact and IT effectiveness.

Today's data centers have zero tolerance for failure or shut-down due to maintenance, their utility costs account for the lion's share of operational expenses, and they produce 25 times more CO<sub>2</sub> emissions and use 25 times more water than a typical commercial office building, Einhorn points out. From an IT efficiency perspective, proper attention must be given to power usage effectiveness (PUE), a measure of how much power is being provisioned specifically for computer equipment, and how it is affected by reliability levels, climate, systems and equipment.

"Server capacity is being increased on a daily basis, which is driving intense needs for power and cooling. Power accounts for half the cost of a data center, so this critical infrastructure need is driving the demand for new design concepts," Einhorn says.

## Deep expertise

EYP MCF brings facilities planning, design and operational support capabilities to HP's existing Data

“It seemed logical for us, as the industry infrastructure leaders, to join HP, as the computing and information technology leader.”



Center Services portfolio and cost-saving power and cooling solutions, and has developed proprietary tools for benchmarking and modeling facilities.

The firm’s Critical Facilities Consulting (CFC) offering includes technology and facilities assessment, master planning and program management. Working closely with the customer’s CTO, CIO or Director of Information Technology, the CFC team develops a strategic and tactical plan to help decide, among other things, how many data centers are needed, their locations and accessibility, level of redundancy, topology, migration requirements and costs.

EYP MCF also offers Critical Facilities Design (CFD) services for data center projects, whether greenfield or upgrades. Through extensive communication with all the stakeholders in the data center—and all businesses that will occupy the facility—potential locations are evaluated, and design concepts are developed and submitted to contractors, with reliability modeling, engineering review and detailed cost estimates.

Finally, Critical Facilities Assurance (CFA) provides ongoing guidance and testing. EYP MCF performs startup testing, consulting to optimize facility operation and performance for the 15-year lifecycle of the typical data center, and management of equipment vendor maintenance programs.

As extensive as these services are, Einhorn says

customers—the majority of which are Fortune 500 companies—were asking for more. They wanted a single point of contact, a one-stop, end-to-end shop to handle everything involved in building and transforming a data center. That demand made joining an IT leader seem like the next logical step.

“We’ve been seeing the convergence of information technology and facilities become a necessity over the past three to four years,” he says. “So it seemed logical for us, as the industry infrastructure leaders, to join HP, as the computing and information technology leader.”

Einhorn says that by combining the two companies’ IT and facilities expertise, HP and EYP MCF can now help businesses deal with all their data center challenges today and into the future.

“By teaming with HP and understanding what its technologies are, as well as how they are being developed, we can look ahead to help our customers plan infrastructure requirements for their data centers down the road.”

For information on EYP MCF services, a white paper *The New Reality of Balance and Optimization in Planning Green Data Centers*, and free book *Thermal Guidelines for Data Processing Environments* available in limited quantities, see Data Center Transformation Services, and Special Offers at: [www.hp.com/go/transform](http://www.hp.com/go/transform)



## Up to date, up to speed

### How a three-way industry partnership helps to cut the specter of modernization down to size.

When San Francisco's famous Bay Area Rapid Transit (BART) system decided to move away from mainframe computing, its decision reflected a growing trend. BART's objectives: new applications, automated processes, and a more flexible infrastructure with integrated, accessible applications and information, enhanced disaster recovery and business continuity safeguards, and an easier path for future upgrades.

The idea is catching on. In a 2008 study, Penn, Schoen & Berland Associates found that 57 percent of those surveyed were planning to move all or some applications off mainframes.\* But the thought can be intimidating. How can you modernize without disrupting the business? How do you choose new infrastructure? Where can you find resources, tools and people with modernization experience to help you take the first steps?

In response to the growing need, HP has helped to found the Application Modernization Initiative (AMI), a three-way industry partnership between HP, Oracle® and Intel® that helps customers identify applications that can be modernized from a legacy mainframe environment onto more modern open infrastructure. HP participates in AMI through the amalgamation of two related programs: the Mainframe Alternative Program, which helps enterprise customers better understand how to transition from mainframe systems, and the Application Modernization Business, which supports the modernization of legacy applications.

"There are three reasons people move away from mainframes," says John Pickett, Manager of the HP Mainframe Alternative Program. "The first is agility. Legacy



applications on a mainframe just aren't as agile as those running on an open infrastructure. Being unable to quickly adjust your mainframe applications to respond to competitive pressures disrupts the whole business."

The second reason, Pickett says, is cost. Mainframes are expensive, and even the new processors to help them cope with today's workloads can cost hundreds of thousands of dollars. Finally, he says, mainframe skills are on the wane. IT managers are facing a shortage of the skills required to support and manage legacy applications and systems. Modernized infrastructures don't face these challenges.

## The modernization map

HP's contribution to AMI includes Application Modernization Services together with HP Integrity servers, working within the Virtual Server Environment (VSE) Reference Architecture. The HP Integrity servers run on Intel® Itanium® processors. Oracle's Grid Computing Platform and SOA capabilities delivered through Oracle Fusion Middleware (OFM) are also a vital element, and includes Oracle® Database with Real Application Clusters and Oracle® Enterprise Manager/Grid Control.

"In making all of these elements work together, HP, Oracle and Intel offer a complete, integrated modernization roadmap," says Sumanth Tarigopula, Director of HP Modernization Services. "We call it the 'integrated stack.' Risk is removed because our testing and validation have been done ahead of time, rather than at the customer site."

In BART's case, Oracle's PeopleSoft Enterprise software provided a quick return on modernization, meeting most of BART's 2600 software requirements 'out-of-the-box,' with minimal customization. BART chose to support the software with an infrastructure based on HP Integrity servers.

"We like the architecture and future roadmap of HP Integrity servers, Intel Itanium 2 processors, and the HP-UX 11i operating system," says Robin Cody, BART's Department Manager of Information Technology. "They will provide us with more capacity, scalability and unlimited growth potential. They have allowed us to bring in applications that couldn't run on a mainframe and rebuild BART's business."

## A step-by-step approach

Customers considering modernization know it has to be done, but the scale of the work can still be intimidating. That's why the AMI team sits down with the customer to work out which part of the business will benefit the most.

AMI offers five approaches to modernization, based on the unique requirements not only of each customer, but of each system. Modernization may mean replacing a legacy application with a standardized one. Or perhaps it's time to simply retire the application, because it just isn't being used or is redundant.

The third option is re-hosting: here hardware is identified as the performance barrier, and the application is moved to a more efficient infrastructure. The fourth approach is to re-engineer a failing application to perform as required. Lastly, legacy apps can be retained as is while other priorities are addressed. This strategy helps to break modernization down into straightforward, understandable procedures, and the synergy contributed by the AMI partners working together makes the process faster, simpler and more effective.

"Customers who know they need to modernize often hold back because they're not sure how to move forward," Pickett says. "That's why it's such a good idea to combine HP's infrastructure and services with Oracle's enterprise capabilities and the processing power of Intel. It gives the customer a broad range of infrastructure, tools and services, and that breadth frees the team to focus on what the customer needs."

To download a white paper *The Application Modernization Initiative* and for special offers including free business and technical books available in limited quantities, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform)



## Making multi-core mean more

**Multi-core processing promises substantial jumps in performance, but unless you optimize your applications for it, they might even run slower.**

“Moore’s law has traditionally allowed processor performance to double about every two years through increases in clock speed, without dramatically increasing power consumption,” says Dave Korf, HP Multi-core Marketing Program Manager. “But now, even small increases in clock speed come with large increases in power consumption. Adding cores has become the favored approach to increasing performance: it boosts aggregate compute power without demanding a huge jump in power consumption.”

However, applications that aren’t optimized for multi-core systems may actually run more slowly. “We’ve already seen this on some benchmarks in our labs,” Korf says. “If the application isn’t optimized to share and use resources, such as memory bandwidth, between the cores, the performance increases you expect with more cores can actually be limited by the extra demand placed on those resources.” In other words, there’s an “IT train wreck” in the works if enterprise applications aren’t optimized ahead of the curve. But if you take purposeful action with your applications now, Korf says, you’ll get the full benefit of the compute power becoming available.

Dual-core processors are already standard, with quad-cores poised to assume the leading role. Eight-core and many-core (16 and up) will become the norm in a few years. While the technology promises dramatic gains in aggregate computing power, enterprises must learn how to work with the new systems to enjoy those gains.

### Known quantities

HP has substantial internal experience in multi-core technology, with its own balanced dual- and quad-core systems that take full advantage of the aggregate computing power now available. In addition, the HP Message Passing Interface Library is optimized for both shared memory and cluster systems on HP ProLiant and Integrity servers, and multi-core application scheduling is accommodated within HP’s XC Linux® cluster software. HP also offers Unified Parallel C (UPC), a development environment that has been available for several years and offers extensions to the C compiler.



It's a strong legacy, but HP recognized the need for a broad-based platform to provide resources to help the whole industry address the challenges of multi-core processing. That's why it has announced the HP Multi-core Optimization Program, part of the HP "Catalysts for High Performance Computing [HPC] Innovation" initiative, which drives adoption of emerging HPC technologies through advanced development projects and customer collaborations. Taking its place alongside other Catalysts for Innovation projects in the areas of computation, data management and visualization, the Multi-core Optimization Program addresses the major challenges that face application developers in reworking existing applications, or writing new ones, to run on multi-core processing systems.

Multi-core optimization is a matter of doing the right things with advanced new technology. But the HP Multi-core Optimization Program comes into its own as a collaborative industry-wide project that aggregates HP's resources with those of a range of technology partners including research institutions, strategic HP customers, hardware partners and development tool providers. These partners together with HP provide tools, technologies and best practices that application developers can use in optimizing for multi-core processors, such as compiler suites, multi-core performance analytics, business intelligence software, multi-core development platforms, mathematical algorithm libraries and more.

### Tools for the job

HP's Multi-core Optimization Program Toolkit serves as a clearing house for information and resources to help with building, testing, tuning and deploying industry-standard multi-core applications. Nearly two dozen partners already contribute, with more coming on-stream.

The Toolkit sorts multi-core issues into categories such

as application development and compilers, performance and tuning tools, job scheduling and libraries, and more. The Toolkit Web site is subdivided according to these categories, and within each category users will find links to HP, partner and open source products and tools. There is also a section on best practices for each category, offering white papers, efficiency processes, demos and multi-core 'do's and don'ts.' Topics include power consumption, application performance on HP servers that use multi-core processors, measuring power against performance as cores are added, and more.

HP tests multi-core performance with each of its partners to confirm that products perform in multi-core systems, and also does interoperability testing so customers know that products and systems will be compatible. In support of the testing program HP has authored a Multi-core Toolkit Taxonomy white paper, to help partners optimize their system testing work.

Future plans for HP and its multi-core partners include a reference model for the development environment, research into non-traditional uses for multi-core systems, and dedicated cores designed for better security, ease of management and other mission-critical roles.

"Enterprises may not see the multi-core problem just yet, but they will when they start going beyond quad-core," Korf says. "The real issue is how to get ready. HP's approach is to address the issue holistically, with a single source of information and resources to cope with the challenges of optimizing applications for multi-core processors."

To review the Multi-core Optimization Program Toolkit, visit: [www.hp.com/go/transform9](http://www.hp.com/go/transform9). For information on the Catalysts for HPC Innovation Program, visit: [www.hp.com/go/transform10](http://www.hp.com/go/transform10)

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# Technologies

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## Securing Web apps through a lifecycle approach

Web applications have quickly become the norm for organizations seeking to provide their customers, partners and employees with the opportunity to do business anytime and from anywhere. But in recent years those applications have also become the most frequent source of security concern. Experts say the majority of security attacks today are aimed at vulnerabilities within the application layer, as hackers seek to avoid firewalls and traditional security techniques. In today's intense regulatory environment, these vulnerabilities expose businesses to significant financial and legal risk.

The cost of such security breaches is staggering. Experts suggest a single breach costs a company an average of \$4.8 million, or \$182 per lost record. And, the average corporation—tasked with the daunting task of concurrently protecting its information while opening itself up to partners, customers and employees—still doesn't have the necessary mechanisms in place to secure against potential loss from Web application vulnerabilities.

Caleb Sima is Chief Technology Officer and founder of SPI Dynamics, a firm recently acquired by HP for its ability to help solve the Web application security dilemma. Sima started his career as a white hat hacker, where he discovered Web application vulnerabilities that would become his impetus for developing SPI Dynamics.

"I found a method via the Web site, or Web application, that hackers could use to easily break into 100 percent of a company's resources, because nobody was paying attention to security around that application," Sima says. "So I created a software product to automate the methodology I used for companies to identify security holes in Web applications."

Sima says the most common exploits are attacks like SQL injection or cross-site scripting (XSS) and exist because of the architectural components needed to make a Web site available and useful to the public. But he has a solution. He advocates a lifecycle approach to application and security testing: applications

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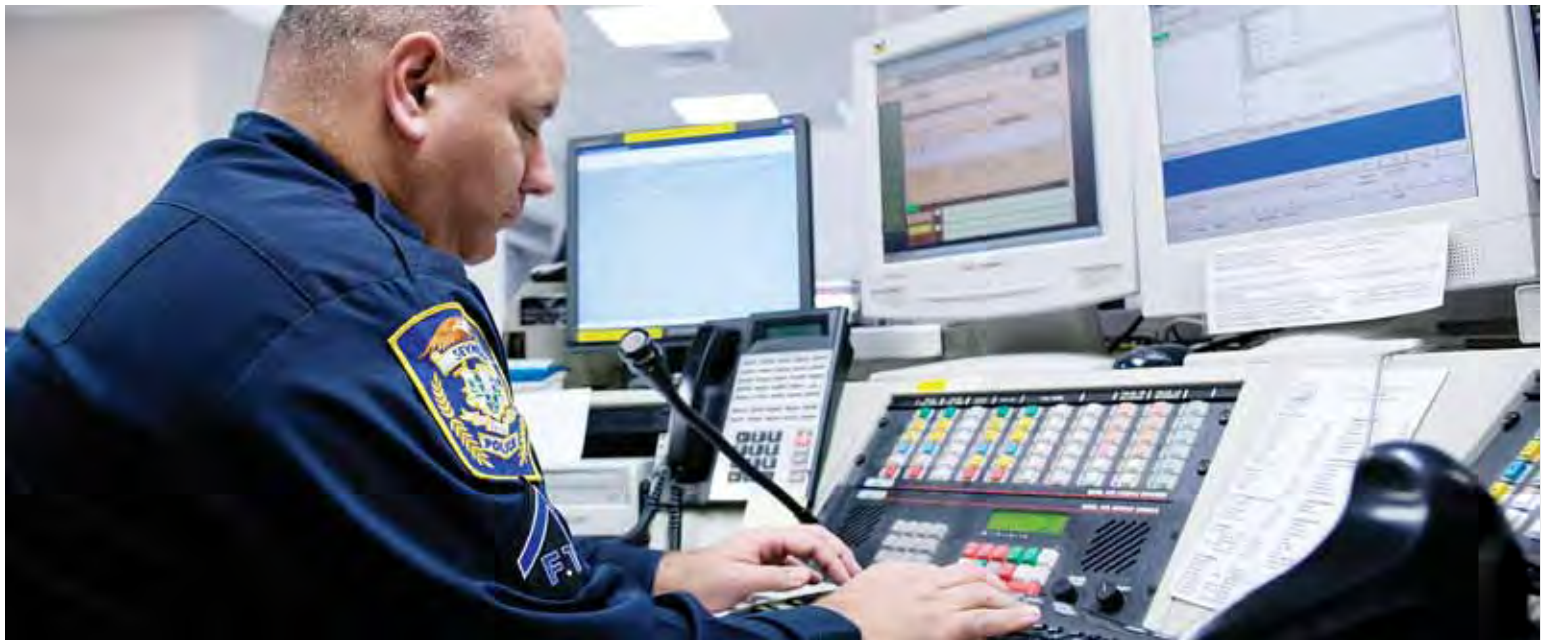
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built using secure coding practices, tested in QA for security vulnerabilities and continually monitored in production.

“Bake security into the application, don’t sprinkle it on top,” Sima says. “The key is to not only discover security vulnerabilities, but to take a holistic approach to fixing and continuously preventing them.”

Sima says that using traditional security tools, while successful in the past, is no longer adequate to guard organization resources. The volume of Internet-based attacks being made on business today is pushing these old security methodologies, like firewalls and intrusion detection systems, to obsolescence.

“Think about how useful your home alarm system would be if you were surrounded by 500,000 burglars all trying to break into your house at once,” he notes. “It’s useless when it goes off every minute. That’s the current state of intrusion detection.”

Exacerbating this dilemma is the number of “false positives” found by traditional security tools during both application development and once software is in production.

End2End VAS ApS, a European-based mobile content and information managed services provider, found traditional tools for security testing wasted enormous amounts of time when used for stringent quality assurance and testing required for the Content Retail Solution (CRS) that acts as the bedrock of its business.

“These tools would simply collect banner information and ‘shout’ vulnerabilities at us, simply because we were running Apache, or whatever application, as part of the project. Too many times, the vulnerabilities they ‘found’ just didn’t exist,” says Jes Beirholm, Director of Information Security at End2End.

Beirholm turned to HP WebInspect software to conduct its risk-based testing. “It’s a question of having tools that probe for the right things, and verify actual vulnerabilities in an intelligent way,” he says.

According to Beirholm, End2End has been able to stay ahead of potential security issues while discovering newfound efficiencies for easier, more proactive development of its Web applications. It’s also helped End2End better communicate its commitment to security to its customers, in part, by presenting WebInspect as a critical component of its risk-management process.

“WebInspect has given us the ability to go the extra mile with our security efforts. In the past we would have found potential security issues, but without the help of WebInspect we weren’t able to resolve such issues efficiently.”

Forward-thinking organizations, like End2End, are now viewing their Web applications as portals to corporate assets and are vigilantly and proactively guarding them against malicious attacks by making security and hacker protection part of the functional and technical requirements of their applications.

Says Sima, “By taking a lifecycle approach to Web application security, organizations can free their security professionals from simply putting out fires, knowing their applications are designed from the ground up to protect the assets and information of their employees, partners and customers. This will lead to higher returns from e-business, greater customer satisfaction and an improved bottom line.”

For an HP white paper on Web application security and information on HP security services, visit: [www.hp.com/go/transform](http://www.hp.com/go/transform). For free product trials and other resources see the HP Application Security Resource Library at: [www.hp.com/go/transform11](http://www.hp.com/go/transform11)



## Turning insight into action

**Knowing what you've got and how it's working is an advantage: being able to act on that knowledge is enterprise agility.**

Today, IT infrastructures are operated within increasingly tight tolerances. Cost controls require fine-tuning the process of acquiring and deploying new assets and optimizing them once they're implemented. IT has to be aligned with the goals of the business, and above all, the services that IT delivers to the business have to be dependable and available. Unplanned downtime can cost millions of dollars an hour.

Remote management is a common pain point, especially for customers with multiple, often remote, sites. Enterprises also find that new software deployments are time-consuming and complex, and are looking for something simpler. New demands have also emerged recently. "Companies are starting to feel that power is a limited resource," says Brad Kirby, ProLiant Management Portfolio Marketing Manager for HP. Managers now have to know how much power is available, and how many servers they can load onto a circuit or place in a rack. Without clear information, they frequently wind up over provisioning to be on the safe side.

Another new concern is virtualization sprawl. It's so easy to create virtual machines that the management piece can be overlooked as the VMs multiply. "A virtual server needs to be managed just like a physical server," Kirby says. "You need a consolidated toolset that allows you to associate virtual infrastructure with physical infrastructure and carry out management functions, such as deployment, health and performance monitoring and patching to be able to react or recover quickly from potential service disruptions."



A consolidated management toolset is the idea behind HP Insight Control Environment (ICE)/Insight Control Environment for BladeSystem. Insight Control is a suite of critical diagnostic and integrated management tools for HP ProLiant and BladeSystem infrastructure. The software automates processes to deploy, maintain and manage HP ProLiant and BladeSystem servers. Capabilities include power measurement, capping and regulation, server asset management, warranty and service contract reporting, server health and performance monitoring, and rapid image or script-based server deployment. Virtual and physical servers can be managed together, and server vulnerabilities can be detected and software patches deployed.

“Gaining Business Value and ROI with HP Insight Control,” an IDC survey conducted in February 2008, found that users were able to realize a 402 percent ROI from single elements of Insight Control, and up to 563 percent on the full suite, with the payback period varying from 6.1 to 9.6 months. IDC also identified faster response to incidents, decreased downtime, an increase in the amount of infrastructure that can be efficiently handled by a single IT staff member, and an improvement in the ratio of time spent maintaining systems to time spent improving them.\*

These are the metrics that mean the most to customers. Willbros Group, Inc., a leading international contractor serving the oil, gas, power and refining and petrochemical industries, implemented HP’s Systems Insight Manager (SIM), part of ICE, four years ago, as it standardized on HP hardware. “We have servers in nine locations, but only three dedicated server engineers,” says Ian Morrison, Willbros Director of IT Operations. “It would have been impossible to keep an eye on everything without SIM.”

At Cnetics, which has been an HP reseller for more than a decade, the hardware management capabilities of Insight Control are a critical part of server virtualization, a technology Cnetics is increasingly involved in deploying for customers. ICE proved its worth in a recent virtualization project for a Georgia government agency, according to Cnetics Solution Architect Dan Gunyon. “Completing the new virtual server architecture is a complete set of management tools such as HP Insight Control infrastructure management software, which has allowed the agency to achieve an 80 percent reduction in server admin downtime, a reduction from five hours per server each month to only one hour,” Gunyon says.

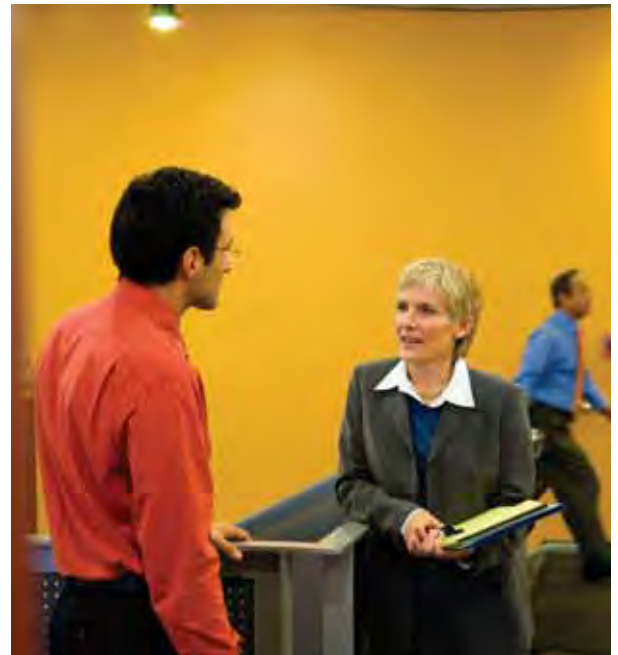
“We’ve done high-availability disaster recovery demos,” Gunyon adds, “and hardware management is one of the biggest components. Obviously if you don’t manage the hardware, it doesn’t matter what kind of disaster recovery you have: it won’t work.” He also relies on the advanced power management tools that are a big part of ICE. “Companies don’t feel they have the ability to analyze power data and these tools are definitely helping with that.”

In the case of Riverside Casino and Golf Resort, near Iowa City, Iowa, ICE supported a massive greenfield deployment of HP ProLiant and BladeSystem technology, a StorageWorks SAN and VMWare virtualization software. The work was undertaken by Vital Support Systems, a leading solutions provider based in Urbandale, Iowa.

Riverside had a fairly complex mix of virtual and physical machines, along with high demand for uptime, security and disaster recovery, among other factors. “They would have needed several different tools to monitor and manage all their systems, and with Insight Control they can do it all with one pane of glass,” says Bob Chaplin, Vice President of Systems Engineering for Vital Support Systems.

“It all comes down to your ability as an IT organization to control your time and resources,” Kirby says. “Customers spend as much as 70 percent of their time on maintenance. Insight Control allows them to spend less time on that and more time and energy on building for the future.”

To download the IDC white paper and additional details on the cases referenced above, and for information on HP ProLiant Essentials and Insight Control implementation and support services, see Server Management at: [www.hp.com/go/transform](http://www.hp.com/go/transform)



## Virtualization makes life easier

### **Managing virtual storage is dramatically easier than a traditional array.**

What would you rather use to hold water: a 12-foot-by-24-foot swimming pool, or its equivalent volume in 8-ounce drinking glasses? We'll save you the math. At four feet deep, you'd need 137,500 glasses to hold the same volume. Now imagine you were in charge of storing water. Big tanker trucks pull up, and they want you to take their loads. Would you rather put it in the drinking glasses, or the pool?

This is the problem that IT administrators face every day. They are using hard drives to contain the flood of data that flows into the system, and have been faced with tying them together into fixed-size arrays; combine a few drives here to make up a terabyte, a few there for another couple terabytes, and so on. But when the needs of the system overwhelm that fixed size, what do they do? Take it all apart and make a larger array, with all the labor and risk of data loss that entails.

Instead, wouldn't it be great if you could just add all your drives to a single pool, and use software to assign parts of that space to different uses? This is the reality of virtualized storage, and it's here today.

Calvin Zito is HP's Worldwide StorageWorks Category Manager. With the introduction of HP's latest—and lower-priced—storage array, the HP StorageWorks EVA4400, he says this technology is reaching a larger audience. "EVA uses only the space it needs, when it needs it. You save money because you end up buying fewer hard drives than a traditional disk array, and you're using that capacity at closer to 100 percent."

For companies that are using non-virtualized disk arrays, Zito says, there's often surprise at how easy virtualized disk arrays like the EVA are to manage. "We brought customers to Houston to do some common management tasks on an EVA4400, and then we asked them to do the same tasks on an EMC [non-virtualized disk array]," Zito says. "They were amazed at how easy it is to manage the EVA." One of the test subjects, Buzz Kazz of Patillo Construction, said of the experience: "We would normally have a consultant help us out when we were going to reconfigure, add disks to a group, create additional



**“We would normally have a consultant help us out when we were going to reconfigure, add disks to a group, create additional LUNs—that type of thing. But it’s so easy, we could do it ourselves.”**



LUNs—that type of thing. But it’s so easy, we could do it ourselves.”

To be effective, a virtualized disk array needs capable software to help manage it, and the EVA series doesn’t disappoint. In a white paper published by the Edison Group, real customers compared the ease of use on an EVA4400 to a Dell/EMC CLARiiON CX3-10. The study asked the participants—experienced IT staff that had previously used neither array—to perform such tasks as creating a disk group, making and restoring from snapshots, and creating clones.\*

The test subjects found that the EVA4400 required far fewer steps to complete the same tasks, and that those tasks were much more understandable and intuitive to execute. In almost all cases, test subjects completed the same tasks on the EVA4400 in half the time as on the CLARiiON. Anecdotally at least, those who use the EVA4400 like it a lot.

Virtualized storage systems allow you to see and manage all your drives as if they were one large device. With an easy-to-use software utility, you can segment that pool of storage into different pieces: two terabytes of “virtual” RAID level five for Exchange, or one terabyte of “virtual” RAID level one for file sharing. And if those requirements change at any time, so can your array. With the push of a few buttons, you can assign more space to the Exchange array, and your chair stays nice and warm.

Another benefit of storage virtualization comes from the more efficient use of capacity. In a traditional disk array, great amounts of storage are often “stranded”; that is, left unused due to overly optimistic estimates of required space. If you add up those blocks, many companies find that a significant amount of storage is completely unused.

“With virtualization,” says Zito, “because it’s a common pool of storage, you can go in and say ‘make it smaller.’ You can take capacity that’s unused in another application, and move it to the application that needs it.”

And what happens when you run out of capacity entirely? Just add more. The virtualization software automatically integrates the new drives’ capacity into the available pool. So next time a virtual water tanker full of data comes sloshing up to your data center, you can happily take it on, instead of dreading the administrative nightmare that comes with mixing and matching old fixed disk arrays.

For white papers from Edison Group and Alinean and other HP EVA4400 resources see HP StorageWorks at: [www.hp.com/go/transform](http://www.hp.com/go/transform). Blog with HP data storage experts at: [www.hp.com/go/transform12](http://www.hp.com/go/transform12)



# Improving data management through consolidation and centralization

**Companies are adopting storage solutions like the HP MSA2000 to address data growth by improving utilization and management, consolidating storage and achieving better availability.**

Massive data growth has implications across the entire enterprise, but it especially affects storage strategies. With the proliferation of virtual server environments and remote offices as well as the desire for tiered storage capabilities in larger organizations, companies are looking for cost-effective ways to store and protect data.

“Companies of every size are battling some sort of storage issue that requires an affordable solution,” says Charles Vallhonrat, a Marketing Manager for HP. “Many of these companies are embracing storage consolidation through the use of a SAN to maximize capacity usage. But for small to medium sized companies or enterprises focused on tier two or three data, cost becomes a key consideration.”

When it comes to storage-related issues, most administrators highlight four common challenges. They are looking to minimize downtime for key business applications including Oracle® and Exchange®. It is also critical to eliminate the need for individual storage solutions in the growing number of remote offices.

The increase in virtual servers has also created a need for storage that can keep pace with the power of the server and deliver better throughput, performance and availability. And larger enterprises are looking to decrease the cost of data management by adopting tiered storage for non-critical data.

HP has introduced a new generation of Modular Smart Arrays (MSA) to offer dedicated, low-cost block storage ideally suited for small application environments, remote offices and as tier two or three storage for enterprise customers. The MSAs are designed to help companies centralize storage, increase management efficiency and reduce business downtime.



When Mark Ross, Associate Director of Technical Services, Kelley School of Business, Indiana University, viewed the beta of the MSA2000, he was interested immediately. Currently, Ross runs three MSA1500s in his environment, and was looking to determine the best replacement option as the school's technology evolved.

"The MSA2000 is everything that the 1500 was, but it's faster and more scalable with improved fault tolerance," says Ross. "For us, that's a huge win. We can store more data, connect more hosts and enable very fast access to large amounts of data. And that gives me great confidence for the future, especially when I consider the fact that since we moved to centralized storage, we haven't experienced any data loss at all."

The MSA2000 comes in two versions. The MSA 2000fc features a high-performance 4Gb Fibre Channel connected array and enables users to grow storage up to 14.4TB SAS or 36TB SATA, supporting up to 64 hosts for Fibre Channel attach. The MSA 2000i features a 1Gb Ethernet iSCSI connected array and enables users to grow storage up to the same 14.4TB SAS or 36TB SATA, supporting up to 16 hosts for iSCSI attach.

"Beyond the capacity and scalability, the MSA2000 provides high fault tolerance through RAID 6," says Steve Petersen, HP's Product Manager for the MSA2000 in the Americas. "Any two drives can fail without affecting data integrity. For large enterprises that use MSA2000 for tier two or three storage, this is especially critical because they are usually relying on large SATA drives for back up. SATA drives aren't high performance, so having that extra

level of data protection in the event of a rebuild contributes to greater data availability."

Petersen also highlights MSA2000's unique cache design, incorporating flash memory. Many storage offerings, especially those in remote office locations, rely on battery back up in the event of a power failure. With the MSA2000's cache design, it keeps enough power to write the data into flash memory. It's a better way of preserving the data in cache.

The MSA2000 also simplifies data management and administration by reducing the need for specialized IT skills. For example, one administrator in a central location can use the software built into each array to configure and manage geographically dispersed storage units, eliminating the need to configure the array from each connected server.

"With data growing exponentially and being replicated across many sites, companies need to manage storage while staying focused on costs," says Vallhonrat. "The MSA2000 helps them strike that balance by centralizing management and delivering consistency with one affordable solution. And it's also versatile—it can help the small business overcome the challenges of remote office data management; it can support the agility of a virtual server environment; and it can help larger organizations with their tiered storage strategies."

For information on the MSA2000 see HP StorageWorks at: [www.hp.com/go/transform](http://www.hp.com/go/transform). To share ideas with data storage experts at HP StorageWorks, see their blog at: [www.hp.com/go/transform12](http://www.hp.com/go/transform12)



## iSCSI A to Z

**iSCSI has matured, delivering storage consolidation and easier SAN integration for enterprise remote offices and small sites without the cost of new infrastructure.**

iSCSI is ready for enterprise prime time. Once viewed as a technology limited to small and mid-sized customers looking for a quick, easy way to migrate away from direct attached storage (DAS), the iSCSI protocol now provides a way for large enterprise customers to extend the reach of fibre channel storage area networks and bring network storage capabilities out to small sites, remote offices and departments that couldn't have enjoyed them previously.

"Today, iSCSI is a viable network storage technology that large enterprises can use to bring their smaller sites onto storage area networks [SANs]," says Shahzada Sufyan, Product Manager, HP StorageWorks Division. "It's a complementary technology, not a displacement technology. Customers can use iSCSI to connect more users to storage area networks, and get more from their investment in fibre channel technology."

The direct attached storage (DAS) typically used in smaller sites can't be shared, and as the volume of data grows it becomes ever harder to manage and protect. DAS is adequate up to a point, but beyond a certain size and geographical reach it quickly becomes difficult to manage and back up. SANs centralize storage, making it easier to manage, enabling it to be scaled more efficiently and reducing cost. Capacity utilization is also improved, and more data protection options become available. One big plus is that iSCSI delivers those SAN benefits but uses existing network infrastructure, unlike fibre channel, which requires a specialized infrastructure.

"Now these users have a network storage solution that fits into smaller environments in the enterprise," says Brad Parks, HP Product Marketing Manager, All-in-One Storage Products. "Using TCP/IP allows them to take that familiar, low-cost architecture and start having some SAN benefits in smaller departments, remote



offices and other sites where it never made sense to deploy fibre channel before.”

There’s another advantage to using iSCSI as the underlying technology, says Sufyan. “Most users are familiar with the Ethernet technology that you use to create an iSCSI storage area network. You use a common Ethernet card, networking Gigabit Ethernet switches and cabling—it’s something users know and are comfortable with.” The use of common infrastructure reduces complexity and also gives iSCSI a considerable cost advantage.

### The enterprise breakthrough

“iSCSI has been around for several years, but it has recently been gaining a lot of steam and is now clearly a mainstream technology,” says Parks. “As larger companies look to tier their storage to both fibre channel and iSCSI or extend SAN benefits to smaller environments they are looking to optimize that infrastructure. Hardware-based iSCSI initiators accelerate the connection between host servers and storage and are contributing to broader iSCSI adoption.”

In other words, the barrier to enterprise performance has been broken. And with major technology vendors offering products, the visibility and market momentum of iSCSI are on the rise.

HP served on the committee that wrote the foundational iSCSI specification, and has a broad, integrated

portfolio that enables it to offer an end-to-end iSCSI solution. The portfolio dovetails neatly with iSCSI’s strengths: iSCSI can be used as a SAN technology, but can also be employed to extend the value of existing fibre-channel SANs, whether to connect different SAN islands, to connect SANs over long distances, or to provide access for servers on Ethernet to storage behind fibre channel. These are all areas where HP has a strong presence.

“We have products not just in storage but also on the server side,” says Sufyan. “We have multifunction network adapters supporting iSCSI on ProLiant blades, racks and towers, an accelerator pack for the multifunction network interface card, iSCSI-enabled backup and restore products, and infrastructure products such as iSCSI gateways.” HP offers a range of iSCSI storage arrays from the All-in-One Storage System, to the recently introduced Modular Smart Array [MSA] 2000i system, up through the Enterprise Virtual Array (EVA) 4400 (see related articles on pages 26 and 24, respectively).

“We’ve got a lot of new products in this market now,” says Sufyan. “It enables us to offer more choices and capabilities to customers.”

For information on HP iSCSI solutions, visit: [www.hp.com/go/transform13](http://www.hp.com/go/transform13). To share ideas with data storage experts at HP StorageWorks, see their blog at: [www.hp.com/go/transform12](http://www.hp.com/go/transform12)

# Transforming Your Enterprise

Technology for better business outcomes

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# Speeding innovation to practice in health and life sciences

A SPECIAL SUPPLEMENT TO:  
**Transforming Your  
Enterprise Magazine**  
Spring 2008

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development at M.D. Anderson  
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Digital Hospital: A real-time health  
information environment

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Tapping into a gold mine by  
managing information strategically



Technology for better  
business outcomes



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**Cover** (left to right): M.D. Anderson Cancer Center—Krishna Sankharam, Director, Research Information Systems and Technology Development; Dr. Lynn Vogel, Vice-President and Chief Information Officer



## Speeding innovation to practice

Jeff Miller, Vice-President,  
Health and Life Sciences, HP

From biotech to billing, the health and life sciences value chain is converging and transforming. A rich, information-based fabric is beginning to connect us in new ways. As technology executives, our capability to capture, manage, and gain insights from information will become either a strategic asset or a liability for the organizations and individuals we serve.

In this supplement to *Transforming Your Enterprise Magazine*, HP examines some of the challenges facing the industry and how organizations are using business technology to improve outcomes.

Are you looking to adopt a digital strategy (page 1)? Find inspiration in Blue Cross and Blue Shield of Kansas City's transformation to an information-driven enterprise (page 6), and the steps M.D. Anderson Cancer Center is taking towards personalized, translational medicine (page 10). Struggling with patient information management? Discover how Heritage Valley Health System is capturing and retrieving rich data at the point of care (page 15). Frustrated by supply chain inefficiencies? Learn how electronic data capture is speeding clinical trials (page 13), and how product tracking and authentication strategies are enabling pharmaceutical companies to meet stringent regulations (page 20).

No matter where you are in your transformation journey, HP's business technology can play a critical role in speeding innovation to practice, while improving quality of care and operational efficiencies.

To provide feedback on this supplement or see previous editions, visit: [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS). For more information follow the links inside, or contact your HP sales representative, your HP channel partner or the HP Welcome Center at 1.800.282.6672, press 5 and mention code DGSY.

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- \* **Page 4** – “eHealth Initiative Releases Results of 2007 Survey on Health Information Exchange,” [www.ehealthinitiative.org/news/2007HIESurvey.msp](http://www.ehealthinitiative.org/news/2007HIESurvey.msp); December 2007.
- \* **Page 19** – “Roswell Park Cancer Institute Improves Storage Capacity and Performance, Builds Proactive Infrastructure, and Gains More than \$7.5 Million in Benefits with HP Solution,” Case Study Forum, August 2007.
- \* **Page 20** – “Combating Counterfeit Drugs,” FDA, 2004.

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# Vision



## The Digital Hospital: A real-time health information environment

A clearly defined framework of products, professional services and partner point solutions from HP makes digital transformations a reality.

A woman in labor requires an emergency caesarean section. Within seconds the anesthesiologist, nurses and obstetrician are notified via a wireless phone network. As they run to the operating room, doors automatically open and elevators are available.

A surgical patient receives a smart wristband equipped with an RFID chip. Prior to surgery, a nurse scans the wristband to verify his identity and other vital information and at various times throughout the procedure, all participating hospital staff members are scanned to create a real-time electronic record of events.

Connecting the dots of  
health information exchange

04



A patient recovering from surgery is thirsty. Using a patient portal and two-way nurse call communication system, she notifies the nearest nurse and moments later is delivered a glass of water.

These aren't just visions for the future, says Baldur Johnsen, Director of Healthcare Market Development, HP Worldwide Health and Life Sciences. Rather, they're real examples of the gains achieved by the digital hospital—a healthcare transformation that goes beyond advanced clinical systems and leverages the convergence between information, medical, communication and building technologies through technology integration.

"A digital hospital initiative is about much more than new hardware and software," says Johnsen. "It's about taking a holistic approach to managing technology, and using it imaginatively to improve processes, enhance safety, improve quality of care and enable customized healthcare."

Born out of a ground-breaking project delivered by HP, Cisco and IMATIS at St. Olavs Hospital in Trondheim, Norway—considered one of the most modern hospitals in Europe—the digital hospital is a journey that requires "leadership, innovation, courage and patience," says Johnsen.

To start, healthcare organizations must overcome management challenges created by a fractured approach to technology implementation, and lay

a foundation that brings people, processes and technology together. "Healthcare organizations need to think about technology in strategic terms and reflect on the opportunity it brings for change," he says. From there, HP and its partners have identified three phases on the path to a digital hospital, whether transforming an existing site or building a new one from the ground up. The first phase is the introduction of a highly available network to support the core technology infrastructure and remove barriers to innovation. "Just like a core utility, it needs to be there all of the time," notes Johnsen. "If it isn't clinicians won't rely on it and will find alternate ways to work around the technology being introduced."

John Aird, Director of Information Management and Technology for University Hospitals of Leicester NHS Trust—a U.K.-based hospital Trust that has partnered with HP to design, implement and manage its digital hospital infrastructure—agrees. "As IT moves into critical areas of clinical service, users need to feel confident in the ease of use and reliability of their new IT systems, especially where substantial change management has accompanied the program," says Aird. "Users just want their system to be there, fast and reliable, when and where they're needed."

The second phase is what HP refers to as IP enablement: the convergence of disparate systems onto one network. "Hospitals need to look at the big



picture of technology infrastructure, including things like nurse call, door openers, intercom, closed circuit television, phone systems, facility control systems, blinds, lights, heating, information systems, medical devices and paper,” says Johnsen. “In order to enable the kind of connectivity that has to happen within a digital hospital, everything needs to be on one Internet Protocol-based network.”

The final phase is integration. That’s where HP and its technology partners bring in an integration engine to tie disparate technologies like medical devices, building control systems, clinical information systems, communication systems, elevators and door openers into one cohesive middleware layer that facilitates information sharing and workflow change. “We make it possible to present information on multiple devices, from IP phones to web portals to anything that’s out there,” he notes.

In a digital hospital, nurses equipped with wireless devices collect and transmit patient vital signs to an electronic medical record in real time as opposed to paper charting which is prone to error. Location-based services reduce the time spent looking for equipment. Lab results and patient information are automatically pushed to physicians using mobile devices.

To help customers on their journey towards a digital hospital, HP offers a range of products and services from current state assessment, architecture design and implementation planning, to infrastructure

implementation, information management and integration. The Digital Hospital Infrastructure, a framework of hardware, software and partner solutions based on the HP Adaptive Infrastructure, provides the foundation for technology convergence. Delivered by HP Services, it brings together diverse technologies to create a real-time health information environment that enables a transformation from inefficient manual processes and point solutions to more efficient technology-enabled processes.

For today’s healthcare providers—faced with the need to respond to increasing patient numbers, a growing demand for services and new regulatory requirements, while simultaneously controlling operational costs and delivering better care—the digital hospital is a means to deal with diverse challenges. It moves them from a world dominated by handwritten notes and tedious data entry tasks to a real-time health information environment where information is no longer a bottleneck in the care delivery process.

If you’re ready to achieve these results by putting a digital hospital strategy to work in your organization, HP has the services, products, technologies and partner solutions that will bring your vision to life.

To learn more and request a Digital Hospital evaluation assessment, see Digital Hospital at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 10.



# Connecting the dots of health information exchange

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## HP brings much-needed structure to the Health Information Exchange process through its HIE Reference Model and Architecture Program.

Governments know it. Healthcare organizations know it. Medical clinicians know it. What's missing in healthcare is there's no easy way to "connect the dots" when it comes to mobilizing information electronically across organizations.

"One of the leading causes of death in the U.S. is medical error, much of which could be avoided if providers had more timely access to medical information at the point of care," says Misha Rizkin, Lead Solutions Architect, HP Health and Life Sciences.

In fact, almost every healthcare challenge—from inefficient processes and skyrocketing costs, to increases in medical errors and sub-optimal quality of care—ties directly back to the lack of a systematic way to electronically move information between disparate healthcare information systems. Which raises another key point: a health information exchange (HIE)—the systematic sharing of information between disparate clinical systems and stakeholders in order to improve healthcare delivery—could be a significant step towards reversing this trend.

According to the eHealth Initiative's 2007 Survey on Health Information Exchange, "the most difficult challenge for health information exchange efforts is

the development of a sustainable business model." The survey pointed to 130 initiatives under way in 2007—one-fifth of which are just getting started.\*

"There are multiple efforts under way to establish these health information exchanges but so far the experience has largely been a negative one," says Rizkin. "People haven't figured out how to run a health information exchange, including who will pay for it and how to get others to adopt it."

Typical goals of an HIE include: access to electronic records, lab result reporting, patient medication history and management, syndromic surveillance to prepare for potential outbreaks, patient selection for clinical trials, and quality-of-care measurement and reporting. In addition to the lack of a viable business model, challenges include gaining acceptance and trust among stakeholders, and maintaining compliance with changing government regulations.

While correct selection and proper use of technology is a key element to HIE success, no product by itself can guarantee success. What's needed is a framework that brings all stakeholders together—which may include providers, payers, government agencies, employers, clinical research organizations, and pharmaceutical and technology vendors—to analyze and assess the softer considerations of business processes, governance, budgets and politics. “Most of the problems experienced by HIE initiatives arrive from the lack of a systematic and disciplined approach,” says Rizkin.

Recognizing this, HP has leveraged experiences derived from other industries to develop an HIE Reference Model and Architecture Program. As HP Program Manager Yvonne Yoneshige describes, the Reference Model is the “what”—what should the components of an HIE look like—and the Architecture Program is the “how”—how to build the roadmap for putting those components in place.

“HIE sustainability depends on each situation; there's no template answer,” says Yoneshige, adding the process of applying the HP model typically starts with a customer assessment. “We identify the gaps between where health information exchange participants are and where they'd like to be, and apply our methodology to close those gaps, laying out the implementation steps that will transform their vision into a robust solution.”

“HP has provided a comprehensive HIE Reference Model,” adds current health information exchange participant Timothy Pletcher, Director of Applied Research at Central Michigan University. “It allows a regional health information organization to get the right questions out on the table, ensures people are saying the same things to each other, and equips the organization to fully understand the magnitude of the short- and long-term impact of its implementation/vendor selection decisions.”

The HP Reference Model is targeted at four functional HIE domains: Clinical, Business, Administration and Management. It's designed to facilitate discussion between stakeholder groups in order to identify and define solution components, including process, information, technology, organizational readiness and finance. The intent is to turn decision-making from an

ad-hoc process into one that is directed at the use of technology to meet business goals.

“In order to be viable, a health information exchange needs to emerge as a duly operationalized framework for clinical and administrative services, and act as a component of a broader sustainable, governable business model,” says Yoneshige.

Once an HIE framework is established, the HP Architecture Program provides a structured process for implementation of technology and overall management moving forward. Through a series of workshops, HP consultants walk HIE participants through their “use case”—the goal or benefit which they've decided to target first, such as electronic medical record implementation, syndromic surveillance, medication history and management, lab result reporting or claims management.

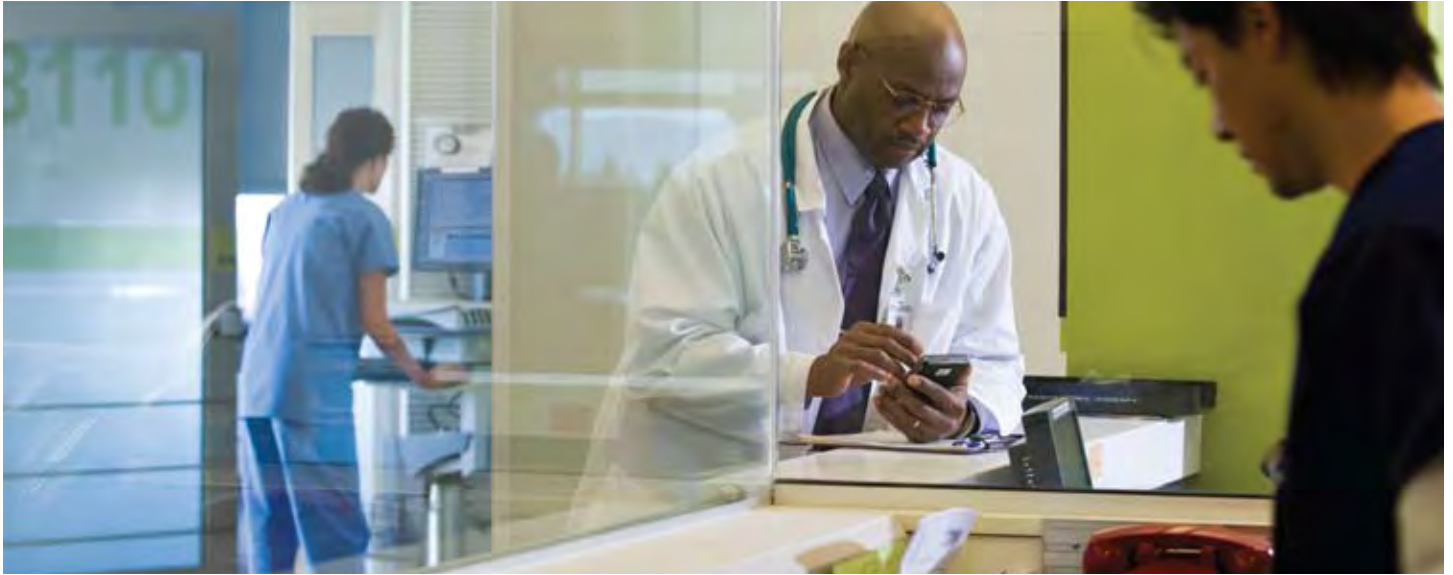
Through the HP Architecture Program, organizations benefit from a systemized and managed way to address potential problems; a comprehensive risk management methodology that helps foster community trust; and a series of scorecards that can be used by administrators and management to effectively align business drivers, goals and objectives.

“We've risen above the battles being fought out between vendors to create a framework into which participants can bring different solutions based on their value in the context of the health information exchange,” say Rizkin, noting the HP methodology is technology-agnostic. “Our methodology and partnerships help to ensure that customers are addressing their most critical issues, and are applying the appropriate tools, techniques and technologies.”

With a long history of innovation and experience solving business and technical problems, HP has the thought leadership and strategic planning to support HIE success. Whether you're grappling with the complexities of how to get started, or need help understanding your current maturity level, there's one more thing you should know: an HP HIE solution will address both your technical and business issues.

To learn more see Health Information Exchange at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 11.

# Solutions



## Tapping into a gold mine

Blue Cross and Blue Shield of Kansas City and Rush Health Associates find that managing health information strategically can improve processes, operations and patient care.

“Our data was a gold mine,” says Darren Taylor, Vice-President of the Information Access Division at Blue Cross and Blue Shield of Kansas City (BCBSKC), “but we couldn’t access it effectively.”

Such is the case for much of the healthcare industry. When a person walks into a hospital, physician’s office, insurance agency or research center, an event is triggered. This event typically involves some type of care, service or research, during which data is gleaned. In most cases, this data leads to a transaction—and then it starts collecting dust.

“Far too many healthcare organizations are still focused on events that lead to transactions,” explains Paul Vosters, Managing Director of HP’s Information Management Practice. “This approach is very short-sighted and limits historical trending and cross-domain analysis.”

**Speeding discovery and development for increased efficiency**

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**Getting back to the point (of care)**

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**From pallet to patient—faster, better and safer**

20



It is also completely devoid of quality-related measurement and examination. In fact, many organizations rely on financial data to evaluate quality of care, health trends, provider efficiency and the like.

“Many payer and provider organizations use claims data to track and evaluate clinical performance,” Vosters suggests. “This information is incomplete at best and documented differently from source to source.”

### **Recognizing an opportunity**

There was nothing inherently wrong with BCBSKC’s data, which is associated with the health coverage of approximately 900,000 members, but Taylor and other company leaders recognized an opportunity for sweeping improvements by becoming an information-driven enterprise. With several technology silos of raw data, BCBSKC set out to integrate and standardize its untapped “gold mine.”

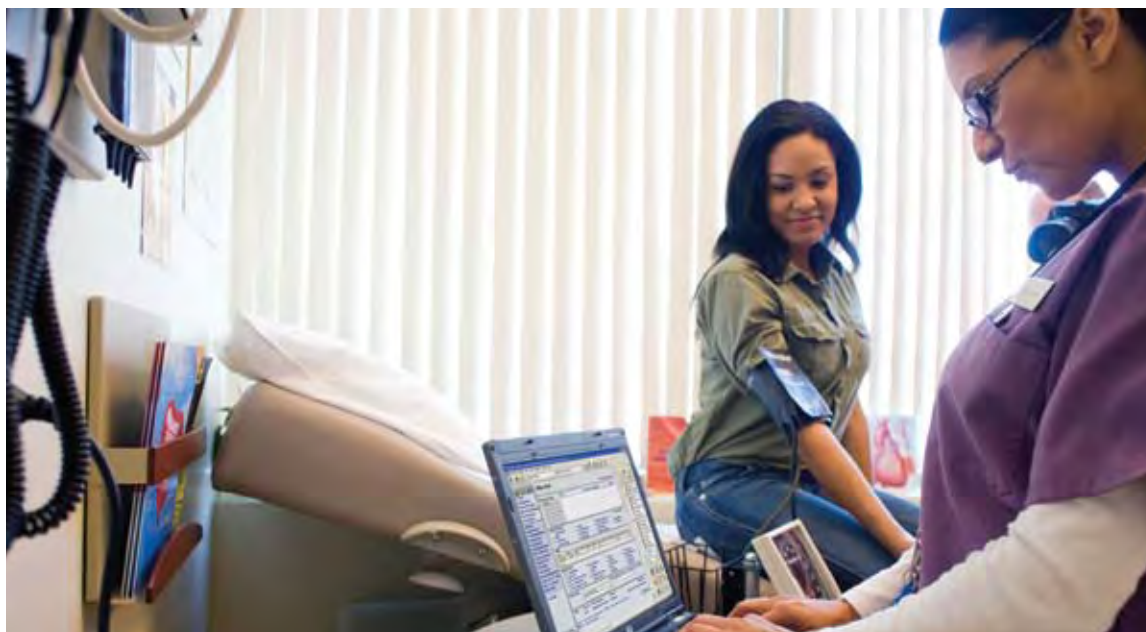
“When it comes to data integration, most health entities fail because they implement and rely upon a front-end application or reporting tool, which is tantamount to a band-aid,” explains Taylor. “True

integration starts with the underlying data. Healthcare organizations must not only bring together data from multiple systems, but assimilate and standardize the different data types and formats.”

BCBSKC did just that, establishing an integrated enterprise data warehouse that aggregates and standardizes information from more than a dozen sources. Once integrated, this data is used to fuel clinical applications, reporting and analysis tools, rules-based applications for specific health campaigns and initiatives, a Web portal for providers and other business- and health-related solutions.

“The new data warehouse has become the company’s information factory. Integrated data is leveraged to identify the unique healthcare needs of each plan member for placement into personal health improvement programs,” says Taylor. “It has also delivered administrative and process-oriented enhancements and improved trending and analysis efforts.”

According to Vosters, BCBSKC has successfully transitioned from a transactional health organization



to a strategic health organization. Taylor agrees, noting the new data structure has enabled BCBSKC to better compete with larger, national companies that take advantage of economies of scale—in addition to delivering day-to-day care and operational improvements.

### **Moving from transactional to strategic**

Rush Health Associates (RHA) is an Illinois-based network of healthcare providers, including the Rush University Medical Center, Rush Oak Park Hospital and more than 750 physicians who are on the medical staff of its hospital members. Company leaders recently acknowledged that clinical and operational users need reliable access to data to support decision-making and improve overall quality of care. Like BCBSKC, RHA set out to leverage its information by creating a cohesive platform that supports comprehensive reporting and analysis.

“We support hundreds of physicians, many of whom use disparate technology systems,” says Brent Estes, President and Chief Executive Officer of RHA. “In the past, we had to manually sift through their charts and databases to measure and report things like healthcare quality, compliance and efficiency. We sought to integrate not only operational and financial data, but also clinical data.”

Estes tapped HP’s Information Management Practice, which delivered a detailed analysis of RHA’s business and clinical requirements and a comprehensive plan

for achieving them. The plan included the vision, goals and strategy, expected business intelligence functionality, technology platform, budgeted financial and resource investments and measurable success metrics. Phase One focused on putting the new data infrastructure in place and assimilating historical data sets. Phase Two, which is now in progress, incorporates clinical data and the ways in which the data will be utilized for improved operations, health analysis and patient care.

“To be successful with this type of project, healthcare organizations need a strong, experienced partner throughout the assessment, strategy and implementation phases” Estes advises. “HP has been great. They have helped us with business and clinical strategies, kept the big picture in mind amidst daily tasks and made sure the implementation went smoothly. As a result, we’re at a point where our data can be accessed and used for higher value initiatives.”

Along the way, HP helped prioritize project components and highlight the value that each delivers.

“We had a three year project, but we couldn’t wait that long to show value,” Taylor says of BCBSKC’s information overhaul. “With HP’s help, we broke it into pieces, started with the low-hanging fruit and demonstrated business value and ROI every three to four months.



"The ROI did not come from the data warehouse on its own," he points out. "The data warehouse has become an enabler and a foundation for new systems and programs, which deliver the ultimate business value and ROI."

With any information transformation project, Vosters suggests healthcare organizations start with pain points and prioritize accordingly. Billing is often the first undertaking, he says, but it could be compliance reporting, process improvements or health-related initiatives. Using the HP Business Intelligence Maturity Model, HP can assess the current state of an infrastructure and its underlying data, help determine the desired future state and develop a strategic, step-by-step plan—with checkpoints and success metrics—for achievement.

"To be honest, our technologies and solutions, while exceptionally tuned for the healthcare industry, are somewhat secondary. The true value we bring is our ability to evaluate current operations and prioritize programs from clinical, business and technology perspectives," says Vosters. "It is our job to understand health and life science endpoints, and then augment data so that it is available and useful at those endpoints."

It is this focus on each healthcare organization, its priorities and its data—which often sits untapped and unused—that has transformed companies such as BCBSKC and RHA. By integrating and standardizing their enterprise data, they have shifted from transactional to strategic organizations and improved overall processes, operations and patient care.

In the healthcare industry, this is as good as striking gold.

For an IDC Health Industry Insights white paper *Bringing Business Intelligence Best Practices to the Health Industry* and more on the HP BI Maturity Model and Assessment, see Information Management at: [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS)

## Do you have data, or information?

Once raw data is turned into usable, actionable information, organizations can analyze and track health-related measures and outcomes to improve quality of service and patient care.

Data sources vary greatly and often can't be managed or tracked uniformly. For these reasons, there is a considerable difference between health data and health information.

"Until health-related data is standardized and integrated, it is largely unusable," says Dr. Geraldine Wade, Director of Medical Informatics at HP. "Health information that is accessible at the right place and time and interoperable with multiple systems is another story."

Improved healthcare, she explains, stems from historical trending, cross-domain analysis and continual evaluation of health-related metrics. By and large, these efforts are time consuming, costly and impractical when using sets of raw, incongruent data pulled from multiple, disparate technology systems. "You can't conduct effective analytics with disparate data that varies in meaning, format and storage paradigms," Dr. Wade suggests. "Data must be standardized and transformed to enable comparison."

How does a healthcare organization turn its unrefined data into valuable, actionable information? Dr. Wade recommends carefully examining existing data resources, establishing priorities and goals and working with partners who understand health and life science requirements and the technology strategies that can deliver.

She points to HP's Information Management practice, which offers Business Intelligence (BI) services and a BI Maturity Model that facilitate the conversion of raw health data into useable, actionable information. These efforts are bolstered by HP professionals who possess advanced domain expertise, which can be invaluable when working with clinical data. The BI experts within HP are then able to help healthcare organizations take advantage of their enhanced information to improve processes, reduce costs and deliver better health-related outcomes. HP's BI services include: Strategy and Planning; Data Transformation and Integration; Information Quality; and Information Delivery.

"Our BI services and BI Maturity Model represent a proven formula for success," Dr. Wade notes. "We evaluate a healthcare organization's data and its priorities from business, clinical and research standpoints. Then we help develop and implement a step-by-step plan for transforming their data and utilizing it to improve overall quality of service and care."

To learn more see Information Management at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 13.



(Left to right) Krishna Sankhavaram, Director, Research Information Systems and Technology Development and Dr. Lynn Vogel, Vice-President and Chief Information Officer in the M.D. Anderson Cancer Center's data center

## Speeding discovery and development for increased efficiency

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For companies that conduct therapeutic discovery and development, leveraging a combination of hardware, services and storage enables them to improve data use and management, accelerating the move from innovation to clinical practice.

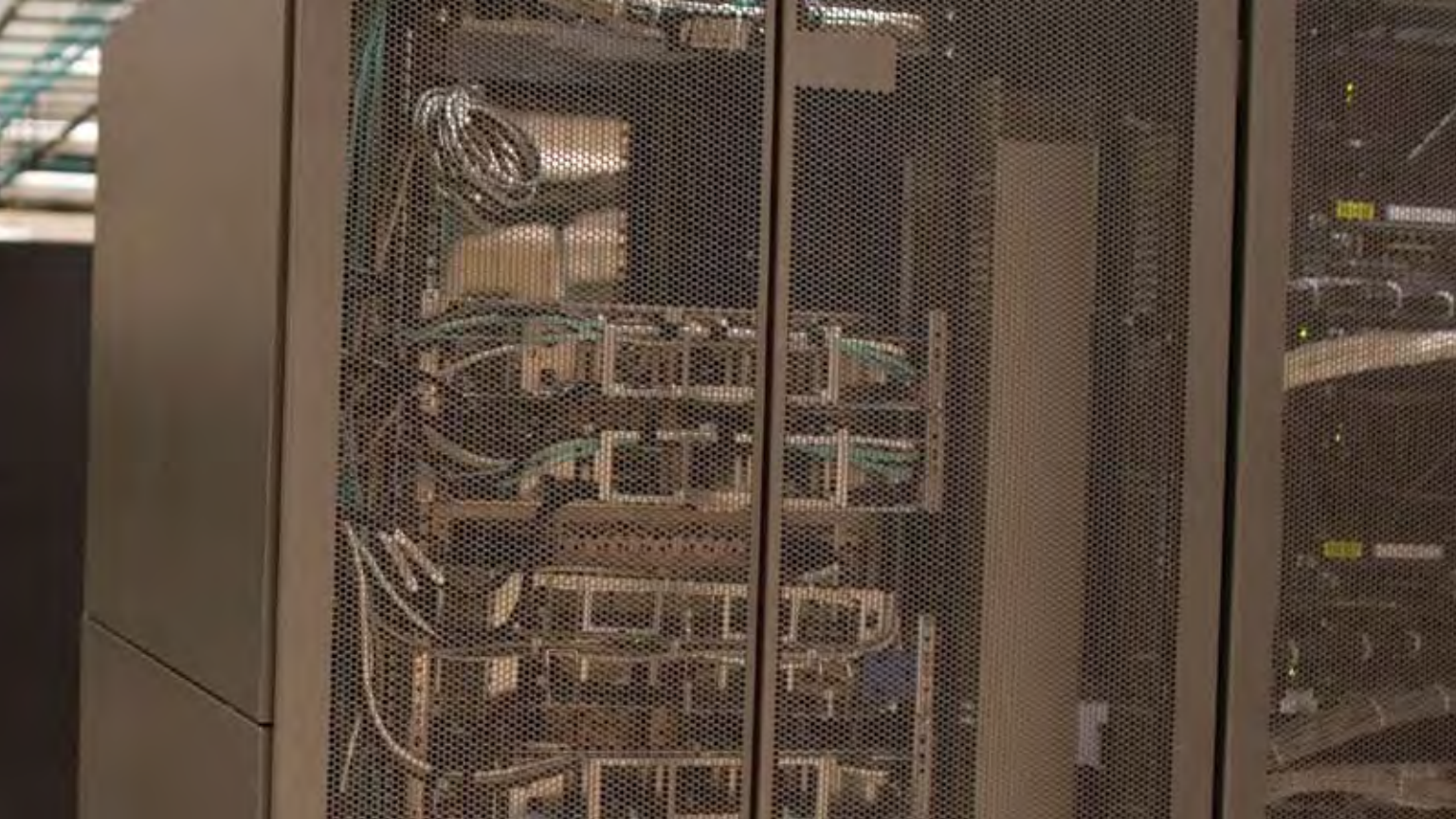
Translational medicine is a top priority for most of today's health care institutions. With growing competition and rapidly advancing technology, organizations that can effectively move new therapies into practice for patient care the quickest gain a significant competitive advantage.

To achieve translational medicine—often defined as 'bench-to-bedside' research—healthcare organizations must evaluate their existing infrastructure boldly and assess the technology required to support exploding data volumes and compute-intensive applications and processes. "To realize the vision of translational medicine effectively, companies need very specific capabilities," says Dave Medina, Director, HP

Worldwide Pharmaceutical and Life Science Markets. "They need to collaborate across the enterprise, break down silos for improved information access and governance, access multiple data sources, and integrate genomic information into clinical records."

### **Striving for translational cancer care**

M.D. Anderson Cancer Center is dedicated to eliminating cancer with integrated programs in cancer treatment, clinical trials, education programs and cancer prevention. Personalized, translational medicine remains a core focus, but M.D. Anderson struggles with common challenges—developing "personalized molecular medicine" that treats cancer and integrating genomic data with clinical data to enhance the quality of clinical decisions.



“At M.D. Anderson, we start with the science, but ultimately, we focus on how to apply the results of the scientific work to the clinical workflow to improve patient care,” says Dr. Lynn Vogel, Vice-President and Chief Information Officer, M.D. Anderson.

“For example, we are applying our understanding of genetic expressions to a patient’s propensity to respond to specific medications, which creates a direct link between the science and personalized treatment.”

When Krishna Sankhavaram, Director for Research Information Systems and Technology Development, joined M.D. Anderson in 2005, his department was brand new. The goal was to create an IT department to support and develop infrastructure and offer tools, applications and services for basic and translational sciences research. At that time, research had its own grants and funding and acted independently of IS in terms of technology.

“As I became more acquainted with the workings of the business, I realized that one of the resources we required was a high powered, high performance computing environment,” says Sankhavaram. “Most people were paying money to buy cluster platform cycles in other places and then cobbling them together as a cluster. There was no centralization

or coordination with central IS; everything was distributed and ad hoc as research needs arose, which created duplications and challenges in collaboration and information sharing.”

### **High Performance Computing**

Sankhavaram assembled a faculty committee with members who were interested in high end computing to understand the technical needs of the organization. They realized the need for a combination of memory and cluster technology as well as the centralization of storage and data archives. Sankhavaram also wanted a partner that had the life science expertise to optimize code and assist with scientific application development. After a detailed evaluation of various vendors, the committee chose HP to implement various hardware and software solutions.

M.D. Anderson went live with the HP High Performance Computing (HPC) solution in November 2006, and by February, Sankhavaram was running the system for 10 to 15 days at a time, at full capacity. A second cluster, double the size of the first install, went live in September 2007 to accommodate the exploding usage across the organization.

“The results were phenomenal,” notes Sankhavaram. “Between November 2006 and summer 2007,



approximately 24 published articles came out from using our cluster as the primary computational resource. Prior to that, we published one or two papers in a year. We now have the resources to support the velocity of our research.”

Within the HPC environment, analyzing an experimental diagnostic imaging dataset went from 20 minutes to 20 seconds. Similarly, radiation physics took 72 hours to run a one billion particle dataset on its own cluster, which became a mere five hours using the HPC cluster.

### **One more step toward translational medicine**

With the success of the HPC implementation, M.D. Anderson extended its partnership with HP to work on a translational science project. The goal is to develop an application platform to improve cancer care by linking molecular data with clinical information. Researchers will then be able to ask intelligent questions, discover, and assess how certain molecular markers behave in specific kinds of cancers.

“Strategic relationships derive from both partners contributing individual efforts to changing the work environment,” says Vogel. “That’s what we have with HP. Our relationship extends far beyond hardware and software; we are engaging with people who are knowledgeable about science and bioinformatics to produce something mutually beneficial. HP has demonstrated a strong commitment to this field, the technology and the science so that we can fuse our strengths to deliver unique value to our patients.”

HP’s Digital Discovery and Development (D3) solution encompasses the D3 platform including High Performance Computing for research, scientific research software partners and grid technologies; GIGPAD (Gateway for Integrated Genomics-Proteomics Application and Data), which helps research organizations process and integrate genomic information into clinical records; and Bioresearch Workbench, which enables access to various data sources.

D3 is an innovative, IT-based solution approach designed to: help companies increase the efficiency of drug discovery by integrating, managing and providing access to disparate enterprise data sources; decrease storage costs for large quantities of genomic research data; improve collaboration and communication with internal collaborators and external partners; and improve the analysis of clinical and genetic data.

“Our Digital Discovery and Development solution targets data accessibility, data governance, and collaboration between research partners,” says Medina. “Combining the platform with an open source, standards-based methodology that leverages HP’s expertise in SOA and Business Technology Optimization solutions in conjunction with our unique life science expertise, we can help companies organize, manage and maintain vast amounts of data more efficiently and cost-effectively to speed time of innovation to practice.”

To learn more see High Performance Computing at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 14.



With electronic data capture for clinical trials, pharmaceutical companies can shorten the clinical trial phase by eliminating manual, paper-based processes and reducing the time and resources required to input and validate data.

## Improving efficiency of clinical trials

When developing new drugs, every day can make a difference in terms of costs and revenue. With growing competition and the widespread acceptance of generics, pharmaceutical companies are looking for ways to accelerate time to market so they can cut costs and extend their window of opportunity for realizing revenue.

“The average cost of new drug development for a blockbuster drug is more than \$900 million. The average clinical trial period, which includes all phases for a major drug, is approximately eight years, with a cost of up to \$400 million,” says Tab Edwards, HP Market Development Consultant. “Pharma companies are looking for any opportunity to reduce the clinical trials stage of development so they can get their products on the shelves and begin recouping those costs.”

Typically, doctors participating in clinical trials collect data manually using paper Case Report Forms. At least two people type the manually-collected data into various databases to ensure accuracy through dual data entry.

For any given trial, there could be 1,000 trial sites or more, each going through the process of dual data entry. The trial sponsor cannot close out the trial until each database is “locked,” which can take weeks, with significant timing differentials between sites.

To combat these issues, companies have adopted electronic data capture (EDC) solutions to speed the time between data collection and availability. One EDC solution that has proliferated in the industry comprises outfitting physicians with laptop PCs

with electronic forms and access to Web-based applications. Though there has been rapid adoption, many physicians find this EDC implementation challenging and feel it is unnatural to their preferred way of evaluating patients.

HP has introduced a solution that enables companies to shorten the data availability and validation aspects of clinical trials while adhering to physician preferences. Using a Digital Pen and Paper-based solution, physicians can “manually” record information on specially designed forms. Once they dock their digital pen into a docking station, all the data is available immediately. Investigators don’t have to spend much time learning new processes or technology or make significant adjustments in their normal visit procedures.

In addition to the Digital Pen and Paper-based solution, which is provided as a hosted, Software as a Service (SaaS) application designed for clinical trials, HP also provides consulting and integration services including a pre-trial readiness assessment as well as infrastructure and help desk support.

“Conducting a clinical trial is a major investment for pharma companies when you take into account what’s involved—facilities, infrastructure, contract research organizations, technology, patients, physicians, and other professionals,” notes Edwards. “So shortening that cycle, even by a week, can have a huge impact on the sponsor’s bottom line.”

To learn more see *Electronic Data Capture* at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 15.



## Assess document output to reveal savings opportunities

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Pharmaceutical companies that assess enterprise document output can identify areas of inefficiency, waste, high costs, and opportunities for improvement.

The document-related information supply chain comprises the flow of information from point-to-point in a business and ultimately results in the creation or use of outputs. Optimizing specific areas of this supply chain can deliver significant savings. However, when most companies evaluate the document-related information supply chain, they often focus solely on the general office and the central reprographics division. These areas are important, but don't span the entire spectrum of the document output spend.

"Most companies only look at part of their enterprise output environment, which results in missed savings opportunities," says Tab Edwards, HP Market Development Consultant. "Especially in pharma, where many companies create significant output that exceeds what's generated in the general office. Those costs must be considered to achieve maximum cost savings."

HP provides an enterprise output assessment that reviews all areas of document production and management, including general office, central reprographics, mainframe, commercial/external production, and SAP output management. Companies can choose to look at all areas or to take a modular approach to assessing their document-related information supply chains. In addition, HP can provide an enterprise content management assessment to help automate and streamline paper-based processes.

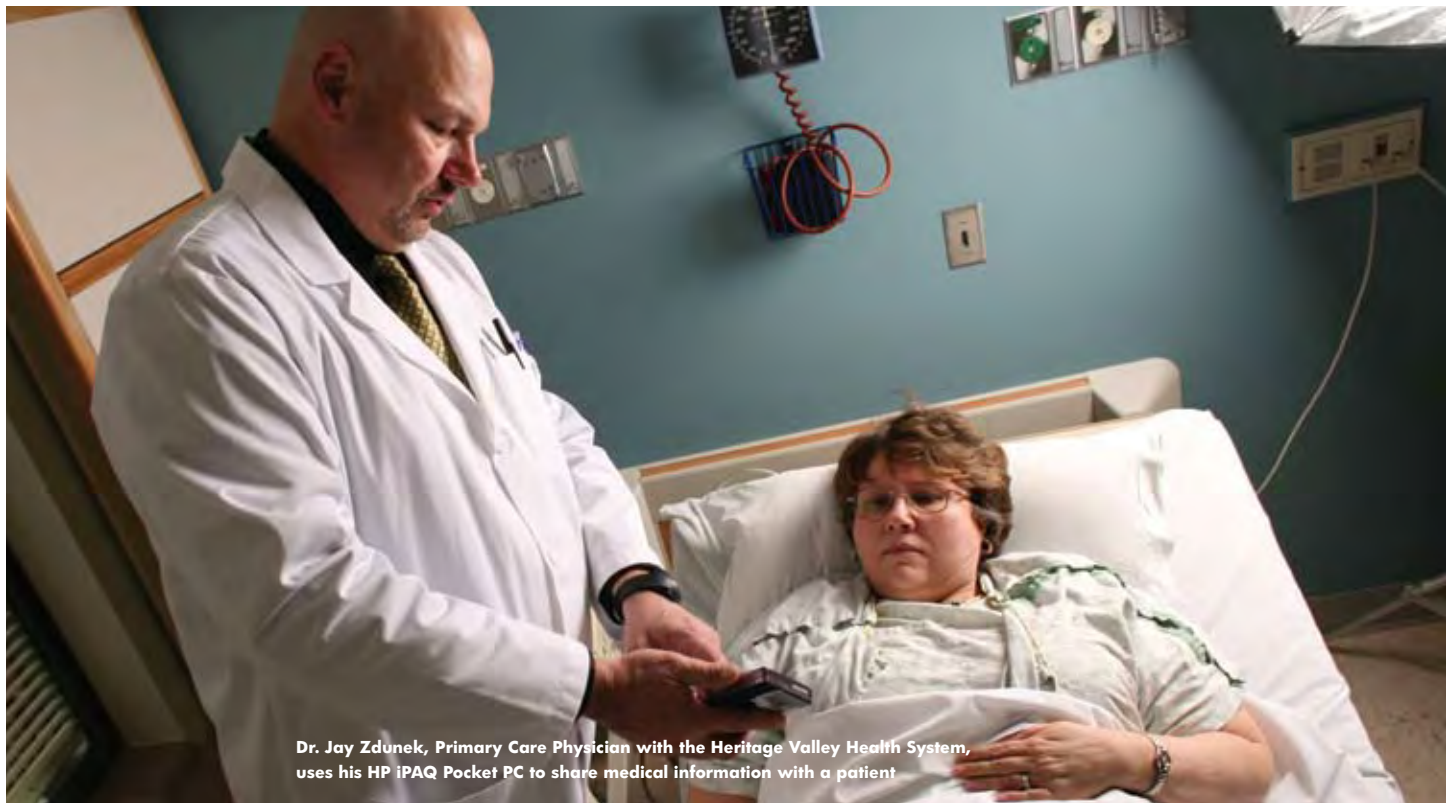
"If you look at certain areas of output production, like commercial or external, it is possible to identify significant cost savings that can be redirected back to the business to fund a research grant or to pay

for output optimization initiatives," says Edwards. "Assessing your document output environment gives you a better indication of what you're currently spending and what you can potentially save."

A major life science company provides an excellent example. The company was looking to reduce the cost of output enterprise-wide. HP started with an analysis of the general office and Central Reprographic Department (CRD), identifying an estimated total cost of ownership (TCO) in the general office of \$9.5 million and in the CRD of \$2.1 million. From this analysis, HP estimated that the company could reduce its TCO in the general office and save approximately \$4 million.

While the general office and CRD findings were useful in highlighting potential savings, the truly revealing discovery came when HP assessed the company's commercial output spend. From this analysis, HP uncovered that the company spends approximately \$75 million on external output and recommended strategies to reduce that spend by 10 percent, for significant savings to reapply to the business. "With a comprehensive, enterprise-wide assessment, pharmaceutical companies can see the breadth of their output spend and derive efficiency gains and real dollar value from making adjustments to their document-related processes," says Edwards.

For a consultation on how HP can help you reduce costs and improve operational efficiency in the document information supply chain, see Enterprise Document Output at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 12.



Dr. Jay Zdunek, Primary Care Physician with the Heritage Valley Health System, uses his HP iPAQ Pocket PC to share medical information with a patient

## Getting back to the point (of care)

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As Heritage Valley Health System found, optimized point-of-care solutions provide fast access to important health information, improving physician efficiency and patient care.

With talk of industry standards, regulatory compliance, electronic medical records, data integration and infrastructure strategies reaching a fevered pitch, one set of critical healthcare technologies is often overlooked: point-of-care solutions.

Healthcare entities routinely cite data security, workflow efficiency, mobility and information access as key priorities. While back-end infrastructure enhancements are generally required to address these needs, so too are front-end devices that capture patient, hospital and research data for analysis, collaboration, storage and follow-up.

“A great number of healthcare organizations have had robust, integrated infrastructure systems for some

time,” says Claudia McGurk, Healthcare Industry Marketing Manager for HP’s Personal Systems Group, “but many still populate those systems using handwritten notes and manual data entry.”

This can lead to workflow inefficiencies at a minimum, while costly clinical errors are not uncommon. Of the paper-based data that is logged electronically (estimated at less than 30 percent), the process of re-keying handwritten information can take days, weeks or months and the cost can be staggering. What’s needed, McGurk suggests, are point-of-care solutions that are tuned to the needs of the healthcare industry and maximize the effectiveness of back-end infrastructure systems.

“Doctors are my customers, and it is my job to enable them,” explains David Carleton (pictured), Vice-President and Chief Information Officer of Heritage Valley Health System. “To do so, we need to give them the ability to capture and retrieve rich data at the point of care, whether it is in an office, ambulatory or acute care setting.”



David Carleton agrees. “The healthcare industry needs a do-over,” says the Vice-President and Chief Information Officer of Heritage Valley Health System. “We need the ability to access and capture the right information at the right place at the right time.”

Based in suburban Pennsylvania, Heritage Valley has roughly 4,300 employees and more than 400 physicians who support two hospitals and a host of outlying clinics and physician offices. While other healthcare organizations focus on the data derived from and needed for acute care facilities, Heritage Valley sought to give its constituents a complete view of the patient/physician world.

“Doctors are my customers, and it is my job to enable them,” Carleton explains. “To do so, we need to give them the ability to capture and retrieve rich data at the point of care, whether it is in an office, ambulatory or acute care setting.”

Working closely with HP, Heritage Valley deployed an

HP iPAQ Pocket PC-based solution, giving physicians and other healthcare professionals access to real-time patient databases, census data, physician schedules, patient updates and test results. More than 200 Heritage Valley physicians are utilizing the iPAQs, nearly half of whom are using the devices to electronically order prescriptions for their patients.

“Whether our doctors are at the office, in the emergency room or at home, they can review three years of clinical and transactional information, health notices, lab results, radiology and pathology reports, upcoming appointments and the current state of the acute care setting,” says Carleton. “As a result, the physicians and hospital staff are much more efficient with their time, which has led to improved productivity and patient care.”

The iPAQ-based solution integrates tightly with Heritage Valley’s desktop and infrastructure systems, with data flowing seamlessly and securely among them. This integration has resulted in a symbiotic



relationship between Heritage Valley's front-end and back-end systems, spawning additional functionality. For example, physicians can use their iPAQs for dictation, which is sent wirelessly to back-end servers that feature automated voice recognition, transcription and Web posting capabilities.

"The HP handheld devices are fully integrated with our server systems and give us a tremendous amount of functionality," notes Carleton, "but some of their greatest features are the most basic. They offer an outstanding battery life, a clean WiFi connection and rock solid reliability. These may seem mundane, but they are very important and few devices on the market can deliver."

HP offers a full portfolio of point-of-care solutions that provide fast access to clinical applications and patient data, streamline workflow processes and can reduce medical errors. HP Notebooks, tablet PCs and handheld devices feature an industry-leading battery life, protect sensitive health-related data through

advanced security features and extend healthcare boundaries through wireless connectivity. HP Desktop PCs provide secure, reliable computing power to expedite care delivery and give customers a choice of form factors, environmental features and functionality. HP thin clients ease the management burden on IT departments, keep sensitive information secured in the data center and offer flexibility for inevitable process and technology changes. Whisper-quiet, high-performance HP workstations are also available for compute-intensive imaging software and radiological displays.

"As healthcare moves more into consumer-driven models, immediate access to data and updated information will be a requirement," Carleton concludes. "And frankly, we see it as a vital component of providing the highest quality of patient care."

To learn more see Point-of-Care at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 16.



## Enhancing patient care with intelligent archiving and data management

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To speed access to medical data, improve application performance and manage growth, Roswell Park Cancer Institute chose a comprehensive HP solution that delivered productivity, reliability and efficiency improvements.

As a leading cancer care and research facility, Roswell must ensure that the vast amounts of data it collects, including medical images and business information, is available, accessible and protected. So when the organization began to outgrow its traditional storage solution, the IT team knew it was time to adopt technologies that could support growth and ongoing productivity.

“We used up our four-year storage allocation in two years,” says Joanne Ruh, Vice-President of IT for Roswell. “Annually, we add approximately 20 terabytes of data to our systems, and our storage processes weren’t keeping up with the pace and demand of our business.”

Roswell was using tape archives to store medical data. But that approach created issues when trying to retrieve images. Oncology patients receive ongoing care, which often requires comparative examination

of past and current charts or scans. But it was challenging to get archived images off the tapes in a timely enough manner for physician demand.

### **A new data archiving approach**

With the goals of proactive growth planning and improving performance and productivity to enhance patient care, Roswell chose the HP Medical Archive solution (MAS) for long-term archival of medical fixed content. With certified integration with the on-site McKesson picture archive communication system (PACS), HP MAS enables Roswell to store and retrieve medical images with continuous access.

Roswell went live with its first replicated 20-terabyte MAS grid in 2006 as an archive for medical imaging. Its second 10-terabyte MAS unit, which retains research and DNA data, went live in March 2008. HP MAS provides a modular grid architecture that retains medical fixed content, including images,



documents, charts and records. The inherent flexibility of HP MAS enables Roswell to manage the volume of image growth with a cost-effective long term archive.

“With this system, organizations can gain better control over data and archive it intelligently based on its clinical value, without having to direct manpower or resources to the task,” says Lisa Dali, Worldwide HP MAS Product Marketing Manager. “Using customer-defined information management (IM) rules, HP MAS moves information from tier to tier based on current business priorities. It provides centralized, automated storage that has dual site failover so information can always be ingested or retrieved, quickly and reliably.”

### **Research innovation**

And Roswell is certainly achieving its goals since implementing HP MAS. From a pure numbers perspective, the results are highly impressive. Roswell projects a cumulative, five-year net benefit of \$7,530,619—driven by increased IT and staff productivity, efficiency gains, and decreased downtime. The project will have an ROI of 107 percent, and a payback period of 22 months.\*

In terms of patient care, clinicians are no longer waiting for data to be restored.

“With the MAS, physicians can click on the system and retrieve the medical images they need to treat a patient in a matter of seconds, not hours,” says Ruh. “The data is there, it is archived according to how our users need to access it and it is always available, regardless of what may happen with the technology.”

Data persistence is another MAS benefit that is helping Roswell comply with government regulations like HIPAA. With the MAS system, data is available continuously so it can be accessed now or far into the future for diagnostic treatment and compliance initiatives.

“The administration is made up of doctors, so they understand that our data must persist, whether we need it tomorrow or 10 to 15 years from now,” says Tom Vaughan, Director of IT Infrastructure at Roswell. “The HP MAS provides upgradeable data persistence, which is critical to how we do business.”

Research is another area that has benefited significantly from the introduction of intelligent archiving. The second MAS system, which went live in March 2008, will enable researchers across the organization to amalgamate information, review it and use it more effectively.

“Prior to having the MAS, our different labs worked in silos, which created duplication of efforts or poorly correlated discoveries,” says Vaughan. “With data mining, we can uncover a wealth of findings that weren’t available to us previously. Being able to tout this technology in recruiting new researchers is essential because they look for advanced capabilities. It becomes a critical differentiator for Roswell.”

Ruh highlights proudly that Roswell has not issued a medical charge for paper records since May 2006. With the growth of digitized information across the organization, it is critical that data is available consistently. “Patients, physicians and researchers simply expect a high level of data efficiency, automation, security and availability. With our HP MAS systems, we have solved our storage, performance, availability and efficiency issues so that any user can access any type of data at any time. Those capabilities contribute to our vision—delivering optimum patient care and driving consistent research innovation,” says Ruh.

To learn more and download a detailed ROI Case Study on the Roswell Park MAS implementation, see Medical Archive Solution at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 17.

# From pallet to patient— faster, better and safer

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HP's Product Tracking and Authentication solution portfolio improves patient safety while increasing supply chain efficiency for the pharmaceutical industry.

The supply chain is vital to any organization that deals with suppliers and customers. But for the pharmaceutical industry, where the products in question can improve, lengthen or even save a life, the supply chain takes on special importance. Pharma supply chains are as complex as any on the planet. The industry is also heavily regulated around the world and rapidly becoming more so.

What's more, pharmaceutical companies face a huge product counterfeiting and diversion problem. Sixty percent of counterfeited pharmaceuticals have no active ingredients at all. Nineteen percent do, but in the wrong dosages, and 16 percent contain different active ingredients from the ones the patient needs. While the threat to human health is the paramount concern, counterfeiting and diversion cost the pharmaceutical industry tens of billions of dollars a year in direct losses, while increasing liability and insurance costs and impacting hard-won consumer trust.\*

## **The right response**

What's required is a solution that can help pharma companies comply with the tough new regulatory environment while helping to address their other security, safety and bottom-line challenges. Technology would be a major element, but the solution has to start from an assessment of business requirements, and have the benefit of an understanding of pharma's unique needs accumulated over years of working with the industry.

HP's Product Tracking and Authentication (PT&A) solution portfolio consists of a range of new and established technologies, solutions, services and expertise from a cross-section of major HP business units with years of experience working with pharma customers. HP has also leveraged the contributions of best-of-breed partners with their own specialized expertise: SupplyScape for experience with pharma-specific regulatory regimes, Nosco for smart labels and SAP for ERP.

A major portfolio component is mass serialization, which involves the application of a unique identifier to anything from a single pill to an entire shipment. This enables tracking from point of manufacture/shipment to point of dispensation, and enables a host of supply chain efficiencies in addition to increasing product security.

"We have a unique value to offer when it comes to serialization," says Paul Behncke, North American Marketing Manager for HP's Health and Life Sciences Industry Vertical. "We have a lot of experience with RFID, but we can also provide serialized print matrices used for printing 2D barcodes through our imaging and printing division and our smart label partner Nosco."

Smart label technology is a critical component of any supply chain optimization strategy, especially when security is a key goal. The smart label category includes a range of printed security and identification



measures, such as lot and serial numbers, expiry dates, traditional and 2D barcodes, and embraces overt and covert identifiers such as digital watermarks and the geometrical ‘guilloche’ patterns similar to those found on printed currency. But there’s much more to HP’s PT&A portfolio than technology.

### **The strategic start**

Iain MacNeil, HP Business Development Lead for Product Tracking and Authentication Solutions in the Americas, is quick to point out that HP has taken business requirements and not technology as the starting point in strategizing for the PT&A portfolio. “We don’t want to present a ‘point’ technology solution, the way some of our competitors do,” he emphasizes. “That forces the customer to put all of its investments into one technology to solve all of its problems. Having a range of technologies gives customers a better opportunity to realize added value in their supply chains as they implement the solution. But more importantly, the portfolio is ultimately a strategy, not a technology fix.”

With business strategy in mind, HP offers a series of supply chain transformation services as part of the PT&A portfolio, drawing on established methodologies such as the processes,

metrics and best practices contained in the HP BPM/SCOR (Business Process Management/Supply Chain Operations Reference) services. These can help enterprises reduce opportunities for counterfeiting and diversion, ease regulatory compliance, improve recall/returns management and reduce inventory and shortages.

HP also operates a PT&A Center of Excellence (COE) in Puerto Rico, where many leading drug manufacturers are based. In addition to serving as an R&D site for the ensemble of PT&A technologies and services, the COE enables pharma companies embarking on PT&A initiatives to see the full solution in action. The COE is living proof of HP’s strong legacy in the pharma industry, and of its long-term commitment into the future.

“With that kind of commitment,” says MacNeil, “customers who invest in the HP PT&A portfolio will find that they have an opportunity to leverage the whole portfolio. This will give them even greater value over the long term.”

To learn more see Product Tracking and Authentication at [www.hp.com/go/transformHLS](http://www.hp.com/go/transformHLS) or call 1-877-258-6162 and reference code 18.



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