

Spring 2011

CSC

WORLD

BIG DATA

Diving Into the Deluge

INSIDE

Succeeding
in Desktop
Virtualization

Mastering
the Future
of Cloud

Dealing With
the Dirty
Side of IT

Shifting the
Focus of
Healthcare





BUSINESS AS USUAL BUT NOT AS YOU KNOW IT IN SEARCH OF A BETTER WAY?

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BUSINESS SOLUTIONS
TECHNOLOGY
OUTSOURCING

Major new technologies like cloud computing are changing the landscape of IT. Customers want to buy services, not infrastructure. Mobile applications are forcing businesses to reassess traditional IT models and transform. Many are moving from the physical to the virtual. So how can more flexibility, efficiency, and value be extracted from IT as a service without losing control of mission-critical computing? We're a world leader and independent provider of business solutions and IT services. Our cloud services and capabilities are available privately on premise or from a CSC Trusted Cloud data center. Now is the time to transform legacy applications and infrastructure. Begin the journey at www.csc.com/cloud.

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Inside CSC World

People have been talking about Big Data for a while. Organizations such as NASA, financial services companies, and healthcare entities have been grappling with the “data deluge” for years. But lately the conversation is moving beyond talk of mere size.

Today's Big Data movement is fueled by the social media revolution, billions of Internet users, and the increasing connectedness of our digital world. Size still matters, but the emerging market of Big Data is more about organizations tuning into new data arrangements that are increasingly connected with their own propositions in an effort to discover new insights.

This topic inspires CSC's Leading Edge Forum's (LEF) latest research and a forthcoming report called “Data rEvolution.” In this issue, we speak with Paul Gustafson, who oversees the planning and execution of the LEF's many technology programs, on the ongoing research. Our conversation reveals what's changing the architecture of information in business.

Big Data is also big business for CSC. As part of our cover story, we profile some key client engagements that are focused on the data dilemma as well as the data issues felt by the health services, chemical, energy, natural resources, and insurance industries. We're also touting our High Performance Computing Center of Excellence as a powerful resource for massive number crunching.

In addition to data, in this issue we're showcasing two important LEF research initiatives that highlight the need for better production and disposal processes for electronics and a shift in healthcare ideology toward treating wellness, not illness, first.

Of equal importance, cloud computing and cybersecurity are just as strategic for our company as they are for our clients. We're building a broad suite of offerings in each space and partnering with thought leaders to bring the most advanced thinking to market.

Michael Capellas, chairman and CEO of The Virtual Computing Environment Company, joins us for one such conversation, discussing the evolution and value of cloud. Plus, our own experts, Carlos Solari, CSC vice president, Cyber Technology and Services, and Sam Visner, CSC vice president and lead Cyber executive, share insights on “situational awareness.”

CSC's breadth of experience is growing across many other sectors as well. In Europe, our Fashion and Retail practice helps Conforama, a leading furniture and household goods retailer, transform its customer experience through improved operations and service policies, and renowned athletic apparel company, Champion Europe, overcome the complexity of an acquisition using our enterprise resource planning software, STEALTH 3000.

We hope you enjoy the issue. You can also find *CSC World* online at www.csc.com/cscworld, where you can subscribe, comment on stories, or download a free iPad or Kindle version.

Chris Sapardanis
Editor, *CSC World*



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CSC is no stranger to data. It’s a core discipline of what we do as an IT provider. Our body of work in business intelligence and analytics is growing and our High Performance Computing Center of Excellence continues to solve and manage extreme computing challenges. We are also helping clients in the chemical, energy, natural resources, health services, and insurance industries solve data dilemmas.



ON CSC.COM

Are you ready? Our new online tool will help you assess your readiness for moving to the cloud by exploring the business value and ease of migration for one of your applications. Try it for free at www.csc.com/cloud.

CSC is redefining the way applications add strategic value to your business. Our next wave of application services provides new levels of flexibility and cost control. Learn more at www.csc.com/applications.

We're transforming the role of IT in Formula 1 racing through our partnership with Marussia Virgin Racing. Join CSCInsideTrack, a community of UK-based CSC clients and employees interested in discussing this transformation and follow the latest on- and off-track action at www.csc.com/virgin_racing.

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We're reducing power consumption in CSC data centers with 1E's NightWatchman Server Edition, and using the experience to offer clients the same efficiencies.

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CSC BizCloud™ combines the privacy, security, and control of a private cloud with the agility, convenience, and commercial model of a public cloud. Our solution, which can be up and running in as little as 10 weeks, takes the work out of implementing a private cloud and helps overcome many objections that security-conscious organizations have to cloud adoption. Robert Mahowald, IDC vice president, SaaS & Cloud Services, says, "CSC has been very strategic with this announcement. They engaged customers in a discussion about their business needs and developed a flexible solution that addresses those needs spot on. BizCloud and CSC's related services break new ground for IT buyers trying to navigate the road to data center transformation." Learn more at www.csc.com/cloud.

TRANSFORMATION SERVICES ACCELERATE MOVE TO THE CLOUD

CSC's new ACE Suite of transformational services accelerate the migration of applications to the cloud by combining our standard processes with best-of-breed technologies from VMware, Inc., and The Virtual Computing Environment Company. The first of these services, the "ACE Factory," is a highly-industrialized automated managed service that quickly assesses, treats, and tests an enterprise's legacy custom and mainframe business applications for cloud deployment.

"In order to successfully grow and manage change, an organization must constantly innovate by creating new products and services, adapting to currency and market shifts, and mitigating the risks of unexpected market changes," says Michael W. Laphen, CSC chairman, president, and chief executive officer. "Our cloud services portfolio enables the reinvention essential to a changing business by redesigning applications and workloads." Learn more at www.csc.com/applications.



FULLY MANAGED VIDEO-CONFERENCING

CSC's new TelePresence as a Service (TaaS) offering is an end-to-end managed video-conferencing solution based on Cisco's TelePresence suite. Unlike other solutions, TaaS provides unique TelePresence packages at fixed monthly costs. The solution can also integrate disparate technology platforms into one user interface. Because we provide all of the equipment, design the TelePresence room, and manage the service through the duration of its lifecycle, there are no up-front costs to the client and fewer barriers to adopting cloud technologies. Learn more at www.csc.com/UCC.

CYBERSECURITY

CSC STRENGTHENS UK SECURITY EXPERTISE

To bolster our cybersecurity efforts in the UK, CSC took on the majority of staff from Symantec's UK Government Consulting business, Symantec-LIRIC. The team strengthens CSC's ability to offer a comprehensive set of security advisory and engineering solutions and services for clients in the region. CSC provides clients tailored offerings to define a roadmap to reducing their enterprise security risk and the security engineering services and solutions to execute the change. Learn more at www.csc.com/cybersecurity.



HEALTHCARE



A SOLUTION FOR ON-THE-GO HEALTHCARE PROFESSIONALS

Patient in Your Pocket™, our new application for BlackBerry® smartphones, lets healthcare professionals more effectively care for patients by equipping them with immediate, secure access to information from any location. Leveraging the communications capabilities of a BlackBerry, Patient in Your Pocket allows caregivers to capture and send narratives, images, and structured data. The application also serves as a unified communications platform that consolidates voice paging, text messaging, and email. Mobile doctors, nurses, and health workers in the U.S., the UK, and the Middle East, are already realizing its value while delivering front-line care to patients. Learn more at www.csc.com/patient_in_your_pocket.



NEW SOFTWARE MONITORS PATIENTS IN REAL TIME

CareVeillance™, a software tool that provides real-time clinical surveillance and reporting for hospitals, continuously monitors and evaluates clinical information generated during patient care. The tool alerts clinicians about patients showing early signs of high-risk conditions such as sepsis or pneumonia, giving caregivers an early opportunity to assess and make sure appropriate treatments are performed during critical time frames. "We were enthusiastic to work on the development and rollout of this tool and think it has the potential to be a real game changer in healthcare," says Greg Ator, M.D., chief medical information officer, The University of Kansas Hospital. Learn more at www.csc.com/careveillance.

AWARDS & RANKINGS

ONE OF THE WORLD'S MOST ADMIRABLE IT SERVICES COMPANIES

CSC ranks among *Fortune* magazine's list of "World's Most Admired Companies" in 2011 for the second consecutive year. We are ranked #4 in the Information Technology Services category and as one of the most admired companies in Virginia. According to *Fortune*, this recognition is "the definitive report card on corporate reputation," as decided by thousands of executives, directors, financial analysts, and ratings companies on nine corporate attributes, from people management to financial soundness.

A 'LEADER' IN GLOBAL IT INFRASTRUCTURE OUTSOURCING

Forrester Research identifies CSC as a leader in their March report, "The Forrester Wave™: Global IT Infrastructure Outsourcing, Q1 2011." The report notes that CSC has the strongest scores for overall current offerings among the 19 suppliers surveyed. High points for CSC's evaluation include geographic distribution for clients, staff, and global delivery model, as well as solid ecosystem participation.



INNOVATION PARTNER OF THE YEAR AT CISCO PARTNER SUMMIT 2011

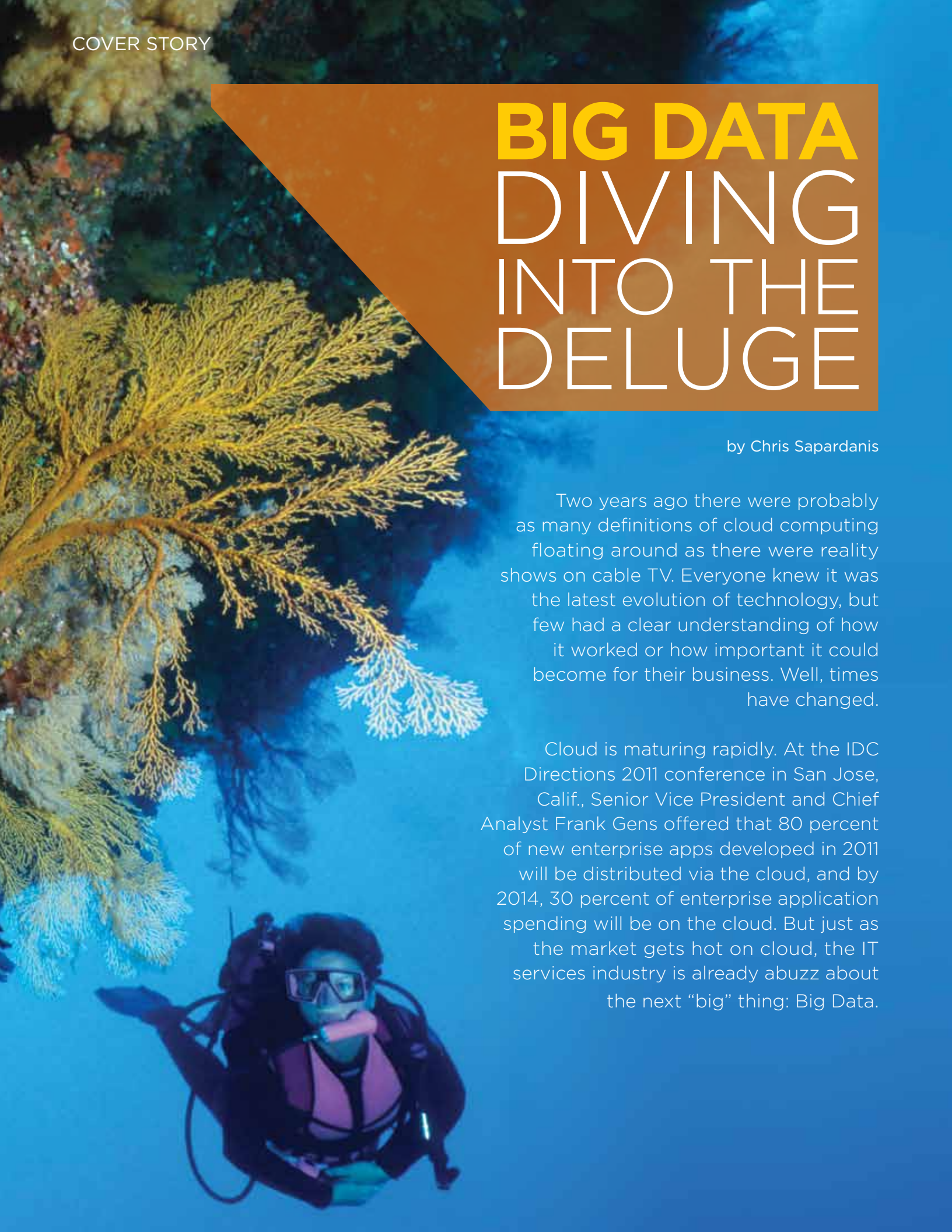
During Cisco's Partner Summit, CSC received two distinguished awards: Solution Innovation Partner of the Year and the Cisco Capital Partner of the Year award for the Multinational/Global region. Our decade-long relationship with Cisco offers clients global scale, multi-vendor integration expertise, and business processes based on world-class technology and open reference architectures — all delivered within a flexible choice of business models. Learn more about CSC at www.csc.com/about_us.

BIG DATA DIVING INTO THE DELUGE

by Chris Sapardanis

Two years ago there were probably as many definitions of cloud computing floating around as there were reality shows on cable TV. Everyone knew it was the latest evolution of technology, but few had a clear understanding of how it worked or how important it could become for their business. Well, times have changed.

Cloud is maturing rapidly. At the IDC Directions 2011 conference in San Jose, Calif., Senior Vice President and Chief Analyst Frank Gens offered that 80 percent of new enterprise apps developed in 2011 will be distributed via the cloud, and by 2014, 30 percent of enterprise application spending will be on the cloud. But just as the market gets hot on cloud, the IT services industry is already abuzz about the next “big” thing: Big Data.





The emerging market of Big Data is about organizations tuning into new data arrangements that are more connected with their own propositions in an effort to discover new insights.

Today's burgeoning Big Data movement is fueled by the social media revolution, billions of Internet users, and the increasing connectedness of our digital world. And just as hard to come by as definitions were in the early days of cloud, is nailing down exact figures on the amount of data being generated in the world and where it's headed.

Gens says there will be 1.8 zettabytes (one zettabyte being one billion terabytes) of data stored in 2011, up 47 percent year-over-year, and that will grow to seven zettabytes in 2014. Another estimate by IDC and EMC predicts that by 2020 the "Digital Universe" will be 44 times bigger than it was in 2009¹.

But beyond the numbers, what exactly is Big Data, where's it coming from, and why should anyone care? Organizations like CSC's Leading Edge Forum (LEF) are working to answer these questions.

Exploring an emerging market

Our LEF provides CSC employees and clients with access to a powerful knowledge base and global network of innovative thought leaders. LEF members work to spot key emerging business and technology trends, and identify specific practices for exploiting those trends for business advantage.

"When innovations are emerging in the market, we too need some time to understand what's being said, and what it means to our business and customers," says Paul Gustafson, LEF director of Technology Programs. "Two years ago with cloud, everyone was doing it, no one was doing it, and it took us four volumes of research to sufficiently unpack and repack what we believed the cloud world was all about."

It's happening again with Big Data, but the term itself isn't new.

People have been talking about Big Data for a while. Organizations such as NASA, NOAA (the National Oceanic and Atmospheric Administration), financial services companies, and healthcare entities have been grappling with the "data deluge" for years. Many times, they've looked to CSC for solutions. For example, one of CSC's Chairman's Award projects developed one of the world's largest healthcare data warehouses that certainly could carry the label of "Big Data." (see story on p. 12).

However, this new data isn't referred to as "big" just because of size. "It's diversity of data; it's complexity of data; it's new ways to organize and manage the data; and it's the new connections inherent in data," Gustafson explains. "Some of that may be big, but it doesn't all mean big."

The emerging market of Big Data is about organizations tuning into new data arrangements that are more connected with their own propositions in an effort to discover new insights. This topic has inspired the LEF's latest research and a report due later this year called "Data rEvolution."

The report says no industry is exempt from the challenges or opportunities of the Data rEvolution. Even the U.S. government has called for all its agencies to have a "Big Data" strategy².

The LEF's research reveals progress across many fields as organizations seek to derive meaning from data. The report says data is increasingly driving our actions, whether for discovering more about the world around us, making financial decisions, or understanding customer behavior for better target marketing. ■

¹ The Digital Universe Decade - Are You Ready?
<http://www.emc.com/collateral/demos/microsites/idc-digital-universe/iview.htm>

² Report to the President: Every Federal Agency Needs a 'Big Data' Strategy
<http://m.prnewswire.com/news-releases/report-to-the-president-every-federal-agency-needs-a-big-data-strategy-118433704.html>

CHRIS SAPARDANIS is editor of *CSC World* magazine.



by Chris Sapardanis

THE ECONOMICS OF DATA

A Q&A WITH THE LEF'S PAUL GUSTAFSON

Intrigued by the emerging market of Big Data, *CSC World* spoke with Paul Gustafson about the Leading Edge Forum's (LEF) ongoing research on the topic. Gustafson oversees the planning and execution of the LEF's technology programs, which include grants, papers, technology research reports, briefing series, Chief Technology Officer Exchange, and centers of excellence.

In addition to his work with the LEF, Gustafson consults with large companies on how to rethink business based on emerging technologies and addresses audiences frequently on these topics.

How is Big Data changing the marketplace?

Gustafson: We were intrigued when *The Economist* published an article¹ talking about the economics of data. It claimed data was becoming the new raw material of business, with an economic input almost on par with capital and labor. That's a pretty strong statement. And yet it's true. We are seeing a number of businesses that grow, develop, and then justify the fact that their data is an asset.

But the biggest buzz in data is what is happening in the social network. We're seeing businesses practically overnight looking to make connections with the data like never before and capitalize on its power. Mostly, the desire is to create some sort of a connection to something that would bring a deeper economic value. This desire to connect data in new ways is true whether we are talking social networks or the power grid.

On the technology front, there is a revolution underway in how we store, process, and manage data to get new insights. This is the move to armies of commodity computers doing parallel processing à la Google, distributed processing frameworks to manage the data across these computers, and new, more

flexible databases. The days of the "one size fits all" database — the relational database approach — are over. Add to this the cloud: on-demand provisioning of processing power and storage so you can scale up or down easily with business needs, and reduce costs as a result of "renting" rather than owning your IT infrastructure, paying only for what you use. The business, and more specifically the data, drives IT consumption.

Is this the same data that's been around for years, or are we talking about actual new data?

Gustafson: It's a combination. The whole business intelligence movement is based on trying to get more out of the data you have. Typically a business intelligence environment of the past was based on historical data that a business owned. It was their intellectual property; it was stuff they produced and generated. This was all well and fine as people built their analytics and made predictions off the past.

The shift taking place now is the blending of their data and someone else's data. This often means blending structured and unstructured data. We call this "completing the context." This practice to glean new insight is not possible with just one's own view of the world of data. It requires the blending of internal data and data from other sources, like time and place data or social network data.

For example, one company is combining location, terrain, weather, time, and sensor data to provide near real-time situational awareness for utility companies. If a utility company knows a heat wave is expected in a specific area, and when, it can notify heavy users to set their thermostats higher to avoid a power outage. By connecting the dots in a timely way, the company can manage resources more effectively and go for a controlled "dial down" rather than an uncontrolled shutdown.





What roles within organizations will be changed by the infusion of this new connected data?

Gustafson: The social space is typically a channel serviced by marketing communications people. The professionals that manage brands are also vested stakeholders and one of the examples we're citing in our forthcoming report, "Data rEvolution," is Procter & Gamble. They created a new organization inside their business to deeply tune in to brand chatter online and defend the company in the social network if needed. This group is using counterintelligence techniques originally designed for federal security agencies to find bad people. And it all started with a group of angry moms posting their experiences with diapers. (P&G later found the claims were erroneous.²)

Do you think this type of group might become common within organizations?

Gustafson: If they care about their brand, and they care about noise and chatter in the spirit of their brand, more organizations may have to launch their own counterintelligence techniques to diffuse what could be false stories. One of the challenges of this social network is its greatest benefit — it's widely connected. So if you've got a bad story out there that's untrue — or worse, a bad story that's true — you will need to launch a counterintelligence tactic to counter that story. That means being much more tuned in to sentiment, and being able to translate that sentiment into information you can act on.

Beyond the brand and marketing aspect, what other observations have you made during your research?

Gustafson: We are moving toward global sharing of data beyond what has been done in the past. Probably the best example is happening with CERN, the European Organization for Nuclear Research, in Geneva. The Large Hadron Collider there is the world's largest and highest-energy particle accelerator. This system and the volumes of data it generates are designed for collaboration because not even the CERN installation is big enough to analyze and store all the data the collider is generating.

Setting yourself up for a much more distributed set of data and analysis is a leading-edge trend, but not only with the collider. It's also happening between the worlds of environmental science and healthcare. We know there are environmentally induced implications around health. We are now seeing the need for data across disciplines in order to truly understand and manage the complexity of the world we live in.



Will this new collaborative world be full of new privacy and security challenges?

Gustafson: I don't think any of that is worked out yet, but there is a lot going on around de-identification. For example, you could still capture the general trend of what's going on in health, in a specific demographic or location, just without including real identities.

Google launched an analytics platform not even using official medical data. They just correlated against search data and had remarkable projections — when compared with actual health data — that were spot on. This started with the H1N1 virus in 2008, when people were doing searches about the flu. Google was able to predict outbreaks of flu in the United States quickly and accurately. There are a lot of people interested in search data as a new form of data, which they don't own, to do their own analysis, combined with their data to provide more insight.

Are we heading toward a completely accessible information-for-all future?

Gustafson: The architecture of information in a business is certainly changing. Until now, the stewards of information have been in the IT department. The broader expectation of the economics of data, in which we need to do more with more data and exploit it like never before, is going to stretch what used to be the core disciplines of data management.

Just like the cloud world empowered non-IT folks, saying, "I don't have time to wait for IT to stand up that kind of equipment," you are seeing business areas take charge of data analytics in a completely different way, drawing from new forms of data that are not IT-oriented, and making judgments and decisions on behalf of the business. As a result, we are seeing an inflection point in the world of IT, and the IT response is similar to that around cloud: Give people the tools and data they need to get their jobs done. ■

 Learn more about the LEF at www.csc.com/lef.



¹ "Data, data everywhere," *The Economist*, February 25, 2010, http://www.economist.com/node/15557443?story_id=15557443

² "Pampers takes on mommy bloggers and wins," *Social Media Influence*, May 10, 2010, <http://socialmediainfluence.com/2010/05/10/pampers-takes-on-mommy-bloggers-and-wins/>

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CHRIS SAPARDANIS is editor of *CSC World* magazine.



BIG DATA

A BIG PART OF

OUR

BUSINESS

CSC is no stranger to data.

We've worked with and managed all forms of information since our beginnings. Data has been a core discipline of what we do as an IT provider and this body of work and its offerings in the business intelligence (BI) space is growing exponentially.

We provide all the traditional business intelligence offerings along with a broad range of cutting-edge business metrics and predictive analytics solutions. CSC employs more than 1,000 BI consultants across the globe, and we work closely with top technology vendors such as IBM, Oracle, Microsoft, and SAP.

Our portfolio of BI services includes customer intelligence, corporate performance management, content management, and BI strategy development. Our Master Data Management solution, for example, tackles "Big Data" by using an innovative approach to integrate common systems across an enterprise. The ultimate goal: to convert large volumes of data into meaningful information.

More than ever, companies are interested in the metrics and analytics that not only serve as business performance indicators of past performance but also predict what is likely to occur in the future.

"You have to generate business intelligence with an industry in mind," explains Bert Lasley, managing director for CSC's Global Information Management practice. "We are creating industry-based solutions in the BI space that our clients find meet their business needs. And we're developing the processes and

organizational components for clients that enable rapid response to ever-changing indicators and predictors."

Our experience in Big Data includes High-Performance Computing, Chemical, Energy, Natural Resources, Insurance, and Health Services work.

HIGH-PERFORMANCE COMPUTING

Before data became a key business issue, there were those whose needs already surpassed average demands for computing power — scientists who study the earth and space, engineers who develop new concepts for flight, and other innovators who traditionally work on the edge of discovery.

CSC has a long history of supporting organizations that push boundaries. Twelve years ago, we established our High Performance Computing Center of Excellence (HPC COE), giving researchers and massive number crunchers a place to obtain solutions to their extreme computing challenges.


Today, the center operates high-performance systems that together have a capability that exceeds one petaflop of data and manages more than 43 petabytes of data for clients such as NASA, the U.S. National Oceanic and Atmospheric Administration, the Alabama Supercomputer Authority, Procter & Gamble, and Gulfstream. It has employees in Beavercreek, Ohio; Greenbelt, Md.; Sunnyvale, Calif.; and Vicksburg, Miss.; and later this year will open an innovation center in Huntsville, Ala.

"We have significant high-performance computing expertise in science and engineering applications for industries like space sciences, climate modeling, weather prediction, oil and gas, and consumer products manufacturing," says Donna Klecka, HPC COE director.

Today, the center offers a variety of services including solutions architecture, staff augmentation, outsourcing, and systems operations, maintenance, and integration. Its specialists have experience using a diverse range of equipment, including hardware made by SGI, IBM, HP, Oracle, and Dell.



 For more information on our High Performance Computing Center of Excellence, visit www.csc.com/hpc.

 Learn more about CSC's Business Intelligence practice at www.csc.com/bi.



CHEMICAL, ENERGY, AND NATURAL RESOURCES



Talking about data can be as exciting as talking about mud — unless you're living at the bottom of a fire-torched hill on the third day of a torrential rain storm. Today more than ever, companies and their IT managers are finding themselves at the bottom of that hill, watching as their organizations fill with increasing pools of data.

However, some savvy ones are looking at building enterprise collection and interpretation capabilities where experts and decision makers can pluck nuggets from the waters and use them to improve both their bottom and top lines.

“The challenge is getting people to think of the business opportunities around their data,” says Bob Welch, president of CSC’s Chemical, Energy, and Natural Resources Group.

“Ten years ago, technology didn’t allow us to even consider this. Now we have the IT maturity to think about how data can benefit an entire enterprise.”

While an organization’s quest to generate knowledge from its data isn’t new, new stresses and drivers along with the sheer amount of data generated call for better solutions.

Take the oil and gas industry, where a key challenge for companies and regulators alike is quickly getting to the data they need. In fact, when CSC and Hart Energy Publishing asked petroleum industry survey respondents last year where the greatest promise of improved productivity might appear, they said, “improved access to technical data and information are most important.”¹

Whether new data drivers result from a need to quickly access data during emergencies, or automate underground fleets of data spewing machinery, or gather enterprise data to promote sustainability, CSC has been creating tools for companies in the chemical, energy, and natural resources industries, including an Enterprise Compliance & Sustainability Solution² and Petroleum Enterprise Intelligence Solution³.

“With IT’s commoditization and virtualization, along with the introduction of delivery models like cloud, we have the ability to move past basic information capture and processing, past thinking about how to acquire data and use it within functions and processes, and now think about information delivery,” says Welch.

Read the full story at www.csc.com/cscworld.

¹ www.csc.com/unified_data

² www.csc.com/enterprise_compliance

³ www.csc.com/pei

HEALTH SERVICES

The healthcare industry is transforming as medical records go digital and more devices begin to record data. Managing and analyzing large data sets is becoming increasingly important.

We built Blue Health Intelligence (BHI), one of the world’s largest healthcare data warehouses, to help the Blue Cross Blue Shield Association analyze and manage data. The warehouse improves benchmarking capabilities and enables advanced predictive analytics using data from up to 40 Blue Cross Blue Shield companies. BHI contains medical and pharmacy claim data for more than 50 million people, while providing the client with a huge competitive advantage.

We are also working with the U.S. Centers for Disease Control and Prevention and the Harvard Pilgrim Health Care Institute on the Post-Licensure Rapid Immunization Safety Monitoring program (PRISM). To combat the 2009-2010 swine flu pandemic, the U.S. government enacted the largest mass vaccination



program in recent history. With millions of people getting flu shots, it was necessary to enact a federal strategy for monitoring vaccine safety. PRISM integrates local immunization information with claims data from large health plans throughout the U.S. The program is able to monitor a large population and quickly identify any signs of adverse reactions.



INSURANCE

In the data rich environment of an insurance company whose financial survival is based upon its ability to assess risk and exploit it for reward, insurers are making considerable investments in business intelligence.

This year, Hastings Mutual Insurance Co. licensed CSC's Insurance Industry Data Model, which unifies multiple sources of data into a complete logical representation of data across an insurance enterprise. Michigan-based Hastings is using the model to gain detailed insights into its business operations for enhanced decision-making.

"In an increasingly competitive environment, insurers need a way to organize data to support advanced reporting and predictive analytics," says Jeffery Schwalk, president of CSC's Property and Casualty Insurance Division. "The Insurance Industry Data Model, which is based on CSC's deep insurance expertise and industry best practices, organizes and unifies data in a usable form for both business and IT communities to enhance product development, distribution, risk management, business efficiency, and financial performance."

The Insurance Industry Data Model, the foundation of CSC's Insurance Optics family of business intelligence solutions, has 400 tables spanning more than 35 subject areas, which include 7,000 distinct data attributes that can be bundled for licensing.

 For more information, visit www.csc.com/insurance_optics.



"PRISM is being held out throughout the federal drug safety world as a huge success and as a model for other programs," says Jim Van Dyke, a CSC Health Services principal. A key to the program's success is using population-level statistics to evaluate whether diagnosis codes are medical conditions caused by the vaccine. When a potential issue is identified, in some cases, a researcher will contact physicians treating those patients to evaluate the causal linkage between the vaccine and the diagnosed medical condition. In all, more than 35 million people have been monitored.

CSC also plays a key role in a public-private partnership formed to research the best methods and technology for drug surveillance monitoring. In doing so, we helped create a first-of-its-kind common data model that standardizes healthcare information and enables a collaborative process for detecting drug safety.

As an outgrowth of our work with the Observational Medical Outcomes Partnership (OMOP), CSC offers a commercial Health

Informatics Platform service that enables our customers to access a wide range of analytic tools and methods and large medical data sets. This platform reduces the cost and complexity of the research process by providing the data in common data models along with a standardized medical vocabulary.

"Based on our experience in these types of initiatives, CSC now offers a health intelligence platform and managed service that customers can use to conduct analysis using any data source and analysis method," says Lynette Ferrara, a partner in CSC's Health Informatics practice. "The platform comes pre-loaded with data, a full range of analytical tools and analysis methods. Customers can add their own data and analytical methods as well as conduct secure collaboration with their partners." ■

 Learn more about our Health IT and Informatics capabilities at www.csc.com/health_services.

JIM BATTEY and **JENNY MANGELSDORF**, writers for CSC's corporate office, contributed to this article.



A Strategy for Success in **DESKTOP VIRTUALIZATION**

Sooner or later, most organizations come to the realization that beneath the calm and order of everyday work lies the chaotic world of IT. For CIOs, attempting to manage this myriad of disconnected systems while keeping everything on track is a complex challenge.



Fixing one problem creates three others. Fixing those problems creates three more. At some point, the wreckage is strewn across the enterprise — and accomplishing your goals becomes a maddening task. It should come as no surprise, then, as organizations seek to streamline PC administration, trim IT costs, reduce compliance risks, and improve security, they're attempting to retake control and calm the chaos through the effective use of technology.

As a result, desktop virtualization is appearing prominently on CIOs' road maps. Mandated to achieve greater flexibility and agility, these leaders have accelerated plans for improved IT management, making desktop virtualization a priority.

However, no road to efficiency is smooth, and CIOs are finding they need help. In fact, 74 percent of IT executives say assistance from a vendor would be "highly" valuable during a desktop virtualization deployment initiative, according to a recent IDG Research Services survey co-sponsored by CSC and NetApp¹. And the need for help doesn't go away once implementation is complete; 59 percent of respondents say ongoing consulting, support, and management are "extremely" or "very" valuable.

Why shouldn't CIOs go it alone? The survey respondents cite concerns over:

- Their ability to support specialized applications
- Having the necessary network bandwidth
- Application performance
- Complexity of implementation

Ultimately, IT leaders must do three things: design an effective strategy, deploy desktop virtualization solutions that achieve performance and maximum return on investment, and keep end users happy — if not delighted — through what can be a very tricky migration. Those who succeed are rewarded with a streamlined computing environment and an improved bottom line.

Why CIOs like desktop virtualization

Thin-client computing and desktop virtualization have evolved considerably in recent years and it shows in the adoption

rates. The IDG Research Services survey, which included 124 CIOs and IT leaders across all industries, found that one-third of companies have already implemented or are in the process of implementing desktop virtualization. Another 24 percent plan to use it in the next three years.

It's not difficult to understand the appeal of a technology whose benefits include:

- More robust administration tools
- Faster provisioning
- Lower operational costs
- Improved flexibility
- A greener IT department
- Better business continuity and collaboration
- Improved security and reduced compliance risk

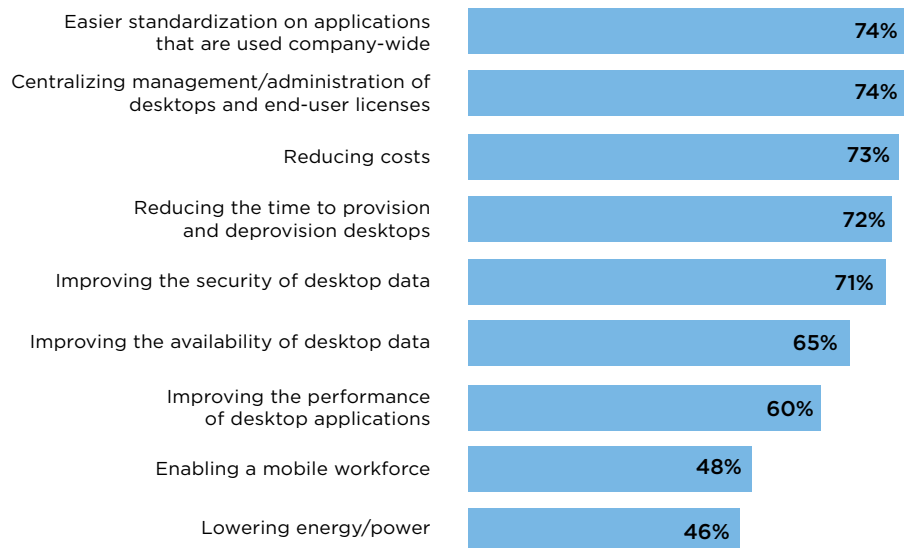
The best desktop virtualization products provide end-to-end solutions, from software to storage. But perhaps the biggest selling point is the decreasing cost of these products.

performance level on par with applications and data residing on a local hard drive.

This approach — also referred to as a hosted virtual desktop — is one of many new "as a service" frameworks that are changing the way service and solutions are managed by organizations. By running a personalized virtual desktop through the data center instead of on a local device, it's possible to manage software applications, processes, and data centrally while dramatically reducing exposure to data loss. Moreover, end users can access this data from any device and have access to the same personalized desktop using a LAN, WAN, or the Internet.

Many IT departments that deploy desktop virtualization find it trims provisioning from days to minutes. It also provides ultra-fast deprovisioning capabilities if an employee leaves the organization or a device is lost or stolen. Administrators

TOP DRIVERS FOR DESKTOP VIRTUALIZATION



Source: IDG Research, November 2010

Desktop virtualization is evolving from a niche product to a mainstream solution. A few years ago, virtual desktop infrastructure (VDI) was little more than a presentation server and thin-client device interacting across a network. Today, VDI is a robust, full-featured, and highly manageable computing environment. An enterprise can run an array of applications across vast geographies and, with a properly configured network, offer a

can use remote administration tools to reduce, if not eliminate, on-site support. And overseeing patching, operating system upgrades, and other updates en masse becomes a thing of the past. Now it happens neatly in the data center.

Finally, desktop virtualization fits well into cloud initiatives and other virtualization efforts. Here's how to achieve success in virtualization:

Advice From Your Peers

The IDG Research Services survey included this open-ended question: What advice would you offer your peers who are implementing or evaluating desktop virtualization? Here are some of the responses:

- Be specific about areas where it makes sense to virtualize.
- Run a pilot for two to three months to get a good feel for performance.
- Start with administrative and executive staff to gain top-down ownership.
- End-user acceptance can make or break you.
- Ensure employee roles/profiles are available before you start.
- Test under the worst possible conditions to ensure performance expectations match reality.

No. 1: Build a strategy

Before designing a desktop virtualization strategy, IT leaders need to determine how it will be used, and what business and IT challenges it will address. When respondents were asked to give their

peers desktop virtualization implementation advice, the most common responses include planning.

Another piece of advice they offered is to roll out desktop virtualization on a project-by-project basis. After achieving success in one department or use case, IT executives can smoothly move to others. This approach ensures that systems work effectively and contribute to an enterprisewide best-practice approach.

For many CIOs, desktop virtualization is one piece of an overall strategy; 52 percent of those surveyed say it is part of a larger business or IT project or initiative. And nearly one-third report desktop virtualization is their path to deploying Windows 7. When it comes to a natural point of entry to desktop virtualization, half of the IDG survey respondents would start with the PC refresh cycle. It's also wise for a desktop virtualization initiative to coincide with Windows 7 adoption.

To maximize results, IT must involve various stakeholders, from business owners to end users. CIOs should consider how desktop virtualization solutions will be used, and what applications and data will

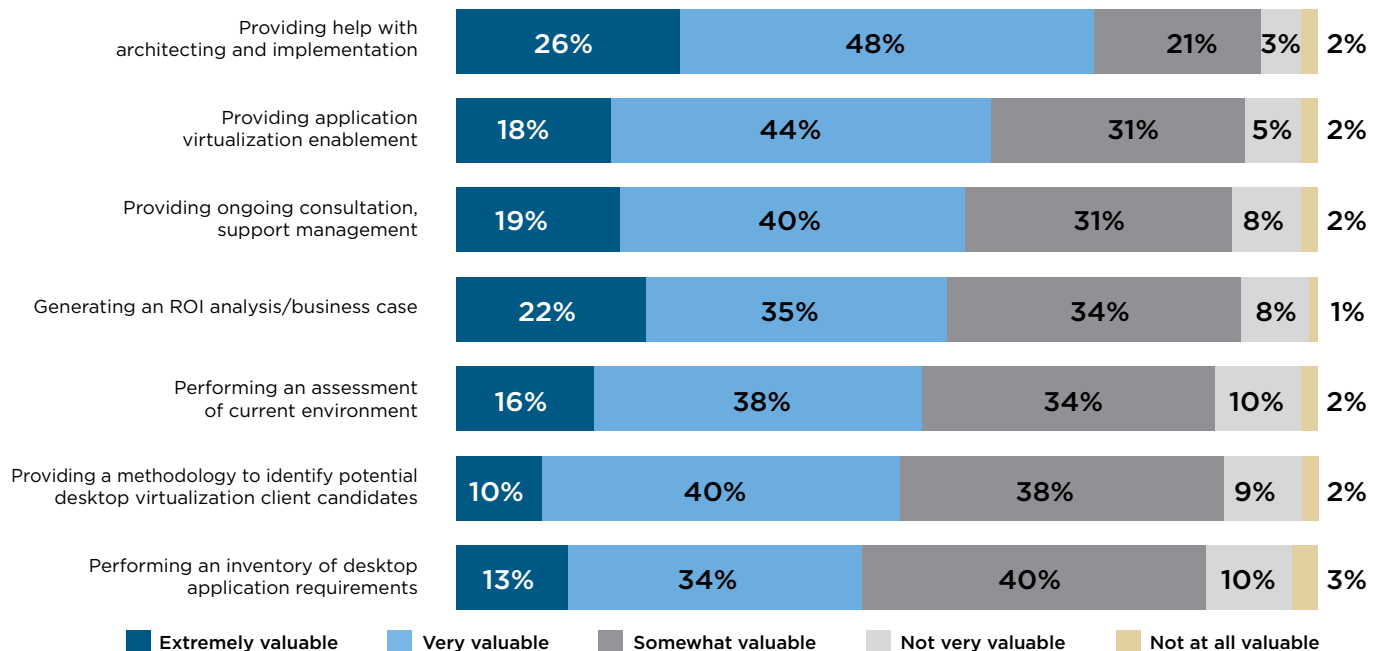
be available to various employees based on their roles and responsibilities. And then there's expertise. A virtualized desktop infrastructure touches many areas of the IT organization, so it's important to develop internal skills to optimize network performance, storage, and a spate of other systems.

A big-picture approach is critical for success, and scalability is a key component. If an enterprise has 1,000 seats in place and opts to expand to 5,000, accommodating that growth is not as simple as increasing resources fivefold. CIOs must ensure that technology investments increase the number of virtualized desktops while maintaining acceptable performance levels.

No. 2: Mitigate, mitigate, mitigate

Desktop virtualization relies on hardware and software that work together to create a "technology stack." The upside for end users is that the desktop computing experience is virtually identical to that of a standard PC. For IT administrators, desktop virtualization offers powerful, streamlined management capabilities, but it also causes concerns. Survey respondents report they are apprehensive

WHAT CIOs WANT FROM VENDORS TO EASE DESKTOP VIRTUALIZATION DEPLOYMENTS



Source: IDG Research, November 2010

about whether it will support specialized applications, and if they'll have the bandwidth needed to accommodate it. Also on their minds: application performance, implementation complexity, acquisition cost, and Microsoft licensing.

Resiliency based on a single point of failure is another concern, and a crucial one. If a single PC fails, it's little more than an inconvenience. But if a key server goes down it can take hundreds of users with it, and deliver a serious blow to the business. IT executives can mitigate these concerns through upfront assessment and planning, and it's best to call for outside assistance at the start. The chart on page 16 reveals areas where CIOs most value outside support.



Technology partners can help organizations understand which applications support a virtualized desktop (certain legacy or homegrown applications might not work directly), get the necessary bandwidth to support the technology, ensure LANs and WANs are optimized for the shift in data flow, and resize servers and storage to manage data flow and computing requirements efficiently.

With this technology, upfront acquisition costs are often significant, so every CIO strategist will want to factor in total cost of ownership — and compare a desktop virtualization initiative to typical PC refresh cycles — along with administrative IT expenses, various operational costs, and potential security risks. And CIOs also would do well to choose technology vendors that assess ROI as this will help them build the business case for investment.

No. 3: Select the right solutions

Best-practice organizations plan ahead, conduct a benefit-risk analysis, run pilots,

and start with a core set of users before rolling out an initiative enterprisewide. They select robust technology solutions that provide a strong IT foundation, and find vendors, system integration consultants, and service providers that support their current needs, but also provide a framework for future growth.

Finding the right solution, however, takes time. It's important to recognize that desktop virtualization doesn't benefit every worker or every situation. IT must ascertain who uses applications that aren't compatible or optimized for virtualization, and where the ROI isn't sufficient to justify the technology. For example, scientists and field technicians who connect real-time or data-intensive instruments and devices to their PCs typically aren't good candidates. Graphic artists, engineers, and others tied to a workstation may not benefit either.

IT leaders must understand the type of work each individual performs, where the work is done, what network path and applications are used, how people within the organization collaborate, what policies and procedures an organization wants employees to follow, and what type of infrastructure and bandwidth exists — including at branch offices and remote locations. And then there are bigger-picture factors like mergers and acquisitions, business process outsourcing, and mobility initiatives.

CIOs need to involve other business departments and functions in their desktop virtualization initiatives to determine which solutions work best. Then they need to choose service and technology providers with the right combination of experience, expertise, technology, and strategic partnerships to support those initiatives over the long haul.

Consider this example: Kluwer, a major publishing company based in the Netherlands, achieved a 90 percent decline in conventional desktop and laptop use and decreased its total cost of ownership by 7.5 percent by deploying CSC Dynamic Desktop. Their technology stack, built using AppSense, Citrix, and NetApp, is

CSC Dynamic Desktop

Our virtual desktop service gives you the security and efficiency benefits of thin-client computing. Users get the rich, personalized desktop environments they expect, and the ability to work from wherever they are located.

Learn more at
www.csc.com/vds

combined with CSC services to streamline data sharing and simplify IT support, and includes features such as automated data deduplication of both desktop and user data through NetApp storage.

UK-based postal services provider Royal Mail saw similar success. The company gained more granular control of systems and access using our desktop virtualization solution — all while providing employees with personalized desktops.

IT must, and can, retake control

In today's increasingly complex and chaotic IT environment, desktop virtualization offers a way to regain control of systems, resources, and how workers handle and store data. It fosters device independence and more secure workflows. The technology helps boost productivity, lower operational costs, and streamline PC management. It improves lifecycle management and creates simpler software and operating system upgrade paths — including through Windows 7.

Desktop virtualization also complements cloud initiatives and the widespread use of server virtualization technology. In the evolution of computing, it is a logical and strategic step forward. Or, as one IDG Research survey respondent says: "It is the way to go." ■

¹ A version of this white paper appears in the April 2011 edition of *CIO Magazine*.

Visualization **BRINGS IDEAS TO LIFE**

by Paul Taroli

We've heard it before: globalization trends and a changing economy demand new strategies from companies that want to compete effectively in the marketplace. Innovation and speed are critical for staying abreast, if not ahead, of the competition, and wherever there's an opportunity to improve, there's a need for innovation.

The public sector is no exception. As the economy recovers, taxpayer demands for better public services and support grows alongside a government's ability to meet expectations and show value for the tax dollar.

We understand that. Innovation at CSC means assimilating and integrating fresh ideas that work. Vis-EDGE is one of our latest innovations. A new process powered by an underlying technology (iRise), Vis-EDGE allows company stakeholders to visualize and interact with working models and simulations of complex technology software solutions and processes well in advance of solutions being coded, interfaced, and put into operation.



“Vis-EDGE isn’t just about the software; it isn’t just about the tool — it’s about an entirely new way of capturing requirements,” says Lem Lasher, chief innovation officer at CSC.

Visualizing a website before it’s online

Vis-EDGE provides high-fidelity requirements that are documented and visual, allowing business stakeholders a much earlier opportunity to see and interact with their applications while providing development teams a clear blueprint to help produce a higher quality coded prototype the first time.

In Minnesota, the Department of Revenue is redesigning its eight-year-old website using this approach. Since last August, stakeholders from the department’s 17 divisions have used visualization to create a working model for a new site that will play a key role in the state’s communications with taxpayers.

“Our website has basically become a clunky and nonintuitive document library, and we need to start over again,” says Kit Borgman, director of communications, Minnesota Department of Revenue. “One of the more challenging aspects of a project of this magnitude is being able to clearly show the business users inside the agency what their decisions would look like.”

During the early stages of the redesign, business users could input their requirements into Vis-EDGE and immediately see how those changes would appear on the site. Previously, requirements would be collected over time and presented in a “big reveal” that could be a shock to some who see something they didn’t expect.

“The immediate payback is that visualization comes with so fewer surprises,” Borgman says. “Without it, we would have been returning to the drawing board multiple times. That could have added months to the design process.”

Visualization software is also beneficial for a large organization like the Minnesota Department of Revenue where many divisions need to participate in the project. The ability to communicate effectively between groups is crucial to success.

Too often, the disparity in experience and understanding between IT and business stakeholders leads to miscommunication and results in project scope changes and budget overruns. Our approach throws light on that intersection between the two parties. By adding a visual hands-on component through the Vis-EDGE process, project requirements are captured more readily from the onset, and through realistic simulations, stakeholders and users visualize how the application will look and work.

By the time the department reached the construction phase, it was confident everyone was on the same page as a result of using Vis-EDGE. While small changes are a given going forward, the wholesale makeovers that can doom the timeliness and budget of a website redesign have been avoided.

“Everyone started out with their own idea of what the website should do and what it should look like,” Borgman says. “The

beauty of iRise is that we can put all these teams together in one room, have them look at the same pages, and discuss the pros and cons of what they were seeing on the screen. I can’t even quantify how much time that saved and how much that enabled the process to work. Visualization is really everything when it comes to putting a website together.”


“Vis-EDGE isn’t just about the software; it isn’t just about the tool — it’s about an entirely new way of capturing requirements.”

— Lem Lasher, chief innovation officer, CSC

How Vis-EDGE works

Through web-enabled or mobile applications, Vis-EDGE uses similar concepts to computer-aided design in simulations during the requirements stage. The visualization process involves three distinct pieces of software:

- **iRise studio** provides a simple drag-and-drop interface with functional, active links, buttons, and drop-down menus, among other customizable applets and widgets, to design required applications. The studio also supports multiple modes of operation, including a high-level whiteboard to define the flow of an application, a user interface that allows users to drag and drop widgets from an extensive library, and data sheets that allow users to add real sample data through a spreadsheet-type interface.
- **Definition center** is a shared server that provides a hub for enterprise collaboration by teams of analysts working on complex visualization projects. It allows for real-time collaborative authoring and comments management, along with integrations to IBM Rational products, shared reusable content libraries, and secure access through Lightweight Directory Access Protocol authentication. CSC has established two definition centers: one for training and development, and a second production environment for use on projects by CSC consultants and our customers.
- **iRise iDoc reader** is an offline feature in the visualization process. Visualization authors can save their visualizations by exporting them to an iDoc. A free download of the iRise reader allows the client to use and review these portable and interactive visualizations and to experience the proposed software. Comments made to an iDoc by stakeholders can be emailed back to authors and uploaded to the definition center where the team can manage and address them. ■

 CSC has more than 100 consultants trained in visualization globally and the number is growing. If you are interested in learning more about visualization, contact us at www.csc.com/contact_us.

PAUL TAROLI is global director of CSC’s Center of Excellence for Visualization.



AWARENESS IS KEY to Today's Cybersecurity

by Jenny Mangelsdorf

Life is full of surprises. In IT, few know that better than those in cybersecurity. As the world becomes more connected and organizations experience massive increases in infrastructure access points due to innovations like the cloud, mobile devices, the new Internet Protocol (IPv6), and “x” as a service offerings, the ability to rapidly counter threats to an operation continues to challenge even the best technologists.

That’s why many stress the importance of awareness. It’s an idea moms have touted for millennia — ‘be aware of your surroundings’— and something just as relevant to IT. Referred to as “situational awareness,” this level of alertness is all about knowing what’s happening within your enterprise as well as in the outside world.

“You cannot think about situational awareness strictly within the confines of your own network or enterprise any longer,” says Carlos Solari, CSC vice president, Cyber Technology and Services. “The challenge is how to correlate the threat information that’s available in the larger picture with the sensor information you have from inside your own network.”

This is especially true as new sophisticated threats emerge, like Stuxnet. This malware, which targets industrial equipment, has infected at least 24 of Siemens’ industrial customers’ systems worldwide¹, including the centrifuges used in Iran’s uranium enrichment program. And while this isn’t the first case of cyber

sabotage — Stuxnet was discovered in mid-2010 — some say it’s a game changer because of the amount of resources used for its development and its sophistication.

“Stuxnet has received the attention of industrial manufacturers and power producers worldwide who now realize their operational systems may be more vulnerable than they had thought,” says Sam Visner, CSC vice president and lead cyber executive. “Because of malware like Stuxnet, public awareness has increased and people are beginning to realize that having situational awareness is even more important — not just for general IT systems, but also to protect against threats to the IT embedded in and used for critical infrastructure.”

Many nations believe these threats are real, as are their consequences. For example, the UK’s 2010 National Security Report lists “hostile attacks upon UK cyber space by other states and large-scale cyber crime” as one of the top four risk areas that should be the highest priority for action, taking account both likelihood and impact.² Evidence of the UK’s cyber emphasis is the fact that even with last year’s deep budget cuts, it has committed £650 million over the next four years to cybersecurity “to give Britain a real advantage in cyber resilience.”³

Increasingly, governments are also viewing the cyber world as a domain unto itself and one that needs protection because if that domain is crippled, it can have far-reaching repercussions.

This view comes from the Stuxnet attacks as well as other cyber events, such as the cyber attacks that flooded Estonian websites in 2007 and the numerous Georgian and Azerbaijani website attacks in 2008.

“In the case of Estonia, cyber was treated absolutely as its own domain,” says Visner. “The perpetrator’s message was clear, ‘Within the cyber domain, you’re isolated and within our sphere of influence.’”

“It was clear that for a few days what happened in Estonia was not up to the Estonians; it was up to someone else, and whoever it was, was physically invisible, but clearly influential. Situational awareness in this case is about managing what happens to you inside of cyber as its own domain.”

As organizations continue to gain first-hand cyber crime experience — the U.S. Department of Defense’s systems are probed by unauthorized users more than six million times per day⁴ — public and private sectors are increasingly working together to create stronger cybersecurity capabilities. For example, more than 500 participants from the public and private sector, including specialists outside the U.S., have formed a Cyber Security Working Group to create cybersecurity guidelines the U.S. can use as it begins to transform its electric power infrastructure into a Smart Grid infrastructure.⁵

A key challenge, says Visner, is taking this collaboration a step further and sharing threat information. Private and public sectors, as well as nations, are increasingly evaluating potential cybersecurity partnerships, especially as they relate to securing global or continental infrastructures, such as transportation, financial, and energy.

“Effective situational awareness requires data gained through stronger international cooperation and the selective use of intelligence that relates to threats to global infrastructures, supply chains, and the international system,” says Visner. “The global cyber environment has grown beyond the control of any single nation. Broader intelligence capabilities related to emerging threats are needed to successfully combat them.”

One misconception to which organizations cling is the belief that if their systems are separate from the Internet, they are safe from attack. That complacency further dampens any urgency in developing a strong situational awareness capability.

“Even if you use a separate network, without situational awareness you may not know that someone has gone in, plugged a device into the network, and is communicating to the outside,” says Solari. “Physical isolation can be breached readily. So the isolation you think you may have because you have a separate physical network is an assumption; you can take no comfort in that whatsoever.”

JENNY MANGELSDORF is a writer for CSC’s corporate office.

Stuxnet was reportedly introduced using removable drives, like USB flash drives, and allegedly attacked Siemens’ industrial control systems via private networks. Some organizations, however, still operate as if security is about stopping a cyber attack from coming in the door, at the ingress points. They don’t pay enough attention to the threat inside and instead focus solely on securing their networks — a view that Solari says has to change.

“The IT industry has miscalculated by its network-centric focus, and continues to do so by its lack of attention on the applications and data, including metadata. These areas still get so very little attention and is why we have the issues we do,” Solari says.

To achieve awareness today takes continuous monitoring, says Solari. Before, the focus was on inspecting an organization’s systems on some annualized cycle. However, because the cyber landscape changes so rapidly, organizations need to monitor their systems constantly, as well as what’s happening in the world outside.

For example, to monitor clients’ systems, CSC uses managed security services on a 24x7 basis to provide information about external threats and identify and protect against potential vulnerabilities. However, today’s tools need to be stronger, says Solari, to keep pace with the continually increasing amount of threat data and turn it into accurate, timely intelligence.

“The ability to deal with the volume of data, and find the exposures and threats inside of all that data, is one of the most significant challenges facing the world of situational awareness,” he says. “That is a big part of the technical challenge, and we are working with our partners to solve that.” ■

¹ <http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo&lang=en&objid=43876783&caller=view>

² http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/documents/digitalasset/dg_191639.pdf

³ <http://www.fco.gov.uk/en/news/latest-news/?view=News&id=23074623>

⁴ <http://www.military-information-technology.com/mit-home/261-mit-2010-volume-14-issue-6-july/3142-mission-success-in-cyberspace.html>

⁵ <http://csrc.nist.gov/publications/nistbul/october2010-bulletin.pdf>

CSC Secures Systems Globally

Our nearly 2,000 cyber experts serve public and private sector clients worldwide, providing a full range of cyber services — from vulnerability analysis, penetration testing, and data-loss prevention to a full range of managed security services. Our global StrikeForce team responds to cybersecurity incidents and provides cyber forensics training and analysis. We also operate Common Criteria Test Laboratories in the U.S., Europe, and the Far East, and have a worldwide infrastructure of Security Operations Centers.



To learn more, visit www.csc.com/cybersecurity.

MASTERING THE FUTURE OF CLOUD COMPUTING

An Executive Perspective

Last autumn, CSC brought together business leaders to discuss the latest technology and security concerns. Michael Capellas, whose 30-year history of technology leadership has given him unique insights, led the conversation, discussing how the world has come to the brink of huge-scale technology-driven business change.

Capellas is chairman and CEO of VCE, The Virtual Computing Environment Company, a Cisco-EMC joint venture with investment from Intel and VMware, started in 2009 to bring together industry-leading IT infrastructure. In August 2010, CSC announced that VCE architecture will be our default platform for cloud-based deployments.

The following is an overview of Capellas' views on what events and disruptions have led enterprises to the cloud and today's IT landscape. Disruptive technologies, in particular the cloud, are likely to be adopted almost universally in the next few years: so how did we get to this point so quickly?

From leased lines to IP


Cloud's story began in 2003, when most large organizations began to use Internet Protocol (IP) for their network management. Until then, most businesses used dedicated leased lines for data networking. The move to IP took place across the world in around 24 months; this fast switchover was all about business realities.

With an IP layer in place, network capacity can be dynamically assigned as needed, and users are only charged for what they use. They may no longer have to concern themselves with making predictions about usage and then committing themselves to renting a fixed amount of space: users can now assume that network capacity will be there when needed.

This marked a conceptual change for most large organizations, as they came to understand the commercial advantages of paying only for usage. Not only did costs generally come down, but it led to greater operational flexibility, with businesses no longer being constrained by availability, and instead able to pursue opportunity wherever it appeared. This provided confidence that their infrastructure would enable growth in any direction.

The processor revolution

The data communications revolution was followed in 2006 and 2007 with a step-change in processor power, with the catalyst being the arrival of Intel's x86 processing architecture. Providing a combination of massive power in a very small space and greatly reduced power consumption, it led to lower processing costs, and fast and fluid scaling.



This has begun to make the traditional microprocessor-driven PC and server model obsolete. Computing needs can be managed through flexible groups of blade servers, which can be slotted into place as needed, leading to a new investment model and greater flexibility.

Expanding the edge

Finally, we are still seeing an explosion in wireless access. This has expanded the edge of both public and corporate networks, while also driving fast consumerization of technology, evidenced by the rapid adoption of smart phones and tablets. As millions of mini-apps spread across the world, barriers between previously separate technologies are breaking down.

Today, content is doubling every six months and includes voice telephony, video, animation, and business data. Content is also digital and can be created, shared, recycled, and blended within a world of multimedia applications and activities.

These are the steps that have brought us to where we are now.

Reaching an inflection point

The cloud is the natural outcome of a decade of fast, evolutionary change. The new architecture reflects businesses' demands for great flexibility, together with the explosion in content. It also means that networks can no longer be managed in a traditional way. But it takes something more than technology potential to create a true inflection point, and that extra factor is provided by economics.

“The cloud is the natural outcome of a decade of fast, evolutionary change. The new architecture reflects businesses' demands for great flexibility, together with the explosion in content.

— Michael Capellas, chairman and CEO of VCE

The financial meltdown and the global recession that followed was an exceptional event, which occurs once every 50 to 60 years. All organizations need to reduce costs and share risks in order to survive, and that has driven demand for entirely new commercial models.

Significant breakthroughs also tend to occur immediately after periods of economic difficulty. Businesses are likely to freeze investment during the downturn, and when conditions change for the better, they want to make up for lost time by seeking big operational improvements.

That's when they seek out and invest in radical new ideas.

A new approach to technology costs

Most businesses need commonsense reasons for moving to cloud-based service models, and the most compelling of these is that traditional models no longer represent value for money because:

- **Businesses buy more software licenses than they need.** They pay for nonessential applications because their legacy technology is too costly to switch off; they also guess at the volume of users, so tend to buy more than they can use.
- **Data centers usually don't run at capacity.** They are filled with servers that are dedicated to specific applications, together with additional capacity for "emergencies." Even a well-run corporate center may only use 30 percent of capacity.
- **Spend on new applications is too low.** New developments to support vital business activities rarely go above 20 percent of total IT spend. That means 80 percent of spend is used for "keeping the lights on," rather than creating value.

That explains why return on IT investment is very low, which leads to problems in plentiful times. In hard times, this is simply unacceptable. It's also now unnecessary.

Convergence in action

The cloud is the commercialization of converged technology, enabling organizations to divest themselves of many fixed costs and focus on their core business. For organizations, buying IT as a set of services, on demand, and paying only for what they need and use enables a revolutionary change for the better in their cost base and agility.

Most end users no longer think much about networking capacity because it is virtualized, thanks to the use of IP. We assume capacity will be there when we need it, and that we will only pay for what we use.

Today, we can apply the same approach to a total infrastructure. In this converged environment, end users do not need to worry about if they have enough servers or the right number of licenses. Applications and data storage will dynamically take up the space they need. It is an automatic, organic process.

“Most businesses need commonsense reasons for moving to cloud-based service models, and the most compelling of these is that traditional models no longer represent value ...





Efficiency and utilization

The virtualized approach means that that an infrastructure can reach unheard-of utilization rates: close to 100 percent. And when demand seems likely to exceed supply, you simply buy another block of converged, combined processing, storage, and networking capacity, just as today you might slot in another low-cost blade. The key principles are:

- **No fixed provisioning**, because in a virtualized environment, applications and data will find the capacity they need.
- **No time spent on configuration**, which may typically account for 20-to-25 percent of all IT department time.
- **No long-term investment**. You buy what you need and then simply scale up or down, as usage patterns flex with business demand.

The cloud is a means of automated virtualization and can be internal or external. Internal means buying combined processing and storage blocks, and taking more as demand grows. External means buying the infrastructure you need as a service. In either case, the result is greater simplification, greatly reduced investment levels, and dramatically reduced costs.

Lessons from the phone network

Capellas points to the global telephone network as a way of understanding how the cloud could work for us today. The international telephone network has been the world's largest machine for almost a century. We can call anywhere in the world without wondering if the systems we are using will be compatible. The dial tone shows us the system is ready for business.

Telecommunication is much more complex than it was in the past, yet even as we invest in smartphones, which are basically specialized devices that transmit data and exchange multimedia content, we still expect the network to carry our traffic.

Just as we don't need to know the details of the telephone network, increasingly users will cease to ask about the processing and storage that supports their business applications.

It matters less and less all the time. What counts is the availability and integrity of the service, which will increasingly be sourced from specialists in the cloud.

A Technology Leader

Before becoming chairman and CEO of VCE, Michael Capellas was chairman and CEO of First Data Corp., a global leader in electronic commerce and payment processing. Prior to that, he served as MCI's president and CEO, where he oversaw its successful rebuilding and transformation from a long-distance carrier to a leading IP networks company. Earlier, he was a key player in bringing about the merger of Compaq and HP. At Compaq, Capellas was successively CIO, COO, and then CEO, ending up as president of the merged HP. Prior to Compaq, he spent 20 years in technology positions for Oracle, SAP, and Schlumberger. Today, he also serves as a senior advisor to Kohlberg Kravis Roberts and First Data, and is on Cisco Systems' board of directors.

The cloud stack

So what is the anatomy of the cloud? It is built from several distinct layers:

- **Infrastructure as a Service:** where the processing and storage exists and is made available to users, as needed, and on a scalable basis.
- **Platform as a Service:** a shared development and support environment that speeds up and simplifies the creation and management of business applications.
- **Software as a Service:** already familiar to many users through a range of commonly understood applications, this approach to software usage is replacing the traditional licensing model.
- **Shared or federated clouds:** enables users to place non-sensitive content or functions on a low-cost public cloud while keeping sensitive data inside their own firewall. This cuts costs and gives organizations the best of both worlds.
- **Business Process Outsourcing as a Service:** this represents a way of outsourcing complex processes on a pay-per-use, non-capex basis.

This is the landscape for the new, virtualized world of converged technology, in which applications, storage, and other technology and process-related requirements are delivered on demand as services. A cloud can be internal, external, or a combination of the two. The more of it brought in from specialist providers, the lower the costs are likely to be, but the technology framework stays much the same. ■

 For information on CSC's Cloud Computing Services, visit www.csc.com/cloud.

RESEARCH

SUSTAINABLE IT

MUST BECOME MORE | NOT JUST
ABOUT E-WASTE | ENERGY

by David Moschella



When it comes to environmental sustainability, the information technology industry's greatest strength is also its greatest weakness. The flip side of our industry's relentless technological progress is rapid product obsolescence and ever-rising piles of electronic waste (e-waste). Put simply, Moore's Law, the driving dynamic behind IT innovation for nearly five decades, is fundamentally not green, and perhaps not even sustainable — at least, not yet.

We have been making this point since our first Position Paper on 'Green IT' back in early 2008¹. But the results of our latest sustainability research project have reconfirmed that, while the IT industry appears on track to be energy-neutral in terms of its net energy consumption and savings, there is still no credible scenario for safely managing the global production and disposal of literally billions of personal computers, mobile phones, and other electronic devices.

Research background

Our sustainability research has always stressed the need to take a holistic environmental approach that accounts for the production, consumption, application, and disposal of IT products. In 2008, we learned that all of the world's data centers, PCs, and networks accounted for just 2 percent of total world energy consumption (and just 1.3 percent of greenhouse gas emissions).

Based on a variety of sources, we also estimated that manufacturing and distributing these same high-tech products (while much less discussed) required a roughly equivalent 2 percent of the world's energy share. Therefore, from a holistic energy perspective, if the application of IT could save just 5 percent of the remaining 96 percent of world energy usage, it could offset its own current consumption and production requirements, since $(.05 \times .96) > (.02 + .02)$. Many would argue that these savings have already occurred.

But, as the energy used in producing and consuming IT continues to grow considerably faster than energy usage in the wider economy, we think that within five years, a 10-percent savings may well be needed to maintain this type of energy-neutral position.²

To better understand the energy-saving benefits of IT and the means and likelihood of achieving these savings targets, in 2009 we commissioned and sponsored a special issue of Yale University's *Journal of Industrial Ecology* to look specifically at Environmental Applications of Information and Communications Technology (EAICT).³

IT industry's top priority

Through this project we found that while progress will be slow and there is no single dominant environmental application for IT, the evidence suggests our modest energy-neutrality target of 5-10 percent savings across the broader economy is clearly achievable, but significant gains beyond this will likely take time to develop.

This is why we believe from a sustainability perspective, the top IT industry priority in the near term should be better handling of the pollutants and toxic substances associated with IT production and disposal, especially the latter. To see why, let's look at the three classes of IT benefits in more detail:

- **Optimization.** For many years, we have heard about smart products, smart buildings, smart cities, and even smart planets, but how real and measurable are the benefits? The EAICT project features papers in four areas: the use of semi-conductors in the overall economy, smart equipment in small and medium-sized businesses, smart irrigation and water-use systems, and intelligent residential energy auditing.

While there is real potential in each area and there are many stories in the marketplace about major savings, the actual results in these cases were mixed. The research shows that smart products and equipment can have relatively short payback periods, but the benefits are often not much greater than would be realized by just keeping existing equipment well maintained. Researchers also found the economics of smart irrigation systems are generally not attractive outside of high-cost water markets such as the American Southwest, and, given today's technology, few households are willing to put in the time and effort needed to accurately monitor their residential electricity usage.

- **Behavior.** While most behavioral change research focuses on the individual, the four EAICT project papers in this area assessed more systematic possibilities: environmental metrics, industrial ecology, mapping/visualization, and complex systems modeling. Again, the results were mixed. By scientific community standards, the environmental field has been slow to adopt modern Web 2.0 tools, and thus a great deal of knowledge is still stuck in various silos, many of them off-line. Ideally, open, semantic web-based technologies would allow sustainability information to flow freely between companies, industries, and nations, but this is still rare. This makes it hard for much-hoped-for developments such as





industrial symbiosis, where one industry's waste is another's input, to emerge. Visual mapping software (showing, for example, how the type and intensity of energy usage varies geographically) can be a powerful policy tool, but modeling the net impact of policy changes in complex environments such as Tokyo is a daunting challenge. At an individual level, the emergence of improved guides, information, and peer pressure is reshaping behavior, but not as fast as desirable. As with optimization, the overall rate of behavioral change is slow and uneven.

- **Dematerialization.** This is where big gains can be quickly realized. Of course, within the computer industry, we tend to use the word 'virtualization.' But as virtualization is used in so many different — and often ambiguous — ways, 'dematerialization' is the more precise term. The EAICT journal features an analysis of traditional and digital music delivery alternatives. But even in this most familiar and straightforward of net benefit examples, hard data can be elusive. For example, while the overall finding is that digital music delivery is 40 to 80 percent more energy-efficient than the traditional CD retail store, most of the savings come from eliminating the energy used by the customer in driving to the store. If customers also make other stops on the trip, the savings are much less clear. The savings would also shrink substantially if the quality of the digital music and album artwork — and thus the size of the required audio and graphics files — were raised to standard CD quality, but this won't happen until our underlying network and storage technologies are more capable.

Yet despite these measurement ambiguities, we think dematerialization will have an increasingly strong impact. Consider the way smartphones are already replacing so many physical

products — cameras, music players, calendars, tape recorders, compasses, maps, books, newspapers, watches, alarms, and even PCs — or the way cloud computing is enabling virtual environments to replace their physical counterparts — data centers, office space, meeting rooms, hotels, stores, malls, theaters, and so on. The lessons from the EAICT project suggest that while the accumulated first-, second-, and third-order effects of these shifts will probably never be precisely measurable, they should be enough to credibly get us to our 10 percent energy savings target, particularly when combined with the optimization and behavioral gains described above. This means that the overall IT energy savings/consumption balance is likely to be positive over time.

Today's e-waste disaster

It is against this modest, but generally optimistic picture that the horrors of today's e-waste disposal practices stand out so starkly. While the IT industry will increasingly show that it is, at worst, energy-neutral in its operations, from a pollutant/toxic substance perspective our industry is creating huge environmental problems that are still getting worse, and for which no real solution has yet emerged.

We all know that electronic equipment (and especially older devices) contains a scary mix of toxic substances: lead, mercury, arsenic, polyvinyl chloride (PVC), cadmium, brominated flame retardants, and more. We also know that, while progress is being made, environmentally safe electronic devices are still a Silicon Valley dream that is probably at least five years away. But even if this goal is some day realized, we still need to safely dispose of the billions of devices in circulation, and the billions more that will be sold before safe solutions are ubiquitous. While Europe has made some real strides here (at least legislatively), even it has a long way to go. In contrast, the U.S., Asia

(with the exception of Japan), and most of the developing world continue to rely mostly on landfill and manual, dangerous, and often illegal e-waste scavenging processes, often carried out by children in the poorest of nations and circumstances.

Many advocacy groups, such as Greenpeace and the Basel Action Network, are calling attention to the worst of these practices, but the lack of government and IT industry urgency is striking. We can think of at least six reasons why society's Green IT priorities have been skewed toward energy consumption and away from the increasingly pressing e-waste challenge:

1. The risks of global warming/climate change have made energy use and related emissions the core of the environmental movement, effectively crowding out other concerns.
2. In developed economies, the cost of extracting toxic substances from retired electronic products often substantially exceeds the resulting value, making this an unattractive business.
3. Governments have been reluctant to seriously regulate the fast-moving and prosperous IT industry, especially in the U.S. and Asia.
4. The emphasis on reducing server and PC power consumption is appealing to IT manufacturers as it helps convince customers to buy new equipment. In contrast, an emphasis on the adverse effects of rapid product obsolescence and e-waste would tend to have the opposite effect.
5. IT customers have been advised that outsourcing recycling to a specialist firm is an industry best practice and have had little incentive or ability to assess what actually happens to various 'recycled' IT products.
6. The public remains largely uninformed and apathetic, especially outside of Europe. Many people simply don't realize there is anything wrong with throwing out old IT products in their everyday trash.


For these reasons, much of the IT community has turned a blind eye toward some truly appalling global practices and conditions, with the developing world too often used as an e-waste dumping ground. While we expect awareness of this situation to improve sharply during 2011 and beyond, we see little evidence that suppliers, governments, and customers are prepared to give this issue the focus and commitment it requires. A comprehensive book on the subject⁴ is reviewed in the EAICT journal.

A strategy for realigning priorities

We think the current e-waste situation is unsustainable, and must become a high priority for the IT industry. This suggests the following overall customer understanding and strategy in each of the three sustainability areas covered in this commentary:

The Leading Edge Forum (LEF) is a global thought leadership community that assesses the growing intersection between business and IT. This research memorandum is part of a monthly series of market commentaries from the LEF Executive Programme, an annual retainer-based research and advisory service for CIOs and other business/IT leaders from large organizations.

LEF Executive Programme members enjoy access to a global network of world-class subject matter experts, peer-level executive conferences, in-depth study tours, and ongoing advisory services.

 For more information about the LEF Executive Programme, visit <http://lef.csc.com>.

- **Reduce IT power consumption.** This is a good thing for companies to do, both to help the environment and to save money.
- **Use IT to reduce energy usage elsewhere in your ecosystem.** While dematerialization (virtualization) is generally the biggest energy-saving opportunity today, smart products and behavioral change should also be part of a strategy.
- **Reduce and properly dispose of e-waste.** More pressure should be put on vendors to produce environmentally friendly IT products. But in the interim, companies and individuals must follow more sustainable disposal processes.

Most observers believe achieving these goals on a societal scale will require significant legislative and public support. Neither seems imminent.

Conclusion

Ever since the global recession took hold in 2008, many environmentalists have understandably lamented the lost momentum of the climate change movement. Consider the worldwide hopes for Kyoto, the dashed expectations of Copenhagen, and the limited interest in the recent meetings in Cancun. But if there can be a silver lining to this decline, it is the chance that the current loss of focus on climate change will create the space for the e-waste crisis to get the attention it requires. ■

¹ David Moschella and Douglas Neal, Green IT - Moving Beyond the 2% Solution, CSC LEF, March 2008

² To get a sense of the many complexities involved in these sorts of calculations, see Lorenz Erdmann and Lorenz M. Hilty, Scenario Analysis: Exploring the Macroeconomic Impacts of Information and Communication Technologies on Greenhouse Gas Emissions, Journal of Industrial Ecology, Volume 14 Issue 5 p. 826-843, October 2010

³ The journal is available at www.lef.csc.com/projects/80.

⁴ Ronald E. Hester and Roy M. Harrison (Editors), Electronic Waste Management: Design, Analysis and Application, Springer/Royal Society of Chemistry, 2009

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FOCUS ON
WELLNESS FIRST

INVIGORATED

BY INNOVATIVE TECHNOLOGIES

by Fran Turisco



Traditionally healthcare has revolved around treating illness, but what if the focus changed to staying healthy?

What may seem like a subtle shift has major implications for the healthcare industry. The growing aging population worldwide, the increasing number of people with chronic conditions, expanded regulatory requirements, insufficient healthcare resources, and rising costs are all burdening today's health system, and creating the impetus for major changes.

Our report, "The Future of Healthcare: It's Health, Then Care," examines the renewed priority on helping people stay healthy, and the emerging practices and technologies being used to detect and treat medical problems sooner – all with the ultimate goal of achieving better health outcomes. The report, by CSC's Leading Edge Forum (LEF), identifies five key trends that are shifting the industry's focus.

When we began our research, we wanted to identify the major trends that are disrupting healthcare to address its current problems, and then investigate the emerging technologies that are facilitating these trends.



An "intelligent pill."
Source: Philips

TREND #1

E-Power to the Patient discusses patients taking increasing responsibility for managing their wellness and health. The Internet and the smartphone are key technologies for assisting the patient, with thousands of applications (apps) offered for free or a small investment. The issue becomes one of selecting the right technologies and applications that suit the patient's health status and lifestyle.

Everyone knows they should have a healthy lifestyle, but knowing what to do and which tools to use can be overwhelming. There are more than 5,800 smartphone apps already on the market, providing medical content, capturing patient information, and sending messages and alerts – all of which helps patients manage diets, medications, and health goals. When coupled with simple medical devices, such as a Band-Aid-like heart rate sensor that transmits data wirelessly to a smartphone, managing health gets easier. In addition, social networking sites enable people to connect with others who have the same medical issue, such as obesity, diabetes, or hypertension, to share specific problems, and discuss treatment options and available resources.

TREND #2

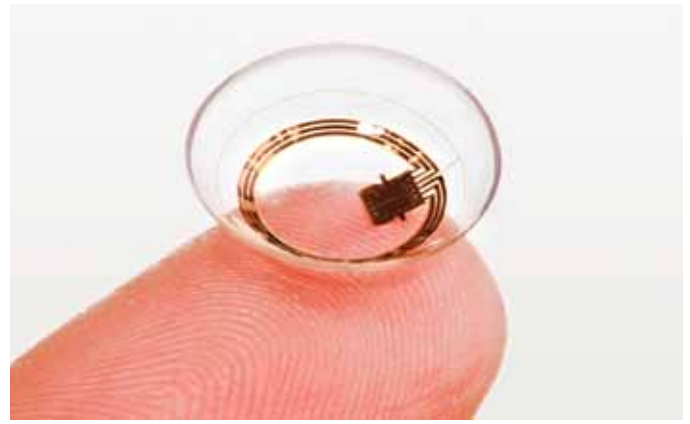
Earlier Detection discusses how emerging technologies can diagnose illness sooner, thereby reducing the amount of damage the illness causes, and, at times, eliminating the illness altogether.

When designing computer applications, if you can detect a design problem early on in the project, you can implement a change more quickly using fewer resources to keep the project on track. It's true in healthcare, too.

Our report cites numerous detection technologies currently in use or in development, including a breath test that uses nanotechnology to detect cancer, an at-home sleep apnea monitoring device, and a smart contact lens with an embedded microchip that monitors for glaucoma. Paper-based inexpensive diagnostic tests have also been developed that can be widely distributed and used by large numbers of people, especially in developing countries. By making tests more affordable and more convenient to use, more people are likely to use them and detect diseases earlier, when they are less expensive, complex, and time-consuming to treat.



A "glucose tattoo."
Source: Christine Daniloff/MIT News



A "smart contact lens."
Source: Sensimed AG

TREND #3

High-Tech Healing covers how new breakthroughs in combining medicine with technology are enabling people to improve medical conditions such as blindness and epilepsy, and better manage chronic conditions.

Regardless of how healthy a lifestyle people follow, or how much testing they undergo, people will become ill.

Diabetes, for example, is a significant health concern worldwide. The International Diabetes Federation estimates diabetes will affect up to 438 million by 2030. Managing the disease is a lifestyle change and requires close monitoring of glucose levels. The report cites developments such as a special tattoo and a rice-sized implantable microchip that will be able to monitor glucose levels, and an artificial pancreas that could potentially monitor and correct glucose levels.

TREND #4

Resources: More, but Different examines the evolution of new care models designed to support increasing demand; these models include teams of care resources, each with specific roles and responsibilities.

The evolution and faster emergence of high-tech devices will help stanch the escalating drain on medical resources; however, it won't be enough to eliminate it.

"Healthcare organizations must be learning organizations, using the data they are collecting to make changes in practices to provide better, more efficient, and effective care," says Dr. Harald Deutsch, vice president for CSC's healthcare sector in Europe, the Middle East, and Africa.

Using a care-team approach requires that all members share data and communicate; technology can be a team member, too. According to the report, robots will play an increasingly prominent role on the care team as the technology matures. The "Huggable" teddy bear (see sidebar, p. 33), in development, can provide real-time data on a child's status, and the "Kompai R&D" robot provides in-home assistance, including communication.

Another aspect of the new care model is 'e-visits,' which range from email and cell phone communication to webcam conferences. The key is using whatever is available to gather data, analyze findings, and provide care wherever it is needed. For example, in remote, poor regions in Africa, volunteer community healthcare workers use cell phones to track and care for pregnant women in their villages.

TREND #5

Global Healthcare Ecosystem emerges by developing the ability to safely connect and share patient and research data, the entire health community can collaboratively focus on the toughest health problems, leading to improved outcomes.

As the world continues to connect, healthcare systems are becoming increasingly linked across states, nations, and world regions.

A richer information environment, which is an important means to this ability to share data, is taking shape as a network of networks enhanced by a variety of initiatives starting to connect the dots. For example, the World Health Organization and U.S. Centers for Disease Control and Prevention are working together on a Global Public Health Grid to improve public health.

Connecting the dots, not only by linking networks but by linking care givers – professional, family, and technology-based – with innovative diagnostic and healing tools, draws together an industrial-strength support system for people, offering a new potential for staying well. ■

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FRAN TURISCO, who led the report's research effort, is an Emerging Practices research principal with CSC's Global Health Services Group.



Read the "The Future of Healthcare" report at www.csc.com/lefereports.

For more information about CSC's Leading Edge Forum, visit www.csc.com/lef.

10 Emerging Healthcare Technologies

New technologies are constantly in development to help people stay healthy, better diagnose disease, treat illness, and provide a better quality of life. Here are some examples:

Intelligent Pills Deliver Medication to Specific Locations:

Philips Research has developed an intelligent pill that can be programmed to deliver targeted doses of medication to patients with digestive disorders such as Crohn's disease, colitis, and colon cancer.¹

Sensor Technology Tracks Medication Adherence: Proteus Biomedical is working on technology that incorporates a tiny sensor into pills for targeting medication adherence for organ transplants, cardiovascular disease, infectious diseases, diabetes, and psychiatric disorders.²

Brain Implants Prevent Seizures: The RNS System, a responsive neurostimulator from NeuroPace, detects abnormal electrical activity in the brain that signals the onset of a seizure, and delivers a specific pattern of mild electrical stimulation to block the seizure.

Contact Lens Detects Glaucoma: Sensimed's scientists have created a smart contact lens with an embedded microchip that monitors intraocular pressure. If a patient wears the contact lens for a day, glaucoma can be detected sooner and more reliably, and the efficacy of the treatment can be monitored over time, potentially averting blindness.³

Artificial Pancreas for Diabetics: Researchers at Massachusetts General Hospital and Boston University have successfully completed a trial with 11 type-1 diabetic patients using a new "artificial pancreas"⁴ that consists of insulin pumps, glucose sensors, and regulatory software.

Printing New Skin: Wake Forest University's scientists have discovered how to apply ink-jet printer technology to 'print' proteins directly onto a burn victim's body for faster and more thorough healing.⁵

Artificial Retina: The U.S. Department of Energy's (DOE) Artificial Retina Project — a collaboration of five DOE national laboratories, four universities, and private industry — is developing a retinal prosthesis. To date, progress has been made by enabling direct communication between the implant and the neural cells that carry visual information to the brain.⁶

Video Games Hone Medical Student Decision-Making Skills:

The University of Texas, Corpus Christi, and BreakAway Ltd., have developed a 'serious' video game that lets professionals and students practice on 3D video patients using the same interactive techniques and decision-making processes they would use with real patients.

Robot Care Givers: MIT's "Huggable" teddy bear robot can serve as a medical communicator for children. Packed with electronic sensors and sensitive skin technologies, the robot can distinguish between cuddling for comfort or agitation by sensing the strength of the squeeze.⁷

Lab-on-a-Chip: Researchers at the University of California, Davis, have created a lab-on-a-chip for HIV testing that does not require expensive resources and can deliver results in seconds. The portable and less expensive lab-on-a-chip is a holographic, lens-free imaging mechanism that counts specific molecules and blood cells to determine if the blood is HIV positive.⁸

¹ http://news.cnet.com/8301-17938_105-10095371-1.html

² http://www.medgadget.com/archives/2010/01/a_quick_look_at_the_status_of_smart_pill_technology.html

³ <http://www.smartertechnology.com/c/a/Technology-For-Change/Smart-Contact-Lens-Detects-Eye-Disease/>

⁴ <http://www.artificialpancreas.org/>

⁵ <http://www.reuters.com/article/idUSTRE63657520100407>, <http://www.fastcodesign.com/1662613/new-pics-inkjet-printer-makes-instant-skin-grafts-for-burn-victims>

⁶ http://artificialretina.energy.gov/pubs/ARN_summer_09.pdf; <http://artificialretina.energy.gov>

⁷ <http://robotic.media.mit.edu/projects/robots/huggable/overview/overview.html>

⁸ <http://www.dailytech.com/New+Lab+on+a+Chip+Device+Revolutionizes+HIV+Testing/article19073.htm>

Household Goods Retailer

TRANSFORMS SHOPPING EXPERIENCE

by Pierre Kalfon

Conforama, a leading furniture and household goods retailer in France, wanted a better relationship with its customers. Working with us, Conforama conducted a top-to-bottom strategic analysis of its operations and implemented new services policies that are transforming the customer shopping experience.

For more than 40 years, Conforama built its leadership position in southern and western Europe by focusing on two key values: low prices and local presence. Responding to changes in consumer habits and expectations, the company decided to add a third major focus: services. To achieve this goal, Conforama needed to enhance its service offerings as well as improve operational execution, while never losing sight of maximizing customer satisfaction.

CLIENT: Conforama

CHALLENGE: Improve customer satisfaction by revamping customer service policies while enhancing operational efficiencies.

SOLUTION: A top-to-bottom strategic analysis of customer service and implementation of a multichannel approach to transforming services and operations.

RESULTS: Increased customer satisfaction driven by highly improved services and an enhanced consumer experience.



Service comes first

Conforama chose CSC to provide the technical and retail expertise needed for the transformation. Philippe Morel, Conforama's director of Programmes and Operations, says, "We contacted CSC as we knew there would be a strong impact on the IT system and we wanted to cooperate with a partner who would be able to support us from start to finish."

CSC began by defining the services policy and then building the services and tools to be implemented. In the initial stages, an international benchmark survey identified and prioritized the services expected by customers of a large brand name in a specialized retail sector. The analysis showed that Conforama was offering most of the key services required, such as delivery, credit, and after-sales services, but these services lacked visibility.

The research also revealed that Conforama would greatly benefit from non-sales services, such as improved product delivery, which would contribute to brand image and increase customer loyalty. "In developing non-sales services, our focus has been on strengthening our bond with customers, thereby promoting one of our major assets, our local presence," says Morel.

A multichannel approach

Conforama's stores and staff are its biggest strengths and remain the cornerstones of the company. We examined what it takes to deliver a more positive customer experience by defining the services that would support customers through their entire dealings with the company, from gathering information before a purchase through after-sales services.

With more than 180 retail outlets in France, Conforama also operates about 50 stores in other parts of Europe, including Spain, Switzerland, and Portugal. A multichannel approach to boosting the customer experience was implemented, and customers now have improved access to services on Conforama's website and in stores, as well as better telecommunications support through a new shared call center.

We translated Conforama's strategic direction into four highly operational areas, for which we then defined the practicalities and economic viability.

For one, in-store services such as product information and check-out stations are better positioned to support the shopping experience. In addition, the physical layout of warehouses has been optimized. Operationally, special attention is being paid to offering goods, delivering them, and after-sales services. For example, shipping rates have been simplified and it is much easier for customers to schedule delivery appointments.

We also supported the creation of a new department in charge of coordinating and developing Conforama's services. Once each service offering was designed, CSC assisted with its implementation. We drew up the specifications for the agency in charge of the visual and architectural appearance of the stores and supported the selection process of the service



provider for the new call center. CSC was also integral in setting up the organization that manages and maintains the company's services policies.

A cultural transformation

The transformation taking place at Conforama also extends beyond its services and stores. "This strengthening of our services is a cultural transformation for the group, which we are not underestimating. In parallel with the deployment, we are paying a great deal of attention to a change management process that allows all of our employees to be involved with this policy," Morel says.

CSC's coordination with Conforama allowed the project to be managed at a sustained pace and completed within budget, with just 18 months between initial conceptualization to fitting out the first store. "CSC was able to understand our customer relations issues and assimilate our corporate culture in order to provide us with support," says Morel. ■

About Conforama

As one of Europe's leading furniture and household goods retailers, Conforama operates 181 stores in France, as well as 50 additional stores in Spain, Switzerland, Luxembourg, Portugal, and Croatia. Conforama has 13,400 employees and achieved €2.9 billion in sales in 2009.

For more information, visit www.csc.com/fashion_and_retail.

PIERRE KALFON is a partner in CSC's management consulting practice in the EMEA region.

CHAMPION EUROPE

Gets IT Makeover

by Chris Sapardanis

Styles come and go, but change is always in fashion at the world's leading apparel companies. For more than 90 years, few brands have met the shifting needs of the market with such adaptability as Champion.

In Europe, the Champion brand has been one of the most recognizable and popular among athletes and fitness enthusiasts for 30 years. But a buyout in 2001 between Champion's European management and Sara Lee Corp., which owns the trademark outside Europe, Africa, and the Middle East, left the newly independent Champion Europe stifled under several disparate information systems.

"Champion was organized in a complex way with several companies in several European countries," says Enrico Vernetti, Champion Europe chief finance officer. "Each Champion entity was incorporated in other larger organizations of Sara Lee and each had a different information system. When we completed the acquisition, we were in front of a group that was facing eight different information systems."

CLIENT: Champion Europe

CHALLENGE: Consolidate multiple legacy systems onto a modern platform capable of handling logistics operations and retail growth from one location.

SOLUTION: STEALTH 3000, CSC's enterprise resource planning software application for the fashion industry.

RESULTS: Since implementing STEALTH, retail has become 40 percent of Champion's business. Notable improvements have occurred in purchasing, logistics and stock management, and product and centralized data management.

Champion Europe began using STEALTH 3000, CSC's enterprise resource planning software application for the fashion industry, in 2003. Since the modernization to a unified platform, Champion Europe has been able to manage a distributed company with one business model across its operations.

A foundation to build on

Champion Europe began as a wholesaler, selling to retailers and key accounts, with a small number of retail stores and a limited ability to obtain a high-level view of total operations. Logistically speaking, the company was difficult to run.

From the onset of the new business, management wanted to unify logistics operations and drive a new retail strategy from a centralized location in Italy. Their existing technology couldn't handle it.

"We were running on IBM A/S 400s and were not seeing this as a technology of the future," Vernetti says. "We were looking for a solution that was fashion industry-focused, not anything that was rigid. We decided on STEALTH because it was the most modern solution."

But it wasn't just about changing the technology behind the company, says Angelo Calabrese, CSC operations director for the fashion market in Italy.

"It's more about an evolution," he says, "which is quite common for fashion companies that continue to have a responsive cycle to the market. The market dictates this evolution, its branches, its business, its consolidation efforts, and so on. Our solution is following the evolution of Champion's business."

Improving processes for growth

Since implementing STEALTH, retail business has grown to represent 40 percent of Champion's business in 2010, with 109 stores in 60 countries. The flexibility of our solution enabled Champion leaders to continually meet changing business models.

A Solution for Fashion

"We believe that IT systems need to be flexible enough to adapt to changing strategy," Vernetti says. "Every day the business is changing, so the ability to adapt quickly and change quickly is a key competitive factor. If you are locked into a rigid IT system, it becomes a problem."

Champion's success can be attributed to consolidations companywide, in:

Purchasing – Before STEALTH, the purchase order (PO) process was problematic. Each country would take bookings from customers and generate POs. Then, the orders were sent as an Excel file to one of two consolidation hubs where they were manually checked and then loaded and processed. After STEALTH, POs go directly into the system and are immediately visible to a central purchasing department, which places the order with suppliers.

Logistics and stock management – Before STEALTH, the company's invoices from suppliers were paper-based and loaded manually into an information system. After STEALTH, the procedure is fully integrated. The file is uploaded automatically.

Product management – Before STEALTH, generating a sales booking analysis, by country, market, channel, product, style, etc., was difficult and sometimes unreliable. After STEALTH, the integrated system changed all of that and improved group information.

Centralized data management – Before STEALTH, every country had to load data by product, costs, suppliers, and selling price lists. After STEALTH, it's all done centrally, giving more financial control. Champion now controls master files for suppliers and pricing information in one location and can readily run analyses by season.

"We supported the transformation of Champion from a number of individual divisions in different countries of Europe into one company centered and managed from Italy," Calabrese says. "They now run a unified business model across Europe." ■

STEALTH 3000 is an enterprise resource planning (ERP) software application that we developed to manage the fashion business from source to customer. Today, more than 120 fashion companies license our solution, making it the industry's standard ERP platform. Because STEALTH is a multicompany, multicurrency, and multilingual product, it is compatible with different contexts, allowing distributed or centralized information system management.

The application provides a flexible framework for capturing industry-specific processes through configurable business rules and parameters – which, in the fashion industry, are strongly tied to product value. The solution also offers cross-company features among its specific functions, enabling a corporation to manage different companies on a single database.

Learn more at
www.csc.com/STEALTH.



For more information, visit
www.csc.com/fashion_and_retail.

CHRIS SAPARDANIS is editor of *CSC World* magazine.

DECISIONS DECISIONS

A 'Common' Take on Being a Better Manager

by Jim Battey

With 17 years at CSC under his belt, Michael Horton is passionate about constructive leadership and the success it can deliver for teams. In his book, *Scrappy General Management: Common Sense Practices to Avoid Calamities, Catastrophes and Lackluster Results*¹ (Scrappy About, 2010), Horton delivers no-nonsense solutions and practical advice for busy managers.

From his remote location in Perth as vice president for CSC's Australian Chemical, Energy, and Natural Resources practice, Horton has responsibility for annual revenues of more than \$400 million and 2,000 employees. Over the years, he has learned the value of good communication and recently discussed what every manager should do to stay ahead of the game.

What are some of the key traits of a good manager?

Horton: We are in the services business, so our job is all about people. To do well, it's all about communication, with our staff and more importantly, our clients. There's no revenue to be gained sitting in the office reading emails. I set a personal goal to get face-to-face with at least one client every day, and if you can do more, then great! My own direct reports are spread around the country, some of them a five-hour flight or more away, but we still get to talk regularly and have developed quite close relationships. Even though we're geographically dispersed, there is a strong sense of team.

Talk about the importance of market knowledge and the best ways a leader can stay informed.

Horton: To be a step ahead of your competitors, you need to have better knowledge of what's going on in your market than them. If you're relying on analyst feedback and surveys, then

you're actually a step behind. Their information is at least a month old and readily available to your competitors as well. We need to use all of the communication networks available, particularly our own staff, to constantly scan and gather intelligence from the street, creating our own market knowledge, and then use the analyst data as confirmation of the trends.

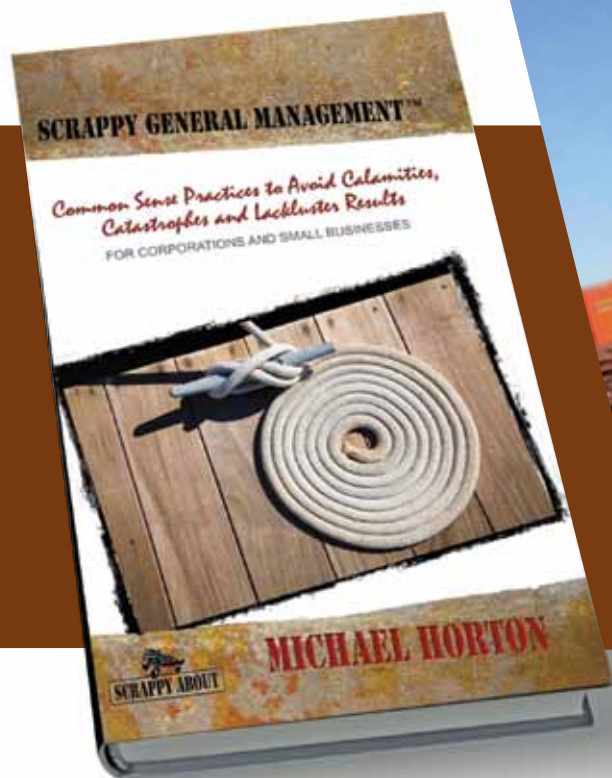
What's your best advice in the area of vision and strategy — short-term and long-term?

Horton: For short-term strategy to be effective, people need to understand and connect to a long-term vision, looking five to 10 years out. However, many large organizations are typically driven quarter-by-quarter, along with annual targets. The trick is to ensure that these relatively short-term goals complement a longer-term strategy, providing building blocks toward the long-term vision. Our job as leaders in the organization is to create that vision and provide the understanding that links it back to the personal 'What's in it for me?'

Tell us about the role of IT in the natural resources industries.

Horton: I occasionally have the privilege of being provided a tour of an operational facility — an iron ore mine, a liquefied natural gas plant, or a steel smelter. The thing that always strikes me is the sheer scale of everything. Everything is big, the trucks, the diggers, the facilities, even the miners themselves are big, with big boots, big hats, and big grins that come from big profits.

Clearly though, the operations are still very mechanical. Dig it, truck it, ship it. If you want to do it faster, get bigger diggers, bigger trucks, and more ships. IT is only just beginning to make





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You need to get out of the office to meet with your staff every day, or if they are remote, find some excuse to call them.

— Michael Horton, vice president, Chemical, Energy, and Natural Resources practice, in Australia.

its way toward the front line, the dirty end of the operations, usually as some form of automation. Until recently IT was just a back office function — ERP, HR, supply chain, finance systems. The future for our clients and for CSC is IT-driven automation that can bring the next wave of productivity improvements, as well as improving safety and environmental controls.

In the book, you discuss the “Cone of Communication” both internally and for customers. How did that come about?

Horton: Because I work in a remote part of the globe, for the most part, my direct reports and my managers have been geographically dispersed. Good relationships can still be created while working at a distance and to achieve this I recognized I was following a regular set of communication patterns or cycles.

The “Cone” is about an ongoing cycle of communication and organizing a framework for communication ranging from informal to formal, with intervals ranging from daily to six months. In daily or less formal meetings, we don’t have a set agenda because it stifles the conversation. But contact is crucial. You need to get out of the office to meet with your staff every day, or if they are remote, find some excuse to call them. I would have an org chart on my desk and make sure to contact each person on that chart every two or three weeks to make a personal connection and also to see what’s going on. It also works well to repeat that pattern with your customers, your peers, and your boss.

What’s your advice on hiring new employees and keeping them motivated?

Horton: Hiring the right people is key, and the right people are those with the right attitude. I would give preference to someone with a great attitude and plenty of energy over someone with good technical skills.

To keep employees motivated there is something called the Goal Theory of Motivation. This was developed and documented by psychologist Edwin Locke in 1969. It’s all about setting goals and giving people the ability to track progress against those goals. In services organizations like CSC, people need tangible ways to track their achievements. It helps with team and individual motivation and focus.

What are some of the key concepts behind managing yourself?

Horton: There’s a degree of discipline needed in looking after yourself and making sure there’s balance in your life. It’s part of leading by example, and managing yourself to be a consistent performer. Your own health, happiness, and continuing personal growth play a large part in this.

Any final advice for managers?

Horton: I can’t say it enough — get out and communicate with your staff and customers as much as possible. There’s no revenue to be made sitting in the office; it’s more fun being out and about. Communication creates engagement and engaged employees and customers are our path to success. ■

¹ *Scrappy General Management* is available at www.happyabout.com.

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JIM BATTEY is a writer for CSC’s corporate office.

THE GREEN CORNER

CSC PARTNERS WITH 1E TO MONITOR DATA CENTER ENERGY USE

by Candace Labelle

As a global corporate citizen, CSC invests in sustaining the environment for future generations. In 2009, we started working with 1E, a global leader in IT efficiency software, to reduce our power consumption, deploying NightWatchman® PC power management software to 50,000 workstations. The results were impressive: power consumption of our workstation fleet was reduced by 40 percent.



When we learned of 1E's new NightWatchman Server Edition in 2010, we wanted to be on the front line with their latest innovation. CSC and 1E agreed to a joint pilot with a twist: an online case study during which CSC would blog on 1E's website about the progress and results. The companies' goals for the pilot were to reduce power needs at key data centers, identify opportunities for decommissioning and virtualization, and allow CSC and 1E clients to experience a real-world deployment of the new product.

The project involved deploying the agent-based NightWatchman Server Edition software onto 80 North American Windows-based servers ranging from Windows Server 2003 to Windows Server 2008 in multiple server rooms and data centers, representing a cross-section of CSC's server environment.

The software ran in the background for several weeks, collecting baseline data on energy consumption, activity, and Useful Work™. The Useful Work engine analyzes the application layer of a server to identify both useful and non-useful (management/support tasks) to expose the usefulness and therefore the efficiency of a server, ensuring it is doing the work the server was commissioned to do.

The Drowsy Server™ power management feature was also tested to ensure servers continued running as expected while entering and exiting from a drowsy state. Servers remained in full production without any performance degradation, outages, or other negative impact. Application owners monitored their servers and did not identify any performance or availability impact.

After more data was gathered, a deeper analysis and update of the processes viewed as Useful Work was completed, and reports were generated.

The information made available allows management of server and energy efficiency at a new level. Clear, server-level opportunities for decommissioning and virtualization were provided, with an index to a level of certainty on the recommendation — taking the mystery out of which servers to research and target for reduction.

A view of energy consumed by the fleet or to the server level was made available without hardware, allowing a holistic energy management approach for server room design and management, as well as detailed energy consumption or greenhouse gas reporting. Energy consumption for many servers was reduced using power management for non-Useful Work periods. Additional savings were achieved through cooling avoidance.

To CSC, the process confirmed that the bulk of our servers were fairly well utilized. However, a number of unanticipated decommissioning and virtualization opportunities were highlighted, pointing the way to future server reductions. Additional energy savings were also measured through power management.

Based on the results of the case study, we found that companies can benefit by driving down server numbers, reducing energy bills, and improving server-level energy reporting and management. ■



➤ The metrics and reported results along with CSC's other sustainability initiatives are available at www.csc.com/greenway.

CANDACE LABELLE is program director for CSC GreenWay.



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About CSC

CSC is a global leader in providing technology-enabled solutions and services through three primary lines of business. These include Business Solutions and Services, the Managed Services Sector and the North American Public Sector.

CSC's advanced capabilities include system design and integration, information technology and business process outsourcing, applications software development, web and application hosting, mission support and management consulting.

The company has been recognized as a leader in the industry, including being named by FORTUNE Magazine as one of the World's Most Admired Companies for Information Technology Services (2010). Headquartered in Falls Church, Va., CSC has approximately 93,000 employees and reported revenue of \$16.2 billion for the 12 months ended December 31, 2010.

For more information, visit the company's website at www.csc.com.