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VIRGINIA CIO **SAM NIXON** WORKS TO FIX OUTSOURCING PLAN HE HELPED CREATE

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CONTENTS

AUGUST/SEPTEMBER 2010

COVER STORY

8

Nixon's Next Move

New CIO and former Virginia Delegate Sam Nixon on what went wrong with the state's battered IT outsourcing effort and how he hopes to right the course.

By Chad Vander Veen

Cover Photo by David Kidd

Photo by David Lubarsky

FEATURES

16

Technology Trailblazer

A steadfast work ethic propelled the first black female CIO of New York state from living in housing projects to launching statewide IT projects.

By Russell Nichols

22

Saving Public Universities

Innovators show how technology and new approaches can cut the cost and improve the performance of public colleges and universities.

By Jessica B. Mulholland

26

By the Numbers

The ABCs of transforming IT perception and performance.

By Robert L. Otto

32

Quick Cure?

Federal CIO's TechStat initiative seeks to diagnose troubled information technology projects and deliver quick treatment.

By Merrill Douglas

36

Simplifying Information Security

In this digital world, it is imperative that government agencies quickly, safely and efficiently receive and distribute information.

By Terry Wieczorek

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D E P A R T M E N T S

42 CIO Central
News, Reviews and Careers

44 Security Adviser
Why public CIOs should pay attention to DNSSEC.
By Mark Weatherford

46 CTO Strategies
Learning about an organization from the inside out.
By Dan Lohrmann

48 Straight Talk
Hard and soft skills are required for public-sector IT leadership.
By Liza Lowery Massey

50 FastGov
Cloud computing needs a meteorologist.
By Paul W. Taylor

U P F R O N T

6 Introduction

ONLINE EXCLUSIVES

www.public-cio.com

VIDEO
Virtual Beverly Hills:
City builds GIS Web portal for emergency operations and public information.

NEWS
Tough Times:
Recession drives more shared-services activity.

BLOG
E-Mail Overload:
Michigan CTO Dan Lohrmann says it's time to take stock of your messaging habits.

NEWS
Government Cloud:
Google announces availability of Apps for Government.

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Publisher: Jon Fyffe jfyffe@govtech.com

EDITORIAL
Editor: Steve Towns stowns@govtech.com
Associate Editors: Chad Vander Veen cvanderveen@govtech.com
Matt Williams mwilliams@govtech.com
Chief Copy Editor: Miriam Jones mjones@govtech.com
Managing Editor: Karen Stewartson kstewartson@govtech.com
Justice and Public Safety Editor: Jim McKay jmckay@govtech.com
Features Editor: Andy Opsahl aopsahl@govtech.com
Copy Editors: Elaine Pittman epittman@govtech.com
Sarah Rich srich@govtech.com
Staff Writers: Hilton Collins hcollins@govtech.com
Russell Nichols rnichols@govtech.com
Karen Wilkinson kwilkinson@govtech.com
Contributing Writer: Merrill Douglas
Contributing Editor: Jessica Mulholland jmulholland@govtech.com

DESIGN
Creative Director: Kelly Martinelli kmartinelli@govtech.com
Senior Designer: Crystal Hopson chopson@govtech.com
Graphic Designer: Michelle Hamm mhamm@govtech.com
Illustrator: Tom McKeith tmckeith@govtech.com
Production Director: Stephan Widmaier swidm@govtech.com
Production Manager: Joei Heart jheart@govtech.com

PUBLISHING
Group Publisher: Don Pearson dpearson@govtech.com
VP Bus. Development: Tim Karney tkarney@govtech.com
EAST
Regional Sales Directors: Leslie Hunter lhunter@govtech.com
EAST
Shelley Ballard sballard@govtech.com
WEST, CENTRAL
Account Managers: Melissa Cano mcano@govtech.com
EAST
Erin Gross egross@govtech.com
WEST, CENTRAL
Business Development Dir.: Glenn Swenson gswenson@govtech.com
Bus. Dev. Managers: John Enright jenright@govtech.com
Lisa Doughty ldoughty@govtech.com
Kevin May kmay@govtech.com
Exec. Coordinator to Publisher: Julie Murphy jmurphy@govtech.com
Regional Sales Administrators: Sabrina Shewmake sshewmake@govtech.com
Christine Childs cchilds@govtech.com
National Sales Admin.: Jennifer Valdez jvaldez@govtech.com
Dir. of Marketing: Andrea Kleinbardt akleinbardt@govtech.com
Dir. of Custom Events: Whitney Sweet wsweet@govtech.com
Assoc. Dir. Custom Events: Lana Herrera lherrera@govtech.com
Custom Events Manager: Karin Morgan kmorgan@govtech.com
Custom Events Coordinator: Tanya Noujaim tnoujaim@govtech.com
Dir. of Custom Publications: Stacey Toles stoles@govtech.com
Custom Publications Editor: Emily Montandon emontandon@govtech.com
Custom Publications Writer: Jim Meyers jmeyers@govtech.com
Dir. of Web Products and Services: Vikki Palazzari vpalazzari@govtech.com
Web Services Manager: Peter Simek psimek@govtech.com
Custom Web Products Manager: Michelle Mrotek mmrotek@govtech.com
Web Advertising Manager: Julie Dedeaux jdedeaux@govtech.com
Web Svcs/Proj. Coordinator: Adam Fowler afowler@govtech.com
Subscription Coordinator: Gosia Colosimo subscriptions@govtech.com

CORPORATE
CEO: Dennis McKenna dmckenna@govtech.com
Executive VP: Don Pearson dpearson@govtech.com
Executive VP: Cathilea Robinett crobinet@centerdigitalgov.com
Executive Editor: Steve Towns stowns@govtech.com
CAO: Lisa Bernard lbernard@govtech.com
CFO: Paul Harney pharney@govtech.com
VP of Events: Alan Cox acox@govtech.com
Marketing Dir.: Drew Noel dnoel@govtech.com

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Sound impossible? Not for the U.S. Marine Corps Air Ground Combat Center, California, in collaboration with Johnson Controls.

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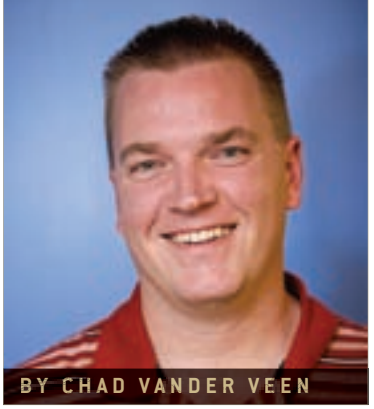

BY CHAD VANDER VEEN

The Human Element

THE RELATIONSHIP BETWEEN Virginia and Northrop Grumman is a story we've followed for a long time. When the IT outsourcing partnership was established, it was cheered by many as setting a landmark precedent for future large-scale technology projects. Despite the well publicized troubles the partnership has faced, neither party has given up on the effort. Rather, all involved seem to be willing the project to the finish line — however distant it might remain.

This month's cover story is about a man who has been at the center of this endeavor since its inception. Sam Nixon is a former Virginia legislator who left the Statehouse to become state CIO, a position in Virginia that has been battered by troubles with the outsourcing project. Nixon's appointment as CIO by Gov. Bob McDonnell brought full circle his career as a public servant, as Nixon had been instrumental in crafting the legislation that allowed the outsourcing partnership to happen. What Nixon had a hand in creating, he is now called upon to help control.

In talking with him for this story, Nixon impressed upon me that he's a man who's both thoughtful and determined. I believe him to be dedicated to righting the course in his state. During our conversation, he was honest and open about the project's failings while maintaining cautious optimism about the future. The conversation, which lasted much longer than I had expected and probably longer than he had time for, helped remind me of something I believe we too often forget: that by and large, the trials and tribulations incurred by projects of any scope aren't really due to machines or technologies. Rather, it's humans who get in the way, who bungle things and who are uncooperative. Yet it's also for humans that these projects — often fraught with risk — are undertaken, and it's humans doing the work that hopefully will make things better for everyone in the end.

Our photographer, David Kidd, spent a day with Nixon and got to know him as a human being. Sure, Nixon commands attention and respect from those around him, but at heart he's also the youngster who, as Kidd recounted for me, used to climb a hill near Martinsville Speedway to watch the car races he loved so much but could not afford a ticket to attend.

When technology projects — or any project for that matter — don't go as planned, we all become experts at pointing fingers and assessing blame. When trouble finds us, it becomes all too easy to forget why a project got started to begin with. Virginia and Northrop Grumman have had more than their share of problems, which we often gladly reported because it was news. Yet Nixon reminded me — at least for a little while — that beyond the problems and bad publicity are real people trying to do the right thing. I think we'd all be better off if we could remember that truth a little more often.

Beyond the problems and bad publicity are real people trying to do the right thing.

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BY CHAD VANDER VEEN | ASSOCIATE EDITOR

NIXON'S NEXT MOVE

New CIO and former Virginia Delegate **Sam Nixon** discusses what went wrong with the state's battered IT outsourcing effort and how he hopes to right the course.

WHEN BOB MCDONNELL took office as governor of Virginia in early 2010, he brought with him renewed hope that the state's troubled IT outsourcing contract with Northrop Grumman could be salvaged. At the time, there was talk of scrapping the agreement — a move that would cost the state hundreds of millions of dollars. But rather than sever ties with Northrop Grumman, McDonnell turned to a man who, seven years ago, was instrumental in forging the partnership.

On March 15, McDonnell signed legislation that restructured the Virginia Information Technologies Agency (VITA) and put the state's CIO directly under the governor's authority. Shortly thereafter, McDonnell appointed longtime Virginia lawmaker Sam Nixon to this post. Nixon, who has several decades of IT experience, was one of the lawmakers who helped write VITA into existence in 2003.

PHOTOS BY DAVID KIDD

VIRGINIA CIO SAM NIXON

Now he was tasked with rescuing the colossal outsourcing deal that he helped set in motion.

TROUBLED PARTNERSHIP

It's no secret that since Virginia and Northrop Grumman struck the IT outsourcing deal, both parties have encountered several high-profile problems. The 10-year, $2.3 billion contract was written such that Northrop Grumman would provide the state's IT services. But the project — the largest of its kind among the nation's state governments — has been plagued by delays, cost overruns and poor service.

The partnership between Northrop Grumman and VITA — created in 2003 when then-Gov. Mark Warner launched a major initiative to centralize and overhaul how the state invested in and managed its technology and networks — originally was hailed as a bold new approach to large-scale outsourcing. But poor planning, ineffective governance, lackluster service delivery and unrealistic service expectations nearly caused the contract to self-destruct.

Despite the best intentions, in hindsight the many moving parts designed to help one another ended up doing the opposite. VITA was tasked with overseeing the contract between the state and Northrop Grumman; the Legislature-created Information Technology Investment Board was given independent authority to appoint the state CIO; and Northrop Grumman agreed to a contract that required too little accountability on its end and too little governance on Virginia's part.

"There were things that only time and experience could foretell. I don't want to say there were flaws, but there were certainly gaps in a contract this complex." — SAM NIXON, CIO, VIRGINIA

The situation became a crisis in June 2009, when VITA fired then-CIO Lem Stewart. Reports at the time claimed that Stewart's dismissal came on the heels of his failure to pay Northrop Grumman on a multimillion dollar invoice. Stewart suggested in several presentations that the lack of payment was due to his belief that the vendor was not meeting its contractual obligations.

Stewart's firing set in motion a game of CIO musical chairs. After several temporary CIOs, private-sector software executive George Coulter was hired by the Information Technology Investment Board. Coulter's time at the helm was also short-lived due to a change in the governor's office.

CONTRACT CHANGES

McDonnell followed the VITA restructuring with a restructuring of the Northrop Grumman contract. The move was greeted with both optimism and skepticism, as the new deal increased payments to the company by $105 million, but also added stringent performance requirements and accountability conditions.

The contract modifications added clarity and scope that were missing from the original agreement, according to Nixon. "If we had known four years ago what we know today, we would have started out differently," he said.

As an author of the original VITA legislation, Nixon has intimate knowledge of the thought process behind the outsourcing arrangement. He said some of the deal's shortcomings could only be discovered once the plan was set into motion.

NEW DIRECTION

Server and desktop virtualization cut costs and raise efficiency in a large, urban school district.

SCHOOL DISTRICTS are facing numerous challenges today, including budget cuts and pressure to deploy new technologies that keep students engaged in learning. Using desktop virtualization, a large school district in Ohio is answering these challenges, deploying a bold solution on a larger scale than perhaps any other school district in the country.

A massive desktop virtualization project will be completed in August 2010 at Columbus City Schools (CCS). CCS is replacing approximately 19,000 computers with thin-client workstations. The district is also repurposing around 3,000 computers, converting their operating systems and other features for use as thin clients. Virtualization of these 22,000 desktops will save significant money for the district, simplify maintenance and support, and give users a better experience. And, there are a lot of users — 53,000 students and 7,400 employees.

Desktop virtualization takes software, operating systems and data normally found on desktop computers and places them on central servers. From there, the resources can be distributed enterprise-wide to thin-client computers.

CCS could be leading the way for other school districts by moving to virtualized desktops on such a huge scale. It's certainly a challenging proposition. And it's made more difficult by the district's heavy use of leading-edge, yet demanding applications, such as streaming video and interactive educational tools. The sheer number of applications the district uses — more than 1,500 — adds another level of difficulty.

"The other big challenge was the desktop, and the delivery of all the video that we must provide daily," said Rod Houpe, CIO of Columbus City Schools. Interactive math and reading, virtual reality learning games and other educational applications are much more demanding than even a typical business requires.

Thanks to advances in desktop virtualization, the technology can now provide these elaborate services to 22,000 computers. "We'd looked at the strategy for several years in a row," said Michele VanDyke, IT operations manager for CCS. "But the technology wasn't mature enough to handle this until now."

The $8.3 million project — which also includes server virtualization in data centers and migration to a new operating system — was funded by a tax levy. "The funding was probably the biggest challenge," said Houpe. "This was a significant piece of this.

COLUMBUS CITY SCHOOLS

- Largest school district in Ohio
- 53,000 students
- 7,400 employees
- 220 square miles
- 127 schools
- 72.6 percent of students receive free/reduced lunch
- 87 different languages spoken
- 4,118 English as a second language students
- 8,354 special needs students
- 11,000 gifted & talented students

Challenges

- Replace 19,000 aging computers in a cost-effective way that also improves performance.
- Find a delivery system capable of handling more than 1,500 applications — including very demanding applications, such as streaming video and interactive educational tools.

Solution

- Virtualized desktops for a 21 percent cost savings, better performance and improved user experience.
- Virtualized servers to improve data centers and lower costs.
- A new virtualized environment that's easier to manage and support.

How do you acquire the funds to facilitate this process? So our voters were key." The funds covered servers, software, licensing and desktop hardware.

The Board of Education invited community leaders to constitute a millage committee to recommend a levy millage amount for the November 2008 election. The creation of an acceptable millage amount would provide the necessary funding to update many needed items, including technology. In 2007, the Board of Education passed a resolution to place a 7.85 mill levy and 1.13 mill bond issue on the November 2008 ballot.

Voters passed the levy and bond issue, which provided the funds to upgrade technology throughout the district. And despite all the challenges, CCS will finish the project six months early. The technology upgrade is assisting CCS in achieving its long-range goals of achieving a 90 percent graduation rate and sustaining a system of excellent schools.

NUMEROUS VIRTUALIZATION BENEFITS

CCS is committed to building a system of excellent schools. The district has noticed several key factors affecting students after graduation: continued earnings decline for Americans lacking 21st-century skills, more aggressive competition for jobs, more autonomous workplaces and outsourcing. The district believes three chief skills are required today: expert thinking, problem-solving and complex communication.

The vision of Superintendent Gene Harris, Ph.D., is that all students will be successful. To that end, she's created the CCS 100% student success model, which includes the infusion of technology throughout the curriculum and business functions of the district.

Technology solution provider Insight played a large role in helping the district realize its vision for desktop virtualization. The company helped design the virtualization solution and aided in the hardware acquisition. Insight is also the managed services provider, and is delivering, placing and configuring the new machines at the district's sites.

Desktop virtualization allows the district to standardize hardware platforms and software content in all schools. The new thin-client computers are less expensive and need less support, so total cost of ownership is lower than with traditional computers. The district will save $145.29 per computer, including software, licenses and installation. That's a savings of 21.2 percent compared to traditional machines.

The thin-client workstations are new, compact and faster than the computers they're replacing. They have no moving parts, such as disk drives or fans, and emit very little heat. Thus, there will be fewer repairs and less downtime. Even disposal costs are lower because there are no hard drives. However, disposal of the new equipment won't be an issue for some time because the thin clients don't need to be replaced as often as traditional, more complex desktop computers.

Users get a faster, better experience with the virtualized desktops, and CCS gains numerous administrative advantages by having applications and information in a central location. All computers will have the same images, making them easier to update, support and maintain. The machines can be managed remotely, so desk-side visits by support staff will be greatly reduced. The thin clients also can be powered on and off remotely, according to schedules, for improved power conservation. Security is inherently better too, since software, data and other elements reside in a secure data center and not on the desktop.

Insight is also helping with "reworking" of old computers either by salvaging "good" parts or "re-assigning" PCs within the district, minimizing the disposal costs for the district.

STREAMLINED ENVIRONMENT

Insight began helping the district improve its data center five years ago with many additional improvements over the years. In 2009, the district virtualized its three data centers, making them more able to respond to increasingly demanding software needs. The district wanted to reduce server sprawl in its main data center, while developing a stronger business continuity infrastructure.

CCS now has a streamlined server environment that's easier to manage, with 113 virtual servers on 15 physical servers. It had close to 250 servers before virtualization. Power and cooling needs have been greatly reduced, operating expenses are lower, and the district now has failover capabilities between its three data centers.

IMPROVEMENTS ALL AROUND

While the new systems mean changing some habits for teachers and students, it's clearly for the best. "The students love the technology," Houpe said. "They're excited to walk in the door, and they say, 'Thank you for our technology and for investing in us.'" Teachers appreciate the students' enthusiasm, as the ability to provide engaging applications keeps them interested in their lessons.

Desktop virtualization also gives the district a better handle on how its computers are used. "We will have an opportunity to look at all the software offerings that we have, for the first time," said VanDyke. "We can really monitor the uses. We can look at the growth potential for some of those. Being virtualized, we can look at the whole picture now, where we couldn't before."

CCS pulled it all together with the help of a good partner. "Anytime you build an initiative of this magnitude, you need to have a partnership," Houpe said. "The relationship with Insight and their ability to provide service for us has been very good." Insight worked closely with the school district to overcome the tough challenges inherent in such a big project.

Insight continues to seamlessly help CCS achieve its goals. "They are our face when they go out to service, support and implement this technology," Houpe said. "Our customer base doesn't know them as Insight. They know them as the technology folks within Columbus City Schools. That's fantastic. That's how it should be."

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NORTHROP GRUMMAN AND THE VIRGINIA INFORMATION TECHNOLOGIES AGENCY SHARE A BUILDING. THE COMPANY IS ON THE TOP FLOOR AND VITA ON THE GROUND FLOOR.

"There were things that only time and experience could foretell," he said. "I don't want to say there were flaws, but there were certainly gaps in a contract this complex, this huge that when it came time to operationalize and actually do those things, it wasn't until then that those gaps became apparent."

The contract modifications came after a 2009 legislative audit slammed the agreement between Virginia and Northrop Grumman. The Joint Legislative Audit and Review Commission pinned the blame on both parties. The audit found that Northrop Grumman's inadequate planning and VITA's inadequate understanding of agencies' needs led to most project delays. Among the audit's other findings: the complexities of state government were not adequately understood by Northrop Grumman; VITA's authority to address delays was inadequate; VITA and the Information Technology Investment Board failed to reach an agreement on how to address performance problems; and both the CIO and the governor lacked the needed authority and accountability.

The new contract provisions are designed to improve performance and boost efficiency. For instance, the amended contract calls for Northrop Grumman to create Rapid Response teams to quickly resolve individual IT issues; expedite replacement of damaged desktops and laptops by replacing equipment within 24 hours of repair determination; consolidate and strengthen performance-level standards, with a 15 percent increase in penalties if the company fails to perform on performance standards; and add new services to the contract, such as improved disaster recovery and enhanced security features.

"The state and Northrop Grumman decided to hold hands and together to step into a puddle. Neither side knew just how deep that puddle was at the time." — SAM NIXON, CIO, VIRGINIA

The new contract also requires Virginia to release $15 million in previously withheld contract payments and includes $105 million in additional cash payments over nine years.

WHAT WENT WRONG

Virginia certainly is not alone in encountering problems during large-scale IT outsourcing endeavors. Like most enterprisewide projects, it was for a noble cause that Virginia

PERFORMANCE IMPROVEMENTS

As part of the upgraded contract, Northrop Grumman will:

create Rapid Response teams — additional on-site resources with additional abilities to quickly resolve individual IT issues;

expedite replacement of damaged desktops and laptops by replacing equipment within 24 hours of repair determination;

overhaul help-desk services — a top-to-bottom review of current procedures to implement changes outlined in the agreement and other suggested improvements. Changes include one-hour password resets — a process that used to take three to five days;

redesign the work-order process and increase automation of the procurement process to speed up purchases;

formalize agreement for Northrop Grumman to develop a new technology investment council for agency involvement; and

move forward on long-delayed migration plans for all desktop operating system upgrades.

OPERATIONAL EFFICIENCIES

The new contract consolidates and strengthens performance-level standards, with a 15 percent increase in penalties if Northrop Grumman fails to perform on clearly identified and measured performance standards;

Incident Response teams quickly determine technology failures and expedite repair;

institutes clear performance measurements for the company that agencies can easily track;

creates an enhanced dispute resolution process;

adds new services to the contract, such as improved disaster recovery and enhanced security features; and

establishes a three-month review period for performance under the revised agreement that ended June 25, which allowed Virginia to test new operational, financial and contractual changes to ensure significantly improved contractor performance in a short time frame.

FINANCIAL

Virginia releases $15 million in previously withheld contract payments after deducting $1 million in performance-level penalties;

the prior gubernatorial administration negotiated contract modifications that included $196 million in additional cash payments over six years with an average payment of $32.5 million a year; and

the contract's current revision includes $105 million in additional cash payments over nine years with a net present value cost of $63 million.

Source: Office of Gov. Bob McDonnell

began this journey. Yet like many grand visions, critical details in Virginia were overlooked or never perceived.

"Northrop Grumman and the commonwealth as a whole saw the value of moving toward a shared-services model to providing the containment of cost, stability, considering more mature services in our case [and] providing services that we didn't have before, but that there is a considerable amount of complexity related to the technology component of making that happen," Nixon said. "And I think that the rate and the scope of change, particularly the scope, was much broader, much more complex than anyone had anticipated. We had an extraordinarily diverse technology environment here that has grown over many decades.

"The state and Northrop Grumman decided to hold hands and together step into a puddle," Nixon continued. "Neither side knew just how deep that puddle was at the time."

One major oversight — which happens surprisingly often in state enterprise projects — was the failure to bring agencies into discussions. In Virginia, before the contract restructuring, agencies had little or no say in the outsourcing arrangements that would impact their operations.

Giving agencies a stronger voice was what drove the creation of a CIO Council — a group comprising state agency CIOs that meets every other month — during Coulter's brief tenure as state CIO.

"Those meetings are for us to communicate with them, but we also have a town council-style interaction with them where they can provide their concerns to us," Nixon said. "We're also standing up an executive-level council called the Information Technology Advisory Council, ITAC. And that's going to be composed of the business owners, not IT people, but business owners of government. That group will

Texas Struggles With Consolidation Plan

TEXAS OFFICIALS ALSO ARE TRYING to retool a struggling outsourcing initiative, but the task hasn't been easy. At press time, the $863 million effort to consolidate and transfer state government servers to IBM was eight months behind schedule, and negotiations between the state and IBM to implement changes had reached an impasse.

Texas CIO Karen Robinson said the state Department of Information Resources (DIR) has been in talks with IBM since late 2009 on making changes designed to speed up the server transfer, better align the outsourcing contract with the business needs of state agencies and improve agency satisfaction with the plan. State officials reached an agreement in principle with IBM in December — which was based on recommendations made by outsourcing consultants EquaTerra — but progress on formalizing that agreement stalled earlier this year, Robinson said.

The issue came to a head in July, when Robinson sent a seven-page "notice to cure" to IBM asserting that the company had abandoned its obligations under the seven-year contract signed in 2006. The notice gave IBM 30 days to fix the shortcomings, or face potential termination of the agreement. IBM denied the allegations and called the notice "unjustified and unnecessary."

New Approach

Regardless of how the dispute ends, Texas officials said they remain committed to data center consolidation. But they intend to alter the state's approach to modernizing and privatizing agency servers, according to Ed Swedberg, deputy executive director of the DIR.

Rather than shifting the entire contents of state servers onto new machines in the privatized data centers, the state will evaluate and prioritize each application running on agency servers and come up with an appropriate course of action. "This is very important because it's going to help us better tailor the priorities of what we transform first based on business requirements and technical risks," said Swedberg, who manages the Texas data center contract.

In addition, agencies will gain more flexibility to decide the level of service they need – for instance, how much downtime an application can have and how quickly problems must be fixed – for each application they run.

"Every application within the portfolio of an agency isn't alike. They all don't need the same level of service in terms of availability and everything else," Swedberg said. "So by going to an application-based transformation, we can go in and profile that application and, working with agency business executives, understand exactly what level of service each level of application really needs. And give them the tools to better be able to manage their IT budgets for data centers."

Notice to Cure

The consolidation plan envisions moving IT operations for 27 Texas state agencies into two new data centers that would be operated by IBM. Transfer of servers from agencies to IBM was supposed to be finished in December 2009, but is less than 12 percent complete, according to the DIR. Just five agencies are completely consolidated, and consolidation efforts are under way in only five more, the department said.

In its notice to cure, the DIR contended that IBM had missed critical deadlines due to poor performance and underinvestment in the project. "We've been trying to work through some resolutions for the past nine months," Robinson said in July. "We continued working closely with IBM to resolve some of those outstanding issues. And their performance continued to degrade and we weren't getting what we expected from them."

IBM spokesman Jeff Tieszen blamed project delays on poor management by the state. "The DIR is an agency with very little real influence, despite whatever state organizational chart you might look at," he said. "They were given a mandate to centrally manage the agencies and they failed to do that." Tieszen added that efforts to formally change the outsourcing agreement "didn't get anywhere, primarily because it came down to the DIR making some unreasonable demands of IBM without adequate compensation."

The issue was unresolved as *Public CIO* went to press.

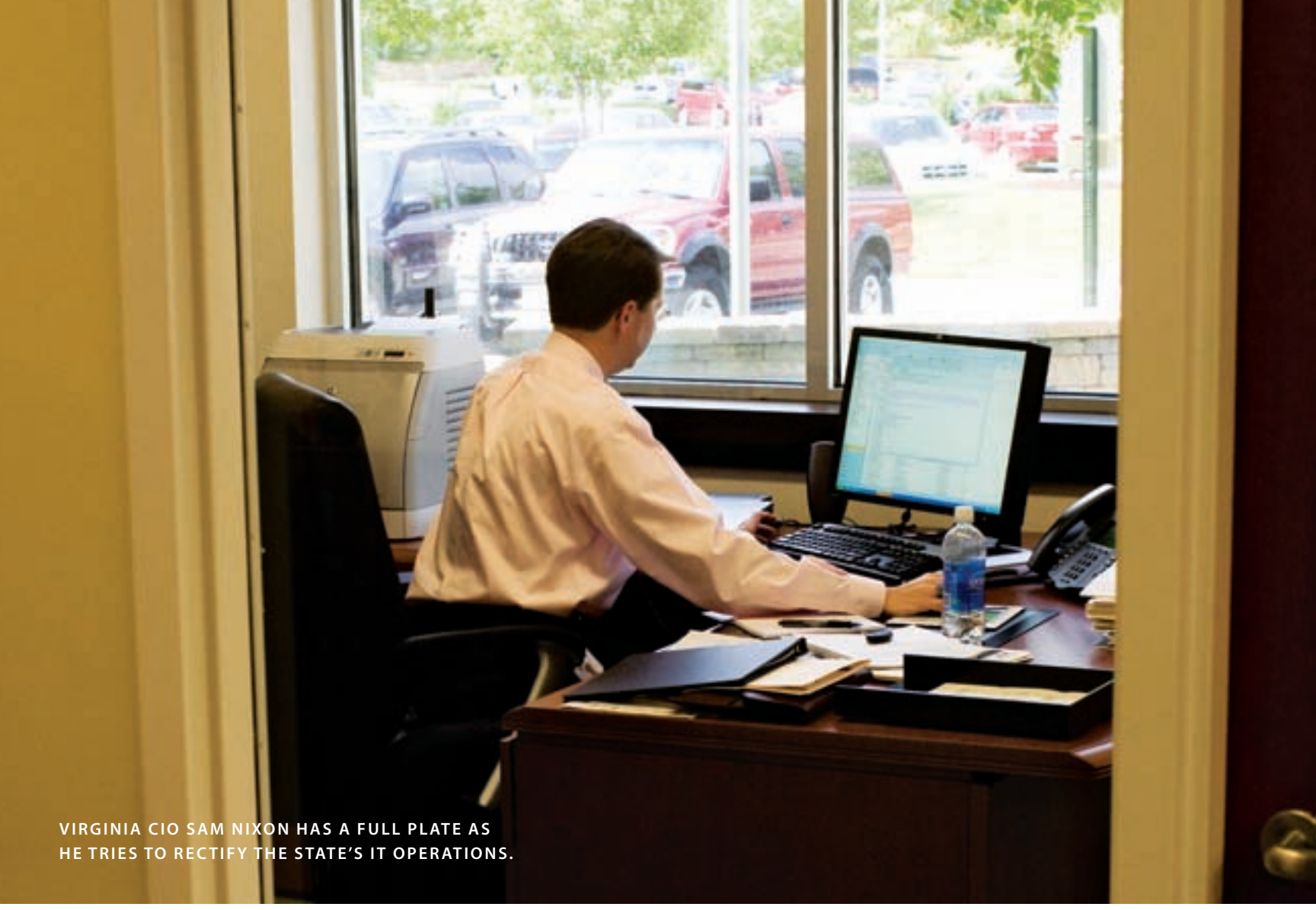
Governance Changes

The EquaTerra report, commissioned by the DIR and released in November 2009, called the existing agreement between Texas and IBM "unsustainable" and recommended a series of revisions. The report criticized the contract's service offerings, characterizing them as "a one-size-fits-all solution" that doesn't meet the diverse business needs of state agencies. In addition, the consultants said governance provisions spelled out in the contract were ineffective and inappropriate for keeping the massive outsourcing deal on track.

The DIR already has taken steps designed to give individual state agencies stronger representation in — and more accountability for — the outsourcing initiative. Earlier this year, an executive committee of agency leaders was created to guide business direction for the initiative. Another committee of agency IT leaders, DIR representatives and contractors was formed to tackle technology issues. And a handful of working groups were created to focus on specific aspects of the project like service delivery and program management.

"We realized many of the decisions that we were making had significant business impacts. We really had to bring agency business leaders into the mix," said Swedberg. "I don't envision how we could have just kept operating under the way we were doing things — which was essentially an advisory council concept where the agencies could come in and tell us all the things that are going wrong, but ultimately it was DIR making all the decisions."

— By Steve Towns



VIRGINIA CIO SAM NIXON HAS A FULL PLATE AS HE TRIES TO RECTIFY THE STATE'S IT OPERATIONS.

"From the state's standpoint, we have responsibility for the problems that ensued, and I think Northrop Grumman does too."

— VIRGINIA DELEGATE STEVEN LANDES

have yet another conduit into VITA, and what I hope would happen, my vision is that group will focus on enterprisewide applications and enterprisewide initiatives."

Also problematic for Virginia was that because the CIO reported to the Information Technology Investment Board and not the governor, authority over the project on Virginia's side was never clear.

"We thought [that] was a creative and unique way of governing IT," he said. "And that worked well for a long time, but it stopped working pretty quickly at the point in which conflict began to raise its head within the partnership."

Complicating matters was the fact that no entity had the authority to compel agencies to do what VITA was asking.

"All the people who were here before say the change in the governance model is a good thing," Nixon said. "And again, it's painful for me to sit here and say in retrospect that the old governance model was broken. … I don't know that it was broken, but it definitely became broken along the way."

This was because once things became confrontational, there was no one to step in, call a time-out and send everyone to their rooms, he said. "We do have that now with the governor," Nixon added. "So I think it's an important difference and one that has been very helpful since I have been here."

GOING FORWARD

Nixon isn't ready to say that the governance changes and contract restructuring are enough to ensure smooth sailing into the future. And many state lawmakers remained unconvinced that the changes are enough. Several talked to the *Richmond Times-Dispatch,* expressing their concerns in a June 21 article.

"There's still some nervousness among the [budget-writing] committee," Delegate Scott Lingamfelter said. Delegate Chris

Jones told the paper he wonders what will happen when the contract runs out in 2019. And Delegate Johnny S. Joannou, though pleased Nixon was named CIO, cryptically likened the outsourcing deal to a "bowl of spaghetti that's messed up."

Delegate Steven Landes, a longtime lawmaker who knows Nixon well, talked to *Public CIO* about his concerns regarding the restructuring. He echoed Jones' sentiment, wondering if the state is painting itself into a corner.

"One of my colleagues, Chris Jones from Suffolk, asked at the last preparations meeting, which I thought was on target, what's going to happen with the hardware when the contract is finished?" Landes said. "Does Virginia own the hardware or does Northrop Grumman? Those are some of the things we're still going to have to work through. But I think we're getting there."

Landes went on to say that he believes Nixon is the right person for the job, especially given the way the governance model has changed. Yet Landes remains unconvinced that the outsourcing arrangement is in taxpayers' best interest.

"As elected representatives, it's our job to make sure money is spent appropriately and that the state contracts are good for the taxpayer," Landes said. "From the state's standpoint, we have responsibility for the problems that ensued, and I think Northrop Grumman does too. And I think early on one of my concerns was it didn't seem like Northrop Grumman thought that there was any real responsibility, they felt like they were meeting the tenets of the contract. But as a contractor with a government entity, there is a little higher level of accountability than just in the private sector. It's not just private entity money that you're dealing with or a group of stockholders, you're dealing with the taxpayers, you're dealing with the average citizen."

Nixon said the experience with IT outsourcing — from conception to present — has changed his perspective on the process, were he to do it over again.

"I'm not sure if I'm ready to change my views on outsourcing, but maybe it has changed my views on how we constructed or went about the outsourcing," he said. "We probably got ahead of ourselves, particularly with VITA, which was still a fairly new organization."

In other words, he said, it was like trying to live in a house at the same time it was being built — at the same time Lowe's showed up with a bunch of lumber, but they didn't have any hammers or nails.

"There were just a lot of things about that that were not sequenced properly," Nixon said. "Looking back, it's really easy to see those things. Back then it wasn't nearly as apparent. It was all shiny and new and all looked like a good idea, but when it came time to actually making things happen, that's when it became very difficult, very quickly."

North Carolina to Consider Move Toward IT Outsourcing

THE DIFFICULTIES IN TEXAS AND VIRGINIA haven't discouraged all states from considering IT outsourcing. In fact, as IBM and Texas worked in July to salvage their partnership, North Carolina set in motion a statewide IT assessment that could ultimately result in the state partnering with one or more vendors.

In a memorandum sent to her executive branch leadership, Gov. Bev Perdue said the need to improve North Carolina's technology infrastructure was one reason for studying how the state delivers IT. Saving money is another motivator, as legislators are making hard choices to close a $3.2 billion budget deficit. North Carolina spends more than $1 billion on IT annually, according to Perdue's office, so cutting costs is a priority whether or not the state decides to bring in a private partner.

The assessment, to be done by a third-party firm, will take an "in-depth look at areas across all executive branch agencies where consolidation and utilization of private-sector IT services would bring more value to the citizens of North Carolina." State CIO Jerry Fralick said in a statement that "any effort to gain efficiencies and improvements in IT must be based on hard, objective data from a third party." The consultant won't be allowed to bid on or be affiliated with RFPs that result from the study.

If North Carolina privatizes some or all of its IT operations, the model wouldn't necessarily look like the agreements in Texas and Virginia, where a single vendor was picked to be the sole technology provider. Some governments have instead chosen to "multisource" their outsourcing contracts so that different vendors are picked for specific functions or services — a piece-by-piece approach.

One piece is already under way in North Carolina. Perdue stated in her memo that within months the state will pick a vendor to build a new state portal, which she said would reduce operation and maintenance costs. If successful, that privatization could embolden the state to pursue a similar solution for other services like cyber-security and hardware management.

The IT assessment was expected to begin in September. Fralick will likely play a key role in the transformation. Perdue is backing a recommendation made by her Budget Reform and Accountability Commission to give the state CIO more authority. The assessment will include a recommended governance structure for North Carolina's transformed IT organization.

It remains to be seen if a partnering vendor will become the central piece of that new structure.

"The goal is to move aggressively toward an improved IT infrastructure that will lower costs, reduce complexity and redundancy, improve the utilization of resources and increase security," Perdue wrote.

— By Matt Williams

MELODIE MAYBERRY-STEWART,
CIO, NEW YORK STATE

BY RUSSELL NICHOLS | PHOTOS BY DAVID LUBARSKY

A STEADFAST WORK ETHIC PROPELLED THE FIRST BLACK FEMALE CIO OF NEW YORK STATE FROM LIVING IN HOUSING PROJECTS TO LAUNCHING STATEWIDE IT PROJECTS.

If you want to get technical, you might call Melodie Mayberry-Stewart an anomaly, as in one who defies expectations — including her own.

Three and a half years ago, she became the first black, female CIO of New York state. As the governor's top information technology adviser, she develops and oversees IT investments for the $134 billion state enterprise with more than 190,000 employees.

But this position provides only a peek into the groundbreaking legacy of Mayberry-Stewart, a black woman who found her calling in a field dominated by white men. To understand how she got here, you have to backtrack beyond her 30-year IT career to her humble beginnings in Cleveland's low-income housing projects, where opportunity wasn't known to come knocking.

Technology TRAIL-BLAZER

It was the 1950s. Her mother worked in a day-care center. Her father drove a bus for the city. Neither of them went to college. But at a young age, Mayberry-Stewart, with her two younger brothers, learned the value of hard work.

"In the nursery school day-care center, we had all kinds of things we had to do to earn our allowance," she recalled. "This was branded in us to take nothing for granted. We learned not to be afraid of hard work and to take on challenges."

Growing up, Mayberry-Stewart's parents enrolled her in various music and sports programs, and she went to camp every year. Most of the time, she and her brother were the only black kids at camp, so she had to work twice as hard to be recognized. A self-proclaimed tomboy, she had no trouble mixing it up with the guys.

But her world turned upside down on April 7, 1964, the day Bruce W. Klunder, a white Presbyterian minister and civil rights activist, was run over and killed by a bulldozer on her street as he protested the construction of a segregated school. Riots broke out. Protesters flipped cars. Police made arrests. Coming home from school, Mayberry-Stewart remembers the riots and the next morning picking up empty tear-gas canisters off the front lawn as chaos erupted around her.

"For me, it was a catalyst," she said. "That event set me on a track to not ever want to be in a situation where I felt so frustrated and powerless that the only option was violence. I did not want to be in a situation where I would feel powerless over my own destiny. You sort of develop a fearless attitude in terms of the challenges you can take on."

Rather than lose faith in her future, Mayberry-Stewart used the incident as fuel for her dreams. Three years after arriving in Lincoln, Neb., to study business and mathematics at Union College, she became the first in her family to graduate from college. She expected to leave Nebraska, but her decision to stay and get her master's degree in sociological research led to an opportunity that would change her life forever: a job as a systems engineer for IBM.

"It was a dream to have this opportunity as this little girl from the projects of Cleveland to work at a major corporation when there weren't many girls or blacks," she said.

In the data-processing division, she was, in fact, the only black and female employee, she said, but her white male coworkers took her under their wing as a little sister. In 13 years, she rose through the ranks. After leaving IBM, she became the first CIO of the nonprofit Community Health Corp. in California. She remained in the health-care field for 12 years.

Years later, after founding an IT consulting company that provided strategic support to nonprofit organizations, her career came full circle in 2002 when newly elected Cleveland Mayor Jane Campbell appointed Mayberry-Stewart as the city's first CTO and CIO.

"Given the mayor's vision and my IT background," she said, "I felt this was a wonderful opportunity to help my hometown advance its agenda."

Five years later, she got a call from the New York governor's office, an invitation to take over the state's Office for Technology. Since then, she has worked with local and federal government agencies, using technology to deliver innovative state government services to citizens and businesses. She oversees about 5,600 state IT professionals and annual technology spending of around $2 billion.

PROBLEM SOLVER

Not long after Melodie Mayberry-Stewart landed the job as New York state CIO in 2007, she faced one of her biggest challenges: straightening out a massive wireless network deployment plagued with problems.

It was touted as the largest IT project in the state's history, and Mayberry-Stewart started by sending a notice of default in fall 2008 to Massachusetts-based M/A-COM, the primary contractor for the New York Statewide Wireless Network project. The notice identified 19 deficiencies in the system and gave the vendor 45 days to fix them.

During a testing period in November 2008, the network — designed to provide interoperable communications for public safety agencies — had 14.5 cumulative hours of downtime, which is well above the U.S. standard of just 52.6 minutes per year. By January 2009, after several rounds of testing, the state officially terminated its contract with M/A-COM and after spending more than $100 million developing the network, it was back to the drawing board.

Mayberry-Stewart made structural changes: A revised governance structure included a steering committee of first responders to push system deployments. And in the following months, the Statewide Wireless Network Program Office was restructured as the Statewide Interoperability Program Office to focus on regional deployments.

"The new approach will enable the state to accelerate replacing and upgrading obsolete state and local public safety systems," according to the 2009 New York State Statewide Wireless Network Annual Report. "This approach reaffirms the state's commitment to replacing and upgrading deteriorating public safety systems, with a goal of statewide interoperability."

The wireless project is a work in progress, but Mayberry-Stewart's contributions have not gone unrecognized. She has been nationally recognized as one of the most important blacks in technology by various publications and has received numerous honors for her efforts, including *Computerworld's* Premier 100 IT Leaders for 2009.

Experience Matters

ViON brings 30 years of data management expertise and government focus to public-sector customers.

THE INFORMATION REQUIREMENTS of government agencies are more demanding than ever before. Massive growth in electronic data, mounting pressure to consolidate IT resources and the need to strengthen resiliency of critical systems all drive demand for sophisticated storage and data management solutions.

At the same time, public-sector procurement rules continue to grow more complex. Evolving purchasing regulations and strategies can easily trip up agencies and vendors that don't track the latest developments.

> *"We are completely focused on the public-sector marketplace. We're not serving the banking industry, the insurance industry or retail outlets.That focus makes us very effective and very responsive to the needs of government customers."*
>
> *— Tom Frana, president and CEO, ViON*

In this challenging environment, public agencies need a partner with deep expertise in storage and server technology, along with an intimate understanding of how governments do business. Since 1980, ViON Corp. has specialized in enterprise storage and server solutions for federal, state and local agencies — using high-performance virtualization, consolidation and business continuity strategies to make its customers greener, more efficient and more resilient.

A 30-year commitment to the government market means that ViON routinely navigates arcane purchasing rules — and it offers proof that the company stands by government customers for the long haul. ViON also understands unique public-sector technology requirements. The company is the largest Hitachi Data Systems reseller in the nation, and is a leading architect and provider of IBM technology products and services for integrated system solutions to the federal government.

"We are completely focused on the public-sector marketplace. We're not serving the banking industry, the insurance industry or retail outlets," said Tom Frana, ViON president and CEO. "That focus makes us very effective and very responsive to the needs of government customers."

A Government Expert

ViON, a veteran-owned small business, has the agility and market concentration to quickly respond to changing government program requirements. For instance, when homeland security and war-fighting in Iraq and Afghanistan drove requirements for sophisticated storage and data management technology, ViON responded with powerful solutions for the Department of Defense (DoD) and the federal intelligence community.

"We have 120 employees calling our customers on a day-in and day-out basis — and the vast majority of that group holds some kind of security clearance," Frana said. "Probably 60 percent of our

employees hold higher levels of clearance to deal with the intelligence community."

Now the company is ramping up to meet new technology needs triggered by federal health-care legislation. Frana said tiered storage solutions will be a vital part of developing cost-effective solutions for electronic health records. Some medical information — recent diagnostic tests or key medical history data — must be available to physicians immediately, he explained. Other information won't need to be instantly accessible, but it will need to be searchable and available in a reasonable amount of time. Strategies to match these data types to appropriate storage platforms will be fundamental to the initiative's success.

"That tiered storage structure is something that we're working on in the health-care environment: How do you bring instantaneous access for current medical records and the ability to search through information from the past five or 10 years that might really tie a diagnosis together?" he said. "Programs already are being defined, and we're working to help define them — and how best to use storage solutions to support them."

Besides supporting key federal agencies like the DoD, Department of Justice and the IRS, ViON also serves some of the nation's largest state and local jurisdictions. The company's state and local customers include California, Illinois, Texas and the District of Columbia. In addition, ViON works with schools, state-funded universities and public hospitals nationwide.

Powerful Hitachi Partnership

ViON's longstanding relationship with Hitachi Data Systems ensures that agencies receive storage technology that's powerful, reliable and ready for virtualized and cloud-based solutions. ViON isn't just Hitachi's largest U.S. reseller, it's the oldest too. In fact, Frana visited Hitachi in Japan, to receive recognition of ViON's tremendous support and partnership over the last 30 years.

Through this partnership, ViON works closely with Hitachi on research and development of new technologies. These activities give ViON engineers and professional services staff deep insight into the solutions they deploy for customers. That results in more effective and reliable government systems.

ViON's 10-year relationship with IBM enables the organization to expand the capabilities it offers to government clients. The company also works with Cisco, Brocade, Fujitsu and other premium technology providers to create best-of-breed solutions to meet government mission needs.

Frana himself has more than 30 years of experience with Hitachi technology. He served as vice president and general manager of Hitachi's North American operations before joining ViON nearly 20 years ago. And most other key ViON staff members also have extensive backgrounds in both sophisticated technology solutions and government operations.

"I think we have one of the best staffs in the government marketplace," Frana said. "Very few people leave us, except for retirement."

Vast Procurement Knowledge

ViON's government expertise also means that the company understands purchasing rules and pressures facing public agencies. Unlike companies that merely dabble in government business, ViON closely monitors evolving procurement practices, helping customers get the solutions they need and comply with applicable laws and regulations.

Record of Success

For 30 years, ViON Corp. has specialized in providing high-performance, high-availability server and storage solutions for public-sector customers. The company's customers include:

- Bureau of Customs and Border Protection
- Centers for Medicare and Medicaid Services
- Department of Defense
- Department of Justice
- Internal Revenue Service
- Social Security Administration
- California
- District of Columbia
- Virginia
- University of Alabama
- Wright State University

The Barack Obama administration currently is reviewing procurement practices across the federal government with a focus on IT-related rules, according to Frana. "We're tracking that closely," he said, adding that federal rule changes often trickle down to state and local agencies. "We're on the leading edge of understanding where these activities are going, and we can often educate our customers on new laws and regulations."

ViON's combination of technical expertise and government experience delivers powerful results for customers. Recent examples include:

- cutting one customer's operating costs by more than $10 million per year by modernizing its tape storage operations;
- consolidating mainframe and open systems servers for a large data center customer to reduce heat and power consumption, while substantially improving performance; and
- designing and installing business continuity solutions — for both mainframe and open-systems environments — for one of the federal government's largest agencies.

The company's track record speaks for itself: For 30 years, ViON has specialized in bringing responsive, powerful and creative solutions to some of the public sector's toughest information management problems.

"Our approach is to constantly ask our customers 'What else can we do for you?' and sometimes they come back with some challenging requests," Frana said. "We pride ourselves on having vast expertise and a great deal of flexibility."

ViON
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ViON specializes in providing storage solutions and assured computing to high performance, enterprise-wide data centers throughout the federal, state, and local governments. We strive to deliver quality customer service. For more information visit **www.vion.com** or call **1-800-761-9691**.

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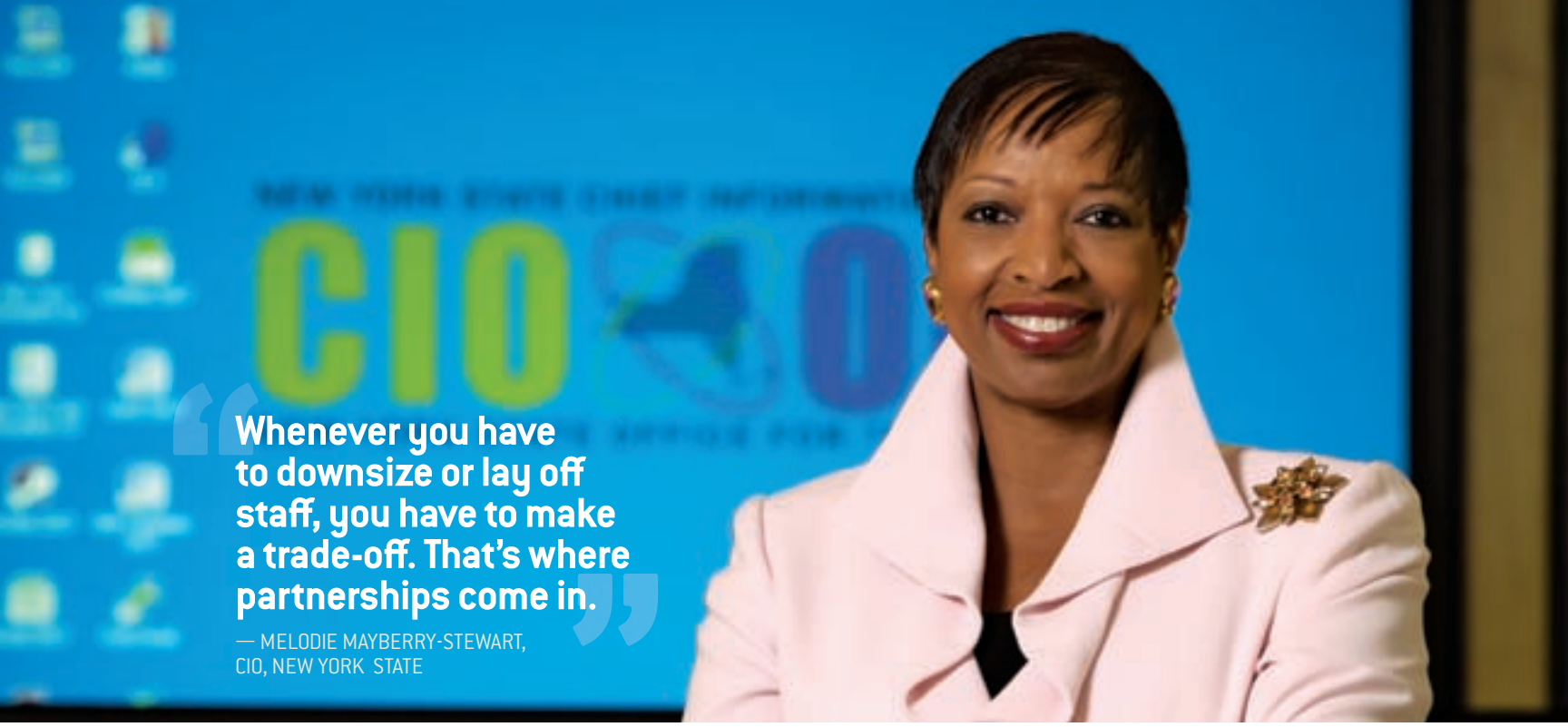

> **Whenever you have to downsize or lay off staff, you have to make a trade-off. That's where partnerships come in.**
>
> — MELODIE MAYBERRY-STEWART, CIO, NEW YORK STATE

Indeed, she was not in Cleveland anymore. But during her tenure, as the recession raged on, Mayberry-Stewart had to come up with different strategies to stretch dollars.

"You're always trying to look at how to get more out of the technology investments you're trying to make, pooling your resources for one and one to equal three," she said. "Whenever you have to downsize or lay off staff, you have to make a trade-off. That's where partnerships come in."

New York state, for example, invested in a $100 million partnership with the Rensselaer Polytechnic Institute (RPI), a leading research and educational institution, and IBM to create one of the world's most powerful university-based supercomputer centers.

Operated by the Computational Center for Nanotechnology Innovations at RPI in Troy, N.Y., the supercomputer system lets researchers in various fields create models of complex processes and solve modeling problems faster than ever.

As part of the investment, New York was allocated 20 percent of the supercomputer capacity, allowing state agencies to solve complex problems in public safety, cyber-security, education, transportation and health or human services at no cost, Mayberry-Stewart said.

This past February, state agencies started migrating from at least six disparate e-mail systems to NYSeMail, the state's consolidated enterprise system operated by Mayberry-Stewart's office. The centralized, standardized network would enhance communication and collaboration and could ultimately save New York $4 million, state officials said.

"You want to continue driving waste out and finding ways to be more cost-efficient," she said, "and at the same time stay at the forefront of newer technology."

No matter how far she has come, Mayberry-Stewart recognizes how opportunities shaped her path. That's why she supports Gov. David Paterson's push to increase the percentage of Minority and Women's Business Enterprises (MWBE) in the state. Her office has made strides to increase technology supplier diversity through a program that helps state agencies identify and include MWBEs as subcontractors in technology projects. Mayberry-Stewart's passion for this cause is personal.

"I want diversity in the work force," she said, "to get the technology field to better reflect the demographics of the communities we serve."

To that effect, she's also been on a mission to close the digital divide, which she recognizes as a solution to increase diversity and boost competitiveness on a global scale. She has been charging forward with the state's broadband initiative, a plan to deliver high-speed Internet throughout the state — especially to underserved populations in rural and urban areas.

"We have a lot of broadband, but it's not all connected," said New York state Sen. Betty Little, who recently co-hosted a Broadband Summit with Mayberry-Stewart to talk about closing the digital divide in the state's northern edge, known as the North Country. "I'm very impressed by Dr. Mayberry-Stewart's whole understanding and knowledge of this technology. She's been very responsive, very hands-on."

Mayberry-Stewart never expected to end up where she did. But despite all the degrees — she was also the first black woman to earn a doctorate from the Peter F. Drucker Graduate School of Management — and a lengthy resumé, her foundation, her inspiration to keep moving forward starts and ends with family.

"What I am most proud of is that I have a wonderful son, and raising him as a single parent," she said. "We just had our annual fishing trip in Canada last week."

How can consolidating data centers help me to better serve my constituents?

The benefits of data center consolidation will allow state and local governments to become more cost effective and citizen-and community-centric, strengthening constituent relationships.

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Please visit www.gdit.com/datacenter to learn more about the constituent benefits of data center consolidation.

GENERAL DYNAMICS
Information Technology

Saving PUBLIC UNIVERSITIES

INNOVATORS SHOW HOW TECHNOLOGY AND NEW APPROACHES CAN CUT THE COST AND IMPROVE THE PERFORMANCE OF PUBLIC COLLEGES AND UNIVERSITIES.

BY JESSICA B. MULHOLLAND

ILLUSTRATION BY TOM McKEITH

The need for affordable and flexible education rings truer today than ever before. According to the College Board's 2009 *Trends in College Pricing* report, the cost of higher education is rising: Tuition for in-state residents at public four-year institutions was about $7,020 for the 2009-2010 academic year, bringing the total cost for one academic year to more than $19,000 when books and living expenses are included. This means a four-year degree at a public university costs nearly $80,000, and according to the same report, a private four-year degree costs twice that — $160,000.

And governors will continue cutting higher education budgets, which will hike tuition costs, said John Thomasian, director of the National Governors Association Center for Best Practices. The lack of affordability combined with the complexity of student financial aid threatens higher education's accessibility, said David Breneman, the Newton and Rita Meyers professor in economics of education at the University of Virginia. "To find out what the actual price of college is going to be is not trivial in this country," he said. "The kids who are coached know how to run the financial aid system if they are eligible, while the kids from less sophisticated families — I think a number of us worry that they sort of get lost at the starting gate."

As university budgets shrink, governors are searching for ways to make the remaining education money more effective, Thomasian said. "One of those ways to make it effective is for higher education to start using a lot more online learning."

Debates about the rigor of online versus traditional degrees abound, but the truth is that the recession is straining traditional public universities, tuitions are continuously rising and students are being turned away from already-overcrowded classrooms. So does online education offer a viable alternative for delivering higher education, career retraining and lifelong learning?

Ray Scheppach, executive director of the National Governors Association, thinks so. "I really believe that higher education has to move online," he said at the

National Association of State Chief Information Officers midyear meeting in Baltimore. "Private universities have done it; government will have to follow along."

A BROKEN MODEL?

Ultimately the higher education system as we know it is in jeopardy, and many contend that the model is already broken.

"Particularly for the public institutions," Breneman said, "if you think their role and purpose is to serve the public in a broad way and to be affordable and accessible, I think we are running a risk of closing out opportunities to a substantial part of the youth population if we aren't careful. We're shifting the cost from the general taxpayer, which is what it has historically been, over to the families."

Carol Twigg, president and CEO of the National Center for Academic Transformation, hesitates to say that the higher education model is broken, but she does think it's in serious danger of cracking simply because higher education, by and large, hasn't used technological innovation to become more productive.

Twigg contends that higher education institutions are competing in the economics of society, and all other industries are incorporating technologies to promote productivity and efficiency. "The more you fall behind, the greater the contrast in your cost of doing business versus other industries," she says, which is one reason there's growing public concern over the rising cost of higher education. "Soon it will be priced out of the average American's ability to pay for it," she added. "It's getting close to that point right now. But people at colleges and universities aren't doing this to be willfully malicious; it's that the model they're using is labor intensive and, hence, costlier."

CHANGING THE MODEL?

Historically, Breneman said, education is an industry that's had very little technical advancement. "If you think about it, colleges are run and courses are taught today very much like they were 40 years ago, 50 years ago, 100 years ago — a professor in front of a group of students," he said. "And the digital revolution we're going through holds a great deal of promise."

Evidence is growing that there are ways to redesign college courses to make greater use of technology and lower costs without hindering performance. But Breneman said that's still within the context of someone enrolled in an institution.

For 11 years, the National Center for Academic Transformation has worked with colleges and universities, showing them how they can redesign courses to improve the quality of student learning while reducing the cost. "And the redesigns we have done — we work with hundreds of colleges — reduce the cost of instruction by close to 40 percent," Twigg said.

> "OUR REDESIGNS APPROACH A COURSE AS A WHOLE ENTERPRISE THAT VARIOUS PEOPLE ARE WORKING ON, BUT THEY'RE **WORKING COLLABORATIVELY TO ELIMINATE DUPLICATION OF TASKS**, OFFLOADING TO TECHNOLOGY THINGS THE TECHNOLOGY CAN DO BETTER."
>
> CAROL TWIGG, PRESIDENT AND CEO, NATIONAL CENTER FOR ACADEMIC TRANSFORMATION

How does the center do this? Stated simply, by reorganizing how courses are taught. Higher education is structured as a handicraft industry, where professors conduct the same repetitive tasks "one by one by one by one," Twigg said. The center's goal is to bring teaching methods into the 21st century.

"So take English composition taught at a big university — you might have 100 sections, and everybody's doing the same thing. They're not working collaboratively; they're not taking advantage of technology," she said. "Our redesigns approach a course as a whole enterprise that various people are working on, but they're working collaboratively to eliminate duplication of tasks, offloading to technology things the technology can do better, like grading math problems."

PUBLIC HIGHER EDUCATION IN ACTION

Because online courses typically are taught using the same basic model as traditional classes, online learning doesn't necessarily deliver savings. The main source of cost is, of course, the instructors, Twigg said. "The people doing the teaching are the same people whether it's traditional or online," she said. "So it depends on how you organize yourself and what choices you make."

Many public universities do offer online courses while primarily maintaining traditional ones. But the public higher-education model for the future may already exist: the completely online Western Governors University (WGU), launched in 1998. Back then, it was described as highly controversial. Now WGU is the largest virtual university in the United States, using technology to offer a flexible structure and reasonable pricing to meet adult learners' needs.

WGU, founded in 1997 by a bipartisan group of 19 western governors, keeps its costs down by relying heavily on

technology and independent learning resources, and by using a student-centric model versus a professor-centric approach. Technically faculty members do not teach the courses. Instead, subject-matter experts who have a master's or doctorate degree aid students along the way as much or as little as they need it. This university has, in essence, done what Twigg is teaching already-established universities to do.

"Her concepts for transforming higher ed are very much in alignment with WGU's practices," said Patrick Partridge, the university's vice president of marketing and enrollment, "which is to use technology and learning resources that put the student at the center of the learning experience — but do it in such a way that you can apply a more businesslike approach, one that leverages the power of technology and existing learning resources to make sure that students are very well educated, but keeps costs down."

Using a computer and written course materials, students study independently and must pass a series of tests, and then submit a portfolio of projects for their degree. "Probably more than you get in the classroom, it's testing you in very discrete steps along the way, and then giving you immediate feedback on whether you've learned at that point," Thomasian said. "Once you've passed these competency steps, you can move onto the next packet within the course. So you're constantly being tested along the way at your own pace, and you have a chance to self-correct."

Additionally WGU is the first and only system that gives students credit for what they know rather than the courses they complete.

"As you take a course at WGU, you pass it by passing certain tests along the way," Thomasian said. "Your tests aren't on a set schedule in terms of, 'You have to take it this month or that month.' You can start moving those tests ahead, passing that competency and moving to the end of the course, and passing the competency for that."

When WGU began, projections indicated the university could have 100,000 students online by 2006. It didn't make that number, but enrollments continuously are increasing. "It was fun to cross the 10,000 student threshold about two years ago," Partridge said, "and we're right at the door of 20,000 right now."

New students enroll every month, and back then, Partridge estimated WGU was growing at about 400 students per month. Now he said the university enrolls approximately 1,000 new students each month. "Our net growth has been in the 25 to 40 percent range every year since 2003," he said, accounting for those who graduate.

In February, WGU held its 18th commencement and graduated 988 students — the largest class to date. "I think this is becoming much more common," Thomasian said. "This used to be very unique, certainly at the scale they were trying to do. This kind of learning has been proven very effective, and it certainly is a model that's being used more and more in states and the public education system."

On the whole, computerization improved productivity immensely, Breneman said, noting that education is in a learning stage of its own. "People are experimenting and trying different techniques, but I suspect it's a promising direction — I'm sure it will continue to have a significant impact on traditional institutions," he said. "The exact shape of how that is going to turn out, I'm not sure I foresee very clearly, and I'm not sure anybody else does either. But it's certainly a major opportunity, and I hope we capitalize on it."

THE COST OF HIGHER LEARNING

Traditional colleges and universities follow the quarter or semester system, and charge a certain amount per credit, which varies depending on whether the student is full time or part time. For example, the University of South Carolina, Aiken, ranked one of the nation's top colleges in 2010 by the *U.S. News and World Report*, charges a full-time resident $3,850 per semester as an undergrad and $4,894 per semester as a graduate. For full-time nonresidents, undergrads pay $7,716 while graduates pay $10,540 per semester.

If, however, the student enrolls in more than 17 hours, an additional $80 is charged per credit hour, and summer school is not included. For an in-state undergraduate with 16 hours per semester, that year of education costs $7,700. And if that student wanted to add one more three-hour class to each semester, the cost would grow to $8,020. Traditional colleges also have set beginning and end dates for semesters or quarters, and of course, they require each student to attend in-class labs and lectures.

Here's how Western Governors University differs: Six-month terms begin whenever the student wants, and each term has a set cost ($2,890 per term to $4,250 per term, depending on the course program) no matter how many units or class hours are taken.

"I THINK WE ARE **RUNNING A RISK** OF CLOSING OUT OPPORTUNITIES TO A SUBSTANTIAL PART OF THE YOUTH POPULATION IF WE AREN'T CAREFUL."

DAVID BRENEMAN, PROFESSOR, UNIVERSITY OF VIRGINIA

2007
2008
2009
2010
IT SPENDING
41%
28%
31%

BY THE NUMBERS

The ABCs of transforming IT perception and performance.

BY ROBERT L. OTTO | CONTRIBUTING WRITER
ILLUSTRATION BY TOM McKEITH

A CHALLENGE FACING MANY NEW CIOS, CTOs and other technology leaders is the need to change their organization's culture and reputation. Fairly or not, technology leaders are often saddled with the perceptions (or misperceptions) that their team can't deliver projects on time or on budget; that they fail to contribute to enterprise performance improvements; and that their bureaucracy and processes prevent them from being agile or innovative. These perceptions can become reality if the technology team begins to accept these diminished expectations.

This was the situation I faced when I became CIO of the U.S. Postal Service (USPS) in 2001. Over the next seven years, we succeeded in transforming IT's performance and perception — reducing IT spending by more than $800 million annually while dramatically improving service levels. But it wasn't just cost cutting; we also matched our key competitors — FedEx and UPS — innovation for innovation. And for five consecutive years, we were named by *ComputerWorld* magazine as one of the best places to work in IT.

I'm often asked how we did it. Although numerous factors contributed to this success — like beginning with a great team that had significant potential — one of the most important was a metrics-driven approach to managing IT. Those familiar with process improvement methodologies, such as Lean or Six Sigma, recognize the need to continually measure performance to improve it. Equally important, this rigorous and business-focused approach also allowed

us to establish ourselves as a valued partner to the rest of the organization. At a minimum, this data can allow you to readily refute erroneous charges.

Embracing measurement as a strategy — and not simply a tool — is key to creating a more strategic and accountable organization. At the same time, IT organizations must recognize that becoming more metrics-driven isn't a quick fix, but rather requires a long-term commitment. In reality, it encompasses three distinct phases — what I call architect, benchmark and communicate (ABC) — executed continually in a life-cycle model.

ARCHITECT: IMPACTING STRATEGIC OBJECTIVES

We need to agree up front that measurement for measurement's sake isn't the goal here. Too often, we fail to report on what's important to the overall organization and instead provide metrics that are meaningless to our internal stakeholders. Providing more of the same isn't the answer.

> EMBRACING MEASUREMENT AS A STRATEGY — AND NOT SIMPLY A TOOL — IS KEY TO CREATING A MORE STRATEGIC AND ACCOUNTABLE ORGANIZATION.

As a matter of fact, IT organizations can produce excellent individual performance metrics from a technical perspective and still fail to meet end-customer requirements. In some cases, we are simply measuring items that don't impact outcomes. In other cases, the aggregate variance from multiple metrics exceeds the norm despite the fact that the individual indicators are all acceptable.

If nothing else, we should begin looking at performance through our clients' eyes (and those of our stakeholders as well). This includes replacing our traditional, bottom-up approach to reporting with a top-down perspective that first builds upon the big picture metric, which is the business or mission outcome. Rather than reporting on uptime and system availability alone, we must consider how better integration or a new data warehouse will improve call center productivity and customer satisfaction.

The missing link here is often an architectural understanding of the enterprise that allows us to quantify and demonstrate our contributions to the organization's success. What's needed are more direct linkages between the IT services that we deliver and their impact on the organization's objectives and strategies.

For example, the USPS was maintaining six database platforms when I became CIO. This created many operational inefficiencies that were my problem alone. That is, until I could demonstrate to my business peers how these data silos also were impacting their performance.

Some may argue that it's impossible to establish these correlations. In reality, we've already created an entire discipline — enterprise architecture — to accomplish just that. The challenge is that in many examples, enterprise architecture isn't being used effectively to shape and mold the organization. This must change.

Another frequently cited challenge is mapping generic services to a specific cost center or allocating these benefits across multiple users. This is certainly difficult initially. However, as you develop your architectural understanding of technology's role in the business, it's possible to refine the model to become increasingly granular.

Going this extra mile is fundamental to addressing the 80/20 paradigm, as it will allow you to capitalize on shared service business models and identify specific areas ripe for outsourcing, consolidation and elimination. Through a more systematic review of inquiries, we cut help desk volume at the USPS from 150,000 to 25,000 calls per month. At that point, it was possible to outsource the "tamed" help desk process, which we did to capture additional savings.

BENCHMARK: CREATING A PATH FOR IMPROVEMENT

Having established a measurement strategy that aligns with the organization's objectives, it is now time to begin using this information. Once again, it's important to recognize that we're not simply collecting data, but instead seeking ways to improve our performance. As a result, we need something to compare our performance with.

In terms of specific benchmarks, we should consider our past performance, industry yardsticks and long-term goals.

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These factors will allow us to readily answer three key questions:

- What is the overall trend (improving, stable or declining)?
- Where do we stand in comparison with our peers?
- How much additional investment and effort are required?

This insight provides context for the data that we are collecting. For example, was 25,000 distinct software applications too many for the USPS to maintain? Yes.

Ultimately knowledge is power. Many organizations lack an effective asset management strategy and rely on their vendors to provide this information. This puts them at a competitive disadvantage when negotiating contract renewals. At the USPS, we captured this information religiously, and we used the insight to optimize each contract — for example, per server or per user — for the application's actual usage profile.

Repetition and continuity are key to continuous process improvement. Without executive commitment to maintaining the rigor of continually measuring performance (and acting upon this insight), the effort will fail.

COMMUNICATE: MEET AND RAISE EXPECTATIONS

Being engineers at heart, technologists often are terrible marketers. We tend to believe that the best product or performance will emerge naturally, and we rarely see a need to promote this superiority. In reality, it's impossible to separate Apple's marketing prowess from its engineering strength when evaluating the company's enviable success.

We need to overcome our reticence to highlight the success of our IT organizations. This is important for two reasons. First, it helps to create a culture of accountability where expectations are regularly and publicly met. Second, showcasing our superior performance helps us realize additional rewards, such as more resources, trust and authority. These tangible and intangible benefits can be important motivating factors for both our leadership team and our rank-and-file work force.

As an example, I converted a conference room into a full-time war room at the Postal Service. Every surface was covered with metrics showcasing our performance and progress. This served as a constant reminder for our team, and myself, of the commitments that we had made and the expectations that we needed to meet. In terms of my peers within the organization, it visibly demonstrated our dedication to running IT as a business.

We also regularly promoted our performance across numerous channels. We published an ongoing newsletter and sought regular opportunities to brief the agency's senior leadership. Through these efforts, we established ourselves as change agents within the USPS.

Widespread use of the CitiStat/StateStat performance-measuring tools and the federal government's adoption of IT dashboards highlight data visualization's role as another important communications tool. Unlike traditional, static reporting, data visualization can be used to provide each stakeholder with a customizable real-time view into operational performance. I've used these tools to foster better collaboration between IT and internal clients, enabling productive conversations about what the appropriate goal should be and at what cost.

Building upon this point, it's important to distinguish between different measurements and segment them accordingly. In reality, organizations have strategic (i.e., long term) and day-to-day objectives, goals and commitments. Reporting on each metric's performance is important to some, but not everyone. Determine what matters to whom and align your reporting strategy appropriately.

While this isn't the quick fix that some might prefer, embracing these ABCs can help leaders create a more customer-focused and outcome-oriented IT organization. Through this process, technology leaders and their teams will secure a well earned reputation as change agents within their agencies.

Robert L. Otto leads the IT Leadership practice at Agilex Technologies Inc. He served in a variety of IT roles over his 38-year government career, including CIO and CTO of the U.S. Postal Service from 2001 to 2007.

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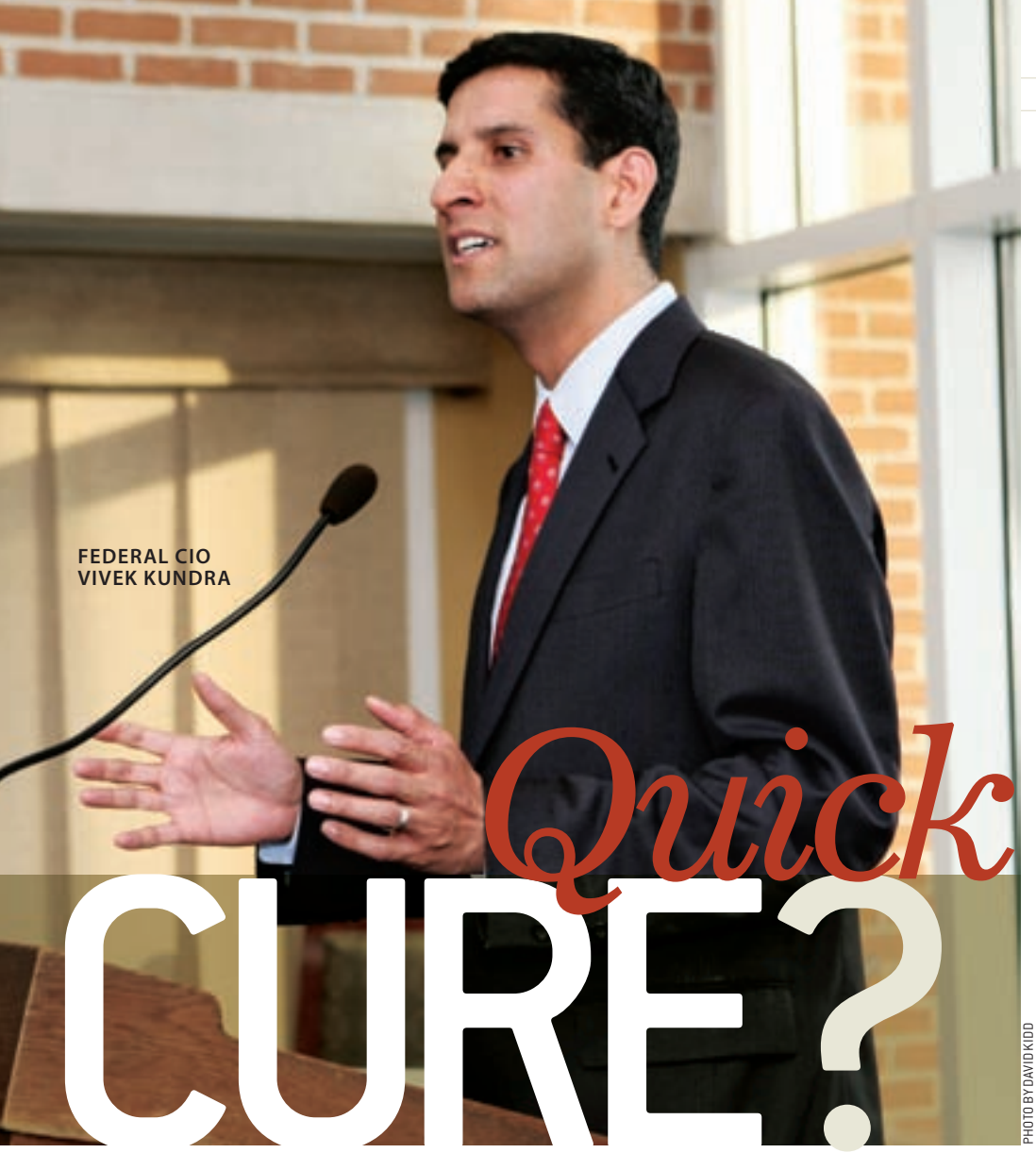


FEDERAL CIO VIVEK KUNDRA

PHOTO BY DAVID KIDD

Quick CURE?

FEDERAL CIO'S TECHSTAT INITIATIVE SEEKS TO DIAGNOSE TROUBLED INFORMATION TECHNOLOGY PROJECTS AND DELIVER QUICK TREATMENT.

BY MERRILL DOUGLAS

WHEN YOU GO to a medical office with a headache and a sore throat, it helps to learn that you're running a fever. But it's even more helpful when the doctor identifies your illness and writes a prescription.

A surprising number of current federal IT projects show signs of serious illness. That was one of the first things that Vivek Kundra learned when he became federal CIO in March 2009. Just minutes after being sworn in, Kundra was handed a document listing $27 billion in IT projects that were behind schedule and overbudget.

As an immediate response, he and his team at the Office of Management and Budget (OMB) developed a Web-based application to monitor — and publicize — federal IT spending. Based on monthly figures from agency CIOs, the Federal IT Dashboard reveals how much each federal agency spends on IT initiatives and how well it manages those investments.

The dashboard provides an important transparency tool, Kundra said. But its debut in June 2009 was just the first step in rooting out wasteful IT spending. "We recognize that shining light alone is not sufficient to take on some of these structural problems when it comes to federal IT," he said.

In other words, it's not enough to take the patient's temperature. You must diagnose the disease, prescribe a medication and ensure that the patient takes it.

Kundra's answer to ailing federal IT projects is the TechStat Accountability Session. A focused inquiry into a troubled IT project, TechStat is designed to determine the cause and prescribe a solution.

Since the OMB held its first TechStat session with the Environmental Protection Agency (EPA) in January, Kundra said the OBM has conducted more than 40 such investigations.

To illustrate the need for TechStat, Kundra cited one particularly disappointing IT initiative: the long-running effort to develop the Defense Integrated Military Human Resources System. "The Department of Defense spent 12 years and $1 billion to implement an integrated human resource system that unfortunately failed," he said.

STOPLIGHTS, LASER BEAMS

The notion of monitoring the progress of federal IT projects isn't new. During the George W. Bush administration, the OMB met quarterly with federal agency officials to review IT projects and score them on cost, schedule and performance. Results were published as stoplight-style scorecards coded green, yellow or red to indicate that a project was progressing well, had problems or had gotten into serious trouble. "We also had a management and a high-risk watch list that were published quarterly," said Karen Evans, former administrator for the OMB's Office of Electronic Government and Information Technology during the Bush administration.

"There was a lot of information behind that, plus a lot of meetings

> "HISTORICALLY THERE'S BEEN A HUGE FOCUS ON POLICY, MEMOS AND GUIDANCE, AND VERY LITTLE ON **EXECUTION**."
>
> VIVEK KUNDRA, FEDERAL CIO

and oversight," Evans said of the OMB's process at the time. "[TechStat] is now the next evolution of that oversight."

Kundra is building on the previous administration's work by collecting data on IT projects more often, Evans said. He also is scrutinizing projects to investigate why they've gone wrong, she said. "What he's doing is very laser-pinpoint. He's been clear about the types of things he's looking at."

Kundra and Evans agree that inefficient IT project management is an old problem in the federal government. Many projects have suffered from unclear requirements or overly broad scoping, Evans said. "The key is to get the data to the right project managers, program managers and acquisitions officials, so they can manage the process."

To better understand why projects run off course, Kundra said he has studied years' worth of documents, from the 1996 Clinger-Cohen Act, to the 2002 E-Government Act, to many reports and memoranda from the OMB, the General Accountability Office and the Inspector General's office.

PHOTO BY DAVID KIDD

These documents reveal a pattern, Kundra said. "Historically there's been a huge focus on policy, memos and guidance, and very little on execution."

It's clear what the right solutions are: They include scoping projects correctly and terminating projects that don't produce results, he said. "The challenge has been that as a government, we haven't acted."

Kundra developed the TechStat session to convert good intentions into action. It's a compact tool, designed to run only 60 minutes. "It's time-boxed to an hour to make sure we have the appropriate decision-makers, and that the time of senior executives in that session is well spent," Kundra said.

The first five minutes of a session provide an overview of the IT project, the next 10 focus on problems that the agency and OMB have identified, and another 30-45 minutes are devoted to devising solutions, said Eugene Huang, senior adviser to Federal CTO Aneesh Chopra. Huang attends the TechStat sessions on behalf of the Technology Division of the Office of Science and Technology Policy.

In the final five minutes, attendees create a list of corrective measures for the agency to implement and report back on, Huang said. "In total, the scope goes from identification of a problem to closing out the problem."

Not surprisingly, the probing required to uncover what's gone wrong with an IT project happens long before the OMB schedules the TechStat meeting. "Sometimes these sessions take months of preparation," Kundra said. He, his staff at the OMB, staff from the agency whose project they're studying and members of the Federal CIO Council collaborate on this preliminary effort. They pore over Inspector General reports; interview CIOs, their deputies and end-users of the system that's being deployed; talk with staff at the General Accountability Office; and study feedback that citizens have posted about the project on the Federal IT Dashboard.

EUGENE HUANG,
SENIOR ADVISER TO THE CTO, WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

"Then we come up with a hypothesis," Kundra said.

During the 60-minute session, participants test that hypothesis against the dashboard data. They decide whether the hypothesis explains why the project is failing or if there's another cause. Then they create a plan. In some cases, they temporarily halt the project; sometimes they pull the plug on it altogether.

Officials from both the White House and the agency deploying the IT project attend the TechStat session. Agency participants might include policy officials, the CIO, staff from the department secretary's office, and staff who work on the project's business and IT aspects.

This kind of broad representation is part of what makes TechStat effective, Huang said. "TechStat is a good way to make sure there is buy-in from senior leaders within agencies as well as from the staff level."

"TECHSTAT IS A GOOD WAY TO MAKE SURE THAT THERE IS BUY-IN FROM SENIOR LEADERS WITHIN AGENCIES AS WELL AS FROM THE STAFF LEVEL."

EUGENE HUANG, SENIOR ADVISER TO THE CTO, WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

NOT-SO-SMART CARDS

To get an idea of how a TechStat exercise can change the course of an IT project, consider a recent initiative at the Small Business Administration (SBA) to give employees identity/access cards based on smart-card technology. According to the Federal IT Dashboard, the project had fallen behind its targets, sparking significant concern.

"So we started studying this issue, and we started benchmarking," Kundra said. Participants looked at factors, such as how many cards the SBA had issued so far, the rate at which it was deploying them and how other agencies were doing their identity card implementations.

Among other things, the investigation revealed that the SBA was spending $1,614 for each smart card it issued. But the General Services Administration (GSA) had already developed identification for its employees using the same smart cards, and it was paying only $250 per unit, Kundra said.

During the TechStat session, the head of the SBA took the lead in halting the agency's smart-card program and obtained cards through the GSA's program. "That ended up saving taxpayer dollars," Kundra said. "But also the speed at which these cards were deployed was accelerated."

Such a review, which forces agencies to deploy technology more efficiently, can free up dollars for new IT initiatives, said Adelaide O'Brien, research manager at IDC Government Insights. In a tough economy, everyone in the public and private sector is seeking ways to cut costs. "It's a healthy exercise for government to be doing," she said. TechStat teaches skills that promote good government and make government officials better stewards of tax dollars, she said.

"BY GETTING UNDERNEATH AND LOOKING AT IT, AGENCIES CAN DETERMINE, 'IS THIS A PROJECT WE SHOULD CONTINUE? IS IT BUY, IS IT HOLD, OR IS IT SELL?'"

ADELAIDE O'BRIEN, RESEARCH MANAGER, IDC GOVERNMENT INSIGHTS

TechStat resembles a strategy that Kundra developed when he was CTO for the District of Columbia, O'Brien said. The district started analyzing its IT projects like they were stocks in a portfolio, regularly rating them to determine whether to "buy, hold or sell" — continue, temporarily halt or terminate.

TechStat similarly drills down into an IT project, O'Brien said. "By getting underneath and looking at it, agencies can determine, 'Is this a project we should continue? Is it buy, is it hold, or is it sell?'"

"Selling" is a genuine option. For example, even before the TechStat sessions began, data emerging from the Federal IT Dashboard spurred the Department of Veterans Affairs to kill several poorly performing projects. "We ended up halting 45 IT projects, of which we terminated 12, which led to $54 million in capital that would have been wasted," Kundra said. "That's why the TechStat sessions are designed to be action-oriented. They're relentless and focused on results."

Among the "hold" decisions that the government has made, probably the one with the broadest impact emerged from the OMB's first TechStat session, focused on the EPA's troubled effort to modernize its financial systems.

"We learned from that experience, and that specific TechStat session, that frankly it's not just the EPA," Kundra said. "Financial systems across federal government have significant problems."

The trouble is that these projects are too broad in scope, cover too many years and try to integrate all their functions too quickly, he

> "THERE'S NO BETTER WAY THAN TO GET MORE OUT OF TECHNOLOGY THROUGH THESE APPROACHES, TO MAKE SURE YOU'RE GOING HARD AFTER WASTEFUL SPENDING."
>
> VIVEK KUNDRA, FEDERAL CIO

said. "The scope of these projects, coupled with their complexity, ends up in failures across the board."

In June, the OMB issued a memo calling for all federal agencies to stop current efforts to modernize their financial systems. "That affects $3 billion of spending annually," Kundra said.

APPLYING IT ELSEWHERE

The principle behind TechStat — using hard data to monitor public initiatives and expose their problems — didn't start in the federal government. Many analysts cite CompStat, an online system for mapping and monitoring criminal incidents, as a forebear of the Federal IT Dashboard and TechStat. CompStat was developed in New York City and later adopted by other cities.

Another Web-based performance tracking system is CitiStat, a program in Baltimore to monitor and evaluate the effectiveness of a broad range of city policies and processes.

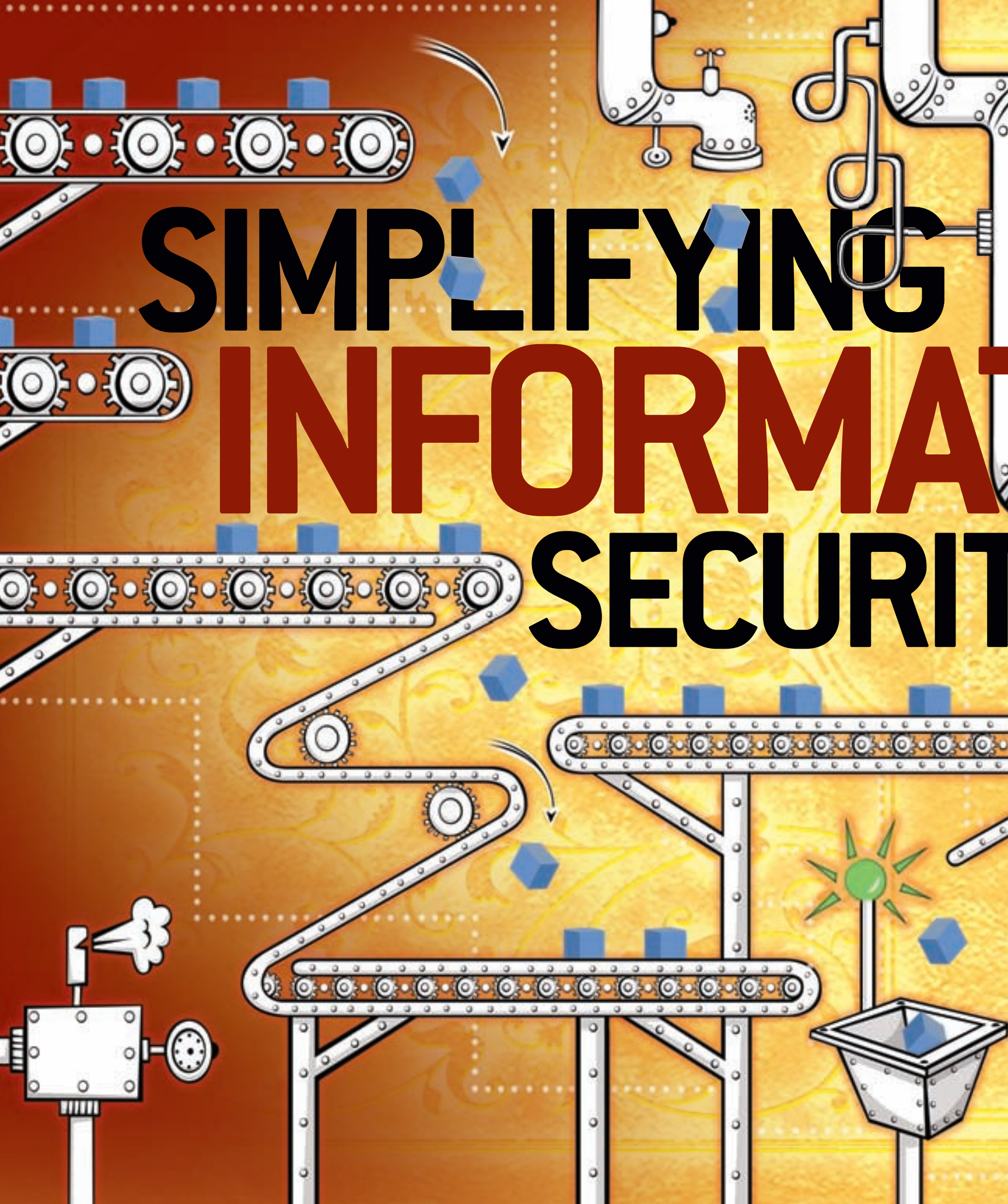
On the federal level, the Department of Justice is developing an online dashboard to monitor federal agencies' compliance with Freedom of Information Act (FOIA) requests. "The dashboard will allow the public to generate statistics on FOIA compliance across the government and from year to year," stated the department's Open Government Plan website.

The dashboard isn't the only TechStat feature that other government management initiatives already use or might use in the future. According to Huang, TechStat offers an excellent model for policy development discussions because of how it assembles many stakeholders, from different levels within their organizations, to focus on common concerns.

"In areas where there is a defined problem, or that require coordination across various government stovepipes, this ends up being an effective tool for reaching across the stovepipes and making sure they get senior agency buy-in, as well as staff-level buy-in, to drive the key decisions," Huang said. The Office of Science and Technology Policy might, for example, apply lessons learned from TechStat to future policy discussions about wireless spectrum allocations, he said.

A disciplined process like TechStat is helpful for governments that want to innovate with technology despite budget constraints, Kundra said. "There's no better way than to get more out of technology through these approaches, to make sure you're going hard after wasteful spending, making sure that you're unearthing the best practices and scaling them rapidly to save money and produce results for your constituents."

Merrill Douglas is a writer based in upstate New York.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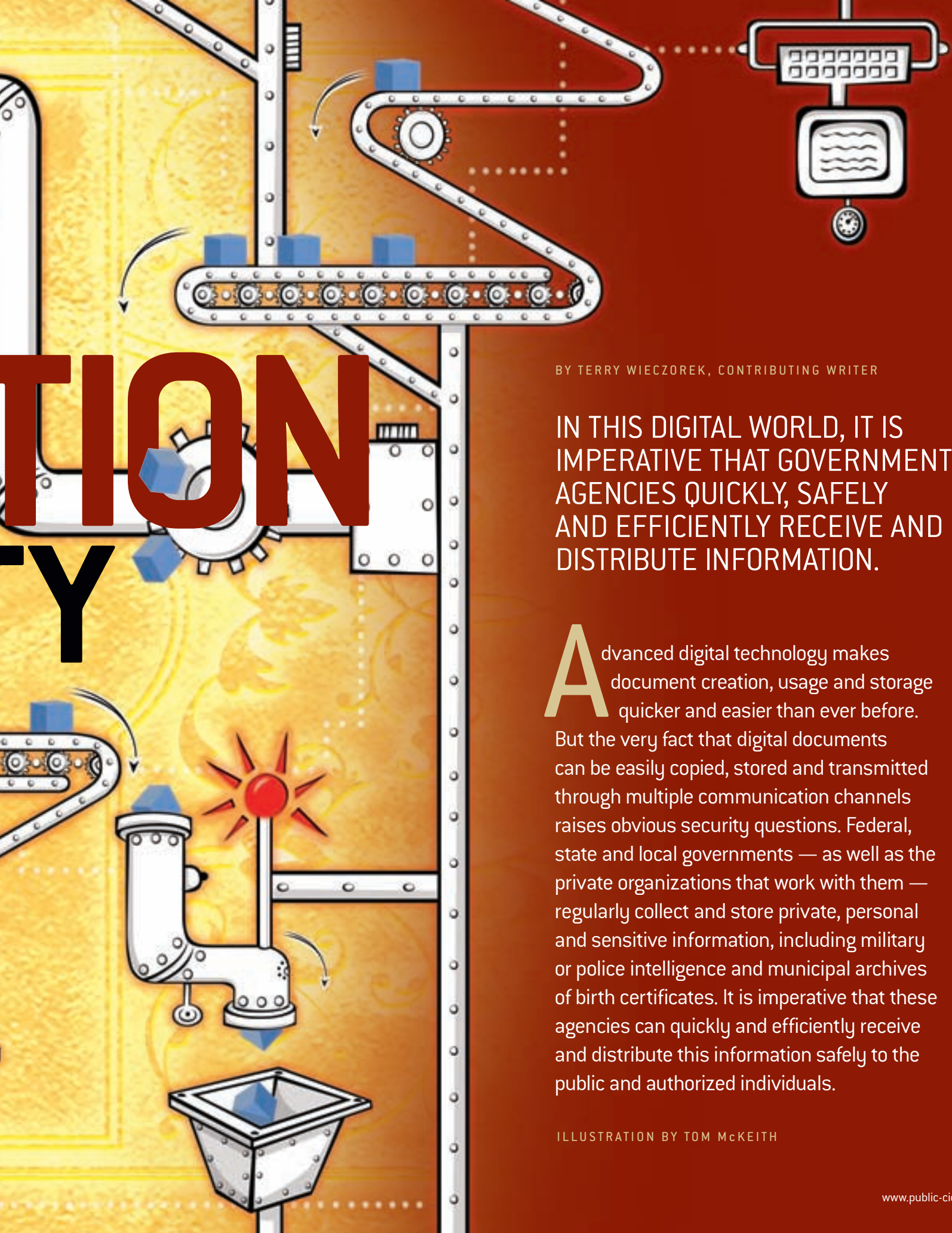

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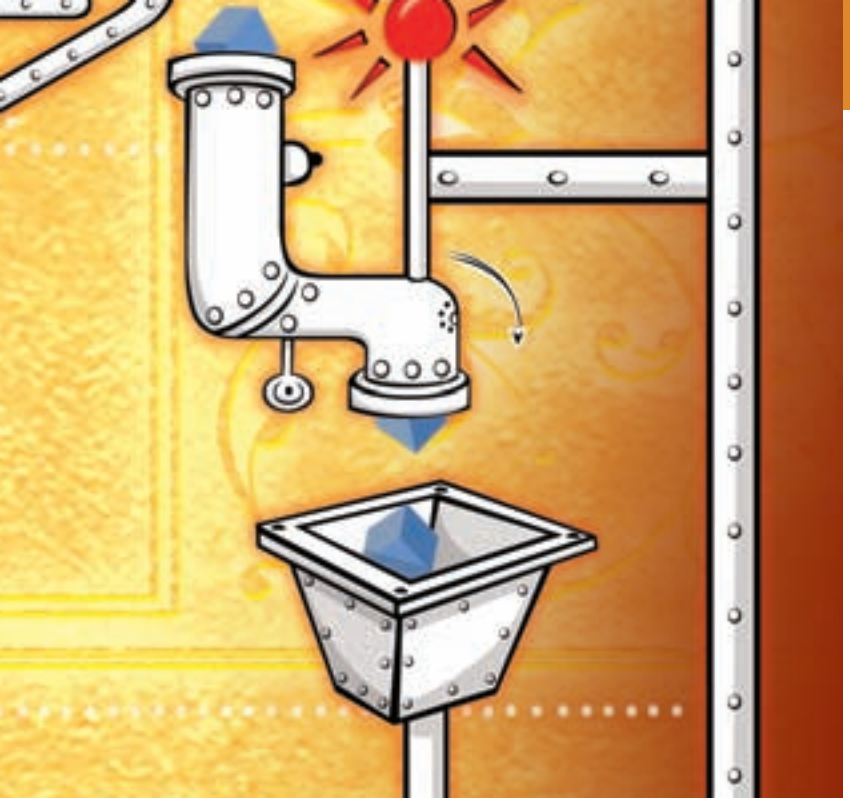
BY TERRY WIECZOREK, CONTRIBUTING WRITER

IN THIS DIGITAL WORLD, IT IS IMPERATIVE THAT GOVERNMENT AGENCIES QUICKLY, SAFELY AND EFFICIENTLY RECEIVE AND DISTRIBUTE INFORMATION.

Advanced digital technology makes document creation, usage and storage quicker and easier than ever before. But the very fact that digital documents can be easily copied, stored and transmitted through multiple communication channels raises obvious security questions. Federal, state and local governments — as well as the private organizations that work with them — regularly collect and store private, personal and sensitive information, including military or police intelligence and municipal archives of birth certificates. It is imperative that these agencies can quickly and efficiently receive and distribute this information safely to the public and authorized individuals.

ILLUSTRATION BY TOM McKEITH



And with today's multiple communication avenues — including wired and mobile phones, and the Internet and its video streaming — the chances for unauthorized access to data archives are at an all-time high. This access can be difficult to detect and ultimately may result in missing or altered documents, which can be costly and involve damaging liabilities for agencies and citizens.

By carefully assessing your agency's information access and security demands, you can take the steps necessary to build and create an effective document archive and retrieval system. With the help of the right solutions, protecting an individual's information has never been easier.

CREATING THE PLAN

Developing an effective, efficient and secure data archive system begins with a review of applicable regulations or public policies, and then assessing your agency or location's specific needs and requirements. To create a solid foundation for a suitable digital archive system, every security policy must address all legal requirements and public concerns. The federal government's National Institute of Standards and Technology (NIST) offers a plethora of studies and guidelines for handling digital information and documents, and these standards can vary widely depending upon how government agencies and even private industries collect and use this information.

NIST's Computer Security Division has published the booklet *Minimum Security Requirements for Federal Information and Information Systems*, reference number FIPS 200 (Federal Information Processing Standards 200), that identifies three key issues as a starting place for developing an effective and practical security policy: confidentiality, integrity and availability.

CONFIDENTIALITY

Protecting data confidentiality is absolutely essential in many situations. Military intelligence is one example and transportation-related information is another. Detailed floor plans for airports and other transportation terminals often are kept confidential, as are plans and routes for moving or storing certain types of products or materials. Medical information is protected by Health Insurance Portability and Accountability Act (HIPAA) regulations, and personal information on citizens and government employees also should be kept confidential or granted only to authorized individuals.

INTEGRITY

Data integrity is necessary in every situation. That is, the information in a document should be stored in its true fidelity, and it should be tamper-proof or at least leave some indication that it has been changed, corrected or updated, when this was done and by whom.

AVAILABILITY

Though availability would seem contradictory to confidentiality, much of the information that government agencies collect, such as local rainfall totals or population demographics, is intended for public distribution. Availability also covers "need-to-know" issues, like who in the agency is authorized to access certain stored data daily, or who may require immediate access to certain documents and information in an emergency.

IT IS **IMPORTANT TO TAKE INTO ACCOUNT** THREE ASPECTS THAT ENCOMPASS ARCHIVING SECURITY: PHYSICAL SECURITY, NETWORK SECURITY AND DATA SECURITY.

Devising a secure archive solution to meet a government organization's complex issues and needs means more than just buying a solution in a box. It requires a team effort to develop procedures that bridge the gap between your specific agency or location and the general standards created by broader governmental policies.

Once the policy is implemented, "eternal vigilance" becomes the order of the day. The agency and staff must make a genuine commitment to finding and deploying the best hardware and software to support the level of security your data archive requires, and constant maintenance and upgrading of these systems is important.

Navigating today's complex state and local government can be a challenge.

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GOVERNING

THE ART OF BUILDING THE SYSTEM

Once you've determined your exact archive security needs and requirements that must be met, the real work begins. It's important to take into account three aspects that encompass archiving security: physical security, network security and data security. Let's take a look:

- **Physical Security.** This involves allowing only authorized and authenticated personnel to access the archive system, and then to access only those documents they need to perform their jobs. Authorized access should include an audit trail for all record transactions; protect physical records and media; support distributed management of records; provide for conversion and migration of records; allow users to access, retrieve and use records; and facilitate records retention and disposition throughout the document life cycle. These rules must be designed for all documents, yet be flexible enough to suit different document types and meet all current and future compliance regulations.
- **Network Security.** Common solutions for network security include firewalls and data management zones (DMZ). Firewalls can include both hardware and software, and provide a filtering mechanism that examines incoming/outgoing data and allows only authorized data to pass through. DMZs basically are subnetworks that stand between an organization's most secure internal network and the outside world. A DMZ might include devices like Web servers, mail servers, file transfer protocol servers and VoIP servers that communicate directly — or through a firewall — with the Internet. Any incoming data passed beyond the DMZ into the internal network should be scrutinized by a second, more restrictive firewall.
- **Data Security.** All archived data stored on a server should be protected by physical and network safeguards, or they can be stored on CDs or other removable storage devices in a physically secure, limited-access facility. CDs also can be password protected and the data encrypted and compressed for even further protection. In either case, the document must be readable, perhaps even years after it was created. The PDF offers both space-saving file compression and platform independence, allowing documents to be viewed on the desktop.

THE HUMAN FACTOR WEIGHS IN

Despite the fact that so much data is automated today, always remember that people create and manage document archiving systems, and people also retain and distribute these documents. Information integrity is essential to helping people make appropriate decisions based on the data, so information must be retrieved quickly and as easily as possible to satisfy the public's needs. It also must rapidly be available to those needing it during a crisis or emergency.

The most important part of a secure document archive system is trustworthy personnel and ensuring that they understand your organization's document security goals and the importance of their positions. Not only does everyone working with the archive system need to be trained in its operation, they also must understand the need for security and take the issue seriously. All staff members who can access and distribute archived information must be updated on both internal and governmental policy, as well as technology upgrades and operational changes. Like the archived data itself, these changes should be monitored and recorded regularly.

THE MOST IMPORTANT PART OF A SECURE DOCUMENT ARCHIVE SYSTEM IS **TRUSTWORTHY PERSONNEL** AND ENSURING THAT THEY UNDERSTAND THE IMPORTANCE OF THEIR POSITIONS AND DOCUMENT SECURITY'S GOALS.

SUMMING IT UP

Our society is increasingly being run on the basis of information. Think of the number and types of permits, licenses, birth and marriage certificates, legal and court documents stored by government agencies, and how citizens and government staff use these relatively common documents daily. While new technologies would appear to put these documents at greater risk, the security challenges they pose are being solved by even more sophisticated technology solutions. Once you have a solid understanding of your location's need for information access and security, you can implement a safe, practical and affordable document archive and retrieval system.

Terry Wieczorek is president and CEO of DocuLynx Inc., a provider of archive retrieval, electronic distribution and Web presentment solutions for print service providers.

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News, Reviews & Careers

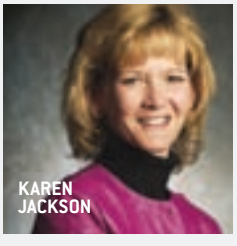
CIO TRANSITIONS

On June 7, Colorado CIO **Mike Locatis** was named the chief deputy CIO of California, a move that could signal the start of shake-ups nationwide in state IT departments as a spate of term-limited governors see the twilight of their time in power. As chief deputy to California CIO Teri Takai, Locatis may be positioned as her successor if Takai receives congressional confirmation as CIO of the U.S. Department of Defense, a post she was nominated to by the Obama administration in March.

MIKE LOCATIS

PHOTO BY DAVID KIDD

And in Maine, after working for more than three decades in public service, state CIO **Dick Thompson** has retired. Appointed in 2003, Thompson was the nation's third longest-serving state CIO. Among his many accomplishments, Thompson is perhaps best known for overseeing Maine Gov. John E. Baldacci's IT consolidation initiative. Thompson's last day with Maine was July 31. He was replaced by Greg McNeal, Maine's CTO since 2005.


KAREN JACKSON

After more than three years as Indiana's CIO, **Gerry Weaver** is moving on by going back to school. In May, Weaver accepted an offer to become CIO of Indiana's community college system. As CIO of the Ivy Tech Community College, Weaver will manage the technology needs of more than 150,000 students across 23 campuses — constituting Indiana's largest higher-education system. Weaver became state CIO in December 2006, leading the Indiana Office of Technology as it consolidated IT infrastructure, an initiative that saved the state $14 million annually.

Effective June 7, Weaver was replaced by state CTO **Brian Arrowood**. The two worked together to consolidate six data centers into a single statewide entity, a move which cut annual IT costs by $7 million, according to the governor's office.

In mid-May, **Karen Jackson** was reappointed as Virginia's deputy secretary of technology. Having formerly served as the director of the Office of Telework Promotion and Broadband Assistance, Jackson encouraged telework alternatives in Virginia's public and private sectors and advised the secretary of technology on broadband-related issues.

On May 20, the governing board for the Texas Department of Information Resources named **Karen W. Robinson** executive director of the agency and state CIO. Since last fall, Robinson served as interim CIO and has led efforts to restructure the state's seven-year, $863 million data center consolidation and outsourcing deal with IBM.

TERI TAKAI

TAKAI'S TECHNOLOGY WISH LIST

Should California CIO **Teri Takai** leave the state for a position at the U.S. Department of Defense, the new CIO under the next governor won't be able to quickly undo or dramatically change what has been accomplished over the past few years, Takai said.

"The question for us here is, 'What is the new normal?'" she said. "There is no normal for us to go back to."

If Takai had her way, California's IT picture would look markedly different five years from now:

1. Takai urged the state's IT decision-makers to maintain what she believes are improved relations between California's technology agencies and the Legislature and executive branch.

2. She's enthusiastic about universal broadband coverage. Providing Californians with the tools and training needed to use the new technology is crucial in an increasingly broadband-centric job market, she said.

3. She predicts that California's technology agencies will play a bigger role in public safety. Takai expects the

state to be a national leader in building a next-generation 911 system.

4. Takai envisions all state IT systems will include geocoding and geospatial capabilities so that public data can be analyzed and visualized online by citizens.

5. California state agencies will continue to solidify their enterprise architecture, she said.

6. Takai believes California will be the first state to adopt a secure single sign-on for government services.

7. California will complete several huge legacy replacement projects, she said, including deployment of a new integrated financial management system that's currently under way.

8. She believes all agency CIOs should be elevated to their department's executive council.

9. Takai thinks the state should create a cyber-security operations center that disseminates information in a unified manner, which someday could be shared with local governments.

10. Multidepartmental and interdepartmental collaboration should be the norm, instead of being forced upon departments by the state CIO's office.

11. Takai believes 80 percent of IT projects should be on time and on budget, and all project managers should be trained on California's project management methodology.

JIM WANG

ARIZONA RECOGNIZES TECHNOLOGY LEADERS

Arizona launched a new awards program that recognizes the state's best and brightest public-sector IT professionals. At the awards ceremony held in mid-May at Government Technology's Arizona Digital Government Summit in Phoenix, the state gave two categories of awards: Several honorees were selected for recognition as an Outstanding IT Professional by an agency or jurisdiction's CIO, and one public servant who showed outstanding leadership, dedication and innovation received the Vision and Leadership in Government Award.

Jim Wang, CIO of the Arizona Health Care Cost Containment System (AHCCCS), took home the inaugural Vision and Leadership in Government Award. He has worked at the AHCCCS since 1991, and under Wang's leadership, the system achieved Level 2 certification for the U.S. Department of Defense's Capability Maturity Matrix. The AHCCCS is the state's Virtual Office pilot and has about 350 employees working remotely. Wang also was instrumental in creating a partnership where Arizona developed and operates Hawaii's Medicaid system.

Security Game-Changer

Why Public CIOs should pay attention to DNSSEC.

BY MARK WEATHERFORD

Editor's note: After a year and a half as a Public CIO *columnist, this is Mark Weatherford's final* Security Adviser *column. Starting in October, Travis Schack, chief information security officer of Colorado, takes over the column. Weatherford, who was California's first chief information security officer, took a job as chief security officer for the North America Electric Reliability Corp. in July. Look for a new critical infrastructure security column from Weatherford in* Public CIO's *sister publication,* Government Technology.

I DON'T TYPICALLY delve into technical issues in this column, but I'm going to take a shallow dive because there's an important issue that I think government CIOs, especially state CIOs, need to begin planning for: Domain Name System Security Extensions (DNSSEC). Most CIOs are somewhat familiar with the original Domain Name System (DNS), but DNSSEC creates some complications, so I'm going to explain why you should care about it.

Let's start with DNS. According to Wikipedia, DNS is a "hierarchical naming system for computers, services or any resource connected to the Internet or a private network." In simpler terms, DNS is the translator between a very scary looking IP address like 134.186.200.20 and the fully qualified domain name of www.ca.gov. The Internet doesn't work without DNS. Unfortunately when DNS was developed in 1983, security controls weren't built in and over the years, serious security flaws have been discovered resulting in many changes. Most recently, researcher Dan Kaminsky discovered a major flaw that allowed cache-poisoning attacks, which deceives a DNS server into believing it has received legitimate data when it may be fraudulent.

One of the biggest changes to DNS is DNSSEC, which adds security controls to the original protocol. Specifically DNSSEC provides additional extensions to the original DNS protocol that allows for origin authentication of DNS data, data integrity and authenticated denial of existence. In simple terms, DNSSEC thwarts spoofing attacks by allowing websites to validate domain names and the associated IP addresses using digital signatures and public-key encryption. This mitigates the threat of bad guys hijacking your Web traffic and redirecting it to fake sites to carry out their dastardly deeds. Citizens and other users of government website services would rightfully consider this unacceptable.

DNSSEC must be complicated right? To a certain degree it is, but it's also becoming easier because as more public- and private-sector organizations implement DNSSEC, the tools, services and procedures become more routine and understood. The U.S. Office of Management and Budget issued a directive in 2008 that the federal government would deploy DNSSEC to the top-level .gov domain by January 2009 and that all subdomains under .gov — such as the U.S. Department of Agriculture at www.usda.gov — must be signed by December 2009.

"DNSSEC changes things," Kaminsky said. "It fuses the canonical, delegated, foundational technology of DNS with a strong cryptographic base. Scalable security? It's coming to those who can host secure DNS records."

The transition to DNSSEC will be neither painless nor free, but it will be worth it in the security and efficiencies it brings. While most of the expense in DNSSEC deployment is establishing procedures and software for key management, it also will require an investment in training, so a proactive DNSSEC migration campaign is a good idea. The key management issue with DNSSEC is solved, but it will require a new skill level for DNS administrators.

CIOs should begin by determining the location of their DNS servers and what's on them. This won't be an easy or trivial undertaking. If you think I'm overdramatizing, just call your enterprise DNS administrator and ask him or her where all the DNS servers in your enterprise are located, who manages them and what other applications or services are running on them. My bet is you'll get some foot shuffling, stuttering and "I'm not sure" answers. That's because it's a complicated question and they don't necessarily own or manage all the DNS servers in your environment.

Patrick McGuire, California's deputy chief information security officer, said it best: "DNSSEC provides citizens an assurance their transaction is with an authenticated website. Whether they are filing taxes or paying a vehicle registration, citizens need to know the confidential and sensitive data they enter into a Web form is actually hosted on a government-controlled system. DNSSEC gives that assurance."

For those of us in the public sector, DNSSEC is a game-changer that we can't afford to miss.

Mark Weatherford is the former director and chief information security officer (CISO) of California's Office of Information Security. He previously served as Colorado's CISO. The views expressed are solely his and nothing stated in or implied from the article should or may be attributed to the state of California or any of its agencies or employees.

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Undercover CTO: Spending Time on the Front Lines

Learning about an organization from the inside out.

BY DAN LOHRMANN

Editor's Note: This is the first in a two-part series covering columnist Dan Lohrmann's experiences as the "Undercover CTO." Part two will appear in the October issue of Public CIO.

IN A RECENT meeting with front-line technology supervisors, I was wrapping up a Q&A session when one person raised his hand: "Everyone in my section is talking about that new TV show called *Undercover Boss*. We were just thinking: Why don't you do that? I mean, why not walk a mile in our shoes?"

Oops. Why did I take that last question? My mind started racing. How to answer?

OK, I believe in management by walking around, but I'm trying to be more strategic … not good.

Try this: There are more than 800 staff and contractors in the technology infrastructure, so I don't have enough time to visit everyone. It wouldn't be fair … strike two.

How about: That's not my job ... never mind. I'm out of strikes.

After a smiling pause, I responded: "Well ... um ... everybody knows me; it wouldn't work. I mean ... but ... you see ... I'm busy. And ... darn it, why not?"

Did I just say that?

Word travels fast. About an hour later I was on the phone trying to explain this to Vera, my executive assistant. "It's true. I'm spending a day on the front lines with each of our eight infrastructure groups this summer. I've already committed to the first stop — field services in two weeks."

There was a painful silence before Vera responded sternly, "We never discussed this. Scheduling will be difficult." She was right.

Nevertheless, I decided to jump in with gusto. I announced the ground rules to my directors: "Your team decides where I go and how long I stay with each group. Your staff will tell me what I do and even what to wear. I will be with front-line staff solving real problems in the same way that they do. Beyond introductions, no other management will be present."

Two weeks later, as I walked into Dave's cube on my first assignment, I noticed his chair was old and looked uncomfortable. He insisted it was fine and proceeded to describe his job with an excitement that was contagious. His role: dispatching field services staff to users who are down and have problems that couldn't be fixed by our phone support staff.

After walking me through his processes and procedures, I asked, "How can we improve? How can I help?" Dave smiled and pulled out his list. *He was obviously ready for this question.*

"We struggle implementing our definition of 'user down.' All of our processes are keyed off of this definition, but the definition is too narrow. In addition, we need better back-office communications with the security group." *Very interesting discussion.*

My next 90 minutes were spent with Jason, visiting end-users who had submitted problem tickets. I was impressed with his knowledge and extensive work experience. (Jason has a master's degree, but he's fixing PCs. Wow!) After working with Jason, I was on the front lines with Jared for an hour. These guys know their stuff.

One issue that arose was "drive-by" support — when another customer in the area has questions and asks for immediate help. Since our policy says they must call the Customer Support Center (CSC) first, resolving these issues is officially not allowed so we can track metrics and work priorities, and try to solve problems on the phone. But Jason mapped a printer in about two minutes to make one woman very happy. Note to self: If a customer can be helped in under five minutes, the drive-by should be allowed without calling the CSC. But we still need to track those tickets.

Speaking of the CSC, that's my next stop in 10 days. Seven more areas to go, but there are already some lessons learned:

1. Staff are sending me unsolicited e-mails and thanking me for taking the time to experience their job. Others have invited me to hear their problems firsthand.

2. We have dedicated professionals who care and have good ideas.

3. Management reports are coming to life. This experience will help in setting priorities. I'm asking myself why I didn't do this a year ago. It's definitely worth the time and effort.

Dan Lohrmann is Michigan's CTO and was the state's first chief information security officer. He has more than 23 years of worldwide security experience, and has won numerous awards for his leadership in the information security field.

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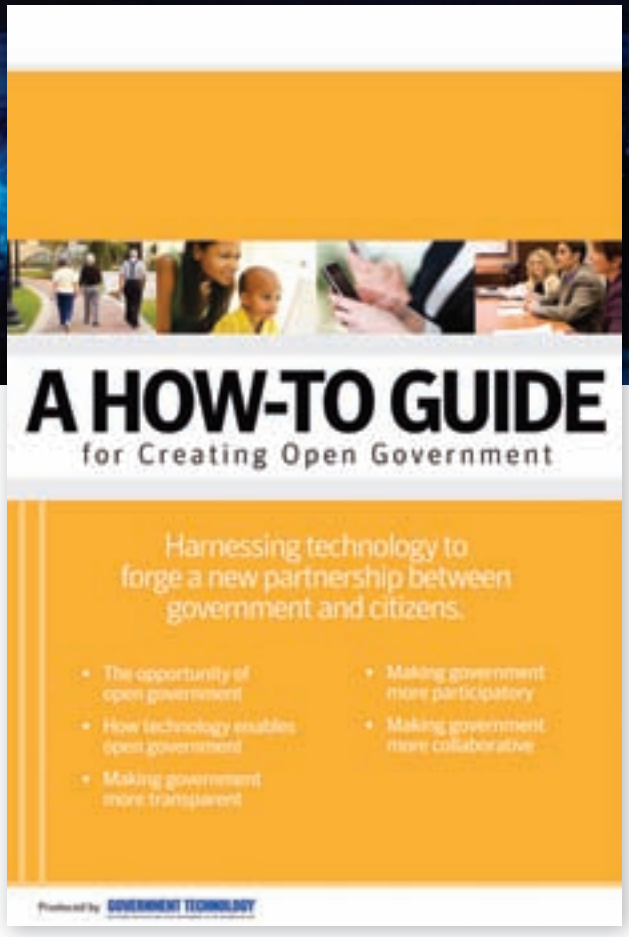

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BY LIZA LOWERY MASSEY

IT Leadership. Art or Science?

Hard and soft skills are required for public-sector IT leadership.

WHILE DISCUSSING possible topics for this column with my husband, who is also an IT executive and former public-sector CIO, I was struck by how I began by throwing out soft-skill topics, while he suggested a few hard-skill ones — topics that were more technology related. What resulted was a discussion of how IT leadership, especially in government, is both an art and a science. While many technology leaders are comfortable with the science part of their role, ignoring the art of IT leadership can quickly lead to problems.

THE SCIENCE OF IT LEADERSHIP

First, there's the science aspect of public-sector technology leadership. I'm often heard saying that good IT leadership requires discipline. This discipline begins with understanding and following the standard business cycle — plan, budget, implement and measure. It goes beyond that though to include best practices. Thankfully it's easier to achieve discipline these days due to well documented best practices-based models. Leading scholars like Peter Weill, chairman of the Center for Information Systems Research at the Massachusetts Institute of Technology Sloan School of Management, have documented their research regarding IT governance and established models that facilitate setting up and managing effective IT governance.

IT leadership's operational side is well covered by disciplined approaches. The Information Technology Infrastructure Library (ITIL) provides guidelines for operational and support excellence. The Project Management Institute (PMI) produces and updates a body of knowledge to support implementation of comprehensive project management processes. Both ITIL and the PMI have become pervasive, and a variety of resources are available to train IT leaders and staff. Models such as the Capability Maturity Model Integration assist organizations with evaluating and determining their ability to integrate and improve business processes.

IT leaders who embrace these models, get educated or even certified in their use and deploy them throughout their organizations, meet the science requirements of good IT leadership and reap the benefits of these disciplined best practices. The art aspect of IT leadership, however, is not so well defined or documented.

THE ART OF IT LEADERSHIP

The art of IT leadership requires development of soft skills, those needed by good managers in any field. Although these skills may not lend themselves to step-by-step processes and procedures, best practices do exist. IT leaders should take advantage of every professional development opportunity that comes their way for soft skills, such as effective communication, leadership, customer service, collaboration, people development and negotiating. Other soft skills, like strategic thinking and political-savvy, are also necessary for IT leaders to succeed.

While many technology leaders are comfortable with the science part of their role, ignoring the art of IT leadership can quickly lead to problems.

These soft skills are so important to an IT leader's success, that six of the top 10 critical IT leadership competencies cited by IT leaders from around the world are soft-skill competencies, according to *CIO* magazine's 2010 State of the CIO Survey released in January. While the other four are more technical in nature, only one was specifically related to technology competency. The other three were related to general business competency.

The message here is that IT leadership requires professional development for both skill sets; an emphasis on one to the detriment of the other results in less effective IT leadership. Hard skills may be easier to obtain and implement, but soft skills should be pursued with equal enthusiasm and discipline.

Liza Lowery Massey served as a public-sector IT executive for nearly 20 years, including as CIO of Los Angeles. She then established The CIO Collaborative to provide public-sector research, benchmarking and consulting services. She also teaches at the University of Nevada, Las Vegas.

public cio Blogs

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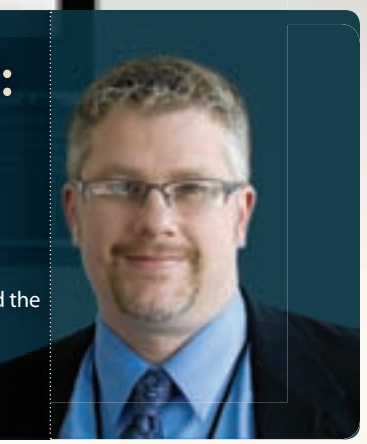

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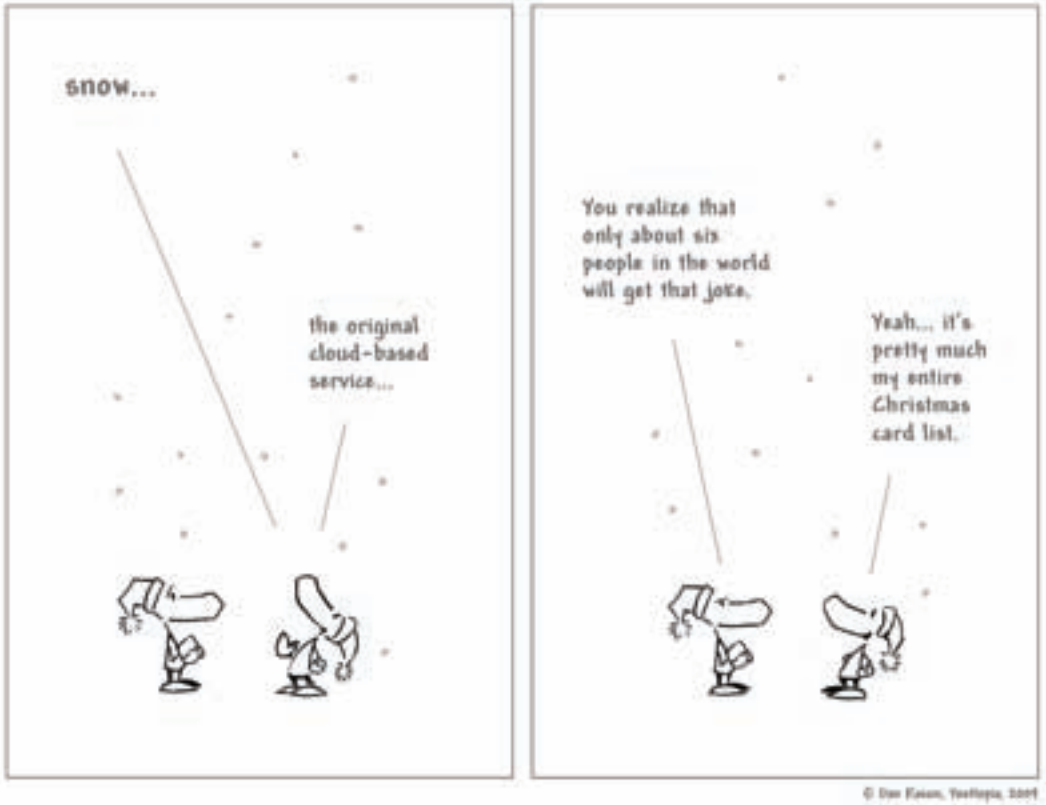
BY PAUL W. TAYLOR

Cloud Computing Needs a Meteorologist

A new set of analogies for a cloud-based world.



Guest illustrator Daniel Kasun takes a lighthearted poke at the fever-pitch marketing campaigns that have rebranded almost everything as cloud-based. Kasun's day job happens to be with a Redmond, Wash.-based software company that has declared itself "all in," where the cloud is concerned, at a time when cloud computing has become an "all skate."

This cloud-is-everything and everything-is-cloud chatter is really not helpful in determining how the cloud forecast fits with your environment. The cloud originated as a way to illustrate the Internet on technical diagrams, but its usefulness as an analogy has not been teased out, until now. A little amateur meteorology may be in order.

Cumulus clouds in nature have vertical development and may appear alone, in lines or in clusters. The analogy to hybrid computing clouds is rather obvious, mixing and matching among private clouds (your organization alone), community clouds (your organization plus closely aligned peers) and the public cloud (usage-based provisioning to multiple organizations on the public Internet through secure connections).

Stratus clouds are the lowest to the ground. Think e-mail, online backup and other utility functions hosted by a third party.

Altostratus are middle clouds where, if you can virtualize it, they can host it.

The higher you go in the cloud, the more configurable the environment becomes.

Cirrus are the high clouds. By analogy, this is the highest-performance cloud — providing configurable development environments or operating systems in the sky.

The higher you go in the cloud, the more configurable the environment becomes. But there remains a bright line of distinction between configuration and customization, the latter of which is still only available on the ground.

Paul W. Taylor is chief content officer for e.Republic. Taylor previously served as the deputy CIO of Washington state and as chief strategy officer for the Center for Digital Government. He has worked in the public and private sectors, the media and Washington's Digital Government Applications Academy.

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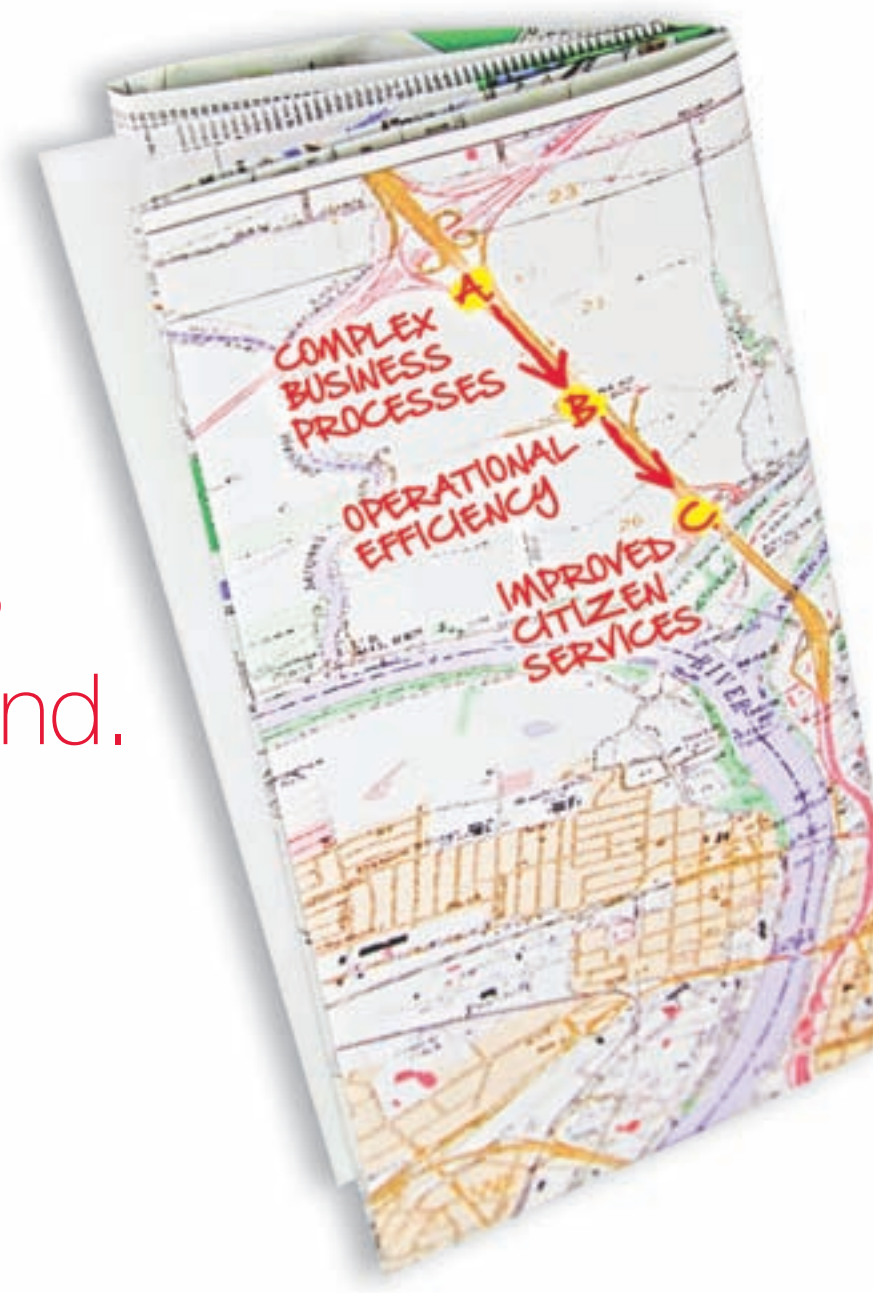

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