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MAGAZINE

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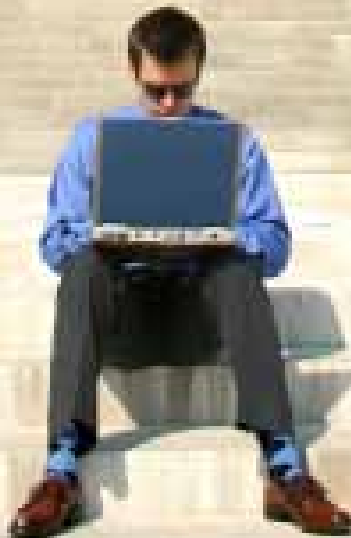
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How IT is helping
state and local
government
agencies achieve
their goals



Saving Money, Time and Energy in the Public Sector with **Remote Manageability**



Learn how agencies are updating their PC environments, both mobile and desktop, to drive down support costs while boosting employee productivity. The secret is managing PCs with 2nd generation Intel® Core™ vPro™ processors.

THE CHALLENGING ECONOMY has drastically limited budgets for government agencies and public-sector organizations, even as constituents demand higher output for vital services.

However, when deploying solutions, public-sector IT organizations have fewer options than their private-sector counterparts. The mandates of state and local governments and educational institutions make it difficult if not impossible to reduce service levels or raise prices. Nor can public-sector IT organizations turn to extensive offshore outsourcing, especially for highly visible functions in a politicized environment.

An overwhelmingly common response for public-sector agencies has been to push IT management from the department level to central IT organizations. In a survey conducted by the National Association of State Chief Information Officers (NASCIO), state CIOs ranked “budget and cost control,” “consolidation,” and “shared services” as their top three priority strategies.

Another trend for state and local governments has been toward visible leadership in reducing energy use through environmentally friendly operations, with IT initiatives at the core of those efforts. According to a

recent Wipro Consulting study, two-thirds of energy efficiency initiatives for state and local governments are IT-based, with the major components including server consolidation and virtualization, granular power-management policies, and transitions from power-hungry desktop PCs and CRT monitors to energy-efficient laptops with LCD screens.

In tight budget times, IT projects have to pay for themselves in the shortest possible timeframe, provide immediate relief to cash-strapped departments focused on constituents instead of technology, and adhere to public mandates to conserve scarce resources, whether fiscal or environmental. The only viable way forward is through cost savings, efficiency improvements and process automation, driven by technology that provides immediate benefit with last-

ing advantages. “Considering the budgetary pressures in the public sector, state and local governments have to undertake IT projects that pay for themselves,” says Eric Heerwagen, platform manager for Intel.

Which is why now is the right time for organizations to look at their client fleet for cost-saving manageability projects. “Right out of the box, PCs with 2nd generation Intel® Core™ vPro™ processors can drive immediate cost savings and greater energy efficiency compared to older PCs,” Heerwagen says. “In addition, with the 2nd generation Intel Core vPro processor family you can apply patches even if PCs are powered down, perform troubleshooting even through an inoperable OS, provide support from anywhere in the world so long as the remote PC is plugged into the wall and connected to the network, and even turn

on and off PCs remotely through a more secure, encrypted connection, which ultimately lowers the entire cost structure for an IT organization.”¹

Across all of these measures, PCs with 2nd generation Intel Core vPro processors deliver much-needed benefits to the public sector:

■ **ELIMINATE THE NEED FOR MOST DESK-SIDE VISITS.** With the 2nd generation Intel Core vPro processor family, IT technicians can remotely power-on and power-off PCs via an encrypted connection to perform detailed diagnoses of system issues and initiate backup and restore procedures.

■ **FOR ASSET MANAGEMENT,** IT technicians can remotely collect detailed information about 2nd generation Intel Core vPro processor family-enabled PCs and their components even when those PCs are powered down, instead of having to visit users’ desks individually. This simplifies the tasks of keeping track of PC inventories, managing firmware updates and maintaining compatibility between software and hardware.

■ **REDUCE ENERGY COSTS** through improved power management, enhanced by more secure remote power up/down. Counted across the PC install base, the energy savings for shutting down PCs when they are not in use add up. Couple that with the already mentioned reduction in technician travel, and public-sector agencies can better meet and exceed targets for reducing carbon emissions.

The benefits of Intel technology have been demonstrated on PC fleets and management consoles of IT administrators and technicians across a wide range

Reduce energy costs by up to 50% through improved power management

of public-sector institutions. Here are five examples of Intel serving both the public sector and the public interest.

Lone Star College

The Technology Services department at Lone Star College supports more than 12,000 PCs, notebooks and workstations used by students, faculty and administrators in classrooms and offices across five Texas campuses. By deploying HP Compaq* business desktop PCs powered by Intel vPro technology, the college expects significant annual cost savings and carbon footprint reductions.

A key project goal was the ability to reliably shut down campus computers, wake them up at night for automated patch management and application delivery, and shut them back down again. With Intel vPro technology, the staff can reliably maintain and upgrade enterprise computing resources, even when PCs have been turned off or have become unresponsive. These remote management features greatly reduce PC maintenance costs, increase end-user productivity through faster problem resolution, and reduce energy costs by not having to leave PCs on all night.

From reduced power consumption, higher productivity of IT staff and lower end-user downtime, Lone Star College expects USD 75,000 in immediate savings, and an approximate USD 400,000 in total savings by the end of the project in 2011.

State of Indiana

In 2009, Indiana’s Office of Technology (IOT) began a four-year plan to convert 20,000 desktop systems to PCs with Intel vPro technology, and the expected four-year result is a reduction of CO2 emissions by approximately 856,000 pounds—the equivalent of the carbon emissions from over 900 barrels of oil. The deployment of laptop and desktop PCs with Intel vPro technology allows IOT to remotely shut down, wake up and update PCs, diagnose and repair hardware and software problems, deploy patches and upgrades remotely, and improve overall security.

IOT estimates that the remote management capabilities will allow technicians to eliminate an estimated 80 percent of desk-side visits by technicians. Ultimately, these remote management capabilities are expected to save IOT an anticipated USD 1.475 million in energy costs over four years.

Livonia Public Schools

The IT footprint of Michigan’s Livonia Public School District consists of more than 5,000 computers linked by a high-speed network across labs, classrooms, teacher work areas, and administrative offices over 39 square miles.

Intel vPro technology enables the district’s IT team to identify and repair software problems

remotely, significantly reducing software repair time and helping the school district better utilize its limited IT staff and budget.

With the ability to deploy patches and anti-virus updates at night using remote management capabilities, teachers and students no longer have to wait for PC maintenance tasks to finish during daylight hours, and administrators can be assured that the district’s IT infrastructure is up-to-date and secure.

“People can turn the desktops off after using them because we can wake them as needed for IT management,” says Jim Seay, network manager for the district. “We expect this capability to significantly reduce energy use by the district,” says Joe Harvey, the district’s energy manager. “By reducing the number of on-site PC repair visits, we also expect to lower costs for fuel and auto usage by the district’s support technicians. It all adds up to a greener IT department.”

Arizona Public Service

To reduce power use and costs at the desktop, utility company Arizona Public Service turned to Intel processors with vPro technology. “The processors themselves consume less energy than previous generations, and the Intel vPro technology enables us to remotely power up PCs after hours, apply patching, and shut them back off to save energy,” says Michael Housley, information services architecture manager at APS.

APS estimates it will save approximately 6.5 kWh of energy and USD 550,000 in energy costs per year based on the improved

Another source of windfall savings has been remote power management

energy-efficiency, automatic power-off, and remote manageability capabilities.

“We’re continuing to replace our older desktops with new Intel processor-based machines,” says Housley. “Once we have enough replaced, we plan to activate the Intel vPro technology. That will save even more energy by enabling us to turn PCs on or off remotely over the network. We’ll be able to patch during off-hours to keep from disrupting users, but without running the desktops 24 hours a day.”

Clayton County Public Schools

Georgia’s fifth-largest public school district enrolls over 50,000 students at nine high schools, 14 middle schools and 38 elementary schools across suburbs that span 143 square miles. Although the district’s school buses travel over 30,000 miles daily, with the deployment of Intel vPro technology the IT department has been able to eliminate most of the time technicians had spent on the road.

By provisioning approximately 2,500 Intel vPro-enabled PCs, the district’s IT department has been able to remotely diagnose system problems, deploy updated disk images, and provide solutions for

non-technical on-site personnel to implement. In addition, the district has been able to manage remotely the specific configurations of its widely dispersed PCs through hardware-assisted asset management capabilities.

Another source of windfall savings has been remote power management. “We can shut the PCs down consistently,” states Support Technician Marc DeSilva. “We can power them on remotely to do any software upgrades or virus patches, and then turn them off again. And when the teachers come in on Monday morning, they don’t have to spend first period waiting for upgrades to occur.”

“Technology is so essential to our mission as educators,” says district CIO Angie Bacon. “Intel’s innovation and leadership in education play an important role in helping us deliver an outstanding educational experience in challenging economic times and prepare our students to prosper in a technology-oriented society.”

Find out more about easier PC manageability for lower costs. Visit the website: <http://www.intel.com/itcenter/topics/manageability/index.htm> ■

¹ Intel® Active Management Technology requires the computer system to have an Intel® AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. System Defense only works with select Intel® vPro technology brand verified LAN cards. For more information, see <http://www.intel.com/technology/platform-technology/intel-amt/>



Intel's CISO explores how new technology risk can actually be an opportunity for mitigation.

Risk or Opportunity?

SOCIAL MEDIA, MOBILITY and even virtualization can be scary prospects, but Intel's CISO Malcolm Harkins looks for the opportunity in it all. He encourages state and local governments to embrace it and consider how the technology can actually help mitigate risks. A social media interaction can be more closely monitored than a conversation at Starbucks. A company-sanctioned laptop can be more secure than a personal desktop. And a virtual machine can be more reliable in a disaster. The trick, he says, lies in establishing the right control structure and making the appropriate risk mitigation decisions.

Q. You've talked before about the dangers of risk misperception. What are the implications in terms of state and local government?

A. In many respects, attempting to over-control is the biggest issue. One public-sector peer's philosophy is: "In God we trust, all else we block." But that thinking constrains the use of technology and gives people a false sense of security. It's like turning a blind eye to the risk. How are you going to stop someone from Tweeting or Facebooking on their handhelds? How can you control security in the midst of Internet access, CD ROMs,

and USBs? The risk is there, so you should really be walking toward it in a controlled fashion.

Q. Governments have to balance security and open government initiatives. Are there parallels with social media at Intel?

A. Any movement toward openness and transparency poses risk considerations. In some cases, it's about managing behavior expectations—your code of conduct for employees. People can have a hallway chat with no issues, but if that same interaction is blogged there can be a magnification to what's said. Training and awareness is key. You need to remind employees that security expectations carry through regardless of the communications channel or mechanism. But you can go beyond education. At Intel, we put moderators in place—blog ambassadors—that monitor the healthiness of interactions, coach employees and occasionally pull inappropriate postings. It comes down to providing openness, but certainly there are boundaries.

Q. Public entities are bound by a myriad of compliance requirements. How has Intel approached compliance? Is it a checklist or is it built-in?

A. Over time, we've built a team that deals with everything from a risk, security controls, and compliance perspective. We try to integrate all of these things and reconcile when they go in opposite directions—like when fulfilling a security desire bumps up against a privacy requirement. With identity and access management, for example, you want to know all there is to know about Malcolm to provide needed protection. But for privacy's sake, you want to minimize exposure of that personal data. So Intel tries to build compliance into security. Still, compliance by nature requires a checklist to be meaningful and to provide substantiated proof that you've stepped on all the security bases.

Q. We're seeing rapid adoption of virtualization strategies by state and local governments. How has Intel approached virtual security?

A. On an aggregate level, you need to think about your single point of compromise and single point of failure. With consolidation, one virtual instance can potentially compromise others. At Intel, we manage that risk by keeping like levels of sensitivities together—meaning data with the biggest potential impact is kept separate from, say, public data. The same goes for business continuity risk and single point of failure. We need the proper risk mitigation, so instead of going from 10 servers to one we might virtualize to two. What's more, we can use virtualization to counterbalance the single point of failure. For example, we can bring up a virtual server faster than

a physical server, which means we can leverage virtualization to reduce availability risk.

Q. Can you talk about your cloud computing and security strategy?

A. Public cloud computing is no different from outsourcing. Do we have a dedicated or shared environment? If it's a shared environment, how is it managed? What information is going to be put outside? What expectations do we have around controls? The controls may be different from one environment to the next, so you have to do the translation. But as long as providers meet your security expectations, it doesn't matter. It can really be distilled to that level of simplicity.

Q. Mobility has a strong business case in state and local governments. What are the key issues in securing the remote infrastructure?

A. Remote infrastructure can be part of your premise—just remote from the mother ship—so you'd implement the same controls. But if you're talking outside the premise, like an employee's home, hotel room, or even Starbucks, things change. You have to look at what they access, what you want them to access, and where they're accessing from. For shoulder surfing, you can always give them a privacy screen. For eavesdropping, training about where not to take sensitive calls is critical. These measures may not be perfect, but they're reasonable mitigation. At Intel we've taken it further, deploying firewalls, anti-virus, intrusion detection, and VPN access on our laptops—which gives us a whole lot more control than we'd have over home desktops. So we've effectively turned mobility into risk reduction.

Q. Finally, with more of IT being delivered on-demand, what are some of the security challenges with the service paradigm?

A. It's just like the cloud stuff. What expectations do we have in how data is handled? And are the right controls and contractual language in place? The most important thing here is to think beyond the traditional IT service. For example, Intel's 401K provider is an information risk—they have my financial information, my social security number, and more. It's not a traditional IT service, yet we apply the same rigor because of that information risk. So don't just focus on IT processes, but rather business processes, too. Then maybe you'll feel more comfortable opening up other services.

BOTTOM LINE: When you approach risk the right way, Harkins contends, your overall risk posture is either neutral or goes down with the implementation of new technology. So walk toward the risk willingly—instead of running from it.



A Different Kind Of Desktop

New Technologies for School Districts

DANIEL LAFLOR/ISTOCKPHOTO

How schools can take advantage of virtualization and cloud computing to reduce costs and increase flexibility

EDUCATIONAL INSTITUTIONS, WHETHER K-12 or collegiate, face a unique challenge. They have a variety of users—students, teachers, administrators—each requiring different kinds of applications, levels of access, and security. Serving these diverse user segments has always been a complex challenge for academic IT staff.

In the 21st century, however, academic IT has the pleasant prospect of advancing technology solutions while lowering complexity. With the availability of new technologies, it finally has options that let it deploy appropriate desktops and back-end systems for the appropriate segment of users.

Even better, these new technologies give cash-strapped school districts a computing model that doesn't force them to choose between rich, interactive content and cost-effective deployment and management. They combine the best of both worlds. They give more control to IT and deliver enhanced, effective 21st century educational materials to students, which translates into a win for students, teachers, and administrators alike.

An Evolving Challenge

IT managers in education have always faced challenges at the desktop. While they needed to allow students access to computers, they had to restrict the ability to download and upload inappropriate content. That almost seems prosaic compared to today's situation, in which technology is an even more integral part of most school systems. This is true both on the back-end, where servers and networks support administrative services, such as electronic attendance and absentee notification, but also in the classroom as well.

Administrators, IT managers, and teachers face an evolving challenge to provide education the way students are accustomed to accessing information: through technology. These new learning paradigms encompass a variety of technological challenges:

- Reliable networks for increased online and video content
- The use of mobile devices for both homework and information access
- One-to-one e-learning for special-needs students
- Higher levels of security

Simplifying Online Education

HOW DESKTOP VIRTUALIZATION HELPS EDUCATION

Desktop virtualization is a flexible family of delivery methods for software applications, ideally suited for educational institutions. Rather than deploying a traditional model, in which IT installs and maintains applications and operating systems on individual platforms, this model gives IT the additional option of streaming them from servers. IT also benefits from centralized management, data security, and lower licensing costs. Because schools pay less for technology investment and maintenance, they can invest more in education.

In addition to the complexity of educational options, technology is constantly evolving. IT managers face a dizzying array of mobile devices, wireless networking options, and desktop options (full-fledged client or virtual). Faced with increasing technological choice on one side and decreasing budgets on the other, IT professionals in school systems must traverse a narrow path toward a sustainable infrastructure.

Preparing For a Changing Future

To make this journey, IT administrators in education need to take advantage of the fundamental foundation offered by standard technology, but also have enough flexibility to accommodate an evolving landscape. Given financial restrictions, this foundation must also be cost-effective. Simply put, today's schools need to adopt an evolutionary model that allows them to accommodate new technology, but doesn't require them to reinvest in new infrastructure each time advancements occur in devices, networking, or even educational methods.

This new flexible model must accommodate both the front-end, where the educators teach and the students learn, and the back-end, where IT's administrative responsibilities lay. This means creating an infrastructure that supports a full-featured learning platform on the client side, whether through a notebook, a tablet, or a thin-client device. It also requires an infrastructure with back-end servers that support applications for administration, basic education, digital content and creation, and mobile access during non-school hours. For the highest degree of flexibility, these applications can reside either on servers that belong to the school district, or on servers of third-party service providers.

Technology for the 21st-Century Education

The hardware, software, and services on which this flexible infrastructure rests are already increasingly deployed in both public-sector and private-sector institutions. This means that educational institutions

can take advantage of lower costs, both in terms of initial deployment and in support, because they are not forced to use a single solution designed primarily for the educational segment.

Here's a look at some options for a new infrastructure:

MOBILE PLATFORMS: Advances in mobile technology mean that students and teachers now have the processing power and storage capability to accommodate

today's applications, and to do so either in the classroom or in other environments, such as museums or laboratories. Even as mobile devices evolve, though, IT maintains the control of applications and operating systems.

VIRTUAL DESKTOP INFRASTRUCTURE (VDI): Thin-client desktop devices benefit from lower licensing and maintenance costs. These devices communicate with VDI servers, which deliver the software applications and operating systems. All data is automatically housed within the data center, increasing data security. Centralized servers also simplify security, because applications can't be uploaded or downloaded from the client.

SERVER CAPACITY: Using hybrid client solutions, schools can also reduce the amount of physical space needed for servers. The servers can be consolidated in one site to provide a centralized private cloud or even a virtualized solution—where applications and even operating systems can be served on-demand to devices throughout a school or school district.

CLOUD SERVICES: Cloud services, whether internal or external, can be used to augment classroom or data center servers. Schools should look for cloud service providers who offer compliance with regulatory requirements—such as the Family Educational Rights and Privacy Act (FERPA)—as part of their service-level agreement, which can reduce the time internal IT staff must devote to compliance.

In aggregate, these technologies give IT managers in education something that hasn't been common before: a standardized infrastructure with built-in flexibility. With this kind of infrastructure, employing platforms for clients and servers based on standardized and widely deployed Intel® technology, IT administrators can take advantage of lower costs while still offering a wide range of options serving the needs of students, teachers, and administrators.

As a result, IT can help schools meet the demands of the present, while effectively creating a scalable, reliable graduation toward the future. ■

PUBLIC INVESTMENT IN broadband infrastructure accelerates economic development and improves workforce readiness by fostering digital literacy throughout all segments of the population. According to the Wireless Internet Institute, the vast majority of local government officials view broadband as a catalyst for private sector job-creating investment.

But today, while broadband is available to 93 percent of the U.S. population, only 63 percent actually subscribe to broadband service, according to a February 2010 FCC survey.¹

The Obama administration has embarked on a large-scale effort aimed at closing the broadband availability and adoption gaps, to bring unserved, underserved and vulnerable segments of the U.S. population into the digital age and raise U.S. competitiveness.

Spearheading Broadband Adoption

State and Local Government—
The Primary Implementation Vehicle for Broadband Stimulus Plan



ROLF BRUDERER/GETTY IMAGES

While state and local governments are expected to play the lead role in this effort, the economic climate has caused budget shortfalls, lower tax revenues and slow growth not seen since the Great Depression. To help alleviate this, Congress passed the American Recovery and Reinvestment Act—the “Stimulus”—an unprecedented \$787 billion federal economic stimulus program. Of that, an estimated \$100 billion is going toward strengthening the U.S. information technology infrastructure.

The investment targets education, healthcare, energy, transportation and public safety, much of which is under direct executive or regulatory control of state and local government. It sets the stage for a large increase in broadband availability and adoption, fostering economic development in the underserved communities.

With broadband available to 93 percent of U.S. households, the federal government has undertaken the effort to reach the remaining 7 percent by awarding \$6.2 billion to deliver high-speed, wholesale broadband to service providers and anchor institutions such as utilities, healthcare facilities, schools and last-mile rural projects. Simultaneously, an additional \$700 million has been awarded to boost use among broadband non-adopters—that 30 percent of the U.S. population made up of persons with disabilities, the economically challenged, and the elderly. The focus areas for these funds are:

BROADBAND MAPPING AND PLANNING GRANTS awarded to designated agencies in 56 states and territories, aimed at mapping availability and promoting usage through outreach and digital literacy training for non-adopters.

PUBLIC COMPUTER CENTER GRANTS awarded to state and local government-controlled organizations such as school districts, library systems and housing authorities to establish shared computer-access facilities and digital-literacy training programs.

SUSTAINABLE BROADBAND ADOPTION GRANTS to non-profit organizations and universities to address youth, elders, the deaf and blind, and other vulnerable minorities.

Spearheaded by their elected officials, community meetings have been an effective way to reach out to non-adopter communities. The city of Minneapolis² held more than 100 neighborhood meetings over the last two years in cooperation with grassroots local community broadband champions. The result: an increase in adoption of their recently deployed broadband wireless network by over 20,000 subscribers.

Cooperative Effort

The last few years of experimentation have shown that success hinges on cooperation between state

and local government and established local private-sector organizations. Most middle-mile infrastructure projects were awarded to state government, regional government and institutional consortia. But the vast majority of the last-mile rural projects were awarded to local cooperatives and family-owned businesses, most of them long-standing recipients of government funding from USDA Rural Development Utilities³ and the FCC Universal Service Funds⁴ programs.

Compelling benefits driving broadband adoption are access to federal, state and local government Web sites and portals allows for better and more informed citizens, less burdensome transactions for a whole range of government services, including licensing, ticketing, tax filing, and allowing front and back-office cost reductions across many government agencies. Benefits also include access to a broad range of health information services such as general and specialized healthcare, remote monitoring services, and insurance and drug fulfillment portals provides convenience and peace of mind, especially to the elderly and disabled.

In school and at home, access to broadband makes for a richer education experience, allowing students access to the vast resources of the Web, parents to engage electronically with school administration, and faculty and teachers to more efficiently deliver a personalized education experience to both students and parents.

Public safety is emerging as a critical area for broadband availability and accessibility through such bandwidth-intensive applications as video surveillance, remote monitoring of vital signs in ambulatory services, emergency response coordination, and interoperable law-enforcement networks.

Conclusion

The Broadband Stimulus is an unprecedented opportunity for the United States to close the digital gaps that have emerged over the last 15 years. Investment in high-capacity middle-mile wholesale infrastructure that services government and institutional anchor tenants, and last-mile rural-area infrastructure that serves government, institutional tenants, businesses and household subscribers will go a long way toward increasing adoption.

Broadband adoption will make a wide range of public services available to local communities at risk of being left behind in the digital age, and will energize local economic development and competitiveness. ■

¹ Broadband Adoption & Use in America working paper by John Horrigan, PhD, Federal Communications Commission February, 2010

² Wireless Minneapolis Community Benefits Agreement prepared by the Digital Inclusion Coalition, June 2006

³ http://www.rurdev.usda.gov/Utilities_LP.html

⁴ http://www.fcc.gov/wcb/tapd/universal_service/



PC Migration:

A Winning Technology Strategy for State and Local Government

WiPro study says migrating to newer model laptops affords greater mobility and productivity, among other key benefits.

IN THE MIDST of social and economic upheaval, technology has taken center stage. And while the private sector clamors loudly for the new and innovative—from iPhones to notebooks—the government is quietly following suit.

According to a recent Wipro Consulting report, the U.S. government is embracing technology with a keen focus on user trends. Inroads have been plenty in regard to wireless and Internet access, but the study reveals room for improvement in other areas. In particular, a strong majority of the state and local government (SLG) PC fleet is still desktop bound. And that inevitably impacts the needs of government employees and ultimately its citizens.

Updating its existing fleet of desktop PCs with more timely laptops could go a long way toward addressing government's challenges, bringing unprecedented and much-needed agility and flexibility to the workforce.

Reshaping Technology

Developments in the U.S. social-economic climate are driving significant changes in government. One need only look at a few key trends to glimpse the influence. Culturally, the proliferation of personal productivity tools like mobile devices has substantially raised user expectations of anytime, anywhere access to information and transactions. At the same time, environmental concerns are exerting pressure to "go green." But it's the economic downturn that is perhaps most impactful with far-reaching consequences.

How is all of this shaping the government's technology strategy? In a recent study sponsored by Intel, called "*Flexible Workforce for a Mobile Nation: Best*

Practices for State and Local Government PC Usage," Wipro Consulting Business Transformation Practice queried 58 IT practitioners within SLG to assess the affect of social, financial, and technological trends. The results have proved telling, quickly identifying four primary areas of note:

All-Access Mobility

According to the Nielsen Fact Sheet, there are 223 million cell phone users over the age of 13 in the U.S. and about 195 million active Internet users. These personal technology habits are no doubt trickling into state and local government. And that has SLG widely adopting the technology. Some 92 percent are wireless-ready so employees can tap applications freely and work more productively. Similarly, 82 percent are working to offer more online capabilities in response to public demand for more self-service tools for everything from the DMV to social services.

New Generation, New Needs

Interestingly, 60+ percent of the government workforce is over 40 years in age, approaching retirement. Government must now lure younger workers to take the helm, yet only 32 percent say they have policies in place to attract that talent. Technology will be a game-changer for this group—a demographic that is tech-savvy, highly mobile, and Internet-dependent—and that means government will need to make some changes in terms of its tools.

The Green Imperative

Citizens are routinely called upon to be good global citizens, but from the government's perspective only 48 percent of respondents claim to already have green initiatives in the works. Notably, a great place to start becoming more energy efficient is by re-evaluating the technology infrastructure; for example, virtualizing to reduce the number of servers. Even investing in more energy-efficient computers can help lower SLG's carbon footprint as newer PC models are manufactured with a green thumb.

A Productivity Boost

Given the state of the economy, with flat or shrinking budgets, "doing more with less" has never been more relevant and government employees are being asked to step up. Sometimes that means filing a report while in the field or working from home during a

weather emergency. Unfortunately, 84 percent of the average SLG PC fleet is tethered to the desktop, and few agencies support teleworking. The fact is, liberating these PCs from the desktop would foster a boost in employee productivity.

Best Practices from Wipro

The Wipro study indicates that government is heading in the right direction, but underscores room for best practices in its technology strategy. Perhaps a re-evaluation is in order.

The consultancy recommends that state and local governments embrace online self-services to deliver on citizens' expectations and commends its continued commitment to fulfilling mobility and Internet access demands. The report even points to the importance of driving energy efficiency by moving away from "older, power-hungry desktop PCs."

One obvious best practice offered by Wipro is to equip employees with full-featured laptop PCs. Employees could get more done while working on the run rather than chained to a cubicle. In fact, the migration to a more modern personal computing environment could very well position government to not only improve productivity but also attract and retain talent, all the while conserving energy.

Still, a migration of this magnitude could be daunting. One approach, suggests the Wipro report, involves using PCs with Intel® Core™ vPro™ processors to ease deployment and maintenance of a new PC fleet with remote management capabilities. These PCs help SLG cut costs and increase efficiency by taking advantage of intelligent performance and unique hardware-assisted security and manageability features. This technology refresh can effectively drive substantial benefits of enabling the workforce without the added burden associated with a major infrastructure overhaul.

Bottom Line: When it comes to meeting the needs of its employees *and* its citizens, these best practices from Wipro could make all the difference in the world for state and local government. ■

➔ **DOWNLOAD** the complete Wipro study *Flexible Workforce for a Mobile Nation: Best Practices for State and Local Government PC Usage*. <http://premierit.intel.com/docs/DOC-5714>.

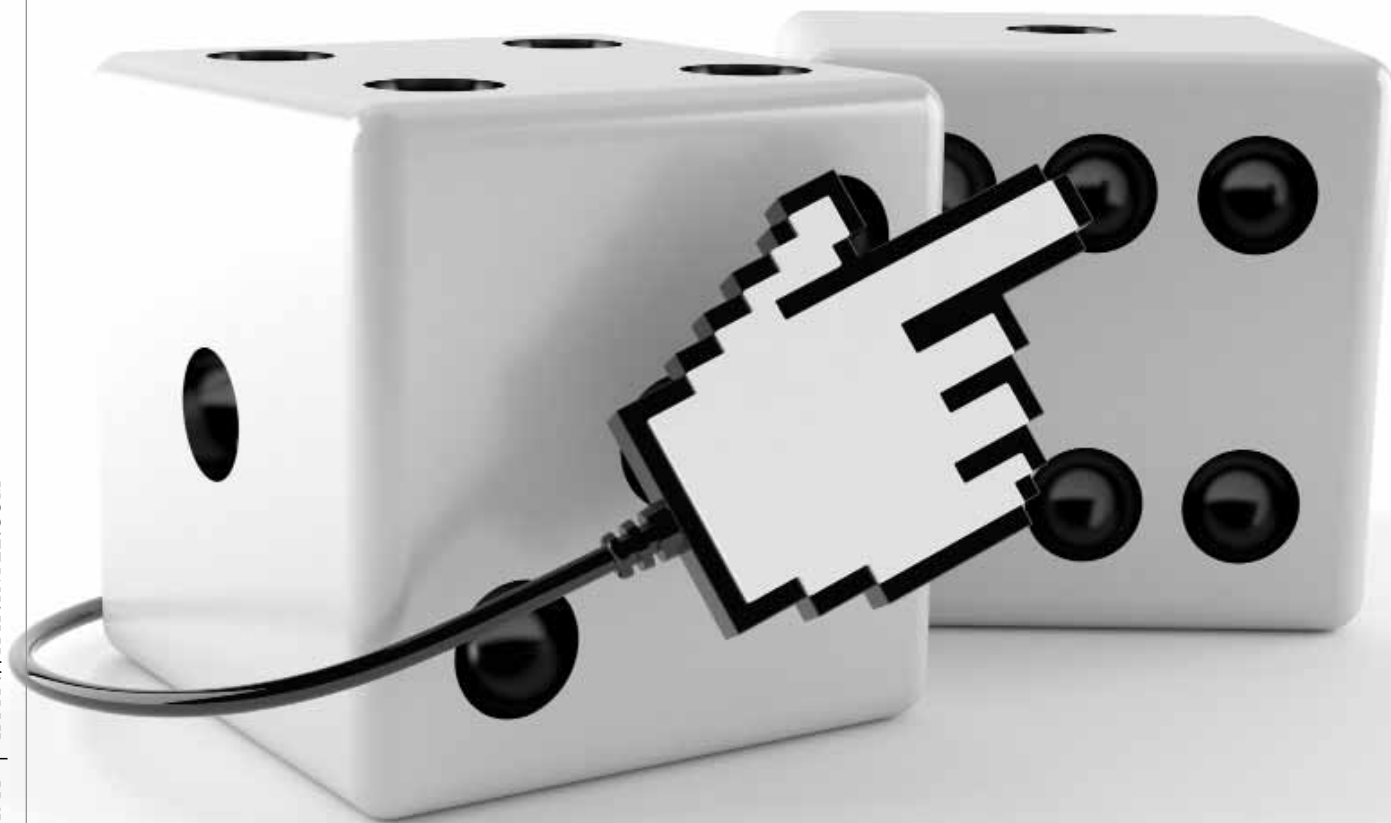
A great place to start becoming more energy efficient is by re-evaluating the technology infrastructure

The fact is, liberating these PCs from the desktop would foster a boost in employee productivity



New Servers Are No Gamble

for Clark County



ECONOMIC DOWNTURNS HIT public-sector entities the hardest, because demand for social services increases at the same time that tax revenues are falling. Frequently, though, because of the efficiencies that technology can provide, public-sector entities ask their IT departments to wrest economies out of the computing infrastructure.

The problem has been especially acute in Clark County, NV, best known as the home of gambling capital Las Vegas and outlying communities. Though gambling is frequently thought to be recession-proof, the recent downturn found the area on the wrong end of a housing boom. At one point, one in 15 houses had received a foreclosure notice¹, and its unemployment rate hit a record 14.8 percent, the highest in the U.S.²

Even so, the Clark County IT department has stepped up to the challenge, embarking on a strategy to sustain the county through tough times. It employed both virtualization and consolidation strategies, using the latest Intel® Xeon® processors, to reduce costs and keep up with expanding automation. The IT department's plan involved retiring dual-core servers with new servers running the Intel Xeon processor 5500 series. Combining the new servers increased performance and virtualization technologies, the county was able to replace every 10 servers with one new one.

Braving the Imperfect Storm

Even before the downturn, Clark County's IT department contributed extensively to making the county run efficiently. It's responsible for about 70 percent of the county's IT infrastructure. As the downturn wore on, however, more county agencies came under

High-performance servers and virtualization reduces infrastructure costs for gambling capital

¹ <http://www.csmonitor.com/Business/new-economy/2010/0729/Foreclosures-ease-in-cities-hit-hardest-by-housing-crisis>

² http://www.bostonherald.com/news/national/west/view/20100820nevada_unemployment_sets_new_record_143_percent/srvc=home&position=recent

increasing pressure to improve their efficiencies. Because that required automating systems to avoid hiring more staff, these agencies turned a hopeful eye toward the IT department. By offloading infrastructure responsibilities to the IT department, their staff could focus more on the business-critical applications that served the county's citizens.

The IT department did not shirk the increased demand throughout the county. It employed three key tactics in order to provide both technological and economical efficiency within its infrastructure.

STANDARDIZATION. Clark County had already standardized on Intel platforms, running both Microsoft Windows* and Linux* operating systems. The county recently added three servers powered by the Intel Xeon processor 5500 series to act as domain controllers for an Active Directory* refresh. Upgrading to the Xeon 5500 series allowed Clark County to take advantage of increased processing power and accelerate server consolidation.

CONSOLIDATION. The IT department's recent SQL Server* consolidation effort moved several smaller, single-purpose SQL Servers onto four Intel Xeon processor-based clusters. The SQL consolidation alone enabled IT to retire eight physical servers in one year, with another 15 scheduled to be retired by the end of 2010. Doing so reduced both licensing costs and power and heating requirements, and offered higher performance and availability.

VIRTUALIZATION. The Clark County IT department has 22 VMware* hosts that support more than 220 virtual servers, yielding a 10:1 (and increasing) consolidation ratio. The most recent expansion of its virtualization environment occurred with the recent addition of an eight-node server farm using the Intel Xeon processor 5450. The county also added a fourth blade farm to its virtualization infrastructure. Based on the Intel Xeon processor 5400 series, the blade farm provides capacity to handle continuing demand for computing resources.

A Big Payoff

Using these three technologies, the Clark County IT department has given itself a rare, but valuable capability: the room to grow. By replacing older

servers with servers based on the latest Intel Xeon processors, it was able to make one server do the work of 10. And in doing this, it was able to increase utilization, maintain performance, and add capacity to support new applications and demands by other agencies. In addition, thanks to virtualization capabilities, it can accommodate these needs using higher levels of automation and lower levels of IT staff resources.

The shift to virtualization not only took older servers that were more costly to support out of the environment, but it also provided a foundation to support new applications whose infrastructure became IT's responsibility. Clark County is deploying virtual servers as the default platform for new applications (though it still uses blade servers as a fallback, and rack-mounted servers infrequently). Doing so not only improves server utilization, but it also frees up space in its data center. Its consolidation strategy has helped save money by postponing the need to expand the facility.

Of even greater importance for a public sector entity during a downturn, Clark County has been able to save money. Greater processor performance and energy efficiency generate significant savings on server total cost of ownership (TCO), as well as postponing the need to expand the data center. Consolidating server workloads onto fewer, higher-performing Intel Xeon processors has also significantly reduced software licensing costs.

Keeping pace with the Intel product roadmap has allowed Clark County to reap benefits. As one county IT leader noted, "Without the huge progress we've made in consolidating, virtualizing, and automating our environment, we would not be able to keep up with the increases in demand and provide such high availability. Because of the infrastructure we have put in place, we're in a better position to cope with whatever comes next."

County IT leaders say they've generated savings by achieving economies of scale, improving resource utilization, increasing reliability and availability, and creating a more energy-efficient and easily managed environment. Thanks to its efforts, Clark County IT has been able to reap a big payoff at a time when it needs it most. ■

Using these three technologies, the Clark County IT department has given itself a rare, but valuable capability: the room to grow. By replacing older servers with servers based on the latest Intel Xeon processors, it was able to make one server do the work of 10.



Herding Clouds

Users are taking initiative to manage complexity of multi-vendor solutions

STILL NOT SOLD on the promise of cloud computing? You're not alone, according to myriad surveys. While compelling in concept, the standardization, tools and features that IT decision makers require to justify enterprise-level adoption have yet to take solid form.

Still, market research groups and government organizations estimate that approximately 1.5 billion people, or about a quarter of the world's population, connect to the Internet now and that

number will grow as mobile Internet-connected devices proliferate. Cloud computing is one solution to deal with that growing phenomenon, promising efficient and cost-effective use of technology and energy.

So for line of business and IT decision-makers, the question is not whether to move to cloud computing, but when—and how to make the right decisions today to benefit from the promises of tomorrow.

Now, end-user organizations are taking matters into their own hands to ensure they can manage the complexity of a multi-vendor cloud environment in an open data center. Intel's vision of an open cloud environment for the corporate data center has sparked a new user alliance that aims to drive vendor requirements for solutions that are interoperable, based on standards, and help avoid vendor lock-in.

Managing the Complexity of a Multi-Vendor Cloud Environment

Many proposed cloud solutions are based on technologies such as hosting and virtualization with which IT organizations are increasingly comfortable, so what's holding people back? Worries of how cloud computing impacts one's overall IT strategy exist. For example, one inhibitor is that cloud computing encompasses an expanding set of solutions such as private enterprise clouds,

End-user organizations are taking matters into their own hands to ensure they can manage the complexity

infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), cloud bursting, and so forth, that can seem overwhelming. But another factor is that many cloud-based solutions want to pull enterprises back to a uni-vendor approach that they've spent two decades pulling away from—they don't want

to be locked in to one vendor, which is perceived as expensive and inflexible.

"If you have a cloud that's built in a closed, proprietary fashion and you're acquired or you buy another company, you basically have to rebuild that cloud when you move over," says Eric Doyle, Intel director Americas Data Center Sales and Marketing. "If you do it in an open fashion, you can take that cloud solution and easily migrate it to the destination cloud where you're going. Right now, end users are seeing vendors saying, 'You can buy everything for your cloud from us,' but they're not buying it. In fact, they spent years moving away from a single vendor solution."

There's also widely documented IT uncertainty about the state of security in the cloud, as well as questions about how service level guarantees are maintained. The mandate for IT is first to protect corporate information assets, whether in the form of intellectual property or customer data and they're leery about exposing those assets to a public Internet that has been ripe with incursions. IT organizations also want to ensure that whatever they deploy has the level of automation required

to manage and adapt to rapidly changing business needs, external requirements, and organizational changes.

Still, the potential is too compelling to ignore: delivering on the promise of business flexibility and efficient use of energy. Doyle says that for most businesses today, to create a business opportunity they'll turn to IT with a set of requirements and it may take six months to set up the required infrastructure. With cloud-based infrastructure, IT will be able to respond almost immediately.

A Look into the Future: Cloud 2015

It's going to take more than marketing promises to convince IT to move critical enterprise computing systems to the cloud, though. To make the leap, IT decision makers want assurances of efficient, secure, and easily manageable multi-vendor solutions.

This user need aligns neatly with Intel's Cloud 2015 vision for multi-vendor cloud solutions that are:

Federated – Ensuring that data and services seamlessly and securely span clouds, so that organizations can move workloads from one service provider to another, add or reassign capacity, and more easily share information across vendors, partners or clients.

Automated – Dynamically allocating resources to agreed upon services levels and automatically optimizing for maximum resource utilization and power efficiency. This includes automation of provisioning, resource monitoring, reporting of consumption for bill back and workload balancing.

Agencies in the Clouds

John Miri, Senior Fellow at The Center for Digital Government, speaks out about cloud adoption at the state and local level—from stand-out applications to usage trends.

What state and local cloud projects are especially innovative?

The California Public Utilities Commission has deployed cloud-based desktop services—not just for cost savings, but for the productivity that comes with device independence. Likewise, the State of Texas has architected its electronic documents system as a web service so anyone can shuttle "paper" around. And the City of Riverside, Calif. uses hosted email for big cost savings.

Is there a predominant flavor for cloud deployments?

It really comes down to the application. Some data is inherently sensitive and more conducive to a private network. But other data is meant to be shared and proves a better fit for public deployment. Still, more enterprise applications are gravitating to a private cloud or shared cloud between two government agencies—for example, the National Business Center is run in the cloud serving back to other agencies.

Where is your "sweet spot" for cloud applications?

Broadly construed communications is the strongest application, with email being the most appropriate fit. Now, that application is growing into richer, better things—so communications has really become the foundation for building more creative uses.

Are agencies tapping internal talent or leveraging partners?

The more common transition is to move internal talent from systems administrator to a role with greater program value. Folks continue to leverage partners because vendors have more experience, greater economy of scale and the biggest infrastructure to share—and that's where the cost savings come in.

What are some of the security wrinkles?

There are obviously new things to consider and you must generally raise your game. But the default thinking—that on-premise is inherently more secure because of physical proximity—is not always the case. Even though the server can be held close to the vest on-premise, it's not necessarily held carefully.

What's the trend line for cloud adoption?

There is a bit of fear and skepticism about the word itself. So there are a higher percentage of state and local shops that are doing it than will actually admit to doing it. In reality, there has been very strong adoption and ultimately cost pressure is driving future growth.

Device-aware – Providing secure access and optimal experience across a range of devices, taking advantage of the capabilities of the device in hand.

Building a cloud that conforms to this conceptual framework can be a daunting task. Intel® Cloud Builders program is a cross-industry initiative aimed at making it easier to build, enhance, and operate cloud infrastructure. A growing list of vendors, including Microsoft, Novell, Citrix, Red Hat, VMware and others, are participating in the program, which is delivering content and community discussion around best practices, success stories and advance research into building cloud solutions for specific business scenarios.

Solidifying Your Cloud Strategy

Cloud computing is an important transition and a paradigm shift in IT services delivery – one that promises large gains in efficiency and flexibility at a time when your data center is likely already nearing capacity and resource-constrained.

By evolving your IT environment into a more adaptive, more responsive entity, you'll be better able to partner with business units to create value, rather than simply being a service provider. The tools, building blocks, solutions, and best practices for cloud computing are evolving, and you need to prepare for the challenges of deploying cloud solutions. ■

➔ **FOR MORE** information on Intel's Cloud Vision 2015 and the activities of the ODCA, visit the IT Center on intel.com <http://www.intel.com/itcenter/topics/cloud/>.

The healthcare reform bill promises to have a major impact on the way CIOs support the processes and policies of healthcare

Driving Patient-Focused Value



THE FACE OF healthcare in the United States changed dramatically on Sept. 23, 2010, when healthcare reform officially became law. These reforms and ongoing industry initiatives are generating new opportunities for healthcare and IT leaders to create new models for coordinating and delivering patient care. Leading-edge healthcare IT teams and their strategies for innovative, patient-centered coordinated care models across multiple systems are poised to challenge the traditional designs of healthcare technology systems.

The critical factor will be identifying the business needs for setting up the processes and technology to move and share information. "Moving data from disparate systems across locations of care is essential for driving more efficient, higher value healthcare," says Brian DeVore, Intel's director of state health policy. "The question is, 'What is the business reason behind that?' As soon as there is a business value, we can deploy technology to facilitate the exchange."

The evolving healthcare business model is emerging as the primary driver. The key questions CIOs have to ask as they define strategies and tactics are, "What will this look like in five years?" and "How will we know we have succeeded?" Keeping these questions in mind will help ensure that projects don't go off track. It will also help measure progress against project milestones. Very few public/private partnerships can clearly convey how their organiza-

tions will operate and how they will be structured in the future. CIOs don't need to define the perfect system for today, but rather envision what will guide and inform their course of action over the next few years.

The Indiana Healthcare Information Technology Extension Center (I-HITEC) is a good example of an effective effort managed around a focused goal. Working with partners across the state, the I-HITEC connects healthcare providers in all 92 counties to help them adopt electronic health records. "It wasn't set up with the hopes of connecting all the people in every state whether you're sick or healthy," DeVore says. "It was much more about solving a specific business problem."

The effort to connect the emergency departments of Memphis, Tenn., is another good example of immediate traction due to high business value. Competing hospitals established an information sharing system to expedite records availability and reduce emergency room visits. "All healthcare providers in the greater Memphis area understood the need for a

comprehensive view of the patients," says Mark Frisse, professor of biomedical informatics at Vanderbilt University. "They understood that many individuals sought care from multiple institutions, and the lack of clinical information drove up costs."

A state government initiative, in partnership with Vanderbilt University, created a system whereby comprehensive hospital care information from consenting patients was made available through secure connections to attending clinicians. After four years, the service provides data on more than 1.8 million patients to several hundred clinicians. "Exchange of information makes a positive difference, can save lives, and can be affordable to healthcare providers," says Frisse.

Focus on the Patient

The challenges are not so much from the technology perspective, but the business perspective, and it can't be entirely resolved until the focus turns to the patient. "There's very little thought of the benefit to the patient in all of this," says DeVore.

Establishing a national health care IT architectural standard makes perfect sense, as long as the reason for the investment is understood and the focus remains locked on the patient. DeVore wonders whether the focus and priorities have truly shifted to the patient yet. “Are we building a system for the system sake or for the benefit of the patient?” he asks. “The quick answer doesn’t always make its way into the architecture or component prioritization.”

Earlier healthcare partnerships like the Community Health Information Networks and the Regional Health Information Organizations struggled with a lack of focus, lack of consistent funding and lack of a cohesive plan. Studying these earlier efforts can help current healthcare and technology executives avoid issues such as integrating disparate data from myriad sources, and procedural pitfalls like managing consensus and cooperation among geographically dispersed, competitive organizations.

The diligence and continued focus on the patient must endure, even into future healthcare IT projects. “At some point, we will connect Sutter [in Northern California] with the VA with Providence [Health and Services in Oregon] with Partners Healthcare [in Boston],” says DeVore. Establishing and following the business case is of critical importance in forming these partnerships, but the patient must remain the primary focus.

Business Needs

Identifying and narrowing the scope of the problem is the logical starting point. Many organizations start with a nebulous goal like wanting to be more connected for higher quality of care. The fear seems to be that if a goal is too narrowly defined, providers won’t be interested and there will be less

buy-in. While DeVore acknowledges that potential risk, he also states that CIOs have to build consensus from a narrow, attainable focus or initiative.

This puts the onus for coming up with cogent strategies for developing and deploying information sharing systems on state and local CIOs, as well as the CIOs of healthcare organizations of every size—from small-town hospitals to the statewide healthcare consortiums. Organizations like I-HITEC can go a long way toward facilitating that sharing of information with proper planning, implementation and built-in scaling mechanisms, says DeVore.

Other industries like retail and finance provide effective examples of consumer driven initiatives and focused problem resolution—and the resulting change in business process. Retail and finance have developed more efficient, effective systems to satisfy consumer demand. There needs to be the same demand in healthcare.

“Changes in retail banking were mostly consumer-demand driven,” says DeVore. “Banks didn’t want ATMs out there. They wanted to drive people to the teller. That’s the way banking was done. [ATMs and online banking] were consumer driven. They ultimately demanded the system change. You don’t have that in healthcare.”

For the most part, patients don’t have higher expectations of the healthcare delivery system. The banking sector realized that empowered and engaged consum-

ers who use technology were less expensive to service. They consequently improved their customer retention and paved the way for an entirely new way for consumers to engage the financial services sector. Those using the healthcare system need to be just as engaged with their healthcare delivery as they are with their banks.

“We have to get people’s expectations of the healthcare system to rise,” DeVore says. “You need to be shocked when you show up in the ER and they don’t have your information or your chart. There needs to be an outcry, and that’s just not happening.” He is optimistic, however, and can see this change in attitudes and expectations coming around in the near future as the baby boomer generation ages and caring for aging parents increases.

For CIOs of healthcare organizations, state healthcare agencies or nascent health information exchanges looking to get started, DeVore advises the following approach: “Start small. Verify the business value, then scale rapidly and provide a vision of where you want to go. What does the system look like in 10 years? What problems did it solve? What problems will we look to it to solve next?”

Starting with a manageable goal built around specific, patient-focused business value is critical to success. “Don’t swing for the fences; which is not to say don’t stretch operationally or organizationally,” says DeVore. “Realize quick wins, bring more people on board, and figure out how to leverage success.” ■

Links for More Information:

Health Care Reform law:

<http://www.healthcare.gov/>

Health Care Tax Credit:

<http://www.irs.gov/individuals/article/0,,id=109960,00.html>

Indiana Health Information Technology Extension Center:

<http://www.ihitec.purdue.edu/>



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