

DIGITAL
STATES
SURVEY
BEST PRACTICE GUIDE

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OVERVIEW

The Center for Digital Government (CDG), through its state government-focused program, the Digital States Performance Institute (DSPI), conducts the biennial Digital States Survey in even-numbered years. It is the nation's original and only sustained assessment of state use of information and communications technology (ICT).

This “best practice guide” reflects the thorough evaluation and analysis of the 2012 submissions. It is intended to inform and assist states as they submit their 2014 surveys and prepare for the 2014 election cycle by highlighting some of the best examples of how effective and efficient ICT is helping to improve public service.

Survey and Grades

The Digital States Survey is specifically designed to identify and promote best and emerging practices in the public sector IT community. It is a comprehensive instrument, created and regularly revised in active consultation with the states, and comprises 5 major categories and 25 sub-categories. By design, it brings attention to all aspects of ICT usage across the enterprise of state government. Notification of the survey is sent in advance to the governors and chief information officers (CIOs) or their equivalent in all 50 states.

CDG analysts, senior fellows and executives analyze state survey responses and relevant third-party data, and assign states grades from A to F. States are also awarded special “top 5” recognition in each of the five major categories.

During the 2012 survey cycle, 10 states received an A grade, 22 received a B, 18 received a C and 2 received a

D. Some states have an edge when it comes to effectively using ICT at the enterprise level to support and improve public service. This report will provide some insight into why. In compiling this guide, an effort was made to identify the best examples of planning and implementation in a particular category, irrespective of a state's overall grade.

Best Practices

The best practices included in this report are examples of tools, systems, implementations and policies that CDG believes can serve as useful comparisons for states. They are drawn from all survey categories. This insight into what others are doing helps states seeking to improve their service delivery and overall use of ICT benefit from the lessons learned by their peers. By building on what has been proven to work, states can accelerate their progress and invest both time and money wisely.

SECTION 1: ADAPTIVE LEADERSHIP

Adaptive leadership in an ICT organization is best described by four attributes:

- The ability to deliver secure, timely and reliable solutions needed for an ever-changing environment.
- The provision of reliable data and decision support to help governors and agency leaders make data-driven decisions.
- The ability to lead and support transformation initiatives through staff competency, corporate knowledge and tools.
- Constant renewal and improvement of reliable, cost-effective ICT services focused on the business needs of the enterprise.

Delivery of Secure, Timely and Reliable Solutions

Governors typically have a two-year delivery cycle for major initiatives and ICT organizations must be ready to deliver solutions within that window. Major project rollouts using conventional planning, budgeting, procurement and project delivery methodologies can be challenged to meet expected delivery windows. Best-practice organizations are upping their game to provide secure, effective applications — often through incremental and agile project solutions.

ICT organizations that demonstrate adaptive leadership can select the right solution to meet the business need and



implement it quickly. Completing an application for a key initiative two years after a governor is out of office is a poor example of adaptive leadership and does nothing to instill confidence in the CIO. ICT organizations that deliver successfully have strategies and governance in place to effectively align ICT plans to the governor's priorities. This organizational maturity requires effective leadership, engaged planning and governance. Some best-practice examples include:

- West Virginia, Michigan and Minnesota have all used ICT to quickly support and deliver key initiatives for the incoming administration.

In West Virginia, ICT supported the Statewide Local E-Government Implementation and Adoption project. A unique collaboration among state entities, the project's objectives included infusing 21st-century technology skills into the state's high school civics curriculum, working with county and municipal governments to increase their Web presence, and developing applications to support e-government services.

Minnesota's IT Services migrated the city of Saint Paul to the state's cloud-based email system and is working with other local governments to reduce costs. IT Services' planned execution demonstrates leadership underscoring the governor's priority of "Better Government for a Better Minnesota."

Michigan adopted strategies to leverage the promise of multi-jurisdictional collaboration to reduce costs. Over two years, Michigan appropriated \$42 million to create the Economic Vitality Incentive program. This program rewards local collaboration with incentive funding to launch initiatives that include ICT partnerships.

- Georgia, Michigan, Minnesota and Utah use IT strategies to link their governors' priorities into actionable IT plans. In Michigan, the governor's policies specifically recognize the role of IT in executing plans. The Georgia Technology Authority partners with the governor's Office of Planning and Budget to identify how agencies depend on technology to achieve the governor's vision. Key technologies are identified and prioritized in an annual strategic planning process that allows state leaders to see how emerging technologies can help make their business vision a reality.

- The Pennsylvania Office of Information Technology's strategic plan advocates breaking projects up into logical parts and using a modular approach to build large, complex systems to position the state for nimble and agile delivery.
- The Utah Department of Technology Services prepares a comprehensive IT plan in conjunction with every department to align projects with agency business objectives and ensure they are fulfilled. These plans are reviewed at an enterprise level to check for redundancies in architecture and ensure that business objectives can be realized in the most efficient and effective way possible.
- Virginia has a technology business plan to help business priorities drive agency and statewide information technology.

Provision of Reliable Data and Decision Support

New administrations expect data to be available to help move initiatives forward and formulate sound policy positions. Best-practice organizations use enterprise architecture, service-oriented architecture (SOA), enterprise service buses and mature data management to connect the right data to the right decision-maker. They not only have the capacity to link data to decision-makers, but have business intelligence capacity to help decision-makers view and analyze data in different ways to guide policy decisions. These states measure budget investment performance and agency performance with reliable data. Here are some examples of states demonstrating best practices:

- The Colorado Information Marketplace, created by the Office of Information Technology, helps individuals understand the impact of programs, initiatives and investments in a way that holds government accountable. This statewide data-sharing framework encompasses data and information governance, the publishing of information and identity resolution of the information across any contributing entity.
- The Maryland Department of Information Technology is focused on interoperable communications, data standardization and data sharing to support key goals of the governor. These efficiencies among state agencies — as well as between state government and the citizens of Maryland — promote better delivery of government services.
- Michigan replaced a metrics patchwork with unifying dashboards, providing every department with a scorecard to track transformational change projects aligned to metrics.



Utah's career information system.

UtahFutures.org, provides career planning tools, training and direct links to employers to help meet the governor's goal of 66 percent of all Utah adults having a post-secondary degree by 2020.

- The Utah Data Alliance collects key data resources from multiple agencies to support business intelligence and respond to a wide variety of data needs in a more coordinated method, saving millions of dollars in the process.

Supporting Transformative Initiatives

ICT leaders are trusted to lead key initiatives or counted on as lateral leaders. Placing an ICT leader on the governance board of major initiatives not only helps ensure alignment with the initiative, but can also help bring organizational leadership to a diverse governance board. Examples of effective lateral ICT leadership include:

- In Colorado, the CIO was also appointed as the secretary of technology, who leads the IT Economic Development Council. This critical role was created specifically for building economic development opportunities for IT businesses.
- The Utah governor established a goal for 66 percent of all Utah adults to have a post-secondary degree by 2020. The primary strategy for achieving the goal is Utah's career information system (UtahFutures.org) for students, job seekers, employment service providers, education institutions and more. The site features career planning tools, labor market information, job search success skills, education and training options, and direct links to Utah employers and employment opportunities. Not surprisingly, IT plays a key enabling role by providing technical specifications, development and support.

Renewal and Improvement of ICT Services Delivery

ICT organizations are called on to do more with less at the same time demands for new and higher-quality services to citizens and state agencies accelerate. Adaptive leadership requires an ICT organization to keep the old trains running on schedule at the same time it launches new bullet trains. Examples include:

- Iowa is reviewing the best implementations across the state to identify successful innovations that can quickly be standardized and duplicated.
- Pennsylvania's Office of Information Technology is challenging old thinking in its strategic plan. Highlights of the plan position the commonwealth to:
 - Develop common infrastructure and platforms that eliminate duplicative agency systems
 - Consider allowing private entities to deliver core IT services when appropriate
 - Limit custom application development and instead use commercial-off-the-shelf (COTS) software and software-as-a-service (SaaS) solutions as the preferred method of achieving end-user business needs
- Michigan ICT positioned itself for continuous improvement and better adaptive leadership by commissioning an ICT maturity assessment. This helps state leaders focus on becoming more efficient and financially sustainable through effective operations. The study recommends — and Michigan is pursuing — improvements in mobility, open architecture and social media.
- Hawaii's State Office of Information Management and Technology launched a 12-year IT transformational roadmap in its 2012 Technology/Information Research Management Plan (IT/IRM).

SECTION 2: ENTERPRISE INFORMATION AND COMMUNICATIONS TECHNOLOGY

This section includes best practices for computing, networks, applications, data and cyber security, energy management and governance. These categories largely represent the foundation of state government ICT. Irrespective of whether a state's ICT infrastructure is highly consolidated or loosely federated, these services are what make state government a single enterprise —



they are often what is first thought of when elected officials or the public think of the IT department or agency. They are also the services expected to be the most efficient and the place first looked to when technology budgets must be reduced. However, their importance cannot be overstated. If these services are not well considered, managed and provisioned, they can quickly bring government operations to a halt.

Computing

A number of states are leading the way to a consolidated computing infrastructure — with Michigan, Indiana and Utah providing some of the best examples. The path to consolidation is not an easy one and may vary from state to state. However, the best practices found in a number of states include:

- Rationalization and consolidation of multiple data centers and server rooms into a single data center
- Sharing a common unified technology architecture and effective standard-setting processes
- Centralized and improved help desk and desktop support
- Single or consolidated active directory
- Unified solutions to identity and access management
- Significant virtualization of the server base (Utah is above 72 percent), resulting in significant documented savings of energy and costs from improved performance and hardware elimination
- ITIL-implemented management processes
- Centralized software licensing management and acquisition for shared applications
- Rapidly provisioning IaaS, PaaS and SaaS solutions to agencies and political subdivisions
- Leveraging cloud computing and storage through a centrally managed gatekeeping operation to provide optimal performance and price points to state customers
- Effective use of service level agreements to manage performance expectations of customers and service providers
- Support of state leadership

Networks

Successful state networks have sufficient penetration and bandwidth to reach all communities, offices and schools within the state in a unified, redundant way with enough capacity and speed to support remote agency users.

Utah's 10 GB shared backbone has redundancy built into critical connections, connecting state and local governments to the back-up data center that provides business continuity services. Michigan's Shared Network Integration Project (SNIP) encompasses 17 sites across 4 counties. West Virginia is leveraging existing infrastructure to build a middle mile network using multi-protocol label switching (MPLS) to switch between microwave and fiber. It is attempting to integrate 1,000 community anchor sites, including schools, hospitals, public safety agencies and jails that were previously underserved.

Wi-Fi is an important part of the network strategy, largely driven by mobile device adoption. States with best practices in Wi-Fi provide secure private networks for their agencies and employees. West Virginia includes wireless networks for all new buildings and provides secure, private wireless networks to support remote and mobile state workers, including an interoperable public safety network for emergency response. Michigan has added over 1,000 secure hotspots in state offices.

Best-practice states like West Virginia make Internet access available to the public through Wi-Fi at the state capitol, state parks, libraries and rest stops. Utah's CapNET extends wireless Internet access to the general public using a separate network from its secure network.

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Applications

States are under increasing demands to replace legacy systems, address changing business needs, improve decision-making with business intelligence and provide citizens with more self-service applications.

IT organizations in Michigan, Indiana, Oregon and California, among others, are using agile project development, where applications are built incrementally, tested and integrated as a module. Michigan's experience demonstrated that applications can be deployed 15 percent quicker and are more likely to meet user needs.



Cyber Security

Cyber security is a top priority for state CIOs. It is consistently listed as a priority in NASCIO's Top 10 list and was the No. 2 priority of state CIOs in the 2012 Top 10 Tech Priorities Survey by CDG's Digital States Performance Institute. States are working hard to leverage resources to detect and counter unwanted intrusions. States that address this successfully update their security policies and strategies as demand and delivery systems evolve. Key best practices include:

- **Training programs:** Constant and effective enterprise-wide security training that is integrated into employee job performance is critical. Indiana revokes computer access if employees do not successfully complete training. Michigan's Cyber Range trains both state and private cyber security staff. West Virginia and Oregon also have effective training programs.
- **Risk management programs:** States that effectively manage risk use a foundational governance framework to understand their cyber threat risk tolerance, and establish internal security policies as well as external mandates. They consistently update security strategies, plans and policies that address all levels of security responsibilities, and continuously account for things like mobile applications, bring your own device (BYOD) and cloud computing. Michigan, Oregon and Utah are good examples of states that are applying risk management to cyber security based on NIST, COSO-ERM and ISO standards. States should also have the long-term goal of automating compliance reporting.
- **Holistic approach to security:** Some states are eliminating the divide between IT system security and business security. For example, Michigan has combined its physical and cyber security agencies. Oregon requires critical agencies to set security thresholds consistent with their data classification and the sensitivity of their business.
- **Infrastructure protection:** Best-practice states have security controls that provide an in-depth defense strategy, such as anti-virus and content inspection from the endpoint to email and Web gateways. An example is the robust intrusion detection and prevention appliance used within the data network by Minnesota. It is also a best practice to have trained rapid response teams that are prepared to go into an agency and address an agency- or enterprise-wide data breach.
- **Infrastructure security management:** Best-practice states leverage technical controls to manage and monitor software usage and deploy critical patches to controls that assess vulnerabilities. These states regularly conduct internal vulnerability scans and assessments and monitor remediation. Minnesota uses an enterprise vulnerability management system to regularly scan internal use of computers and externally scan network customer systems for vulnerabilities. States including Indiana, Utah and West Virginia manage laptop and mobile device security and encryption.
- **Access control:** Best-practice states employ controls that only allow privileged users access to certain resources. These states employ two-factor authentication for sensitive information and use trust management services such as certificates with a trusted public key infrastructure (PKI) for integrity. Minnesota and Pennsylvania offer good examples of single sign-on identity and access management systems that improve overall security through user authentication. Unwanted access is prevented by managing and auditing user privileges. As cloud interactions increase, these controls need to integrate into cloud applications.
- **Line of business risk:** Industry best practices to prevent exfiltration of sensitive information, preserve confidentiality of information residing on-premises and ensure continuity of business services include: data loss prevention, encryption, data backup and high availability controls. Oregon uses an information security business risk assessment maturity model to help agencies set appropriate information security targets within key ISO domains. This approach recognizes that effective information security must be tailored to the line of business.
- **Domain name system (DNS) security:** California improved DNS message security through the addition of security extensions for DNS, which now validates authenticity and integrity of DNS messages.
- **External audits and assessments:** States need external enterprise cyber security assessments of controls and practices with accountable and timely remediation.



Pennsylvania and Oregon use trusted and knowledgeable external organizations to perform audits and risk assessments as a quality check. The Department of Energy National Laboratories is an excellent resource for security assessments.

- **Security event simulations:** Best-practice states conduct and participate in cyber security simulations like cyber storm exercises.
- **Relationship building:** Best-practices states have solid working relationships with other states, sharing information, analysis centers (Industrial Security Awareness Councils), best practices and lessons learned.
- **Security framework:** Best-practice states use a security framework such as SANS 20 Critical Controls: “Critical Controls for Effective Cyber Defense V4.1.”

Energy Management

Leading states issue policies and standards requiring the management of computer equipment and operations to reduce energy consumption and greenhouse gas emissions. These are coordinated with and integrated into an overall statewide energy conservation and greenhouse gas reduction strategy. Examples of best practices include:

- Automated power management systems
- Enablement of Intel® vPro™ technology for desktop power management
- Extensive virtualization of servers in the data center; Indiana has virtualized 50 percent of its servers and Utah has virtualized over 72 percent
- Retrofit or design of data centers with hot aisle/cold aisle and airflow containment; California achieved 1.6 power usage effectiveness (PUE) during the retrofit of the Gold Creek Data Center
- Tracking, monitoring and reporting of energy consumption, including PUE in data centers
- Policies to close non-tier III and server rooms
- Capturing and utilizing waste heat; waste heat captured (17.3 billion BTUs) from the Salt Lake Data Center is used to heat Capitol Campus for 9 months a year (on average, this is enough energy to heat 95 houses a year)
- Using building automation systems to enable remote monitoring and management; Michigan’s Building Intelligence System (MI-BIS) and Minnesota’s BAS integrate facilities



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data and ICT management into state goals for energy conservation and greenhouse gas reduction targets

Governance

Governance is the intersection point where IT service, system and project delivery align with the overall goals and strategies of the state. Effective governance aligns ICT resources and services with outcomes sought by the governor and cabinet. The operational variability of government and the changing nature of the executive branch resulting from the four-year election cycle make state ICT governance dynamic. What fits one state may not fit another. What worked under the last governor may not be effective under the new governor.

States that handle governance well seem to share some common themes, including:

- An effective planning process that integrates the strategic direction of IT with the overall direction of the governor and cabinet, while also measuring performance. Georgia, Michigan, Minnesota, Utah and Pennsylvania are among states that effectively use IT strategies and plans to link their governors’ priorities to actionable IT plans.
- Engagement and support by top state government business leaders (cabinet-level officials) in the strategic direction of IT, project approval, project oversight, operations, services, rate setting, ICT budgeting, standard adoption and policy adoption. Successful examples of this include Michigan, Utah and Minnesota.



- A centralized project management office that leverages multiple functions and expertise into an integrated team to manage and deliver major IT projects or high-risk projects. Successful examples include California, Colorado, Michigan, Minnesota, West Virginia and Utah.

SECTION 3: FINANCE AND ADMINISTRATION

This section identifies best practices in supporting the core administrative functions of state government, which are often referred to as the business systems of government. They keep the bills paid and provide a way to meet the needs of both government employees and those who do business with government. It is the information in these systems that people are looking for when they talk about government transparency. They also generate the raw material that sustains the open data movement. Once commonly referred to as “back office systems,” they now stand at the forefront of state government service delivery.

Open Data Portals

States must make information available on a portal that can be easily accessed by citizens on a 24/7 basis. Citizens can create views of specific information, which is updated as new information is added. Transparency portals provide an effective channel for state agencies to share information that citizens want and may request. Utah estimates that it saves \$15,000 a year from reduced public information requests.

Delinquent Citation Collection System (DCCS)

In 2005, municipal courts in West Virginia were owed an estimated \$10 million in unpaid traffic offenses. A project initiated by the State Tax Department, the West Virginia Office of Technology and 300 identified municipalities developed a self-funded Web-based application to collect the delinquent fees. The DCCS promotes collaboration among local government, state agencies and the private sector to improve efficiency and increase cost-saving methods through technology. In 2011, 47 municipalities used the system to recover over \$180,000 in delinquent fees. Collecting these fees helped to avoid cash flow and budgetary concerns.

Strategic Sourcing

Savvy states that aggressively pursue cost cutting use strategic sourcing and spend management to analyze the effectiveness of their purchases against market conditions. Utah has one of the best examples of enterprise guidance, helping all state employees involved in procurement understand how they can help participate in these efforts to improve contracting outcomes while reducing costs.

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One-Stop Shop for Employee Personal Services

Utah transitioned its employee gateway to the cloud, which contains a wide variety of information and services for benefits, career development and state policies. It provides single sign-on at www.employeegateway.utah.gov to over 23,000 state employees, who can manage 401k investments, update tax information, take online health benefit courses, manage personnel reviews and submit payroll information. Colorado made modifications to its employee self-service application to transition to paperless pay in 2011, which is expected to streamline the process and save over \$60,000 annually.

Next-Generation Electronic Procurement Systems

Most states have legacy procurement systems that are either an integrated module of their ERP system or best-of-breed solutions that support a procurement portal for bidders to obtain bid information, which provide an effective interface with state financial management systems. Older legacy systems often lack workflow, spend analysis capability and an effective interface with legacy accounting systems. Michigan leaders bought some time by adding workflow to their existing system while they plan a new system that will allow for greater transparency.

Colorado OIT is working with procurement officials to implement the OIT Storefront, using a cloud-based application that navigates buyers through the easy-to-use system to identify, evaluate and acquire IT goods and services. Colorado expects to reduce procurement and provisioning



timelines by approximately 30 percent while improving the quality of goods and services being procured.

Arizona's e-procurement system is a good example of connecting purchasing data to better understand spending patterns. This enables Arizona to develop better strategically sourced commodities. Virginia, an early adopter of e-procurement, launched eVA 4 Biz, which provides real-time mobile access to its online procurement system.

Alignment of IT Acquisition

ICT service acquisition is often a key component to successful IT service delivery. If the process is appropriately staffed and integrated into an effective project plan, it can help obtain the right outcomes at the right time. If the process is poorly aligned with the project plan, risk is increased. The relationship between the procurement function and the ICT function is critical and continues to evolve.

To better align IT contracts with the IT organization, Pennsylvania moved the control of IT procurements from the Department of General Services to the Office of Administration's (OA) Office of Information Technology. The newly formed OA Bureau of IT Procurement manages contracts used by state agencies (statewide contracts) and agency-specific procurements. A joint procurement taskforce with representatives from the technology industry provides feedback on alternative procurement processes to reduce work effort and cost for both the vendor community and the commonwealth. California, Colorado and Ohio also moved the IT procurement responsibility from General Services to the CIO office.

Streamlined Travel Reimbursement

Pennsylvania overhauled its travel management policy and processing systems and expects to save \$2 million per year in employee travel expenses. The new policy requires receipts or documentation for all expenses. IT system changes were made to accommodate the timely review of more receipts, and to allow travelers to upload and attach receipts directly to their expense reports. New workflow functionality allows supervisor review and approval of reimbursement requests online. These changes not only save money, but add integrity and accountability to the travel reimbursement process.



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SECTION 4: PUBLIC SAFETY

This section identifies effective ICT practices within the state first responder community. There is perhaps no more fundamental government service than public safety. No society can be successful if the rule of law isn't enforced or if its citizens aren't protected. The systems and tools available to public safety have changed significantly over the past few years — they are more robust, more integrated and they support greater collaboration than ever before. They also make information that was once confined to a brick-and-mortar building readily available to officers in the field via mobile devices.

Integrated Public Safety/Criminal Justice Information Systems

Linking state, local and federal data sources that have not been available to law enforcement organizations can lead to breakthrough opportunities in criminal investigation and law enforcement. The ability to search data sources and analyze structured and unstructured data is one of the most powerful tools for law enforcement. Best-practice examples include the Kansas Criminal Justice Information System (KCJIS), as well as the states of Ohio, Utah, Colorado, Pennsylvania and Michigan.

Digital Imaging

States are driving better law enforcement outcomes with digital imaging. Getting high-quality images and other sensitive data into the hands of officers in the field greatly



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California's Routing on Empirical Data (RED) project

developed a statewide Web-based, GIS database combining millions of records into a secure, usable format that enabled over 460 local 911 answering points and California Highway Patrol to answer 98 percent of all emergency calls within 10 seconds.

improves both officer safety and their ability to conduct successful investigations. For example:

- Michigan was the first to connect with the FBI's facial recognition database, enabling searches based on images captured from videos or even a forensic artist's sketch. When this capability is supplemented with local law enforcement's ability to access automated fingerprints, the combination of data and data analysis is a powerful tool.
- Pennsylvania's facial recognition system integrates 36 million driver's license photos with the Pennsylvania Justice Network's 3.5 million criminal booking photos to aid investigators in quickly identifying suspects.
- License plate reader capability in Virginia and New York allows police officers to identify stolen vehicles.

Collaboration

Collaboration and integrated training among law enforcement jurisdictions is fundamental to achieving success with integrated data systems. Ohio's Law Enforcement Automated Data System (LEADS) and the Ohio Law Enforcement Gateway System (OLEG) join other states with integrated CJIS that link data from all levels of law enforcement and public safety.

Data linked to CJIS provides opportunities for law enforcement to link location-based data to crime incidences.

Michigan uses Data-Driven Approaches to Crime and Traffic Safety (DDACTS) to put more officers in high-crime and accident zones and to reduce traffic accidents.

New York expanded crime analysis and intelligence capabilities with four county crime analysis centers that use a federated search of federal, state and local data. Each center is hiring an expert in intelligence-driven policing and crime analysis to provide training and support to participating organizations.

Automated Workflow

Automated workflow enables traffic and DUI citations to be created online through an enterprise service bus. This connects data and process flows developed by state police, the courts and motor vehicle departments. Some states like Minnesota and Oregon are making the service available to other police agencies in the state. Through service-oriented architecture (SOA), states integrate data from across state and local government and rapidly deploy new services. Utah's Warrants Check System is a good example.

California's Routing on Empirical Data (RED) project solved a critical public safety problem. The rapid expansion of mobile phones made it impossible to keep up with growing demand, resulting in 46 percent of the 11.6 million wireless callers receiving a busy signal. The RED project developed a statewide Web-based, GIS database combining millions of records into a secure, usable format that enabled over 460 local 911 answering points and California Highway Patrol to answer 98 percent of all emergency calls within 10 seconds.

**SECTION 5:
HEALTH AND HUMAN SERVICES**

Changes in federal laws such as the Health Information Technology for Economic and Clinical Health (HITECH) Act in 2009 and the Affordable Care Act (ACA) in 2010 left states scrambling to create programs and systems in response to new requirements. Additionally, citizens' needs for assistance during the recession put tremendous pressure on state HHS organizations that often created ICT challenges.

With these challenges also came opportunities. The U.S. Department of Health and Human Services recognizes the old model of building single monolithic systems to meet



unique program requirements is not sustainable. Policies are beginning to change, accepting, and in some cases encouraging, multiple program use for systems. Funding became available for a variety of innovative state solutions through Early Innovator Grants, Health Information Exchange Challenge Grants and Demonstration Projects to Integrate Care for Dual-Eligible Individuals.

The challenges and funding opportunities put state ICT organizations into overdrive to respond with significant improvements. Following is a list of best practices and state efforts responding to challenges in HHS.

Online Benefit Self-Service

HHS departments are constantly being challenged to provide quick and easy access to the programs they administer. Citizens expect to have the ability to assist themselves, especially in the area of benefits. Online self-service makes it possible for them to do so 24/7 from any location. It also allows for greater process standardization, more consistent data collection and better system integration. Perhaps even more importantly, it allows state employees to focus their personal interactions with clients on those cases that require intervention, which improves service delivery without the need to add employees.

Michigan added all human service benefits, including cash, energy assistance, medical and daycare to its MI-Bridges self-service application. Initially built to allow citizens to apply online for food assistance, other programs are now leveraging this one-stop, self-serve application.

Colorado OIT launched its Program Eligibility and Application Kit (PEAK), allowing citizens to screen and apply for medical, food and cash assistance programs online. PEAK allows individuals to conveniently access a full suite of services, including the ability to anonymously screen for program eligibility, apply for benefits, check the status of benefits and update personal case information. Since the launch of PEAK, over 171,009 accounts were created, 134,919 screenings completed and 51,708 applications submitted. PEAK has saved approximately \$1 million in operational costs while reducing application enrollment times by over 30 percent. OIT also launched a self-service model for the Colorado Child Care Assistance Program, providing

a Web portal for the Childcare Automated Tracking System that allows parents to apply and renew benefits and request county hearings online.

Program Integrity

Fraud, waste and abuse continues to vex assistance programs in every state. In a recent Governing Institute survey of state and local leaders, 53 percent said that eligibility fraud will increase in importance over the next two years. Four out of five of the leaders surveyed said that eligibility verification is either very important or the most important initiative to achieve their mission. Florida is piloting an identity authentication system with software that verifies a person's identity based on personal information similar to online financial services.

Telehealth

Telehealth uses ICT and statewide broadband networks to support long-distance clinical health care, patient and physician record sharing, patient and professional education, and health administration. The Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS) is using telehealth across the state to conduct crisis evaluations and psychiatric admission evaluations. With live, interactive audio-video communication or videoconferencing between the person in need and the crisis service delivery system, it is a viable option for delivering behavioral health services in rural and underserved geographic regions. In FY 2012, crisis service providers conducted an estimated 3,986 evaluations.

Other states, including California and Oregon, are extending broadband connectivity to rural and urban regions so that telehealth networks can provide more health services to underserved residents. Colorado launched a pilot program to connect prisons to the telehealth network.

Integrated Service Delivery

Aligning the architectures of different systems to respond to disparate federal program requirements can be a challenge, but it can have huge rewards, including reducing redundancy and costs. The federal government recognizes this and encourages shared usage through policy changes and funding opportunities. In 2011, the U.S. Department of



Health and Human Services announced new rules to give states more flexibility “to adopt innovative new practices and provide better, more coordinated care for people with Medicaid and Medicare.”¹

South Carolina is a demonstration state for dual eligibility coordination for Medicare and Medicaid. When completed, this will provide a step towards integrated service delivery that will also move to a more citizen-driven experience, rather than a program-driven experience. California, Colorado, Connecticut, Massachusetts, Michigan, Minnesota, New York, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, Vermont, Washington and Wisconsin are also working on projects to coordinate care for individuals with dual eligibility. Ohio is developing an integrated eligibility system built on SOA. Once in place, the system will benefit HHS agencies in Ohio by being interoperable with external systems and adaptive to changes in policies and business rules.

Kentucky’s health insurance exchange completed 7,000 applications in the first 48 hours it was launched.

Express Lane Eligibility

Express lane eligibility (ELA) enables states to streamline and automate enrollment and renewal of children in Medicaid and the Children’s Health Insurance Program (CHIP). States like Alabama, Iowa, Louisiana, New Jersey, Maryland and Oregon are approved to leverage eligibility findings from other need-based programs like Head Start or the National School Lunch Program to determine eligibility of uninsured children. An ELA can potentially furnish a single online application to identify and retrieve relevant information from other state databases and apply business rules² to make real-time eligibility determinations.

Louisiana’s Medicaid Program and the Department of Children and Family Services collaborated to automatically enroll children who are eligible for one program, such as the Supplemental Nutrition Assistance Program (SNAP), into another program like Medicaid or CHIP. This reduces the need for applicants to submit enrollment paperwork for each program.

Health Insurance Exchanges

Sixteen state or quasi-government exchanges were launched in October 2013. Building these exchanges was a monumental undertaking for the states, requiring a massive amount of work in an arguably insufficient length of time. To meet the requirements of ACA, most states building their own exchanges had to update or replace legacy systems and build new interfaces to link to Medicaid, CHIP and state exchanges. New people, roles, policies and systems with interfaces to multiple legacy systems outside of state government create a complex challenge full of risk.

The initial rollout of state exchanges has encountered bumps in the road. Some exchanges were overwhelmed with more transactions than were anticipated; others were unable to complete enrollment transactions. However, there were success stories as well. Kentucky completed 7,000 applications in the first 48 hours and Connecticut had impressive early enrollment figures.³ California, Colorado, Connecticut, Kentucky, Massachusetts, Minnesota, Nevada, New Mexico, New York, Rhode Island, Vermont and Washington exchanges were able to accept applications and create accounts within the first week.

Emerging best practices include:

- **Simple design:** States that were able to keep the design simple and initial services more basic met project deadlines. Less moving parts in a fixed timeframe reduces risk of schedule overrun.
- **Iterative development:** These projects required agile development methodologies to roll out and test modules incrementally. Complex systems with multiple dependencies can mitigate risks with phased rollouts.
- **Rigorous testing:** Early testing is critical for any successful IT system rollout. The challenge for states with more complex systems or with late starts was that they didn’t have sufficient time to test and remediate. Connecticut and Minnesota tested access to the critical federal hub (identity and income verification from various federal agency databases) as early as possible, but states did not control when critical interfaces with federal systems could be tested. Early testing of interfaces allowed states to remediate and retest and avoid problems.
- **Collaboration:** The New England States Consortium Systems Organization (NESCSO), led by Massachusetts and



supported by the University of Massachusetts Medical School, comprised the technical and business leads from Connecticut, Maine, New Hampshire, Rhode Island, New Hampshire and Vermont. It provided a forum for states to share lessons learned, best practices, joint development and technology.

SECTION 6: TRANSPORTATION AND MOTOR VEHICLES

Highways, bridges and state transportation networks not only get us where we need to go, but allow us to move and deliver our nation's products and goods. Transportation has a profound impact on the nation's economy. State departments of transportation have the role of constructing, maintaining and operating this valuable asset. Like never before, technology is playing an increasingly important role, helping states create an efficient, safe and cost-effective transportation infrastructure.

Over the past two decades, the poster child for government process improvement has been the motor vehicle office. Often maligned for long lines and wait times, most states have now applied process automation, electronic commerce and online self-service transactions to meet many of the public and dealer licensing needs. Yet many states still maintain legacy systems and struggle with regulatory and legislative changes involving citizenship and driver's licenses.

The following section highlights best-practice states that are using ICT to optimize and improve the operation and maintenance of their transportation assets and manage their motor vehicle processes.

Intelligent Transportation Systems

Coupled with traffic management centers (TMC), intelligent transportation systems (ITS) effectively optimize traffic operations and maintenance of the transportation infrastructure. ITS works best when effective regional governance structures exist. Roads, bridges and other transportation modes interconnect through jurisdictions throughout the state, making collaborative planning essential. The system in operation must share data and information among jurisdictions, not only to present a holistic view of the transportation network, but to synchronize the system.



SHUTTERSTOCK

A key to the success of Ohio's ITS is the use of off-the-shelf products, standard TDP/IP protocols, nimble internal software development and cloud-sourced speed data.

For example, Michigan's corridor dashboard is able to show the public a border-to-border overview of I-94. Ohio's open regional architecture and Utah's architecture help facilitate data sharing from multiple legacy systems throughout the region. A key to the success of Ohio's ITS is the use of off-the-shelf products, standard TDP/IP protocols, nimble internal software development and cloud-sourced speed data.

Other attributes of an effective ITS include:

- Computer-controlled coordinated traffic signals
- Management of traffic incidents
- Location reporting for maintenance equipment
- Dynamic reader-board message signs
- 511 motorist information telephone system
- Traffic and road condition portal

Other best practices:

- Automated vehicle location (Installed GPS devices help get the right resources to the area in need for maintenance and weather events. For example, Minnesota is able to continuously monitor snow plow locations.)
- Data sharing agreements
- Effective governance structures
- Modular approach to projects

High Occupancy Toll (HOT) Lane

In an innovative approach to toll operations, the Georgia Department of Transportation and the State Road and Toll Authority are implementing a system of demand toll lane management based on variable pricing for the toll related to the



Over 1 million citizens in Virginia now receive online account PIN, vehicle and license renewal notices by text messaging, email and voicemail, saving the state \$2.5 million in postage alone.

congestion and demand for lanes. The management system uses mobile automated license plate readers (ALPR) to manage toll charges and to aid in enforcement of occupancy requirements for cars traveling in the HOT lanes.

Mobile Traffic Application for Smartphones

Tennessee's SmartWay mobile applications and Utah's mobile app provide motorists with traffic information, incident reports, alerts and road conditions customized to users' routes or county.

Tablet Kiosks

Kiosks speed drivers through license renewal. The Tennessee Department of Safety and Homeland Security uses iPads in 26 driver service centers located primarily in urban areas to help improve wait times for customers who need to renew or replace driver's licenses. Customers use a special application on the iPad to complete and pay for their license renewal or replacement using a credit or debit card and receive their new license within minutes.

Next-Generation Portals

Next-generation portals enable online renewal of driver's licenses, vehicle registrations and title transactions at the convenience of the customer. California, Minnesota and

Virginia (MyDMV) allow citizens to access personal secure accounts for information about driving records, licenses, registration expirations and owner information.

Over 1 million citizens in Virginia now receive online account PIN, vehicle and license renewal notices by text messaging, email and voicemail, saving the state \$2.5 million in postage alone. Approximately 11.5 million California customers made online transactions and 8.1 million vehicles were registered on California's portal in 2011. In Utah, drivers can renew their license and register to vote online. Pennsylvania processed nearly 36 percent of all vehicle renewals and approximately 31 percent of all driver's license renewals through its website in 2012. The Minnesota Licensing and Registration System (MNLARS) project is scheduled to be completed in 2016 and will provide customers with an account view of their vehicle and driver information. Automated self-service transactions will streamline processing and enable better performance measurement. In Maryland, people over 40 can take vision tests at their optometrist and have the results submitted online. Over 355 participating optometrists sent 2,500 vision certificates through the portal in 2012.

Smart Roadside Inspection System

New Mexico uses license plate reader technology to scan license plates on commercial trucking and match them against real-time data in the Federal Commercial Carrier Safety Administration's Compliance, Safety and Accountability (CSA) database. This returns a score, which helps New Mexico officers decide if a closer inspection is needed.

Smart Bridges

The departments of transportation in Minnesota, Nevada, Kentucky and Florida are equipping bridges with sensors built to provide data on vibration, corrosion and day-to-day performance.⁴

Electronic Permitting Systems

Self-service, Web-enabled permitting systems for oversized, overweight and other specialized equipment allow carriers to quickly acquire permits. North Dakota sells 75 percent of its permits online. Kansas is developing a Web-based permitting system involving the departments of transportation, revenue and highway patrol that will feature an advanced GIS interface to provide auto-routing.



Pennsylvania is using e-permitting to automate highway occupancy permits (HOP) issued to businesses, utilities, developers, homeowners and municipalities that require access to state roadways. The old system had many handoffs, as county and district offices performed multiple governmental reviews. The new system automates workflow and allows permit tracking. The average completion time for a permit has dropped from up to 45 days to 10 days. The system may be leveraged as a platform for future automation of multi-function/jurisdiction workflows.

SECTION 7: CITIZEN ENGAGEMENT

This section features best practices in open government, online services, mobile services and social media.

Open Government

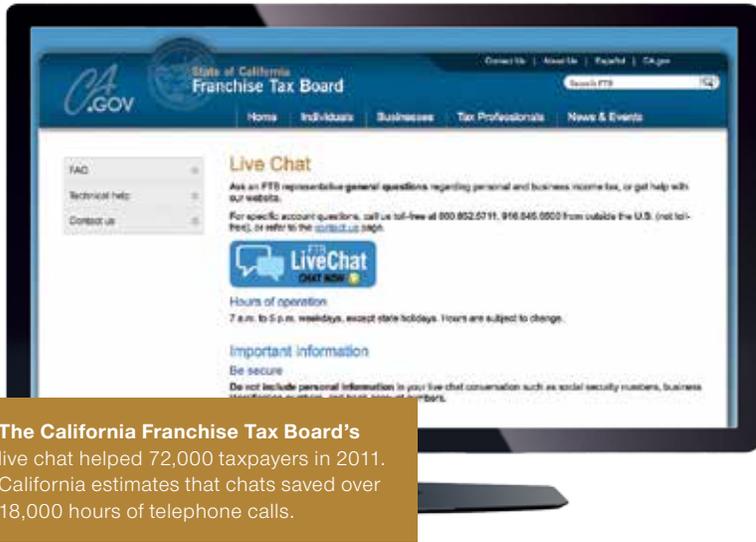
Also known as transparency, open government is a response to constituents seeking access to an ever-expanding set of information that ranges from salary records and agency expenditures to tax credits and revenues. By providing commonly requested information to the public via easily navigable open government portals, smart states are finding benefit in the reduction of demands for live interfacing. These portals are proving to be an effective and inexpensive way for state agencies to share information. In some states, transparency sites are spurring a two-way discussion between citizens and state agencies, which is a necessary element of citizen engagement. Examples include:

- **Dashboards** showing performance by program or agency give citizens insight into government operations. Tennessee has a user-friendly site providing citizens with comparative performance in key program areas. Michigan also provides a user-friendly site, showing prior and current performance metrics in key program areas with easy “thumbs up or down” indicators of progress. Agency performance is also monitored through monthly agency scorecards. Indiana provides a dashboard of agency performance, including specific key performance measures.
- **Open application program interfaces (APIs)** allow citizens to create mash-ups of data from websites and embed links to data from a state open data portal that automatically notifies third-party sites when data is refreshed. Michigan, Utah, Oregon, Washington and California are examples of states with open APIs.
- **User-created views and graphs** allow citizens to create their own views of data and provide options for tabulating and graphing data. California, Oregon and Washington, among other states, offer this capability.
- **Video** is being offered by some states for constituents to view either in real time or on demand. Tennessee is a best-practice leader in this area.
- **Integration of local government data** makes open government portals in states like Utah and Michigan a great one-stop site for citizens.

Citizen Online Services

The promise and driving force for e-government operations is the expanding ability to provide self-service applications to citizens and businesses that can be accessed through a Web browser. Best-practice states are in the second or third generation of systems that offer intuitive, simple-to-use Web pages, permitting citizens to obtain services like license renewals from a mobile computing device. Payment engines allowing secure and easy payment transactions and robust search capabilities characterize these portals. A number of best-practice states have well over 1,000 online services available on a 24/7 basis.

- **Enhanced search capability:** The most important and effective tool on a website for users is an effective search tool. Michigan is using Google’s newest search appliance to provide more accurate and focused search results for site users. Enhanced search capability includes new tools such as query expansion to extend a user’s search query by adding search terms that are more relevant than the terms users may initially use. Utah’s use of search instantly changes results as users type the search topic.
- **Uniform design and security guidelines** published by Michigan ensure consistency, simplicity, improved access and secure customer experience for all state website visitors. Mobile guidelines facilitate the development and interoperability of mobile devices.
- **One-stop business portals** provide streamlined licensing and renewal for businesses, professionals and citizens.



The California Franchise Tax Board's live chat helped 72,000 taxpayers in 2011. California estimates that chats saved over 18,000 hours of telephone calls.

States like Michigan and Utah use this system to provide a single point of entry to users and to streamline the payment process with a single payment system. Over 99 percent of all professional license renewals in Utah are online.

- **Customer feedback and usability testing:** Citizen engagement means not just getting information out to the customer 24/7, but also listening to the customer to create an experience where citizens get what they need the way they want it.
 - Michigan works with Michigan State University twice a year to perform usability testing with a focus group to validate design and taxonomy.
 - Utah asks at the bottom of its Web pages if the information on the page is helpful. This single survey question is more likely to be answered than a more lengthy survey and enables the placement of pages and continual evaluation of whether citizens are getting the information they seek.
 - Oregon requires its contractors to perform usability testing on all new designs. Agency customers and Oregonians are asked if they are willing to participate in user testing. Testers are then asked to perform specific tasks on designs. Their reactions and efforts are observed, recorded and analyzed. The process is carried out iteratively as designs are modified to improve their usability.
- **Live chat:** States like California, Indiana and Tennessee use a live chat feature on their websites to help citizens

find services. The California Franchise Tax Board's live chat helped 72,000 taxpayers in 2011. California estimates that chats saved over 18,000 hours of telephone calls. The effective use of live chat improves the citizen experience and, with its penetration in online retail, has become a standard that customers expect from any website.

Mobile Services

- **Mobile device access:** With the explosion of mobile devices, state websites must provide immediate and user-friendly access to information. Michigan uses an “auto-detect” feature on its website that recognizes if a mobile device is accessing its home page, redirecting the user to a mobile-friendly site. Other states like Indiana, Tennessee and Utah use responsive design technology that allows the state portal to render Web pages dynamically, based on users' screen resolution. This permits easy viewing of the website from a wide variety of mobile devices and removes the need for a separate content page.
- **Use of quick response (QR) codes and imagery technology:** In Michigan, users with mobile reader applications can take a picture of a bar code on a document and are immediately linked to a website with corresponding information. Indiana embeds a QR icon in every IN.gov page, allowing users to acquire the Web URL through the scanned QR code and easily access the page from a smart device.
- **Standard Web-based multiple platform:** Mobile Template v4.0 is used by California's Mobile Development Program to create mobile applications in a few hours when coupled with agency data. This gives agencies low-cost alternatives to creating mobile-based alternatives. California, Utah and Tennessee are good examples of states that post their mobile apps for public use. Utah.gov's innovative “Connect” portal allows users to access and submit mobile applications.

Social Media

States use social media, including Twitter, Facebook, YouTube, Flickr and others to share information and interact with citizens. Many states utilize social media to promote citizen engagement with agencies and programs within



government. Successful use of social media is often found in public safety, transportation and health and human services.

Utah.gov's "Connect Portal" is one of the best examples of citizen engagement using social media, giving users a portfolio of tools to engage with Utah state and local governments. Users can submit applications, videos and photos; download feeds, podcasts, apps and widgets; and connect with a wide variety of government-related social media tools. South Carolina also uses a connect page concept to channel citizens into an easy-to-use site to access agency social media. Michigan's site provides a gallery of social media for state agencies with access to policies, procedures and style guides for social media.

CONCLUSION

The past two years have been unprecedented. State governments are caught between severe austerity measures and an unrelenting demand to modernize legacy systems and provide new services to citizens. During this critical period, ICT organizations responded with innovative solutions and best practices that pave the way for more digital states.

It is critical for transportation, criminal justice and human services systems to share data. Within these communities, the collaborative development of architecture and data management is essential to meet the demand for more and better data. Data sharing must not stop within program boundaries, but must bridge programs, jurisdictions and citizen needs. Interoperable design to easily accommodate broad and pervasive data sharing will support ongoing success of the digital state. Sophisticated business intelligence tools to help analyze a universe of ever-growing data will help make more effective policy decisions and develop new breakthrough solutions.

System/application interoperability does not end with data. SOA applied within programs and across the enterprise through service buses enable workflow to make processes lean and efficient. Using more efficient workflow processes has enabled some states' criminal justice communities to manage ticketing more quickly, accurately and cost-effectively than ever before.

In health and human services, tremendous investment is in progress to leverage existing systems or build new ones to enable single eligibility processes. Rather than require citizens to navigate multiple systems, why not link the

systems? Or better yet, rationalize them so that an individual can sign on to a single system to address all government interactions. Why can't this theme extend beyond HHS to all touch points within government? Several states are starting with self-service benefits. The digital state of tomorrow must be more citizen centric in approach, eliminating program funding and budget constraints that create barriers and lead to unnecessary system duplication.

In the future, the pace of change will continue to accelerate, in part due to technology. In the digital state, system modifications and new applications will be completed, tested and placed into operation to support business objectives faster and with better results. To achieve this requires accelerated improvements in project management, procurement, oversight and governance. A state must continue to innovate its delivery cycle if it is to keep pace. High-risk, short-fuse projects like health insurance exchanges will become the rule, not the exception. To be prepared, digital states will have hybrid cloud capacity in place with effective cloud governance structures and policies.

Security will challenge the digital state. States with integrated risk management frameworks for managing not just cyber risks, but all risks, will be better prepared. States with strong governance models that always assess risk for business operations and technology will be better positioned to protect the security and integrity of their information. Digital states will invest in, support and measure performance against proven cyber security frameworks like the SANS 20 Critical Security Controls.

Citizen engagement means more than just sharing information with citizens. The digital state will not only make information easily accessible to citizens, but will use more sophisticated thinking, usability testing and constant citizen feedback to design and deliver system that citizens want and can easily use. Citizen engagement means listening to the public and responding with meaningful services, information and answers. More citizen-driven, self-service applications must be developed. In the digital state, individual agency-provided systems will give way to a single citizen site where agencies interact with citizens.

The promise of citizen engagement is high, but the stakes are higher. Effective citizen engagement sets the stage for state government to redesign itself to achieve a more responsive and cost-effective digital government.



ENDNOTES

1. U.S. Department of Health and Human Services, New Flexibility for state to improve Medicaid and implement innovative practices, April 14, 2011
2. Putting Children on the Express Lane to Health Insurance, The Kaiser Commission on Medicaid and the Uninsured, January 2010
3. State-Run Health Insurance Exchanges Showing Early Success, Chris Kardish, *Governing*, October 7, 2013
4. American Association of State Highway and Transportation Officials, August 23, 2013k, Press Release

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