

IT-AS-A-SERVICE IN STATE AND LOCAL GOVERNMENT

*LEVERAGING TECHNOLOGY AND
INNOVATIVE STRATEGIES TO LOWER COSTS
AND PROVISION SERVICES ON DEMAND*



INTRODUCTION

One year ago, Utah was in the same precarious situation as many states across the nation. As the country had fallen into recession, budgetary challenges had increased substantially — concurrent with calls for assistance from state agencies, local jurisdictions and the public, all of which were suffering their own financial setbacks.

State leaders were vapor-locked. They knew they needed to provide more services with fewer dollars, but to do that, changes needed to be made. Changes that would certainly reap financial rewards in the future, but required start-up money that wasn't there.

Fortunately, Utah had an ace in its pocket. The state had begun moving IT personnel under one department years before and had consolidated its 38 data centers down to two in just 18 months. With organizational barriers under control, the state could begin thinking more creatively and in 2008, leaders launched an innovative plan to establish a private cloud.

That plan was nearing completion in 2009, and when state agencies and local municipalities called for help, Utah had an answer. An answer that would not only help the agencies, cities and counties to obtain the needed services at a lower cost with increased security, but that would save the state \$4 million annually.

Utah's plan is an example of the evolution of computing in which technologies and strategies such as consolidation, virtualization and cloud computing are combined to produce a hybrid approach to IT service provisioning — an approach that can reduce costs, increase flexibility and improve services for all involved.

Utah isn't alone. Other state and local governments are also on the hunt for efficiencies. This white paper will discuss the technologies involved in a new model of delivering IT as well as the challenges in implementing such an environment and the benefits that can be realized if success is achieved.

WHAT IS IT-AS-A-SERVICE?

Simply put, IT-as-a-Service is a pay-per-usage, business needs-driven, on-demand approach that delivers IT services according to well-defined service level agreements. IT continues to be critical to agency operation, but the entity providing it and how it is provided, does not. IT becomes a tool to meet business needs, the means to an end, rather than the end itself.

ITaaS does not mean that all IT functions are outsourced to a third party IT service provider as in "lights out"¹ outsourcing. Instead, it is a shift in service delivery away from the philoso-

CHARACTERISTICS OF ITAAS

- ✓ Multi-tenancy for more than software
- ✓ Known cost of all IT services, whether provided internally or by third parties
- ✓ Pay-per-usage for all IT services
- ✓ Reduced ownership of IT resources, including IT staff
- ✓ Elastic service levels based on business unit needs and funding levels
- ✓ IT is no longer a black hole for funding or charged back as overhead
- ✓ All providers — internal and third party — measured against agreed-upon service levels
- ✓ Internal IT operation competes against third-party IT providers

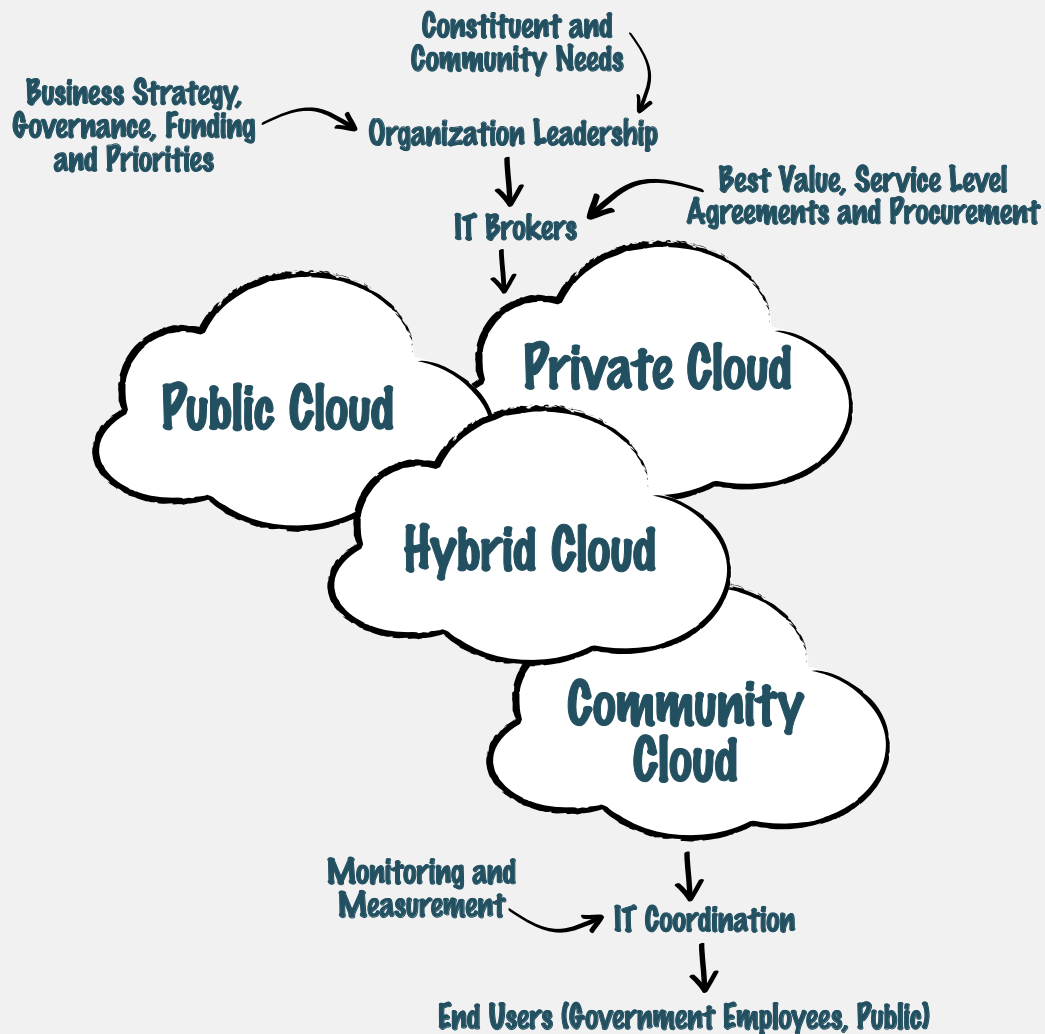
phies of "do it yourself" or "outsource to a third party," to a blend of the right sourcing options that mask the IT resources and operations from end users, focusing instead on elasticity, availability and affordability of enabling IT. Underlying this delivery approach are the people, processes, and technologies necessary to deliver IT solutions in a standards-based, technologically sound, secure environment.

In an ITaaS model, internal IT resources could instead become brokers and coordinators of services, not necessarily providers. ITaaS also differs from outsourcing in that some IT services may be provided by in-house IT staff, using resources owned by the organization, but these services are provided on-demand, with a pay-per-usage, service level-oriented approach. Governance, planning, procurement and contract management remain crucial for success.

THE EVOLUTION OF ITAAS

ITaaS is the next step in the evolution of IT service delivery. It focuses on what is delivered, when needed — and not on how, where or by whom. ITaaS builds on the principles and combines the advantages of consolidation, shared services and cloud computing — and uses virtualization as an enabling technology — to reap even greater rewards in the form of lower costs and better IT provisioning. In order to fully understand ITaaS, it's important to look at how these technologies and strategies work together.

ITaaS Model



IT CONSOLIDATION

IT consolidation is the process of abstracting and combining common technology functions from separate operating divisions to act as a shared service back to the divisions. It provides a number of benefits for government agencies, including eliminating the capital cost of hardware, reducing carbon footprint and freeing up staff time. As organizations

look to lower costs and provide services more efficiently, they often start with consolidation.

Such was the case in Utah. The state began with stringent — and sometimes rapid — consolidation when it began moving to a cloud model. “This is very real and very useful,” says Stephen Fletcher, Utah State CIO. “After you go through that you realize you are a center of excellence because you are operating very efficiently.”

The state of Tennessee has also embraced consolidation and is often cited as an example of saving money when you have little or none to spend. In 2009, the state was supporting 81 percent more servers and 175 percent more databases despite a 17 percent decrease in employees due to economic conditions.²

CLOUD COMPUTING

Clouds are a large pool of easily usable and accessible virtualized resources that can be dynamically reconfigured to adjust to a variable load, allowing for optimum resource utilization. Cloud computing is a pay-per-use model in which guarantees are offered by the provider through service level agreements. Many of the advantages that cloud computing has traditionally offered — including economies of scale — can be seen with ITaaS.

Utah has chosen to harness the advantages of both the public and private cloud (see Cloud Classifications sidebar) and has moved thousands of physical servers into a virtualized infrastructure. The state's cloud infrastructure provides a multi-tiered approach to cloud provisioning, including Infrastructure-as-a-Service, Platform-as-a-Service and Software-as-a-Service (See Navigating the "As-a-Service" Models sidebar).³

The state is using cloud computing to provide ITaaS. "What you find is that you can partner with a small city or county that doesn't have a lot of capital to use," says Fletcher. "You can trade that capital investment for their operation and maintenance budget, so you can be a real consumer. You don't have to have a huge investment in capital because it is just part of your operations. This is a very appealing option for cities and counties if they don't have budgets out there to move forward."

SHARED SERVICES

Sharing services — and collaboration in general — is an important part of a successful ITaaS model, and something that will undoubtedly become more common in the future as state and local governments continually strive to pare down costs. Fletcher says that the poor economy has forced his state to discuss and look at things in a different light — these kinds of discussions can lead to the consideration of different models that help state and local governments survive in the short term and thrive in the long term.

"Rich people are poor collaborators because they don't have to do it," says Fletcher. "Poor people have to scratch and beg and collaborate so they can get done what they have to get done. It is

CLOUD CLASSIFICATIONS

Private Cloud — In a private cloud arrangement, cloud technology is used within an organization to provide software in an on-demand manner. This type of cloud is for government entities that want to have a large amount of control or who utilize unique applications. Organizations can sometimes leverage existing infrastructure for a private cloud.

Public Cloud — A public cloud is hosted by a third party and is available to many users. Software and services are delivered through secure Internet connections. With a public cloud, government organizations can gain access to infrastructure that is already in place and eliminate the need to make a large upfront investment.

Hybrid Cloud — A hybrid cloud is a combination of different deployments of cloud. Organizations that use applications that are cyclical — such as applications at school districts that are used heavily during registration months, but very little throughout the rest of the year — can use hybrid clouds. The hybrid cloud is less of a new model and more a statement that one size need not fit all. A given organization can mix and match cloud models, depending on the application and requirements for portability.

Portability of applications and software environments between external public and internal, onsite clouds is a key feature of hybrid cloud infrastructures. The ability to move applications onto public clouds when additional hardware resources are needed relies on the presence of a common software frame. This flexibility allows an organization to take the benefits of the private and public cloud and make the right platform decision for each of their systems.

Community Cloud — Community clouds are gaining in popularity, and are typically formulated when several organizations with common interests or needs come together to share IT resources. With a community cloud, multiple cities or several related state agencies can share the same cloud.

a great environment as it has forced us to talk about these things in a different light.”

VIRTUALIZATION: ENABLING TECHNOLOGY

Virtualization separates resources from the hardware that provides them and is both the enabling technology for IT consolidation, and the essential catalyst for transitioning to cloud computing.

In Tennessee, virtualization has allowed the state to provide services (rather than host them) to agencies in an end-to-end model. “(Provisioning services) is tied heavily to virtualization efforts. It allows the agencies to not have to worry about refreshing hardware and instead they give us a monthly fee. We can provide everything from the maintenance, administration, backup and storage. We have been doing that for years and it is working very well,” explains Tennessee CIO Mark Bengel.

**GETTING STARTED:
TRAILBLAZER TIPS AND TRICKS**

While an ITaaS model certainly leverages modern technology to be successful, it also requires innovative thinking when it comes to organizational structuring and business processes. Moving to a new model can give state and local governments an impetus to

evaluate their existing operations. For state and local governments looking to provision services, there are best practices.

METRICS: FIND OUT WHERE YOU ARE

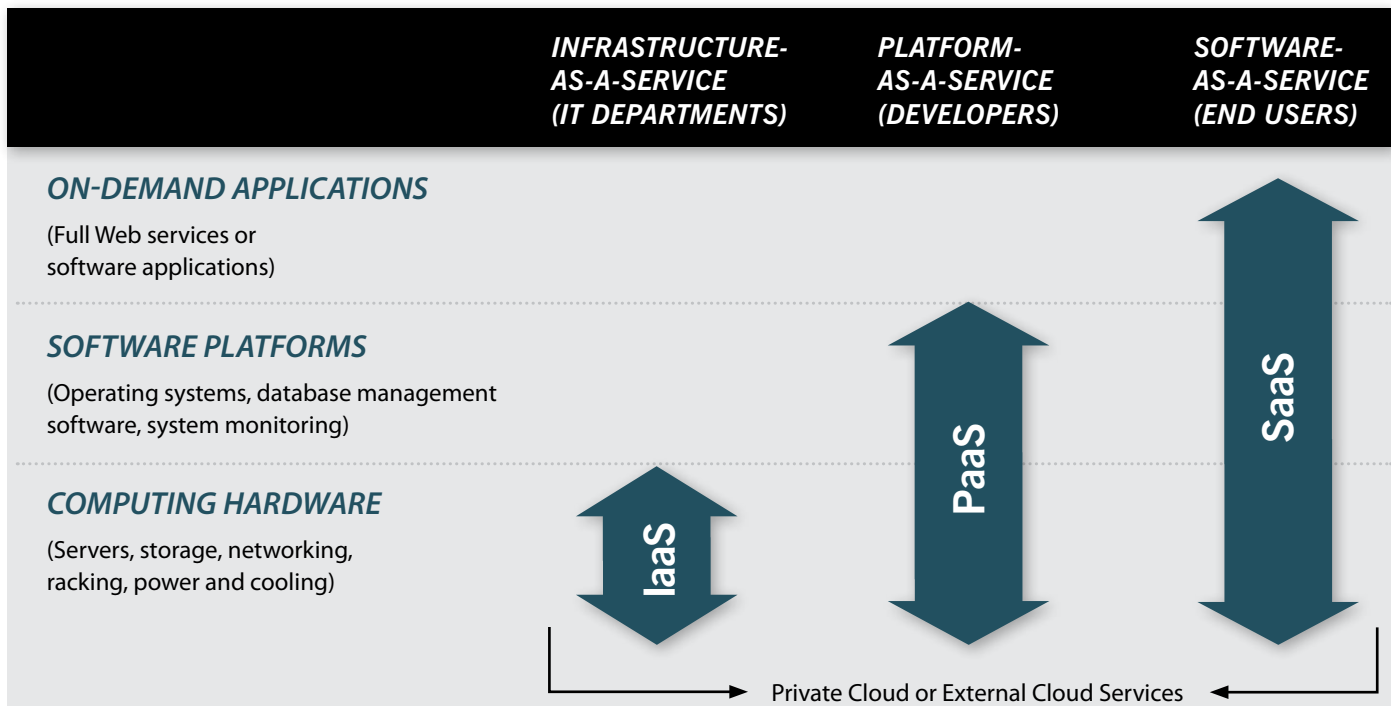
Utah CIO Steve Fletcher says that organizations that want to provide IT services must have good metrics in place, but before they can develop metrics, they must evaluate and have a firm understanding of how they are currently providing services and what their costs are.

“A lot of people don’t control their IT activities and can’t get a handle on how much they pay,” Fletcher says. “These are the fundamental and basic issues and in a lot of cases are really not understood.”

As agencies move forward in delivering IT-as-a-Service, metrics — and the tools to set those metrics — continue to be important. Agencies must be diligent in defining the products and services they are going to provide.

SERVICE LEVEL AGREEMENTS: SETTING EXPECTATIONS

Closely related to and dependent upon metrics are service level agreements (SLAs). SLAs are vital for an organization to measure performance and ensure it is delivering technology effectively and on time.



NAVIGATING THE “AS-A-SERVICE” MODELS

Infrastructure-as-a-Service

Providing computing, storage and network resources in near real time on a pay-as-you-go basis to state agencies and local government jurisdictions.

Platform-as-a-Service

Provisioning database management and system software in near real-time on a pay-as-you-go basis to state agencies and local government jurisdictions.

Software-as-a-Service

Giving state agencies and local jurisdictions access to software via the Internet. In Utah, customers can access state-provided software such as fleet management and finance.

Tennessee CIO Mark Bengel is a firm advocate of the power of service level agreements to transform an organization’s IT shop. When Bengel began as CIO, there were 420 people in what Bengel describes as a “very unpopular organization.”

“I had no way to measure my operational performance until someone called in and complained. (There was) no way to know which parts were performing well and which parts were not,” Bengel says.

By establishing SLAs for every area the organization provided services, Bengel was able to set a baseline to know what to expect from his staff — and what customers could expect from the organization.

“When we first started we were only meeting about 72 percent of our SLAs the first year and by the second year were meeting them at 98 percent. Now we are at about 99 percent,” Bengel says. “That is really due to shining the light on the issues and moving forward with process improvement.”

CULTURE CHANGE: ELIMINATING ‘TURF WARS’ AND MISCONCEPTIONS

Change can sometimes be hard in government and some of the biggest challenges leaders may encounter when proposing an IT-as-a-Service model are employees fearing the loss of control and the perception that consolidation means that someone will

be laid off. When implementing any kind of change, it is critical that there is support from the top — many an IT project has failed because of poor leadership.

“Change is a good thing,” Fletcher says. “One of the biggest culture changes you have to get over is the concept of giving up control. They (the agencies) still have control, because they pay for it. It is a change in the way they think because they control it financially.”

Any time re-organizations or changes in structure occur, there can be a fear that employees are going to be laid off — particularly during tough economic times when lowering costs is a first priority. But utilizing the tenets of ITaaS streamlines operations, allowing organizations to save money on hardware and software costs. Rather than layoffs, employees can be redeployed to other areas and higher value work that focuses on improving operations rather than struggling to stay afloat.

SECURITY AND MANAGEMENT: EMBRACING CONSTANT CHANGE

Fear of perceived security problems is one of the top concerns for CIOs when looking at options like cloud computing to deliver services. It’s important to understand that security in the cloud requires a different approach. Legacy security solutions worked by keeping things locked down and static. Cloud-based models and ITaaS require rapid and dynamic reconfiguration. Security for cloud-based models cannot stop or prevent change and dynamic movement — it has to embrace it.

State and local government leaders are increasingly finding that third parties deliver better security controls than they can themselves. That was the case for the New Mexico Attorney General’s Office when it recently deployed a cloud-based e-mail system.

Before selecting the cloud provider’s application suite and storage options, the office looked at their standard security policy. “The attorneys looked at it, and they talked to the cloud provider’s attorneys,” says CIO of the Attorney General’s Office James Ferreira. “We felt that the cloud provider had better security than we did, with 24/7 physical security and advanced monitoring of accounts.”

Utah’s Fletcher says that it is important to address concerns up front and outline exactly what is expected. “We say, ‘Anyone that works with state data must conform with the same background check and security check that we impose on employees in the

state. We want a list of all the people who are going to be handling our information and we want to know if they have passed background checks and a security review.’ We put that in our RFP because that is what the requirement is.”

Like security, management is critical in successful implementations of new IT delivery models. However, the management model in ITaaS environments also needs to evolve — moving from preventing and minimizing change to embracing constant change as the natural state of IT.

Management can be a concern for agencies used to having data in a physical location and leaders can sometimes perceive hosting data in a cloud as giving up control. But Fletcher disagrees. “You are switching from control of management to paying for and saying how you want it to be done, he says. “There is greater empowerment.”

ON THE HORIZON

By harnessing the advantages of technologies and strategies like consolidation, virtualization and cloud computing, ITaaS is quickly becoming a reality for state and local governments. By employing these technologies and strategies, government leaders are already realizing cost savings, enhanced data sharing, and increased availability — imagine what can be achieved by combining them with best practices based on governance, planning, procurement and contract management. The resulting IT service delivery model could reverse the trend of increasing costs and complexity.

Following this path for the evolution of IT service delivery could ultimately result in the elimination of IT as a separate business unit. Instead, the organization’s strategy would lead to implementation of initiatives that include IT as an enabling component. IT-only projects would no longer dominate public sector’s to-do list and process improvement, project management, development of business requirements, and measurement of success could be conducted

elsewhere in the organization with business and executive leadership and oversight.

A team of business professionals — including those with IT procurement subject matter expertise — could obtain the services needed to achieve the organization’s strategy. This team could broker the best value solution from among competing providers. Public sector agencies could focus their resources on government services and meeting the public’s needs, leaving IT product and service delivery to organizations that specialize in it.

With ITaaS, access devices could be distributed directly to end users based on their needs and replaced instead of repaired when needed. Although this approach requires ubiquitous connectivity and true plug-and-play capabilities, these are becoming increasingly available. With decreased complexity, low cost, replaceable hardware and increasing levels of end user IT sophistication, support could be delivered virtually in most cases.

Other services within today’s internal IT operations could be folded into overall government administration. For instance, IT strategic planning becomes a component of government strategic planning; IT disaster preparedness and recovery becomes part of the organization’s continuity of operations plan; IT policies are included in employee policies, and responsibility for data retention and access belongs to records management officials. Even security of IT systems and resources can be folded into the organization’s security unit or provided by a chief security officer responsible for security of all assets.

By steering public sector away from the questions of who delivers IT and from where, government officials could instead drive IT innovation by demanding flexibility and capacity to do the things they want to do — or those things the public desires. Through ITaaS, state and local government’s attention could return to where it belongs — on the front lines to maximize the use of public funds and improve public service delivery.

ENDNOTES

1. The term “lights out” refers to IT operations that do not require a human to be physically present.
2. “Cracking the Consolidation Code,” Center for Digital Government, 2009. <http://www.govtech.com/library/papers/Cracking-the-Consolidation-Code-Getting-it.html>
3. <http://www.nascio.org/awards/nominations/2010/2010UT6-Nascio%20Utah%20Cloud%202010.pdf>



VMware is the global leader in virtualization and cloud infrastructure. From the datacenter to the desktop, VMware solutions significantly reduce the costs and complexity of IT and enable more agile service delivery. Leveraging our industry-leading virtualization solutions, VMware provides an evolutionary path to cloud computing that preserves existing IT investments, security, and control. VMware is revolutionizing the way IT serves its customers and providing a clear, pragmatic path to cloud computing.

Learn more at www.vmware.com/industry/government.



The Center for Digital Government, a division of e.Republic, Inc., is a national research and advisory institute on information technology policies and best practices in state and local government. Through its diverse and dynamic programs and services, the Center provides public and private sector leaders with decision support, knowledge and opportunities to help them effectively incorporate new technologies in the 21st century.

www.centerdigitalgov.com

ACKNOWLEDGEMENTS:



Liza Lowery Massey, Senior Fellow, Center for Digital Government

Liza Lowery Massey is an associate professor for Information Systems Management at the University of Maryland, University College, a senior fellow with the Center for Digital Government, and a columnist for *Public CIO* magazine. Previously, Liza served as the IT executive for the city of Los Angeles and, prior to that, the city/county of San Francisco. During her public sector career, she was recognized in the Top 25 Doers, Dreamers & Drivers of IT in Government.



Jeana Bruce is the director of publications at the Center for Digital Government. She is the former editor of *Converge* magazine and holds a bachelor's degree in journalism from the University of Missouri — Columbia.