White Paper

Changes in IT Consumption and What They Mean for Government and Education Organizations

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Introduction

Government and education organizations have recently begun changing the way that they consume Information Technology (IT). Individual Lines of Business (LOBs) within these organizations have been sidestepping traditional implementations. They have procured and implemented services directly from providers, rather than working through traditional technology procurement and delivery paths. Frequently referred to as "Shadow IT," this new method of procuring services bypasses an organization's traditional procurement team, and can open the door to unknown security risks. In addition, what may have started out as simply an effort to embrace a more efficient model, such as commodity cloud services, can result in multiple clouds within an organization, presenting the same problems that technology and server sprawl have created previously.

This paper provides Cisco's perspective on changes in government and education IT procurement in response to IDC's January 2014 article "How IT Consumption Is Changing in the Public Sector." In this paper, we will examine and bring light to:

1. The changing nature of government and education IT consumption
2. The impact these changes have on public sector missions
3. Implications to security, data availability, and portability
4. Economic impact of collaboration, data availability, and reliable network management
5. IT solution acquisition strategies: Build or buy easily deployed solutions?

IT decision makers need to consider carefully all factors before deciding which consumption model or combination of consumption models to choose. Cisco has a comprehensive solution portfolio that accommodates new consumption models, including network infrastructure, cloud and data center solutions, security, and collaboration applications.

Discussion

1. What is meant by the term "IT consumption," and how is IT consumption changing?

"IT consumption" refers to the way organizations and individuals use information technology assets for a variety of purposes, including administrative functions, collaboration, analytics, business improvement processes, and fulfillment of mission objectives. The ultimate objective of network professionals is to balance IT consumption factors such as cost, efficiency, productivity, competitive advantage, and desirable outcomes.

> "Today, IT consumption is based on acquiring what is needed from a model that can be implemented quickly enough to impact the desired outcome in a much more compressed timeframe, and a model that allows for the acquisition of additional services/feature functionality as use cases are discovered."
>
> **— Andy Campbell, Cisco Collaboration Business Development Manager**

IT consumption also refers to the ways in which organizations and departments acquire the resources that they need to do business. Options include capital expense for direct equipment purchase with expenses to operate and maintain IT assets, financing and leasing models, and managed service offerings. For several decades there was, in essence, only one consumption model: acquire upfront, deploy on premise, implement over time, and hope that by the time implementation occurred the solution could still provide the impact envisioned back when it was acquired.

Many organizations are migrating away from capital expenses toward more managed-service offerings. These offerings allow organizations to pay for what they use and or to pay as they go.

This simplifies IT consumption by eliminating the need for direct capital expenses, lifecycle equipment maintenance costs, and costs to refresh equipment. It also allows organizations to transfer risk to service providers and to have the agility and flexibility to choose the right services to meet their business needs. Many CFOs and CIOs like the budget and expense predictability that managed services offer. However, convenience and choice can result in overall cost increases in some cases and lower performance standards in others.

2. What is the impact of these changes on the mission of typical government and education organizations?

Government and education organizations are now able to add, subtract, and modify service delivery in a more flexible manner. New consumption models allow public sector customers to impact their missions more quickly with very targeted services and feature functionality that drive desired mission outcomes within a much shorter time horizon. This provides a tighter alignment between government and the constituents being served.

> "More advanced managed service offerings, such as hosted collaboration services are now available, but IT professionals should be careful to only procure these services from vendors that have a track record of quality service and support."
> **— Gary Hall, Cisco Chief Technology Architect, Federal Intel**

Impacts of changing consumption models vary by an organization's mission area and functions. Many organizations find a hybrid approach that blends traditional on premise IT services with new managed service offerings to be effective. Mission-critical functions may be maintained on premise or migrated to secure private cloud offerings, while administrative functions like email and HR processing may benefit from managed service offerings.

The flexibility and choice provided by managed services have the potential to rapidly shift government and education technology spending from enterprise IT departments out to the lines of business. For federal agencies, the shift toward spending through lines of business will result in more consumption by mission elements. In addition to reducing and shifting costs, there are many tangible benefits government and education organizations can potentially realize, as described in Table 1 below.

Table 1. Benefits of Cloud Computing

Benefit	Comment
Cost Savings	Organizations can reduce or eliminate IT capital expenditures and decrease ongoing operating expenditures by paying only for the services they use and, potentially, by reducing or redeploying their IT staffs.
Ease of Implementation	Without the need to purchase hardware, software licenses, or implementation services, an organization can deploy cloud computing rapidly.
Flexibility	Cloud computing offers more flexibility (often called 'elasticity') in matching IT resources to business functions than past computing methods. It can also increase staff mobility by enabling access to business information and applications from a wider range of locations and/or devices.
Scalability	Organizations using cloud computing need not scramble to secure additional, higher-caliber hardware and software when user loads increase, but can instead add and subtract capacity as the network load dictates.
Access to Top-End IT Capabilities	Particularly for smaller organizations, cloud computing can allow access to higher-caliber hardware, software, and IT staff than they can attract and/or afford themselves.

Benefit	Comment
Redeployment of IT Staff	By reducing or eliminating constant server updates and other computing issues, and by cutting expenditures of time and money on application development, organizations can focus IT staff on higher-value tasks.
Focusing on Core Competencies	Arguably, the ability to run data centers and to develop and manage software applications is not necessarily a core competency of most organizations. Cloud computing can make it much easier to reduce or shed these functions, allowing organizations to concentrate on critical issues such as (in government) the development of policy and the design and delivery of public services.
Sustainability	The poor energy efficiency of most data centers, due to substandard design or inefficient asset utilization, is now understood to be environmentally and economically unsustainable. Cloud service providers, by using economies of scale and their capacity to manage computing assets more efficiently, can consume far less energy and other resources than traditional data center operators.

In contrast to the hybrid and managed services strategies described above, organizations that are capable of doing so can develop and implement their own private cloud(s). By integrating server, storage, and network technologies into a converged solution, organizations can establish a solid, purpose-built private cloud. For example, The New Mexico Department of Information Technology built a private cloud based on a Cisco Unified Computing System™ (UCS) platform that offers a complete application infrastructure for the state's agencies. "We felt we needed to develop bigger, better, faster, cheaper services than the agencies can develop on their own," says Michael Martinez, IT Department Director. The cloud implementation supports both internal and citizen-facing applications, which can now be rolled out in less than a day.

By consolidating operations on virtualized platforms, the state saves money, space, and energy. In addition, the IT team created a revenue stream by charging back for the services, giving them more budget for keeping their technology up to date. In essence, they have become a leading-edge service provider within the government. One of the most significant cloud computing opportunities for the public sector is the capability to share technology resources among multiple agencies. While governments have tried hard to create frameworks geared toward shared services, these have not always been successful. Cloud computing offers an easier and less burdensome route to more efficient and effective public sector information management. This may be especially true for smaller or tightly budgeted organizations that do not have the technology, skilled personnel, or resources to create world-class infrastructures.

3. What are the implications for security, data availability, and portability?

New consumption models based on cloud service delivery allow for more consistency in the areas of security (for example, FedRAMP), data availability (such as increased risk allocation across a larger pool of resources), and portability (including reduced dependency on the skills of locally available resources).

> "Organizations can no longer rely on point in time or stove-piped solutions; rather, they have to look at an integrated strategy that covers the entire consumption model" Gary Osland."
>
> **— Cisco Cyber Security Business Development Manager**

Taking advantage of new consumption models based on cloud service delivery enables government and education customers to provide operational soundness today in security, data availability, and portability, while being able to adapt to requirement changes in these areas more quickly and with more effectiveness as needs arise. While new cloud models may support more consistency regarding security, the new IT consumption model has greatly increased the attack surface for adversaries, causing public sector organizations to rethink their security strategies and frameworks. With the move to always on customer service and data consumption, availability and portability become paramount to success.

The consumerization of IT means more people have and want access to data from more devices, so organizations must adapt to meet the needs of the mobile work force. This means organizations must find a way to wrap governance, process, and security around their IT resources and user data. It is also important to note that public cloud offerings are not secure or reliable enough to process sensitive or classified data. Most government and education organizations have a responsibility or a requirement to provide secure, reliable services to leaders, citizens, and other stakeholders. Many regulations make public cloud services impractical. Fortunately, alternatives exist that achieve the same economic and productivity benefits while securing data and increasing reliability. Alternative IT consumption models include secure, private cloud offerings, on premise "cloud-like" offerings, and application-centric infrastructure.

> "As the workforce continues to mobilize, IT must follow their lead and implement policies that expand and scale to meet the needs of their users and their users' customers."
>
> **— Michael Shepherd, Cisco Public Sector Cloud Computing Business Development Manager**

Organizations that require highly secure and reliable IT resources need to understand how to secure data throughout its entire lifecycle, from creation of original source data, ingestion into the network, and through replication and exploitation. This data journey spans machines, devices, applications, interfaces, networks, and data centers. In order to accomplish these objectives, IT professionals must take advantage of the intelligence in the network, next-generation cryptography, context-aware and content-aware computing, and security at every level, from the device through the network to the data center.

Cisco can help educate customers about choices in commodity clouds, Cisco Powered™ clouds, and traditional build-your-own network architectures. This enables customers to make choices that deliver the most efficient, secure, and architecturally sound solutions that make use of existing investments in network, data center, and communications solutions.

4. Do things like collaboration, data availability, and reliable network management have an economic impact on government and education organizations?

In the current economic environment, government and education entities must continue to do more with less; obligations to past financial commitments continue to grow as a percentage of their budgets, while requests by constituents for service delivery continue to increase. These entities have turned to technology for decades as a means to increase productivity. Public sector financial constraints and constituent service requirements are drivers of new consumption models, and public sector customers are demanding new IT consumption models because they are no longer able to risk their limited capital on projects where all the risk falls to them. These customers are strongly encouraging service providers to craft new ways to take advantage of collaboration technology for enhanced constituent interactions and more productive intra-government communication; new models by which data is available at the right time and space for the user requiring access; and new means by which network-based services are always available to constituents.

Collaboration, access to data, and reliable networks have a significant impact on public sector organizations as they continue to deal with the slow recovery and shrinking budgets. These tools provide organizations with the necessary resources to deliver IT services to any device, anytime, and anywhere data is required, which ultimately can reduce costs, increase productivity, and increase customer satisfaction.

5. As for "solution acquisition strategies," is it better for most government and education organizations to build their own solutions, or to buy easily deployed solutions?

Simply put, there is no one answer that is better for most government and education organizations. The most appropriate IT consumption model is wholly dependent on the specific use case presented by the specific customer *and* the customer's desired time frame and outcome for the use case in question. What's important is that providers offer customers choices for IT consumption that provide operationally sound models to achieve government and education customers' requirements.

Easily deployed solutions typically offer pre-tested standardized technology that can allow organizations to quickly keep up with technological advancements without over-tasking the IT workforce. Public sector organizations have been under constant pressure to keep personnel costs down and many are under hiring freezes. This makes it very difficult to allocate resources to research and develop in house solutions.

> "Which IT consumption model is most appropriate is wholly dependent on the specific use case presented by a given customer and that can be attained in a timeframe suitable to achieve the IT consumer's desired outcome for the use case in question."
>
> **— Andy Campbell, Cisco Collaboration Business Development Manager**

The short answer is that public sector organizations should employ both consumption models; core applications should remain behind the corporate firewall and non-core applications can and should make use of the scale and economics of public clouds. As cloud solutions continue to evolve, workload mobility will become more mainstream, which will mean public sector organizations will be able to take advantage of both models to maximize costs, access, and scalability (Hybrid Clouds) for individual workloads.

The bottom line is that every organization is different and what is right for one agency may not make sense for another. The best thing for government and education organizations to do is to start by mapping their business needs and processes to their key technology enablers. That is the first step toward developing an architectural approach that will identify the most productive and effective ways to manage their IT consumption. Once they have clearly identified their needs and have an idea of the basic technologies and services that can help them fulfill their needs, they should begin the process of finding the right vendors and service providers to help them. Most public sector organizations do not have the resources or expertise to conduct full-scale network architecture reviews and assessments. In these cases, it makes sense to rely on trusted advisors, such as Cisco, and to benchmark successful IT transitions that have already been accomplished by their peers and mission partners.

Conclusion

IT decision-makers need to carefully consider all factors before deciding which consumption model or combination of consumption models to choose. Cisco has a comprehensive solution portfolio that accommodates new consumption models, including network infrastructure, cloud and data center solutions, security, and collaboration applications to enable each phase of a technology transition. Cisco is the only IT company that can provide secure network access to data center and collaboration applications from a single vendor, ensuring access to information, people, and applications on any device regardless of operating system. In addition, Cisco understands the unique requirements of consumption models for government and education organizations and stands ready to guide our customers through change, help solve business problems, and prepare organizations for the future.

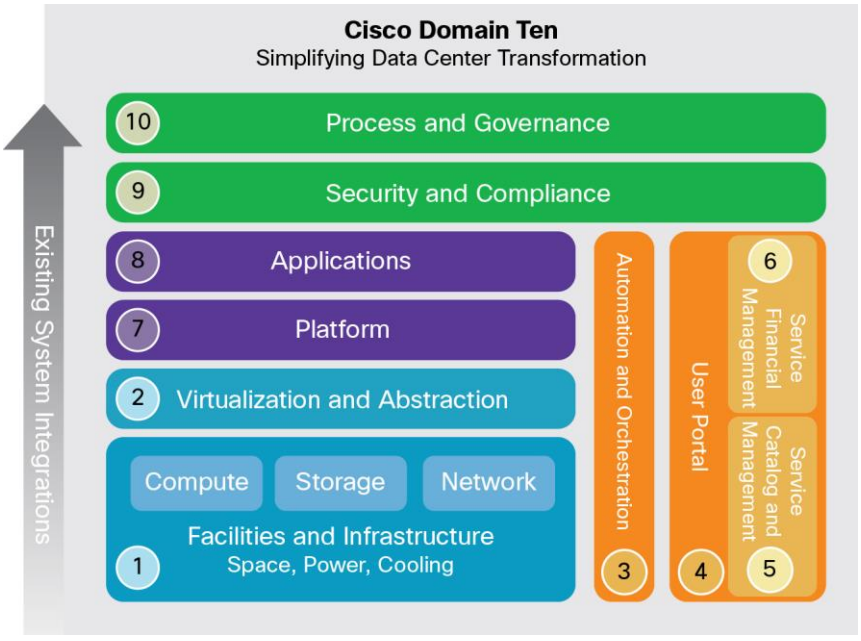
Our value lies in our foresight and ability to see around corners with regard to:

- Core routing and switching requirements to connect to the cloud
- Empowering organizations with Cisco® Unified Fabric/Cisco Unified Computing/Cisco Intelligent Automation for the Cloud/Cisco UCS® Director
- Helping customers to understand the benefits of application-centric infrastructure
- Enabling government and education customers to take advantage of X as a Service (XaaS) with either on-premises or off-premises assets
- Understanding security challenges as consumption evolves
- Understanding the enabling infrastructures for Cisco Collaboration Solutions

The challenges of the new consumption model combined with rogue Shadow IT spending are quite significant for CIOs. In fact, in a recent survey of 165 organizations representing over $47 billion in IT spending, conducted by advisory firm CEB, CIOs estimate Shadow IT at 40 percent beyond official IT budgets. So, how can we help you successfully manage cloud adoption and transition to an agile IT services management organization?

In working with customers across many industries, we have developed the Domain Ten framework to help successfully transform the data center into a more agile, cost-effective resource (see Figure 1).

Figure 1. Cisco Domain Ten Framework



The Cisco Domain Ten℠ framework covers all of the important aspects of infrastructure, virtualization, and automation to better map your transformational journey to the new IT consumption model through virtualization and cloud adoption. In addition to technology considerations, the framework covers security, compliance, process, and governance implications. Our Domain 10 framework e-book can help you visualize and start to identify gaps and create an architectural roadmap for consolidation and virtualization, cloud, and applications: http://www.cisco.com/assets/services/cloud/cisco-domain-ten/index1.html.

The first step is to gain visibility into cloud usage by identifying all cloud service providers and understanding the whole picture of your organization's cloud usage and its associated costs and risks. With this visibility, you can then establish a strategy to mitigate costs and risks associated with cloud usage and put in place an optimized governance program for cloud. Next, we will help you transition towards an agile IT services management organization, creating an automated, services-oriented private data center, as well as a services catalog connecting employees to private and public IT service resources. Finally, through our Cloud Consumption Optimization Service and Cloud Enablement offering portfolio, we will ensure your transition success using the industry's leading data center services and products to formalize an effective, agile IT services management organization for you.

Acronyms

CFO	Chief Financial Officer
CIO	Chief Information Officer
HR	Human Resources
IT	Information Technology
LOB	Line of Business
UCS	Unified Computing System

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

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Printed in USA C11-731399-00 04/14