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Cloud in the public sector: Shifting from stalled to driven

A tipping point in innovation, flexibility and value for agency cloud migrations

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In 2019, the U.S. government introduced its "Cloud Smart" policy, saying:

"The case for using cloud capabilities in government has been clearly proven— to drive savings, to improve security, and to deliver mission-serving solutions faster." [9]

Cloud computing today is considered a highly mature technology. It is the stable infrastructure that drives organizations in almost every industry. In the public sector, cloud deployment has moved beyond cost concerns to be a key enabler for digital transformation. As government agencies and public sector organizations worldwide face an uncertain and budget-constrained future, cloud represents perhaps the only viable option to help them sustainably fulfill their mission and deliver digital services that citizens demand.

Globally, 57 percent of public sector leaders feel that accelerating cloud adoption is business critical, and 83 percent feel that it is essential to fuel innovation and enable new business models.[1]

Consistent with its "Cloud Smart" strategy, the United States government is increasing its cloud spending. Deloitte estimates that U.S. federal agencies spent $6.9 billion on cloud in 2020.[2] However, that spending was only a small proportion of the total federal IT budget of $88 billion.[3] Meanwhile, commercial spending on cloud technologies is outpacing government, with approximately 32 percent of total IT budgets dedicated to the cloud.[4]

While CIOs often cite security and compliance as barriers to cloud adoption, a major hurdle continues to be legacy infrastructure. Simply keeping the lights on for existing systems can consume more than 90 percent of the IT budget for some agencies.[5] In the United Kingdom, official figures showed that "£480 billion of the Government's operating revenues and at least £210 billion of non-staff expenditure, such as pensions and entitlements, were reliant to some extent on legacy [systems]."[6]

The Institute of Government says, "Relying heavily on legacy technology creates several risks for organisations: data and security vulnerabilities; being locked in to uncompetitive support arrangements with a single supplier; and a proliferation of work around processes as systems cannot keep up with changing business needs. The organisation as a whole becomes less responsive, as it becomes costlier and takes longer to adapt public services to policy or other changes."[7]

The compromise between the maintenance of legacy systems, the operational and data silos they create and IT modernization and service innovation is no longer sustainable.

As countries slowly emerge from the COVID-19 pandemic, public sector organizations are faced with increasing citizen demand for services. At the same time, budgets and revenues are decreasing sharply. In the U.S. alone, some estimates suggest that state governments face a shortfall of $500 billion or more.[8]

The public sector has reached a tipping point. If there were once a choice between spending on legacy systems or investing in cloud driven digital transformation, it does not exist anymore. Delivering excellent citizen services requires the scale, agility, flexibility and cost-effectiveness of cloud computing.

1   Accenture, Public Service cloud: A continuum of opportunity. (2021)
2   Deloitte, Don't just adopt cloud computing, adapt to it. (2022)
3   Bloomberg Government, IT Modernization Funding Expected to Fall in FY 2020. (2019)
4   Foundry, Cloud Computing Study 2022. (2022)
5   Nextgov, Some Agencies Spend More Than 90% of IT Budgets on Legacy Systems, Report Finds. (2016)
6   Institute for Government, The hidden obstacles to government digital transformation. (2018)
7   Ibid
8   Center on Budget and Policy Priorities, States Need Significantly More Fiscal Relief to Slow the Emerging Deep Recession. (2020)
9   Federal Office of Management and Budget, Federal Cloud Computing Strategy. (2019)

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The benefits of cloud computing for government

The Gartner® 2020 CIO Agenda found cloud to be one of the three main game changers for public sector bodies.[10] Moving to a cloud-driven strategy will help the public sector in the following areas:

Flexibility and efficiency

With a cloud service provider, agencies do not need to worry about relying on limited resources, buying and housing servers and hardware, updating software or data protection. Using the cloud makes it easy to add and change services without the hassle of work stoppages or adding or removing digital space. This flexibility means that new services and applications can be brought online quickly to help boost employee productivity and efficiency.

Cost savings

Using the cloud when more space or computing is needed eliminates the cost of additional servers and hardware. The cloud also allows agencies to shed their physical data centers and costs related to maintaining legacy infrastructure. In addition, the on-demand, pay-for-what-you-use model replaces capital expenditure (Capex) with operational expenditure (Opex) that is regular and predictable.

Security and compliance

Compared to legacy, custom-built applications housed locally, the cloud is well equipped for cyber security, often reaching levels that would be unattainable with on-premises infrastructure.[11] Cloud providers continually improve and upgrade to the highest levels of information security and data protection, with the added benefit of backing up and restoring data to ensure high availability and business continuity. With regulations in many countries ensuring cloud suppliers meet stringent security requirements, government organizations can be confident that the cloud solutions they have adopted are as secure as possible.

Data and integration

The public sector is facing a "data tsunami," as the volume and variety of data that agencies must handle increases exponentially. In many cases, existing systems struggle to cope with the demands of big data. The cloud offers both the scalability to accommodate the growth in data and the ability to make that data available to systems—such as artificial intelligence (AI) and analytics—where it delivers the most value. It overcomes many legacy integration issues with application program interfaces (APIs) that make it easy to securely transfer data between applications.

Collaboration and innovation

Beyond just sharing documents, cloud services also allow government employees and contractors to access documents from anywhere in the world with internet access. This allows agencies to create digital ecosystems of partners, suppliers and other entities to work together on the development and delivery of new citizen services. In addition, the cloud allows for the rapid delivery of increased compute capacity to quickly scale and test ideas and models.

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10 Gartner, Cloud Strategy Leadership. (2017)

11 Ibid

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Agility and delivery

Cloud-based collaboration enables government agencies to transition from waterfall to agile development methodologies. They can also deploy low- or no-code solutions for application development and service delivery that speed time to market while improving service quality.
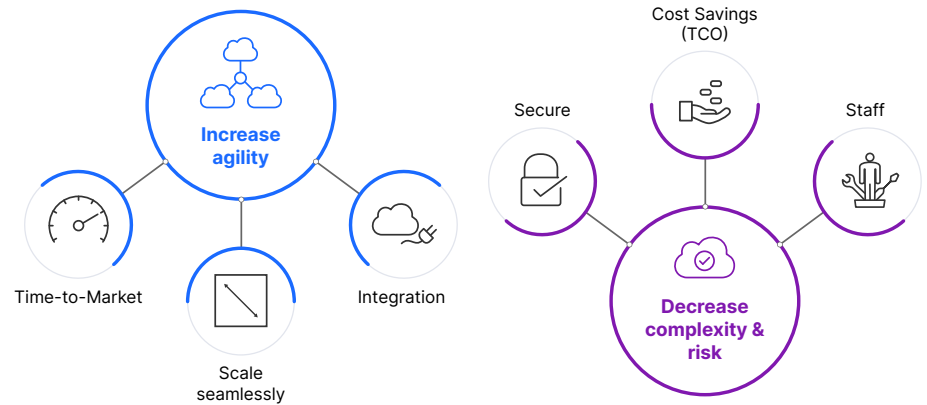
Government workloads in the cloud accelerate innovation

Private vs. public cloud

Public cloud services offer government agencies a cost-effective way to update their data infrastructure. A key benefit is pay-as-you-go scalability, which means that agencies can avoid making large initial investments in hardware and software solutions. They can start with small deployments and gradually expand to update and modernize their entire infrastructure.

Concerns over security, privacy and vendor lock-in have led the government sector to adopt private cloud two-to-one over public cloud.[12] However, Gartner suggests that most private cloud deployments amount to a virtualized on-premises infrastructure that lacks the scalability or flexibility of pure cloud implementations. Gartner has found that fewer than five percent of government private clouds are enjoying full cloud features.[13]

But there are feature-rich private cloud platforms available—such as the OpenText™ Cloud—that offer levels of service customization, performance, compliance and information governance comparable, and sometimes superior, to those of a public cloud provider.

To address the perceived shortcomings in private or public models, government agencies are beginning to gravitate towards hybrid clouds. This has the potential to offer the best of all worlds, with agencies able to build the optimal mix of public cloud, private cloud and on-premises infrastructure.

The early hybrid alternative was to maintain all sensitive data on premises and move everything else to the cloud. Today, this model has matured and government organizations can choose to place workloads on the platform best aligned to their mission needs and budgets.

12 Gartner, Understanding Cloud Adoption in Government. (2018)

13 Ibid

14 Nextgov, White House Makes Subtle But Significant Changes In Final Cloud Smart Policy. (2019)

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One of the most important benefits of this approach is that it virtually eliminates the risk of vendor lock-in, as an agency can create multi-cloud environments to meet its business and operational needs.

Traditional cloud deployment models reflected a progression of increasing vendor-ownership through system layers. "Industry has since moved to a more finely differentiated set of capabilities at different layers," said U.S. government officials in reference to the Cloud Smart strategy. "The rapid development of both open source and proprietary offerings have made possible today [to have] almost any combination of vendor and Government ownership of these various layers."[15]

A government agency can now select the right cloud services for its needs with the assurance that, in a multi-cloud hybrid environment, it is able to switch services in a matter of minutes.

Security and compliance

A major reason for the increase in governments' migration to the cloud is the success of related security programs, such as FedRAMP in the U.S. These initiatives aim to ensure that government data stored in the cloud is protected and secure, while saving time, money and resources.

In 2019, there was a 30 percent increase in the number of cloud services authorized by FedRAMP and a 50 percent increase in the number of cloud products used by multiple federal agencies.[16] Such growth demonstrates that the FedRAMP program has achieved its goal of building confidence in the security and privacy of the public cloud and established growing demand among agencies.

Other governments with similar security programs include Canada, with its Protected B program, and Australia, with its Information Security Registered Assessors program. U.S. states have rallied around StateRAMP, launched in 2021 to provide similar guidelines for states as FedRAMP does for the federal government.

Contrast this with the U.K., where a "Cloud First" strategy is also in place but there is no specific program to promote security. In a 2020 survey within U.K. government departments, 85.2 percent of respondents cited security as a major barrier to public cloud deployments, while 78 percent cited vendor lock-in.[17]

15 Nextgov, White House Makes Subtle But Significant Changes In Final Cloud Smart Policy. (2019)

16 Federal News Network, FedRAMP's banner year leads to more ideas to speed up, improve the processes. (2020)

17 UKCloud, The State of Cloud Adoption Report. (2020)

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Government agencies that use a cloud security framework can achieve a range of benefits, including:

- Significant cost and time-savings in the assessment process.

- Uniform evaluation and authorization of information security capabilities of cloud solutions and providers.

- Enhanced insights into cloud security capabilities of solutions and providers.

- Increased confidence in cloud solutions and providers.

- Reduced security concerns during cloud adoption.

By offering a standardized approach to security assessment, authorization and continuous monitoring for products and services, cloud security frameworks can help the public sector save considerable time and expense. In addition, they allow cloud service and solution providers to demonstrate the highest levels of security and data privacy to government agencies worldwide.

The foundation for digital transformation in government

Digital transformation is driving the distribution of services and control closer to citizens, employees, partners and ecosystems worldwide. It offers the potential to improve how agencies serve their citizens while reducing pressures on budgets and resources.

However, Deloitte research shows that most government agencies believe they are significantly behind other organizations on their transformation journey.[18] While most admit to struggling with digital transformation, 75 percent of Deloitte respondents said that digital technologies are disrupting the public sector. Virtually all respondents said that those technologies would have a significant impact on their remit.[19]

The reality is that government agencies are highly unlikely to achieve digital transformation through existing systems and infrastructure. While the initial goals for cloud computing in government were improving efficiency, adding flexibility and gaining value for money, its role has now expanded to become the foundation for disruptive technologies that drive digital transformation.

AI and machine learning

AI has developed rapidly to become the government CIO's chief game changer, according to Gartner.[20] AI and machine learning allow governments and agencies of all sizes to digest terabytes of data, resulting quickly and effectively in meaningful conclusions, accurate predictions and forecast models. They can help government agencies serve and protect their citizens.

For example, using an AI-based solution—such as OpenText™ Magellan™—a smart city can support public safety by aggregating and analyzing data on its public spaces to create a more efficient, integrated view of events.

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18 Deloitte, The Journey to Government's Digital Transformation. (2021)

19 Ibid

20 Gartner, Gartner CIO Survey Identifies Organizational Disruption and Funding Shortfalls as Key Challenges for Governments. (2020)

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In the past, the compute power required to handle vast amounts of data and operate these AI solutions hampered deployment. The cloud provides the answer for governments looking to harness the power of AI. In addition to machine learning, AI techniques such as natural language processing (NLP) are being used to extract more value from content and support self-service activities for citizens.

Data analytics

Governments worldwide are beginning to create predictive analytics solutions to improve services and move to preventing problems rather than reacting to them. Deloitte has termed this "anticipatory government."[21] If a government agency is able to properly manage vast amounts of data, it can shift from a reactive to a proactive posture.

The idea that government should focus on preventing problems instead of just reacting to them is not new. What is different today is the ability to do this by regularly—and successfully—analyzing information to identify patterns and trends that give insight into operations and real-world demand for services.

A new generation of AI-assisted analytics solutions—combining AI techniques such as machine learning or NLP with data analytics, and business intelligence—are exploiting cloud infrastructures to enable massive scalability in both data storage and raw compute power.

Process automation

Most public sector processes remain heavily manual. Employees spend large amounts of time in data collection and manipulation, paperwork and email communication. The process is costly, prone to error and often unsatisfactory from a citizen's perspective.

Government agencies are becoming serious about automation. Digital process automation—using cloud-based solutions such as OpenText™ AppWorks™—allows public sector organizations to transform their operations. It creates opportunities to re-engineer processes around customer needs and deliver seamless citizen and employee experiences.

Government workers are already saving thousands of hours previously spent on mundane, manual tasks. Employees at "digital agencies" can spend time on more strategic, mission-critical work. However, this is still the tip of the iceberg. A Deloitte study estimated that AI and automation could free up to 1.2 billion working hours in the U.S. Federal Government, with a potential annual workload redirection valued at $41.1 billion.[22]

Citizen experience management

As citizens increasingly demand digital experiences like those they receive from the private sector, government agencies must look towards improving end-to-end public service delivery through omnichannel communications. That means personalizing the experience at the technology and informational level.

Digital citizen experience management solutions allow for tailored communications with each citizen in the format and on the device of their choosing. In addition, cloud-based identity platforms—such as OpenText™ Identity and Access Management—provide unique digital identifiers for all citizens and employees.

21 Deloitte, Anticipatory government – Preempting problems through predictive analytics. (2019)

22 Deloitte, AI-augmented government: Using cognitive technologies to redesign public sector work. (2021)

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These allow for creating a seamless citizen experience across different service areas and empowering self-service access.

The power behind a low-code revolution

Cloud infrastructure is enabling one of the most exciting trends in government computing in recent years. Public sector organizations are moving to adopt low-code or no-code platforms to increase business agility and reduce costs.

At a time when budgets are constrained, highly skilled technical staff are in short supply and large IT programs have a history of costly failure, low-code application platforms dramatically reduce overhead tied to development while widening the universe of people capable of participating in the project.

Low- or no-code platforms can help take modern public sector IT practices such as agile development and DevOps to the next level. They enable business users and citizen developers to get directly involved in the process of creating new systems and services. These platforms—such as AppWorks—allow the agency to place business goals before technical requirements when modernizing their IT environment.

GCN outlined three areas where the new generation of low-code application platforms tools can help streamline, secure and improve government systems:[23]

Rapid, business-focused development

Traditional development relies on custom code. It requires skilled programmers and business analysts and can take months or years to develop. However, a significant proportion of government solutions include proprietary, open-source and mixed-source code that requires no custom-code development.

No-code application platforms require no custom code. Instead, predefined templates and containers are customized to meet the business requirements. This requires little programming experience and can be completed by a business user. Low-code tools cover as many functional use cases as possible, leaving the extremely complex and specialized use cases to development teams.

Not only does this allow an agency to concentrate on business requirements, it also shortens the development process for simpler applications. Research shows organizations using low- or no-code methods say they are almost 50 percent less likely to report application delivery times that take more than 12 months. In fact, low-code users were 15% more likely to deliver mobile applications in 4 months or less compared to those not using low-code.[24]

Enhanced security

With a traditionally custom-coded solution, agencies can be vulnerable to an attack based on the code that they write. With a low-code solution, the platform provider has a vested interest in keeping its applications and software safe from attack. In addition, the ability of business users to create small applications to address specific business problems can virtually eliminate the proliferation of shadow IT, where users install their own insecure solutions on the corporate network.

23 GCN, How agencies can reduce development time and improve user experience. (2020)

24 Outsystems, The State of Application Development: Is IT Ready for Disruption? (2019-2020)

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Improved user experience

As many low-code solutions allow non-developers to contribute, they effectively increase the size of the agency's development team and further reduce the time it takes a solution to reach the end user. Conversely, less custom coding gives developers more flexibility to change approaches without rebuilding everything from scratch. The time saved from not working on low-level details allows developers to focus on the finer points that truly impact both employee and citizen experiences.

Emerging from the COVID-19 pandemic, the government sector must find a way to deliver systems that ensure faster mission attainment, enhance service delivery, provide more fluid agency operations and enable better sharing and reuse across agencies. All this is necessary to shrink budgets and timescales. A cloud-based low-code revolution can help.

Towards the world of cloud-driven government

Government bodies are under ever-increasing pressure to modernize their data systems and technology. But with tight budgets and limited resources, these organizations are hard pressed to keep up with rapidly changing demands. The benefits of the public cloud are becoming too great to ignore. For many, cloud adoption is no longer an if but a when.

It is time for agencies to become "cloud driven"—to deploy the power and scalability of the cloud and gain full value from new, disruptive digital technologies. The cost, operational and citizen-experience benefits of digital transformation are reliant on a high performance and secure cloud infrastructure.

The barriers to cloud adoption in government are eroding. However, moving to the cloud is not one giant leap, it's a journey. It takes carefully planned steps to make a smooth transition. Fortunately, cloud services, solutions and providers are now in place to enable any agency to move at its own pace and create a cloud-driven environment tailored to its specific requirements.

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