HOW IT INVESTMENT STRATEGIES HELP – AND HINDER – GOVERNMENT'S ADOPTION OF CLOUD & AI

Federal agencies have made significant strides in adopting cloud technologies. But a new survey of government IT leaders reveals that how agencies commit their IT investments plays a key role in their ability to modernize their IT systems, deploy microservices and leverage artificial intelligence. The survey also reveals how IT leaders anticipate shifting investment commitments over the next two years and the primary benefits they expect to gain.

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The rapid rise of cloud computing services is revolutionizing how organizations deliver IT. Cloud's promise of greater agility, improved security and lower costs, however, has been harder to realize at government agencies.

While agencies have made significant strides adopting cloud technologies, IT leaders face complicated investment choices as they seek to modernize an aging and complex portfolio of infrastructure and enterprise applications.

Among other choices, they must weigh which of several IT and cloud investment models will offer the greatest combination of value and security, including:

- On-site, government-run data centers
- Outsourced, privately-managed government cloud / data centers
- Government-only community cloud
- Public/commercial cloud
- Hybrid

Agencies are testing or implementing all of these models to varying degrees. However, a new FedScoop study of federal IT decisionmakers reveals for the first time where agencies are currently concentrating their IT/ cloud investments and how agency executives anticipate adjusting their investment portfolios over the next two years and why.

The study breaks fresh ground in linking how those IT investment strategies are helping, and to a certain extent hindering, agencies and their ability to capitalize on many of the benefits cloud computing services can offer.

The study, for instance, found that 63% of executives at agencies which invest predominantly in a hybrid model, also report being at stages 4, 5, or 6 of Gartner's 6-stage cloud adoption maturity framework, compared to just 34% at agencies that invest primarily in their own on-site data centers.

Those investment commitments also shape how advanced agencies are in using artificial intelligence and technologies such as software containers and microservices, which are serving as pivotal platforms to modernize legacy applications across multiple IT environments.

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Cloud Service Models

On-site, government-run data center

The infrastructure is owned and operated solely for and by an agency.

Outsourced, privately-managed government cloud / data center

The infrastructure is owned and/or privately managed by a contractor for an agency, on or off premises.

Government-only community cloud

The infrastructure is shared exclusively by several government organizations in facilities typically managed by a cloud services provider but under terms that meet federal security and compliance requirements.

Public/commercial cloud

The infrastructure is available to the general public and owned and managed by a cloud services provider.

Hybrid

The infrastructure is a composition of two or more clouds (private, community, or public), often connected to traditional IT, operating as a unique environment bound together by standardized or proprietary technology that enables data and application portability. For example, among executives whose agencies currently use, or plan to use, artificial intelligence technologies, 54% invest primarily in government community, public/commercial or hybrid models. In contrast, among those at agencies not using or planning to use AI, 68% invest mostly in on-site or outsourced data centers.

Agencies are clearly recognizing the potential of software containers to speed application development and portability. Among the 56% of agency IT leaders who said their agency is using or planning to use containers, slightly more belonged to agencies investing primarily in their own on-site, or privately-managed data centers (52%) as belonged to agencies investing in primarily in government community, public/ commercial and hybrid clouds (48%).

The study suggests that agency IT leaders aren't sitting still: 74% of those surveyed said that over the next two years, their agency plans to shift its IT investment strategy. Like investors shifting from bond funds to growth stocks, executives in the study reported big spending swings away from on-site data centers toward government community cloud and hybrid models. Many agencies have good reason to keep investing in on-site and privately managed data centers. But the study points persuasively to the expanding capabilities agencies are achieving as they invest more heavily in modern hybrid or secure community cloud models for their infrastructure and platform services.

The study also details where agencies that have adopted cloud computing have seen the biggest gains; what obstacles still stand in their way; and how civilian agencies differ in their outlook from defense and intelligence agencies.

Collectively, it reveals that agency and IT leaders no longer look at cloud services so much as a way to lower costs as they do an integral component toward modernizing aging IT systems and applications. But more than that, the study points to the growing recognition that investing in a hybrid environment, including government community clouds, will likely lead to greater agility, value, security and reliability over the long term.

Recommendations: This report concludes *with six recommendations* for federal government agencies to consider as they evaluate their approach to a balanced IT investment portfolio.

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mirror_mod.use mirror_mod.use elif _operation == mirror_mod.use mirror_mod.use mirror_mod.use

#selection at mirror_ob.select= modifier_ob.select bpy.context.scene print("Selected" This study is based on a July 2018 online survey of 169 prequalified federal government agency and IT decision makers — 113 from civilian (including independent) agencies and 56 from defense and intelligence agencies — conducted by FedScoop.



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Allocate budget dollars for cloudbased IT services

Responsible for acquisition or contracting of cloud-based IT

Cloud-based IT influencers

Almost half (47%) of respondents reported their agencies are at advanced stages of estimating, provisioning/automating services or operating cloud environments at scale for their IaaS platforms; 44% are at comparable stages with PaaS platforms.

However fully one-quarter of respondents said their agencies are still at the assessment stage for IaaS and PaaS.



Q: How far along is your agency in adopting the following cloud platform models? (Select the farthest stage your agency has reached implementing the following as of June 2018) *Based on Gartner's cloud adoption framework

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Stage 1: Assess readiness / build skillsets

Stage 2: Select cloud service providers

Stage 3: Architect cloud services; mitigate risks

Stage 4: Estimate spending; establish governance

Stage 5: Provision and automate cloud services

Stage 6: Operate cloud environments at scale Agencies are investing in multiple infrastructure and IaaS models. Many respondents (38%) said their agencies invest predominantly in **on-site, government run data centers**; but 20% reported investing predominantly in **government-only community clouds** and 16% now favor a **hybrid**. Agencies are taking a similar approach investing in PaaS, but with a slightly higher proportion (23%) of respondents favoring **government-only community clouds** compared to IaaS investments, and slightly fewer (33%) favoring **on-site**, **government run data centers** for PaaS.



Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for IaaS and PaaS?

Civilian agencies are investing more in hybrid approaches for IaaS (17%) and PaaS (14%) than defense/intelligence agencies. Contrarily, defense/ intelligence agency respondents indicate they are investing more than their civilian counterparts in government community cloud for those platforms, due to the need to modernize and also protect sensitive data.



Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for IaaS and PaaS?

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Base: 158

Defense/Intelligence Agencies



Nearly half (45%) of those whose agencies invest primarily in **on-site data centers** report their agency is still at the earliest stages of cloud adoption. In contrast, 63% of those investing mostly in a **hybrid model** report being at Stages 4, 5, or 6 of Gartner's 6-stage cloud adoption framework.



Q: How far along is your agency in adopting the following cloud platform models?

(Select the farthest stage your agency has reached implementing the following as of June 2018) *Based on Gartner's cloud adoption framework

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Stage 1: Assess readiness / build skillsets

Stage 2: Select cloud service providers

Stage 3: Architect cloud services; mitigate risks

Stage 4: Estimate spending; establish governance

Stage 5: Provision and automate cloud services

Stage 6: Operate cloud environments at scale Similarly, those whose agencies invest more towards hybrid and public/community cloud models also report being more advanced in their PaaS cloud maturity, compared to those that invest primarily in on-site data centers.



Q: How far along is your agency in adopting the following cloud platform models?

(Select the farthest stage your agency has reached implementing the following as of June 2018) *Based on Gartner's cloud adoption framework

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Stage 1: Assess readiness / build skillsets

Stage 2: Select cloud service providers

Stage 3: Architect cloud services; mitigate risks

Stage 4: Estimate spending; establish governance

Stage 5: Provision and automate cloud services

Stage 6: Operate cloud environments at scale Federal agency and IT leaders report that the three greatest benefits their agency has experienced so far from moving to the cloud include the ability to:

- Modernize legacy IT systems
- Improve security posture
- Lower total operating costs

In many instances, agencies have made significant headway consolidating data centers using the cloud, but are still working to consolidate workloads to lower total operating costs.



Q: Which of these benefits has your agency experienced the most progress on in moving to the cloud? (select up to 3)



ANTICIPATED SHIFT IN INVESTMENT STRATEGY OVER NEXT TWO YEARS

74% of respondents reported they expect their agency to shift where it is concentrating its IT/cloud investments over the next two years.*

Top expectations in shifting strategies



applications.**

*Q: Over the next two years, do you expect your agency to shift where it is concentrating its IT/cloud deployment model investments? **Q: If your agency expects to shift to a different IT/cloud model two years from now, which of the following benefits are you expecting to gain? (select up to 3)

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48[%] of those planning to shift their

investment focus said their top reason or expectation was to improve their agency's security posture. The next biggest expectation: For civilian agency respondents, it was increasing speed and agility in developing apps; for defense/intelligence agencies, it was modernizing legacy

Over the next two years, IT leaders overall anticipate sizable investment swings away from on-site data centers, toward government community, public/commercial and hybrid cloud models.



*Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for IaaS? **Q: Which type of IT/cloud deployment model is likely to receive the biggest increase in its IT investment 2 years from now for IaaS?

When it comes to platform services (PaaS), respondents expect the biggest investment increases over the next two years to go toward government community, public/commercial and hybrid cloud models.



*Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for PaaS? **Q: Which type of IT/cloud deployment model is likely to receive the biggest increase in its IT investment 2 years from now for PaaS?

Defense/intelligence respondents anticipate the biggest IaaS increases will go to government community clouds over the next two years, while civilian respondents see increases across a range of models.

Both civilian and defense/intelligence respondents anticipate the biggest increases in PaaS investments will go to government community clouds over the next two years.



Q: Which type of IT/cloud deployment model is likely to receive the biggest increase in its IT investment 2 years from now for IaaS and PaaS?

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Defense/Intelligence Agencies



While enterprises are increasingly embracing a hybrid or multi-cloud strategy, government agencies face a combination of challenges. Among the obstacles most cited by civilian and defense leaders:

- Resolving security concerns
- The complexity of legacy applications across multiple clouds
- The lack of skilled staff and/or competing IT priorities



Q: What are the biggest obstacles at your agency to moving to a hybrid/multi-cloud model? (Select up to 3)



CURRENT USE OF ARTIFICIAL INTELLIGENCE, MACHINE LEARNING AND DEEP LEARNING



47% of all respondents said their agency **is currently using, or considering, artificial intelligence or machine learning.***

Base: 169

Among those "Using/considering AI" **

have been achieving demonstrable value from AI within the past 5 years or more

16%

6 are beginning to achieve a demonstrable value from AI



expect to achieve demonstrable value from AI within the next 1-2 years

6% expect to achieve demonstrable value from AI within the next 3-5 years

16% were unsure when they might achieve demonstrable value from AI

*Q: Is your agency currently using or considering artificial intelligence (including machine learning and deep learning) to support your agency's initiatives?

**Q: How long has your agency been achieving – or when will it likely achieve – demonstrable value?



Agency leaders overall see the greatest potential for AI, machine learning and deep learning to help manage and make sense of the growing volume of data. Defense/intelligence respondents see even greater potential for AI to augment or improve workforce decision-making.



Q: Which applications of artificial intelligence (including machine learning and deep learning) do you believe hold the greatest potential to support or add value to your agency's mission or initiatives? (select up to 3)

More than half (54%) of executives at agencies currently using or considering artificial intelligence or machine learning also say they invest primarily in government community, public/commercial or hybrid models for IaaS. In contrast, 68% of those not using or considering AI say their agencies are investing primarily in on-site or privately management government data centers. The figures are similar for respondents based on PaaS investments. The findings suggest government community and hybrid models give agencies greater ability to use AI and machine learning.



*Q: Is your agency currently using or considering artificial intelligence (including machine learning and deep learning) to support your agency's initiatives? **Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for IaaS and PaaS?

USING CONTAINERS TO RUN APPLICATIONS

56% of respondents reported their agency is using or planning to use containers to run applications.*

56%



*Q: Is your agency using or planning to use containers to run applications? **Q: What type of applications is your agency primarily using containers for? ***Q: How are you using or planning to use containers? (choose all that apply)

Software containers have emerged as a preferred way to develop and deploy applications across multiple IT environments quickly and reliably.¹ IT leaders whose agencies are using or planning to use containers for **IaaS** and **PaaS** report they are further along the cloud adoption maturity curve than non-users, giving them a greater edge in modernizing their legacy applications.



Using/Planning to use Containers**

15%	14%	21%	18%	21%	12%

*Q: How far along is your agency in adopting the following cloud platform models?

**Q: Is your agency using or planning to use containers to run applications?

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Stage 1: Assess readiness / build skillsets

Stage 2: Select cloud service providers

Stage 3: Architect cloud services; mitigate risks

Stage 4: Estimate spending; establish governance

Stage 5: Provision and automate cloud services

Stage 6: Operate cloud environments at scale Agencies using or planning to use containers for **IaaS** and **PaaS** are concentrating more of their IT investments in government community and hybrid or multi-cloud models than non-users.



*Q: Which type of IT/cloud deployment model best describes where your agency is currently concentrating its IT investments for IaaS and PaaS? **Q: Is your agency using or planning to use containers to run applications?

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Using/Planning to use Containers**



1

Recognize the emerging role of hybrid models. Agencies are shifting sizeable portions of their IT investments to a blend of private and community cloud environments; many see hybrid as the ultimate destination for enterprise infrastructure.

2 Take a fresh look at how your IT investment portfolio is balanced. How agencies choose to concentrate their IT infrastructure and platform investments plays a significant role in how quickly they can modernize their legacy IT systems and applications.

Leverage the cloud to gain traction using artificial intelligence. Agency leaders who see tangible value utilizing artificial intelligence and machine learning also tend to be further along in adopting hybrid computing models than those relying primarily on on-site data centers. Capitalize on software containers regardless of which IT model you use. While agencies leaning toward hybrid investments also are more advanced using containers, creating portable applications that work in multiple environments preserves longerterm flexibility and agility.

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5

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Choose the IT investment approach best suited for long-term needs. One-fifth of agency leaders are still concentrating their IT investments on on-site infrastructure. That may be the best call, depending on risk tolerance, agency priorities, data sensitivity and available resources. But designing now for a hybrid future remains the best long-term strategy.

Don't discount public/commercial cloud offerings. While agencies over the next two years expect to invest in government-only community clouds more than any other infrastructure model, public/commercial cloud capabilities are evolving more rapidly and promise agencies greater opportunities to modernize their operations.

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