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The Role of Cloud-based Application Platforms in Government Innovation

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SUMMARY

Catalyst

Government IT is no longer the realm of technology-minded types divorced from business and political reality. Cloud application platforms are becoming a tool of choice among government innovators who can marry forward-thinking systems change with financial savvy, as they offer fast implementation, high return on investment (ROI), cost-avoidance potential, and the ability to create positive feedback effects throughout the agency. Decision-makers are using the flexibility of these platforms to tap into the social and mobile revolutions in a number of ways, launching government transformation efforts in the face of dwindling budgets and a global crisis of confidence in IT.

Ovum view

In the past few years, much of the attention in the cloud computing space has been devoted to software-as-a-service (SaaS) and infrastructure-as-a-service (IaaS), while platform-as-a-service (PaaS) has been relatively overlooked. This is understandable in some ways, as PaaS is harder to comprehend and has constituted a smaller percentage of overall cloud uptake. It is also, however, unfortunate: in Ovum's view, cloud application platforms have a greater potential to make a transformational impact on agencies than the other two categories.

However, in 2013, PaaS is set to take over as the fastest-growing segment. Ovum perceives that the increasing enthusiasm for PaaS, and for cloud application platforms specifically, is as much about culture change as it is about the implementation of an emerging technology. Public sector innovators at federal, state, and local levels are using these platforms to guide their agencies on a challenging journey away from a compliance mindset and toward a focus on outcomes. Governments require technologies that allow for rapid customization and deployment at the lowest possible cost. These requirements, combined with a better understanding of security and the emergence of stronger standards for the cloud than even a year ago, will lead visionary program managers, CIOs, and policy-makers to consider PaaS as their go-to application development and modernization toolkit.

Key messages

- IT reform, customer experience management (CEM), and data proliferation are the major policy and technology trends impacting the uptake of PaaS in government. These factors are driving the adoption of technologies that have high ROI and the ability to create positive feedback loops for innovation.
- Ovum's projections show that PaaS is now the fastest-growing cloud computing segment, and has the most potential for transformational ROI. It is poised to increase from 7% of the market in 2012 to 16% in 2016. However, as cloud computing has grown, media attention has been geared primarily toward IaaS and SaaS. This is partially due to IaaS and SaaS enjoying a larger overall share of the public cloud market, but also because the concept of PaaS is more difficult to digest.
- Government thinking around security concerns in the cloud space has evolved significantly in the last few years, to the benefit of cloud services providers. This has been followed up with standards that make it easier to define what should and should not go into the cloud,

broadening the range of agencies that should consider a cloud platform approach to hosting and deploying applications.

- Application ecosystems such as Salesforce.com's AppExchange for Government will become increasingly important as a part of the value proposition for PaaS. The majority of development on platforms is still done internally for custom requirements. CIOs encounter a different cost-benefit ratio for the creation of each new app: if an app is to be rolled out to many users, then it often makes sense to develop it internally on top of the platform. However, as agency leaders become more comfortable with less customization, they will increasingly rely on application ecosystems.
- The most important factor in government innovation and the best way to mitigate risk in the adoption of emerging technologies is strong leadership, specifically that which embraces a framework charting a path to the end goal. Embracing communities of practice is a good way to set in place the incentives that can lead decision-makers to success.
- As described in Ovum's Cloud Services Catalysts Framework, PaaS comes with a set of inherent business needs and implementation skillset requirements, against which executives should measure themselves. The degree to which the relevant skills are in place and the business needs are understood is a good indicator of whether or not the adoption process will be smooth.
- Agencies must be willing to commit to the platform in the longer term. An increasing number of case studies in government demonstrate that a cloud application platform is a tool that has low barriers to entry and high adaptability. The more apps created on a PaaS platform, the more valuable the platform becomes, especially given the low marginal cost of each new app.

THE CONTEXT

Government challenges, priorities, and trends

The "do more for less" slogan is still alive and well in government, driven by cost-cutting and decreased budgets. Many of the public sector's major challenges revolve around adhering to this notion, with agencies struggling to avoid ending up doing less for less. This is driving an emphasis on better calculation of ROI for new investments and finding ways to stimulate innovation despite constrained resources. Within this context, three major technology and policy trends are worth noting, all of which support the case for considering a cloud application platform approach to IT innovation.

Taking on IT reform

There is a global crisis of confidence in government IT, with an acknowledgement that far too much is spent and far too little delivered; clearly, the status quo is broken. Some governments are therefore undertaking a series of IT reform efforts, motivating others to attempt the same. The US federal government provides the best illustration of the problem: despite 243 CIOs and the existence of an overall federal CIO, there is no central commanding figure that can take truly binding decisions. Nonetheless, the federal CIO position comes with a powerful bully pulpit and, in 2010, then-CIO Vivek Kundra's 25 Point Implementation Plan kicked off a radical rethink of the logic behind IT procurement and delivery. Since then, a variety of shared services initiatives, a "cloud first" policy, procurement reform, an emphasis on agile development, improved review of "troubled" IT projects, and data center

consolidation have been pursued in order to leverage technology more effectively for the benefit of the citizen. There is a long way to go, but the conversation and subsequent policy response is well under way.

Particularly important to note here is the considerable debate around whether the cloud-first style mandates are an appropriate method for driving IT procurement and utilization reform. Despite the debate, there is no doubt that the adoption of such mandates is a trend that is gaining steam. In Ovum's view, these mandates are a positive development that explicitly recognizes the opportunity cost of inaction.

Renewed focus on customer experience

Shifting consumer expectations along with a demand for transparency and accountability are forcing agencies at all levels to begin improving long-stagnant service delivery channels. In some cases this means enabling self-service, while in others it means reconstructing processes based on outcomes for citizens rather than compliance with guidelines. From a political standpoint, it also requires communicating more effectively with citizens about what is being done on their behalf behind the scenes.

Government agencies are just beginning to understand the idea of CEM, defining their "customers" not just as citizens, but also as internal players, such as members of the armed forces, members of congress, diplomats abroad, and civil servants. In 2011, President Obama issued an executive order catalyzing agencies to rethink how they define and interact with stakeholders, and a number of city and state governments have followed suit. To begin rebuilding trust with citizens and improving service delivery, government agencies globally are rethinking CEM and focusing on unlocking departmental silos. To do this, they must invest in new technologies that are easily scalable, facilitate the rapid creation of apps and services for myriad stakeholders, and do not quickly become obsolete.

Data proliferation

Related to CEM is the massive amount of data being collected by governments from direct citizen input, internal agency output, sensors in the built environment and "the Internet of Things," social media, and increased video surveillance by public safety and national defense agencies. The US federal government's Digital Government Strategy, released in May 2012, is an example of an attempt to govern and make use of this data. It pitches a plan to move into "government-as-a-platform" territory, aiming to establish open APIs as the norm in agencies, and release data in formats that can be used by entrepreneurs and citizens. To accomplish these goals, and to capture productivity gains from the effective use of this data, agencies need to mature their data environments to a point where performance management and data-driven decision-making are the norm. Many agencies are still at the beginning of this process and require a boost in order to move forward.

The PaaS marketplace

Two definitions of PaaS

Of the three cloud categories, PaaS is perhaps the toughest to understand. The well-accepted National Institute of Standards and Technology (NIST) definition of PaaS is as follows:

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud

infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application hosting environment.

Ovum's definition of PaaS is slightly different and slightly less technology-centric, but better encompasses its role:

PaaS makes it easier to develop, deploy, and run applications using programming languages and tools as well as packaging and deployment facilities supported or delivered by the PaaS provider, and middleware and/or application services delivered by the PaaS provider. Examples of middleware services include transaction, scalability, authentication, and integration services. Examples of application services include business intelligence (BI) and collaboration services. PaaS users are in charge of creating, deploying, integrating, maintaining, and managing the applications they run on top of the PaaS resources, and defining and configuring the PaaS resources they require (to the extent allowed by the service provider).

Public clouds are gaining momentum

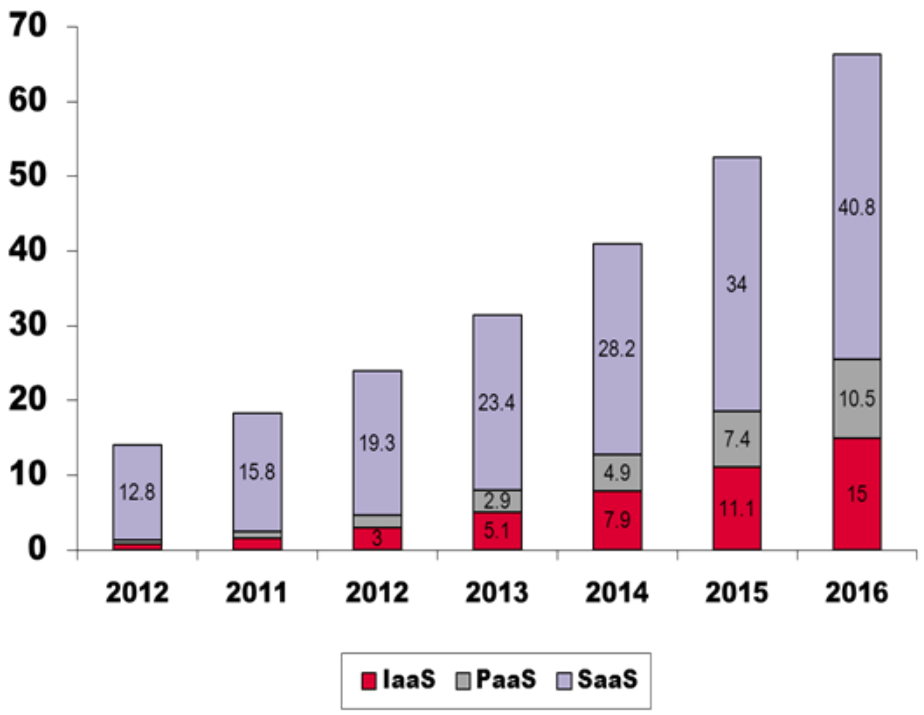
Public clouds are rapidly increasing in market value year-on-year (see Figure 1). A peculiar dynamic tends to occur in the uptake of public cloud computing in the public sector: adoption of one cloud segment stimulates positive feedback loops toward others. The ongoing success of SaaS or IaaS drives PaaS forward, and vice versa.

As cloud computing has grown, media attention has been geared primarily toward the IaaS and SaaS segments. This is partially due to IaaS and SaaS enjoying a larger overall share of the public cloud market, but also because the concept of PaaS is more difficult to digest. However, Ovum's projections show that PaaS is at an inflection point, poised to increase from 7% of the market in 2012 to 16% in 2016, making it the fastest-growing segment.

PaaS is also set to become the platform of choice for the fast development and delivery of greenfield applications, evolving to cater to the requirements of enterprise developers and help them not only create new applications, but also re-engineer legacy ones. It is the cloud application platform aspect of PaaS that is currently the strongest driver of adoption in government.

In Ovum's view, PaaS will become the main deployment tool for SaaS, taking over from IaaS and custom platforms. Indeed, public clouds, especially government-driven ones, are increasingly approached not only as technology delivery platforms, but also as ecosystem hubs for cloud service providers and consumers. PaaS as a mobile and social application platform is already a well-established trend that will continue to grow.

Figure 1: Enterprise public cloud market growth, 2012–2016 ($bn)



Source: Ovum

The public sector's three approaches to PaaS

The public sector approaches cloud computing from three major angles: as a user/buyer, as a regulator, and as an economic manager. The marketplace looks quite different from each perspective. As a user, a government agency may find that cloud application platforms present the greatest potential in stimulating innovation from the cloud ecosystem's offerings. Momentum is building around adoption, particularly as vendors committed to the public sector provide government-dedicated cloud instances. As a regulator, an agency faces confusion about how to deal with data breaches or transnational data flows; as always, the law lags behind the technology. As an economic manager, a government may see cloud computing as a way to stimulate job growth. Cloud application platforms have the extra benefit of stimulating ecosystems of small and medium-sized enterprises (SMEs) and independent software vendors (ISVs) that build on top of the core offering. In this way, small companies can also sell to agencies and jobs are created, which has already been demonstrated in the private sector.

Obstacles to PaaS adoption in government

From the user perspective, the usual major obstacles to faster adoption exist. As these are widely discussed elsewhere, we address them only briefly below. In the course of Ovum's conversations with agency decision-makers, these obstacles were, for the most part, deemed to be addressable.

Security and standards

From the outset, security and standards have made government IT decision-makers uncomfortable with cloud computing, often for good reason. They are particularly a concern for those with highly sensitive data that is not fit for public consumption, such as intelligence agencies and national security

agencies. However, security is much better understood now than it was five years ago. Standards have been developed that address issues around service-level agreements (SLAs), resiliency, and other specifications. Programs such as the Federal Risk and Authorization Management Program (FedRAMP), which create an "authorize once, use many" process, make it easier for vendors to enter the government market and simpler for agencies to adopt tools without duplicating assessment efforts. Particularly for those agencies that deal with public or non-sensitive data, a PaaS option should be on the shortlist for consideration.

A lack of awareness

While potentially the most impactful, PaaS is also the most confusing of the three cloud types. "PaaS-washing" is on the rise: an increasing number of vendors are jumping on the bandwagon with offerings that actually have little to do with PaaS. This, along with the unfortunate "fear, uncertainty, and doubt" (FUD) marketing tactics employed by a number of firms, sends mixed signals to government procurement officers and CIOs. As mentioned earlier, while PaaS is the fastest-growing cloud segment, it also accounts for a smaller percentage of total cloud deployments; successful case studies have not yet penetrated the market with enough scale to prove its utility.

The fear of vendor lock-in

Government CIOs are wary of vendor lock-in for good reason, given the history of public sector IT procurement, the massive data silos across agencies, and the expensive legacy investments still in play because of the difficulty of switching. While it is a legitimate concern, it can be mitigated for PaaS with techniques such as open source licensing, code escrow, standardization on widely adopted frameworks, thriving ecosystems that provide choice and ensure service in the long term, and interoperability with alternative platforms.

Federal versus state versus local dynamics

There are inherent differences in how emerging technologies are adopted at the state, local, and federal levels, and these dynamics apply equally to the adoption of cloud application platforms. While there are always exceptions, at the federal level there tends to be a brighter spotlight shone on new technology adoption. Despite major inefficiencies in the procurement system, this tends to push adoption forward, particularly when innovation is necessary in the era of "do more for less." At the local level, the government is much closer to the citizen, and necessity pushes the uptake of emerging technologies that have clear ROI. The state level is an awkward spot in between, at a distance from the citizen yet without such a bright spotlight on its activities. The state level is therefore less incentivized to retire legacy systems and embrace better ways of doing business, and with budget cuts it is more likely that IT spend will simply cease rather than be properly adapted. Avoiding this scenario means making tough decisions and displaying adaptive leadership.

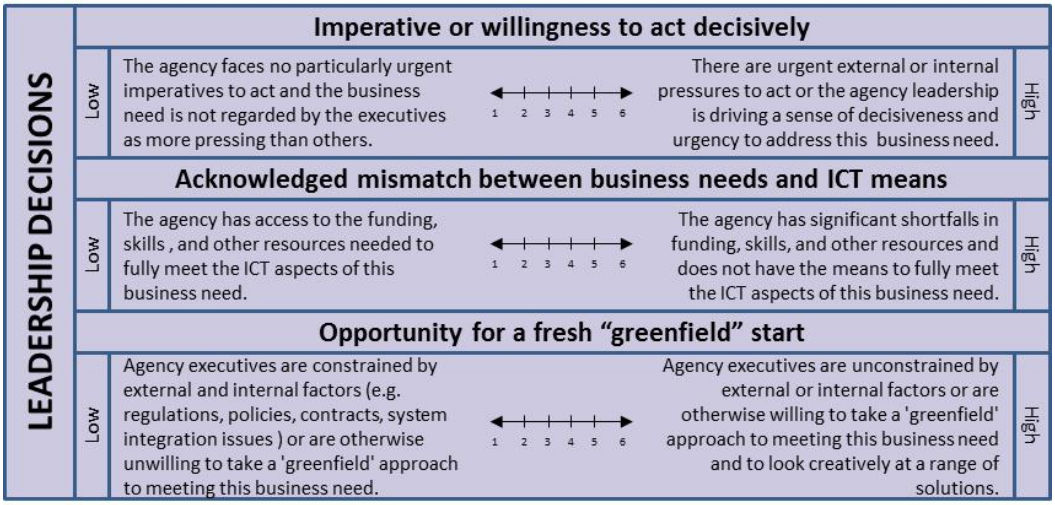
The importance of leadership

The topic of leadership has arisen more often than any other in Ovum's conversations with agencies on cloud application platforms. In Ovum's view, it is by some degree the most important factor in government innovation and the best mitigator of risk. Indeed, at a time of major technology disruption, effective leadership is the difference between an IT infrastructure that enables powerful outcomes for citizens and one that simply checks boxes and leaves money on the table.

The Ovum Cloud Services Catalysts Framework (Figures 2–4) defines the key leadership decisions and business needs that empower agencies to embrace PaaS. It is designed to help executives

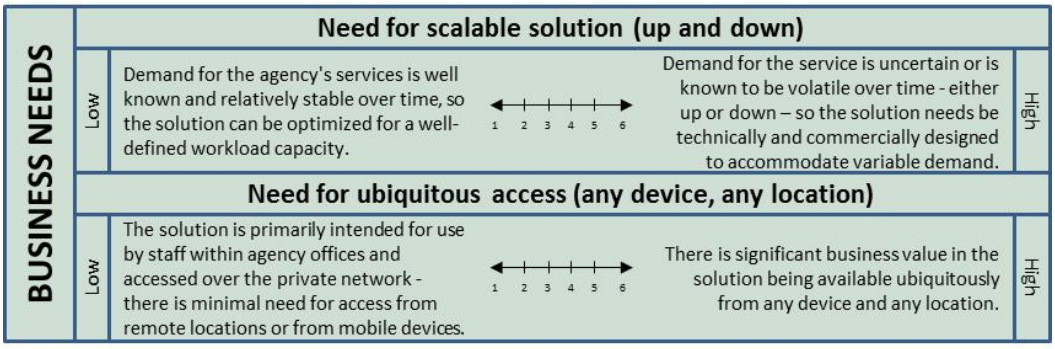
understand the characteristics of agencies that have successfully embraced cloud services. When evaluating whether or not to move to a cloud application platform, or how to respond to a cloud-first style mandate, this framework should enable an honest assessment of incentives and leadership.

Figure 2: Ovum Cloud Services Catalysts Framework: leadership decisions catalysts



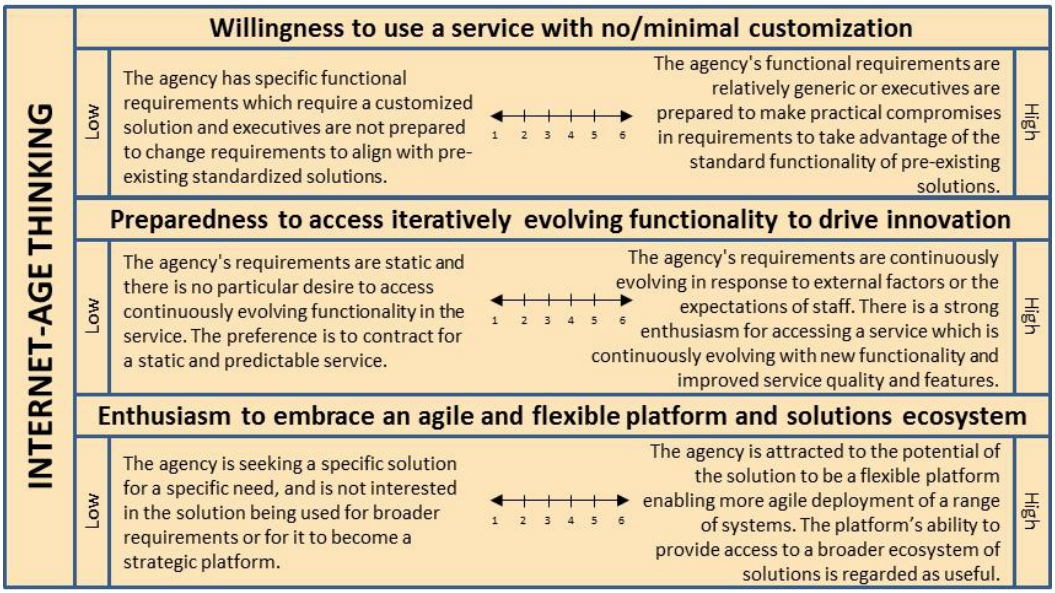
Source: Ovum

Figure 3: Ovum Cloud Services Catalysts Framework: business needs catalysts



Source: Ovum

Figure 4: Ovum Cloud Services Catalysts Framework: Internet-age-thinking catalysts



Source: Ovum

Visualizing progress via a staged approach to innovation

Frameworks that comprise a staged approach to innovation are often the most effective, as CIOs can visualize progress and report successes as they occur. One example is the Human Services Value Curve, the business model stages through which leaders must guide human services agencies in their journey toward better outcomes. The first stage is regulative, focusing on serving constituents through the perspective of service eligibility and policy compliance. The second is collaborative, where the agency moves toward supporting eligible constituents by working across programmatic silos. The third stage is integrative, where the focus of leadership is on the root causes of client needs, addressed through greater service integration. The last stage is generative, where the focus is on creating healthy communities as a whole via co-creation methods.

The complexity of IT reform and its relation to business strategy within larger organizations can be daunting, and this sort of framework provides a way to focus planning and measure progress. In Ovum's view, one framework is often no better than another; the key is to embrace one and stick with it, and for leaders to find ways to steer their staff through the discomfort and opportunities that come with the sustained period of disequilibrium that is inherent in innovation. This requires successfully defining "big, hairy, audacious goals" – ones that allow employees to place themselves in a greater narrative and re-imagine their work as sexy rather than paper-pushing.

USE CASES AND CASE STUDIES

Agency use cases

The following short case studies – two focusing on vertical sectors, one focusing on horizontal use – are given as illustrations of the integral role that cloud application platforms can play in innovation focus areas of government. It often happens that PaaS is adopted for a vertical-specific need and then it quickly becomes clear that the tool can also be used for a variety of horizontal or

solution-focused uses across the agency. Part of the allure of cloud application platforms is that they are well-suited for specific business cases or as overall application development and process automation toolkits that deliver benefits over time. What this means for the CIO is that the potential for "low-hanging fruit" and quick wins is considerable, and shining a reform-tinted spotlight on one area of the agency will draw attention to the others.

Vertical focus: transportation

Transportation agencies face monumental challenges, both service-related and technical, in a range of areas. Infrastructure projects in the transport space are high profile and customer-facing; the customer experience element must therefore be carefully designed. New Jersey Transit is the largest state-wide transportation provider in the US and the third-largest provider overall – almost 1 million passenger trips are recorded daily on its infrastructure. NJ Transit invested in a cloud platform initially to provide it with reporting capabilities and a 360-degree view of siloed customer feedback channels, ranging from walk-in and contact center to email/web and written correspondence. The average time spent processing a case decreased substantially. This encouraged the agency to build apps on its platform across a range of other vertical-specific applications, including a dispatch and report system for undercover agents and a workflow management process.

NJ Transit leaders were very particular about investing in a model that could be tailored over time around the business model, and not vice versa. They particularly emphasized the sense of accountability that the new systems fostered in employees, leading to that most chimeric of accomplishments in government: culture change.

Vertical focus: healthcare

Like transport organizations, healthcare agencies are highly complex and require a wide range of specialized tools. One example is that of the US Food and Drug Administration's Center for Devices and Radiological Health (FDA CDRH). A major complaint against the FDA from medical device manufacturers had been the amount of time it took to approve new drugs and devices. Traditionally, there had been little communication between the FDA and device firms early on in the lifecycle. The arduous approval process led many manufacturing plants to move abroad as other countries promised faster approval of medical devices with similar levels of safety and quality rigor, ultimately costing the US key jobs. CDRH and OSTP therefore piloted an "Innovation Pathway" program to speed up market entry of innovative devices. PaaS is enabling the FDA to create a near-realtime, secure, device-centric collaboration environment between regulators and those being regulated. This promises to significantly reduce the time to market of devices by improving communication between all parties and changing the cultural context of the previously noxious regulator–manufacturer relationship.

Eight pilots have been run overall, costing less than $1m in total instead of the $1m per pilot that it would have cost using traditional approaches, all within much faster timescales. As with NJ Transit, and typical for most agencies that Ovum interviewed, the cloud application platform caused innovation to proliferate throughout the FDA, including the establishment of an IT services library where the platform's applications developed in one center could be shared across the FDA. One of the key strategies that led the FDA to such progressive use of technology was the recruitment of "entrepreneurs in residence" (EIRs) – individuals mandated to drive change through the organization, who are well-versed in the lessons of agile technology startups and the private sector.

Horizontal solution focus: publishing content

A common refrain among agencies that we interviewed was that PaaS made it easy to develop for a broad range of horizontal areas, limited only by imagination and motivation. Examples of these include policy tracking, program management, events, customer service, IT and operations, financial management, and budgeting.

Publishing content is a particular area worth highlighting. Agencies serve many different types of customers and often have business units that take on a publishing role, clearing articles and statements for public consumption and communicating intent. In the case of the US State Department's Bureau of International Information Programs (IIP), which engages overseas audiences in support of US policy objectives, that customer is often not a US citizen. As the US government has embassies in more than 140 countries, IIP needed a true enterprise solution to launch products faster, improve search of communications on a central platform, and move away from a limiting desktop application that required too much maintenance. It decided on a cloud application platform, on which it quickly established a portal that enabled editorial collaboration, story approval, and content distribution. This significantly reduced the time taken to push out communications.

As in our other case studies, once an initial app was created on the platform a variety of new ones quickly followed, such as workflow for digital video requests, webchats, and a 24×7 helpdesk. Eventually, IIP intends to use its platform as a full content management system and introduce its publishing system to the field to increase scope and output. This will allow it to publish in many more languages straight from the field; it is currently restricted to seven, working with an on-premise platform based in Washington, DC.

If the agencies discussed here had decided to solely go with a SaaS solution for their immediate needs, they would have been restricted in what they could do in future. Instead, they each had the foresight to understand the changing dynamics of their agencies.

Vendor example: Salesforce

A variety of vendors approaching the PaaS market from different angles serve the public sector market. We highlight Salesforce.com here as a strong example of a service provider that has embraced the ecosystem component of PaaS as key to its business model, with a cadre of successes already under its belt to prove its value proposition.

A cloud appropriate for government

The first step toward establishing a foothold in the government space is building trust with agencies and ensuring reliability. This includes investing in experts that understand the public sector context, offering SLAs that take into account government-specific requirements, and providing a security and standards infrastructure designed around initiatives such as the Federal Information Security Management Act (FISMA) and FedRAMP. Government standards tend to be higher, and if security levels are up to par here, the same approach can be taken commercially in the private sector.

Salesforce.com has invested in a government-specific cloud instance, with an accompanying AppExchange geared toward government, and a program to train small businesses on the Salesforce platform as a means of stimulating vendor offerings tailored to agencies. It recognizes that seeding an ecosystem of app developers that target the public sector will be good for its long-term prospects. It also positions itself to help governments increase value-for-money from ICT spending while also supporting the local ICT industry.

Finally, its track record in the private sector – 1 billion transactions per day and 1 million AppExchange installs on its platform to date – shows off another particular strength: a focus on the social and mobile components of transforming an agency into one that is better connected and more agile. Ovum found two case studies particularly interesting, which represent the vendor's abilities and the impact that PaaS can have on agencies more generally.

Customer case study 1: The Texas Department of Information Resources (DIR)

The US state of Texas has a non-cabinet form of government, which means that every agency has its own IT system, CIO, budget, and roadmap. Within this complex environment, Texas DIR is the central technology agency with responsibilities that include running a telecoms division for the state, operating the state web portal for citizens, implementing a mandated shared services strategy, processing credit card transactions, and consolidating data centers. In its quest for simplification, DIR conducted a technical deep-dive on available cloud services incorporating statute and policy-driven needs, including payment terms, SLA terms, and legal terms.

Since implementing Salesforce.com's Force.com platform five years ago – one of the first state governments to do so – DIR has created at least 26 applications, ranging from contract governance/operations management for Texas.gov to activity management for data center services and a budgeting, planning, and reporting app used to manage the annual budget-planning process. In conversations with the DIR's leaders, Ovum was impressed by the stress placed on cost avoidance, mobile access, and having a single view of the customer as the factors driving its use of the Force.com platform. DIR also regularly demonstrates its PaaS abilities to other agencies in Texas and other states.

Customer case study 2: US General Services Administration (GSA)

The GSA is unique in federal government: as well as being a cloud computing user it also has responsibilities in facilitating its uptake. Its journey to cloud applications – in this case the Force.com platform – was driven by a gradual increase of its levels of comfort with the cloud: beginning with a Salesforce.com CRM solution, moving to Google for email (another step toward cloud computing), and eventually embracing Force.com for application development, CRM for customer lifecycle support, and Chatter for collaboration/communication needs.

The GSA built more than two dozen apps in less than six months, and now has more than 75 apps running on three major organizations within the agency. It is also engaged in ongoing application development at a rate of five to six apps created every 10–12 weeks, for a wide variety of internal processes including workflow automation, simplified project management, dashboard tools, spend trackers, and service/support requests.

Existing applications undergo continual iteration and, given the low comparative marginal cost for each app, the GSA is in a position to create "short-term" apps that are needed for specific initiatives and then archiving them once complete and enterprise-wide models are available. GSA clearly believes that cloud platforms – an example being the Force.com platform – are key tools to use in stimulating process, culture, and innovative change in the agency.

RECOMMENDATIONS

Recommendations for agencies

- When evaluating a vendor, pay attention to how it arrived at the PaaS market – did it start as a SaaS provider or an IaaS provider? Its starting point is likely to color the emphasis and strengths of its offering.
- Look out for so-called FUD tactics by vendors attempting to engage in “PaaS-washing”, particularly those that pit private clouds versus public clouds.
- Consider the external benefits of the platform approach to application development and cloud services. There is a real impact on job creation, SME involvement in government procurement, and the possibility of innovation proliferation beyond a single agency. However, it is also important to temper expectations; the EU, for example, hopes to create 3.8 million jobs by 2020 through investments in cloud computing, but this may be an unrealistic expectation.
- Larger agencies should use economies of scale to their advantage. Smaller agencies should deal with vendors that understand government and structure SLAs accordingly. SLAs should be unambiguous and fit the payment method that agencies are legally mandated to use.
- Think about and adopt strategies to mitigate the risk of lock-in to get the most value out of a platform, such as open source licensing, code escrow, standardization on widely adopted frameworks, and interoperability with alternative platforms.
- Find or create a community of practice around PaaS. Communities of practice are useful at every stage of the process, such as research, testing, implementation, and development, and in leveraging platforms better over time. They are key enablers of successful leadership and can operate across different geographies, functional units of an agency, and levels of government.
- Rethink the level of customization required for the applications that your agency needs. Governments need more customization than most private sector entities, but in Ovum's experience this need is usually overestimated. Our interviews with visionary CIOs and IT decision-makers reveal that having a level of comfort with tradeoffs – or at least knowing that needs will change over time – is a central tenet in the adoption of cloud application platforms. There is more risk in the short term due to the change process but less in the long term due to the adaptability of the technology.
- Build often and develop a small, specialized team that can rapidly iterate. The nature of pricing for PaaS means that the only additional costs to build more apps are the sunk cost of the internal workforce, so the more you build, the more value for money you get. Given the complexity of CEM in government this is particularly relevant; different constituencies will often require different approaches, and cloud application platforms provide a flexible method for different constituencies to develop apps cheaply and deploy them quickly.

APPENDIX

Further reading

Breaking the Cloud Barrier for Government Services, IT007-000671 (January 2013)

2013 Trends to Watch: Private and Public Clouds, IT017-004055 (November 2012)

2013 Trends to Watch: Cloud Computing, IT017-004008 (November 2012)

Practical Steps to the Cloud for Government Agencies, IT007-000629 (July 2012)

Revisiting the NIST Definition of Cloud Computing, IT017-003912 (November 2011)

Cloud Computing in the US Federal Government, IT007-000448 (June 2011)

Methodology

- Primary research/vendor briefings – ongoing meetings with government technology vendors and IT decision-makers in government agencies.
- Secondary research – industry publications, broker and analyst reports, academic research, and data from public databases.
- Existing Ovum research.

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