

G-Cloud Innovation and Transformation

Best practices in Government Cloud Outsourcing

<http://CloudBestPractices.info>

Executive Summary

The UK's [G-Cloud program](#) is about far more than yet one more new IT product to be added to the existing mix, instead it represents a wholesale transformation of the whole estate and how technology is procured and implemented, and it's a trend that is occurring throughout the world.

Therefore it's a complex domain with a number of strategic perspectives. The objective of this paper is to provide a brief summary of these for ministers and senior management within government, and how it may be applied to their department.

Legacy 2 Cloud - Planning and managing business transformation



The G-Cloud initiative is a multi-faceted program, featuring technology virtualization, data-centre consolidation and an ASG – Application Store for Government. This is a challenging combination, and so requires a suitable planning and management toolset.

Best practices include the [ADM framework](#) (Architecture-Driven Modernization) from the OMG, succinctly explained in their white paper '[Transforming the Enterprise](#)'. This describes how transformations, moving from one system to another, can have three different dimensions, and moving to the Cloud can mean activity on all three:

1. (T)echnical Architecture, Virtualizing the platform to simply improve the underlying hardware usage.
2. (A)pplication Architecture, re-engineering the software architecture to become Cloud Aware.
3. (B)usiness Architecture. A full reinvention of the whole organization and business model, migrating business process itself online to harness "Crowdsourcing" models.

This is reflected in a maturity model approach, as described in the VMware white paper '[IT Value Transformation Roadmap](#)' (24 page PDF). This offers a 3-Step maturity model is proposed that begins with virtualization and grows into full utilization of Cloud computing across three stages that they quantify as i) IT Production, ii) Business Production, and iii) ITaaS.

The paper defines a journey that progresses through simple virtualization of IT resources through more important applications like Exchange email, through to the full strategic capability of business applications being made available on a utility basis.

Most importantly it quantifies this in terms of the IT organization becoming more mature in terms of their 'Business Transformation' abilities, their ability to quantify and exploit IT in terms of ROI and value for money.

Business Value Portfolio Management

This emphasizes how critical it is that this not simply be technology adoption for technology sake, but rather that there is a clear framework for defining how it will generate Business Value.

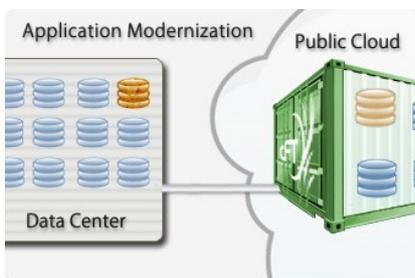
In particular the strategic piece is the link between Cloud computing and how it will enable the [Digital Britain policy](#), improving the nation's overall commercial competitiveness through new technology and skills modernization, and **simultaneously** also the efficiency of the government too through the 'Digital Switchover' agenda.

"Digital Switchover" refers to government agencies being obliged to 'go digital' in the same way analogue TV was decommissioned and replaced by Digital TV.

In this case they refer to government services, like tax returns, Student Loans, Companies House Registrations, electoral roll registrations and so forth, and how they will be migrated to be serviced online only.

This will deliver capabilities that enable organizations like government to better achieve strategic objectives set to them. For example it will mean more agencies can e-enable their process, helping achieve compliance with regulations like the [Government Paperwork Elimination Act \(GPEA\)](#) in the USA, which specifies improvements through the use of electronic forms, electronic filing, and electronic signatures.

These types of initiatives are fairly pervasive and common through all levels of government. For example in Canada they have [Red Tape Reduction programs](#) that mirror the GPEA.



The '[Legacy 2 Cloud](#)' method is the science of this Application Modernization, upgrading legacy systems so that they can be integrated to the web this way.



Citizen Service 2.0 – Open Government, as a Service



The ultimate conclusion to this journey is achieving a 'Cloud BPM' capability. Business Process Management systems that operate fully integrated within the Cloud.

Fundamentally this is the principle challenge all government agencies face. In this modern Web 2.0 world they need to integrate their legacy systems and present them to the web for direct citizen engagement.

There is more to this than just convenient web access, it evolves to meet the most demanding and strategic policy requirements of government agencies, 'Open Government'. For public sector managers this means transforming traditionally 'closed' government processes to instead fully utilize the web 2.0 effect and engage the public in transparent and collaborative online ways of

working.

The [Peer to Patent project](#) provides a key case study example. It demonstrates how when a government process was moved from a legacy approach to one in the Cloud, it meant a lot more than simply changing hardware-level virtualization systems.

It illustrates how Open Government is not just about more open reporting for people to passively look at, it's actually about re-engineering the process itself, to deliver considerable efficiency improvements and critically, enable more open public participation.

Using '[Open Innovation](#)' the site has transformed the process to apply for a patent from a "closed" version to an Open one that operates "in the Cloud".



Pioneered by Open Government leader [Beth Noveck](#), she provided a detailed case study of the thinking behind her project in this 40 page Harvard [white paper](#). She describes how the agency was building up a huge backlog of patent applications due to a 'closed' approach where only staff from the USPTO could review, contribute and decide upon applications.

Not only did this cause a bottleneck due to the number of resources being utilised but also in terms of the volume and quality of subject matter expertise being applied. With no involvement from outside contributors, such as experts from the scientific community, then awards were being granted for applications based on very limited and often inaccurate knowledge.

By moving the workflow online to a Web 2.0 environment they have been able to "open up" the workflow to a distributed community of experts from across many different organisations, and apply collective efforts to increase both quality and speed.

G-Cloud Aware Applications



Integrating applications into the web this way highlights a key technical factor of migrating them to the Cloud. This would correspond with the level 2 activity of the ADM transformation process, the (A)pplication Architecture re-engineering.

This can play a key role in enabling IT teams to advance their abilities to deliver Business Value for departments and agencies. This is highlighted in their core process, where they would respond to the technology needs of each department through the same traditional IT procurement process, mapping their business process needs to some form of COTS (Commercial Off the Shelf) application deployment.

This would meet the local level needs of the department but creates problems at the global one:

- **Isolation** - Each application is entirely stovepiped, operating on its own dedicated hardware, with its own dedicated user authentication system and so forth.
- **Business Continuity** - Each of these applications is installed in a single data-centre.
- **Innovation Gridlock** - End to end the process of translating the departments needs into a deployed system could take one, two or more years.

These points quantify the matrix of major business benefits that are needed, there are huge

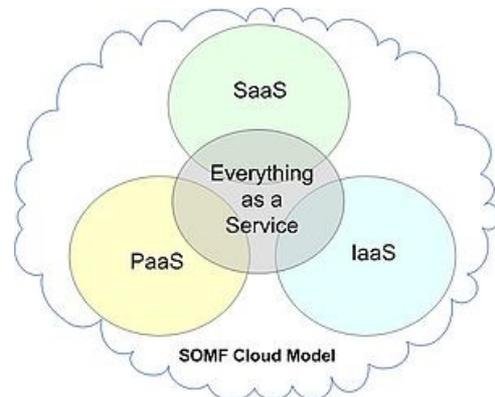
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The huge potential for the Cloud is that it will address all points **simultaneously**.

These benefits will be realized through Cloud service providers adopting and integrating ongoing innovations in Cloud technologies, to achieve a fully converged IT environment.

Although we currently classify Cloud services in terms of separate domains of SaaS, like Salesforce.com, or running custom code on IaaS/PaaS like Amazon or Azure, the real sweet spot will emerge that is their overlap, where:



- **Cloud Aware Applications** - Isolated applications will be re-engineered to be more fluidly integrated with their hosting environments and the other applications within it, such as using common, shared identity authentication modules.
- **Cloud BCP** - Leveraging technologies to virtualize and replicate applications across multiple rather than single data-centres, achieving "Business Continuity built-in".
- **Rapid Cloud Applications** - Legacy software methods will move to a modular "Software Factory Assembly" approach.

Fundamentally all software itself is being abstracted to operate at a higher level operating across multiple data-centres, where it is better integrated, more modular and thus more easily re-programmed.

Governments will tailor sub-sets of this for their specific security and standards requirements. For example British Columbia in Canada is [pioneering the use of Infocards as an Identity system](#), and COTS vendors who re-engineer their applications to be compliant are making them **G-Cloud Aware**.

Virtual Software Factories



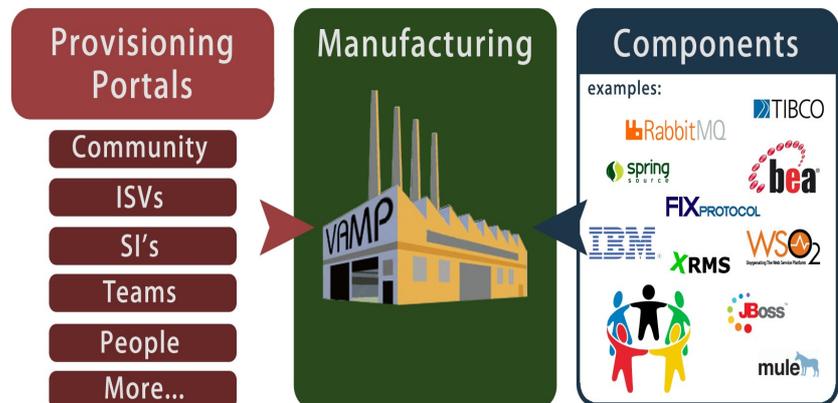
The level 1 tier of the ADM transformation is where the core virtualization of applications is applied. By abstracting software from the underlying hardware that it operates on, an organization creates a platform for a heightened level of software deployment agility.

A system for virtual server lifecycle management enables a 'software factory' approach to deploying solutions, where component parts of software images are compiled together from a catalogue, like assembling a PC at Dell, and then deployed to any appropriate Cloud provider.

This approach provides the key to the overall strategic benefit that the UK Government is seeking

from the G-Cloud, namely the reuse and sharing of best practices policy defined in their [Open Source document](#) to this effect. The factory can cater for the features of sharing and reusing components, including all related aspects of architectural control, compatibilities and dependencies.

This can include open source, commercial source and open source components and bundles, with self service portals for managing VM image repositories, and catering for features like peer feedback and review on components.



Global G-Cloud Innovation Program

As highlighted the critical point for government ministers and senior management is to consider the broader organizational, policy and economic benefits of this program.

First there is opportunity to reduce costs through consolidation of infrastructure, and secondly as part of this process upgrade applications to more modern Open Government style approaches. This achieves compliance with the need to become more citizen-centric.

Thirdly there is relationship to economic stimulus, and how government adoption of Cloud computing can drive new start-ups and help small businesses.

A key goal of the White House strategy is liaison with the commercial Cloud industry, especially to **‘reduce barriers to entry for small innovative technology companies’**. This will directly link massive government spending to product innovation in the world’s most exciting tech growth market.

Similarly the centrepiece of the UK’s G-Cloud strategy is their ASG – Applications Store for Government, where:

- **Encourage innovation and broaden competition:** *The G-Cloud and ASG should encourage suppliers to provide innovative solutions to the Public Sector and broaden competition in the Public Sector ICT marketplace to encourage SME and niche suppliers.*
- **Empowering Business Change:** *New solutions for the Public Sector business should be built using shared components for deployment onto a shared infrastructure.*

This new approach to IT consumption by government provides exactly the right framework for this policy. A more modular approach to IT systems lowers the barrier to entry as new software suppliers don’t have to build such large applications any more, and with this standardized approach to Cloud hosting, small service providers can be started locally to cater for the needs of local government agencies.