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When Evolution Drives Revolution: The Cloud as a Business Model

Evolving Information Technology (IT) is driving a revolution in the business of government. The arrival of cloud computing was the first of many dominos that have fallen into patterns that now represent an entirely new way of conducting business. In a domino chain, each individual domino that falls is both a cause and an effect. This is evident in changes such as the proliferation of mobile devices, more and more online transactions, growing use of social media, and the coming tsunami of Big Data.

As a result of all these changes, both government and the businesses that support it are constantly discovering new ways to accomplish the work they have been doing. At the same time, new capabilities are allowing managers to make new demands of technology and to envision new goals that they could not have imagined only a few years ago. The enthusiasm over all this potential is tempered only by mounting concerns about security and privacy of data as enterprises move further into the Web.

Having watched the evolutionary dominos fall over the last five years or so, it may now be possible to make some observations about their profound – dare we say, revolutionary – impact on how the federal government conducts its business.

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>
> –Joe Klimavicz
> CIO, NOAA

A Technology Driven Business Model

A tremendously important effect of cloud computing has been to move IT services closer to something like utilities. This concept is fairly new to government, but by leveraging commercial experience, agencies are using it to improve the way they do business.

Utilities involve no capital investment. Instead, they are paid for as they are consumed. Building an IT system to support an agency program used to be stressful and expensive for IT managers. However, now that computing power, storage, and other IT can be purchased as services, agencies can more easily respond to changing needs. For example, an agency can experiment with an innovative program without significant, long-term IT investment. If a program supported by a large IT operation is cancelled, the IT infrastructure bills automatically drop off. There's no server farm to keep running or data center to repurpose.

Joe Klimavicz, Chief Information Officer at the National Oceanic and Atmospheric Administration (NOAA), has noted, "We're looking at some very different skill sets coming into government."[1] He concludes, "We need to be using services and not building systems."[2] The huge advantages of such an approach explain why the cloud revolution in government has been driven more by mandates from management and executives than by demands of a younger generation, as one normally expects from a revolution.

The first of these mandates was former federal CIO Vivek Kundra's 25 Point Plan to Reform Federal to Reform Federal Information Technology Management, issued in 2010. This plan

required federal agencies to begin moving systems to the cloud. Kundra's successor, current federal CIO Steven VanRoekel, raised the bar on this effort, and the cost savings potential of cloud computing, long a contentious issue, are becoming clear. According to VanRoekel, beginning in FY 2013, migrating email to the cloud is expected to save agencies about $100 million per year.[3] Agency executives expect to save about 6 percent, or $5 billion, of the government's annual IT budget by shifting data storage to the cloud.[4]

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Utility computing has also made it much simpler for the government to consume IT. This has helped to streamline government purchasing processes and increase competition. Agencies are beginning to compare competing IT service bids by, essentially, comparing rate cards. Prices are easier to compare, and agencies are no longer stuck purchasing products they don't need as parts of bundles.

In addition to the economic advantages of cloud computing, federal workers are discovering that the cloud offers them flexibility in the way they work. There are nearly 200,000 federal employees under the age of 30 (about 10 percent of the federal workforce).[5] Many of these Y-generation employees, who have grown up on the Net, are driving the change in how IT is consumed and delivered across the government. The agility and economic benefits of cloud computing are so apparent that even the older generation is embracing clouds as viable delivery channels for IT services.

With this new technology, agencies are creating and capturing value for the American taxpayer in a multitude of new ways. Citizens are finding it easier to access and interact with their government because of technologies enabled by cloud computing. For example, many important government forms, such as those to change a mailing address, can now be submitted through a website. Even for non-public-facing government functions, mobile applications and virtualized desktops help federal workers create value and serve their country in new ways and new places.

Ever Evolving Government

Some recent developments haven't yet had time to play out, but experts anticipate great benefits. Options such as platform-as-a-service will give agencies the ability to produce applications quickly and efficiently, without the complexities of an operating system. The platforms already exist, and soon agencies will discover that when they use these platforms, applications roll out much faster.

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Cloud computing is also enabling new kinds of collaboration between government and the private sector. On May 23, 2012, VanRoekel announced a new plan to guide IT development in the federal government over the next few years. The Digital Government Plan outlines directives for federal IT managers to make available vast amounts of data for public and private consumption, in organized and useful ways, through web application programming interfaces (APIs).[6]

This plan leads directly to another IT iceberg of which agencies can only see the tip – Big Data. Huge amounts of government data, stored in the cloud, will become available to be mined and analyzed using tools, processes and skills that are developing rapidly in response to the ongoing data explosion. For example, the cloud has enabled NOAA's Global Earth Observation System of Systems (GEOSS) program, which aggregates vast amounts of observational data from 80 countries to provide integrated data sets that allow NOAA to more effectively achieve mission-critical functions, such as battling drought and improving forewarning systems for natural disasters.

The explosion has been fueled in part by cloud computing, which has spurred the growth of data worldwide. By one estimate, the worldwide sum of data is growing by 40 percent every year.[7] Federal agencies are already feeling the weight of the volume of information being created. Every six hours, the NSA alone gathers as much data as is contained in the Library of Congress.[8]

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In response, it is likely that the National Institute of Standards and Technology will create standard terminologies for big data, as it did for cloud computing. TechAmerica has already launched a commission on big data, similar to the one it formed for cloud computing.[9] There are already dozens of big data projects in the federal government, and it is likely that investment in such projects will increase.[10]

Although big data is not a new trend, its impact on government operations will grow rapidly in the coming months and years as new ways are found to manage, distribute, secure, and analyze huge data stores for actionable insights. Massive data sets can be powerful assets, and once agencies can mine them effectively, government practices will evolve as well. Clouds will provide the scale to store, manage, distribute, correlate, and analyze the vast amount of data that will deliver business intelligence never seen before.

A Future in the Cloud

The federal government's embrace of cloud computing, not just as a technology but as a business model, will make it very easy for the government to procure and consume IT services and lower its cost of operations in the near term. IT will continue to be commoditized, and while this creates business challenges for IT service providers, it presents managers with a set of interesting opportunities.

The underlying cloud infrastructure – a highly virtualized environment comprised of compute, storage, and networking technologies -- represents a growth platform for the IT industry at large. This platform is the foundation for the next generation of applications and services, many of which will emerge from modernizing existing legacy applications that will ultimately be delivered as pay-as-you-go cloud services. This shift, in turn, will require a comprehensive assessment and modernization of existing application portfolios. These next generation applications will be published and sold via secure, yet universally accessible, "App Stores" hosted on the cloud, tailored for enterprises and government agencies.

These will likely be the defining trends driving the next generation of business practices. Call it evolution or revolution, the impact on how government conducts its business will be profound and will be felt for many years to come.

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