Developing a Business Case for Cloud

Analyzing Return on Investment for Cloud Alternatives May Yield Surprising Results

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Executive Summary
Even in an age of rapid technological advancements, the speed with which private sector organizations have embraced cloud-based data management solutions has been remarkable. Government agencies are pushing forward rapidly as well, spurred on by the Obama Administration’s 2011 “Cloud First” Federal IT policy urging agencies to look to cloud-based services whenever possible to address their data management needs. Employees are now so accustomed to the instant access to data the cloud allows them as they shop online and access social networks, they are starting to lobby their own IT departments to deliver the same real-time access to data in the workplace.

Urged on from above and below, IT managers may feel pressure to move as quickly as possible to move away from their legacy infrastructure to cloud-based data management solutions. Vendors are urging them on, promoting a range of private, public and hybrid cloud-based products with promises of dramatic cost savings and extraordinary new capabilities, as well as varying levels of data protection.

While the cloud’s potential to transform the way data is managed is indeed extraordinary, Booz Allen Hamilton has found that agencies are often surprised by the results when they undertake a rigorous, systematic analysis of the return on investment (ROI) of various cloud solutions before signing on to a preferred system. Many cloud solutions will actually fail a business case calculation of ROI. Organizations working through this process often find that they cannot justify a move to the cloud on cost savings alone. Transition costs, and ongoing costs of fixed investments in facilities and labor, for example, often overwhelm the near-term savings of moving away from in-house data management systems, which are not easily and quickly shut down. Only when the very real potential for productivity gains is analyzed and factored into the equation does the case for cloud become compelling.

Look Before You Leap to the Cloud
Private sector adoption of cloud solutions has exploded. The speed of the cloud’s adoption in the business world and the transformative nature of the solutions it provides has been truly remarkable, and far beyond the impact of many other technological innovations that affect IT systems.

End users have helped drive this transformation, enthusiastically embracing cloud-based applications. Whether they are accessing information through their smart phones 24 hours a day from any location, or purchasing an infinite variety of goods and services, or connecting via social media, individuals are using the cloud in almost every facet of their daily lives. End users therefore have a basic comfort level with cloud-based services that is helping support the transition to, and demand for, the cloud in the

Problem
To date organizations have pursued cloud implementation strategies that failed a rigorous business case.

"Is The Cloud Overhyped? Predicted Savings Hard to Verify."
— FEDERAL TIMES, OCTOBER 2012

"Agencies have made progress implementing OMB’s Cloud First Policy, but Better Planning is needed for future effort."
— GAO 12-756, JULY 2012

Solution
Our model offers a total-value perspective on IT cost that evaluates the explicit and implicit value of a migration to cloud-based services.
workplace. The transfer of email services, for example, from legacy systems to the cloud may be influenced by users accustomed to accessing private emails on their smart phones and want the same kind of access to workplace information in real time and from any location.

The question now is how quickly public sector organizations grab the baton and take advantage of the opportunities for mission improvement that cloud-based services can provide. Slowed in part by security concerns, public entities have taken longer to move away from in-house systems, only turning to the cloud in earnest in 2011, when the White House’s “Cloud First” Federal IT policy directed agencies to look to the cloud for data management solutions.

With so many potential users already familiar with the benefits of cloud, and vendors now able to allay privacy and security concerns in the handling of non-classified data, agency chief information officers (CIO) and their employees may already be sold on the benefits of transitioning to the cloud for certain systems. But as is the case with any other type of business investment, the devil is in the details. Senior leaders may have difficulty translating the business imperative for the cloud to their organization. Potential savings might be lost in a less-than-optimal implementation.

Perhaps most importantly, a particular cloud-based alternative, such as a private cloud solution with strong security protection, might make sense for one organization such as a laboratory wishing to share data amongst employees. However, it would not be the ideal solution for an agency wanting access to open-source media and to sophisticated analytics in order to prepare and respond to natural disasters or security threats. In the world of cloud solutions, one size does not fit all.

Booz Allen’s work with a number of clients exploring cloud solutions leads us to advise agencies to take the necessary time up-front to develop a business

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**Exhibit 1 | Cloud Cost Model**

**Business Activities**

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<thead>
<tr>
<th>Mission Support</th>
<th>Productivity</th>
<th>Effectiveness</th>
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</thead>
<tbody>
<tr>
<td>• Organization Activity and Output Framework</td>
<td>• Calculate increased output</td>
<td>• Measure impact to mission through ABC modeling</td>
</tr>
<tr>
<td>• Activity Based Costing to evaluate impact to mission</td>
<td>• Lessened FTE cost to maintain current output</td>
<td>• Repurpose staff to increased focus on mission critical tasks</td>
</tr>
<tr>
<td>• Compare to existing IT budget</td>
<td>• Measures effect of repurposing staff to other priorities</td>
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**IT Infrastructure**

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<th>Facilities</th>
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<td>• Implementation</td>
<td>• Offsite Backup/Recovery</td>
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<td>• Red Hat</td>
<td>• Acquisition</td>
<td>• Personnel Office</td>
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<td>• Network Switches</td>
<td>• Oracle</td>
<td>• Maintenance</td>
<td>• Business Services</td>
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<td>• Spam Filters</td>
<td>• VM Ware</td>
<td>• Upgrades/Updates</td>
<td>• Risk Contingency</td>
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<td>• Load Balancing</td>
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<td>• PC Virtual Private Cloud</td>
<td>• Physical Security</td>
</tr>
<tr>
<td>• Firewall</td>
<td></td>
<td>• Business Support</td>
<td></td>
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</table>

Captures Cost of Transition and Phase-Out and Projected Savings

Source: Booz Allen Hamilton
case for a cloud transition. Before committing to such a project, agencies need to carefully examine the cost considerations, potential productivity benefits and overall ROI of the cloud solutions they are considering. As illustrated in Exhibit 1, by looking early in the planning stages at costs across the organization and over the length of the transition, considering productivity gains as well as cost avoidances, agency leaders can get a clear picture of the costs and benefits of moving to the cloud.

**Data Management Choices are a Strategic Issue**

Leaders of all types of organizations tend to underestimate the impact a technology investment will have on the organization’s overall operations and strategic planning process. With the cloud, this tendency is amplified—the potential costs, savings and productivity gains can be particularly diffuse, reaching far beyond a CIO’s typical area of range and control. Individual IT project teams run the risk of failing to see the whole picture, both of the current data system’s costs and of the cost savings (see Exhibit 2) and productivity potential of a move to the cloud. Therefore, a decision over whether to make a move to the cloud should be made at the agency level. The recommendations from the CIO and their department should weigh heavily on this decision, but agency leaders should also ensure that they consider all aspects of costs and benefits across the organization.

One of the most important factors that affect the potential ROI of cloud solutions is the type of cloud system an agency chooses to handle its information needs—whether that includes simple, low-cost data storage capabilities, software to analyze quantities of data, the ability to share data internally or publicly, or any number of other specific requirements. The three main types of cloud systems are public or external clouds, private clouds that emulate cloud computing on either in-house or private networks, and hybrid cloud systems, that may employ combinations of internal and external providers. Each system offers particular benefits and drawbacks depending on a client’s particular needs.

Even before they begin the process of moving to the cloud, clients often have a particular favored cloud solution in mind. However, the ideal cloud solution for the problem at hand may not be readily apparent before a business case is completed and the ROI for each potential solution is calculated. For example, a hybrid solution may appear to offer the best of both public and private cloud systems but may also prove too complex to monitor and manage. Putting all cloud options into a strategic decision framework and laying out the business case for each solution allows stakeholders to look objectively at the mix of tradeoffs involved in various cloud solutions, and to compare returns of each system—including the in-house system the cloud solution would replace.

**Cost Savings Alone May Not Make the Case for Cloud**

Moving to the cloud, while a significant and potentially transformative step, is only the latest in a series of investment decisions and transitions IT managers have made over the years as their data storage needs have grown. Because of this, an agency’s legacy systems—and the hardware, infrastructure and employees connected to those systems—represent a significant investment. The operating costs tied to those systems are unlikely to disappear the moment a transition to the cloud is made.

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**Exhibit 2 | Annual Cost Savings Estimates**

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<th>CY + 2</th>
<th>CY + 3</th>
<th>CY + 4</th>
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<td>$6,813,302.01</td>
<td>$3,213,131.93</td>
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</table>

Source: Booz Allen Hamilton
A manufacturer looking to cut costs by outsourcing some manufacturing operations to a contractor in a new location must calculate not only the cost differential of producing products in the new place versus the old; he or she must also take into account the cost of transitioning operations from one site to the other. This cost will increase the longer the transition takes. Transition costs could include buying out the contracts of existing laborers, shuttering facilities and other costs that must be factored in to understand the true ROI of the outsourcing decision.

Moving data management systems to the cloud involves the same sort of calculations. Cost savings from moving to the cloud can only be realized once the organization is able to stop paying for its legacy infrastructure. Therefore, the liquidity of labor contracts, facilities leases, and other expenses must be factored into the ROI equation. Agencies should examine whether buildings and employees can be repurposed, and that may involve looking beyond the IT department and across the organization for redeployment opportunities. The purpose of the Booz Allen model is to ensure that clients have adequately assessed the transition costs and have developed a clear understanding of how quickly they can close out the legacy architecture and shift software and applications from the legacy systems to cloud-enabled solutions.

When looking at particular budget items, storage might be the first area of cost savings that comes to mind when thinking about a move to the cloud. However, storage represents only a small share of a data center’s total cost, as illustrated in Exhibit 3. Labor costs are a far higher percentage of the mix, and those costs are often difficult to eliminate or even reduce, particularly if workers are full-time government employees. Facilities costs are another fixed investment that are often not factored into cost savings calculations during a transition to the cloud.

The extent to which data storage facilities and the IT workforce can be repurposed or retrained may play a big part in determining whether a move to the cloud will generate significant cost savings. An agency, for example, that has only recently invested in a new centralized data center, with a multi-year lease on the facilities and a number of government employees dedicated to managing the center, may face a lengthier and costlier transition to cloud systems than an organization that has not made that investment. Conducting a complete analysis of existing costs and the cost of exiting contracts and re-deploying workers will enable agencies to understand whether true cost savings can be achieved through a transition to cloud; otherwise, agencies may find themselves spending for systems that duplicate those in place.

Transition costs also extend to the expense of shifting software and applications from the legacy environment to the cloud-enabled environment. If moving to the cloud requires an organization to rewrite its programs or re-build the knowledge sharing applications on which their employees rely, costs can escalate dramatically. A particular challenge when mapping the true costs of existing systems and potential for cost savings is taking into account costs that are shared across department budgets. Once all the costs across the organization are included in the baseline estimate, stakeholders usually experience some sticker shock because they thought they were spending less on existing data management systems than they really were.
Productivity Gains: Cloud’s Real Promise

In Booz Allen’s experience, the biggest benefit of moving to the cloud comes from creating efficiencies within the organization once data is more universally and readily accessible. However, as any economist will tell you, productivity gains across disparate activities can be difficult to pin down, and even tougher to ascribe to a single investment.

Including the potential for productivity gains in a calculation of ROI begins with a study of current costs, analyzing whether or how those costs can be permanently reduced once in-house data management is replaced by a cloud system. Permanent cost savings may come from lower facilities costs, if dedicated data facilities can be re-purposed, or from lower labor costs if workers can be re-trained and assigned to jobs elsewhere in the agency. Other costs may also be avoided by moving to the cloud, and these should be analyzed and assessed as well. For example, widespread access to cloud-based information may allow employees to forgo live meetings, leading to lower travel costs. The real-time nature of cloud access may also allow organizations to avoid the cost of system breakdowns when information delays are eliminated. These simple examples illustrate how productivity questions often raise issues that must be dealt with beyond the IT department level, since they involve gains that may not accrue to the department but may benefit the larger organization. This is yet another reason why it is important to secure buy-in from senior leaders before migrating to the cloud.

Those tasked with the decision to implement cloud solutions can work through and arrive at a range of likely potential productivity gains such as those described above, but only if they employ a systematic approach. A common measure of productivity is the sum of all labor costs that surround the use of various systems. The more physical “touches” a system requires, the more expensive it will be. The extent to which an organization is able to employ the cloud to reduce these touches will ultimately decide how much of the potential productivity increase it is able to capture.

Productivity gains can also come from introducing new ways of working that are more difficult to quantify. Knowledge sharing is where the cloud truly offers exciting promise, since it allows information to be available to everyone at any time. With significantly enhanced knowledge sharing capabilities, people may find ways to work more productively than they ever realized, devising new and less formal ways of working together. Practically speaking, clients may have to go back to the drawing board and push themselves to envision the cost avoidances and productivity gains that arise from the move to the cloud, in order to gain a full view of what the cloud can really bring, perhaps beyond their original objectives.

By integrating a productivity model with a cost model, clients can obtain a much clearer view of how a transition to cloud will work, the steps they must take to get there, and the potential for transformation the cloud offers.

Case Study: Calculating ROI for a Cloud-based Email System

The CIO of a large division of a government agency, with multiple locations and a highly collaborative workforce, sought a business case analysis from Booz Allen to help decide whether moving to a cloud-based email system was a viable option for them, and to weigh the relative merits of alternative cloud systems. Booz Allen helped the client develop a decision framework that allowed stakeholders to systematically evaluate the costs and benefits of the alternative systems—including the existing in-house system. We worked actively with the operations groups to gather information on existing system costs, and by doing so began to create transparency around the true cost of the existing system.

Next, we undertook a holistic analysis of transition costs and savings, including not only hard savings such as the reduction in licensing and server costs, but also administrative costs that would likely migrate from the IT department to procurement in a move to the cloud. We worked with our client to analyze the
potential benefits of cloud solutions, including avoided costs from eliminating the travel costs associated with meetings. A workforce analysis was conducted to quantify potential productivity gains. In this instance, we also developed an archiving strategy to preserve data as the organization moved off its legacy system.

Our decision framework allowed the client to see clearly that the cost savings they had envisioned would be difficult to achieve, but that the collaboration component of moving to the cloud had the potential to create financial benefits that were not initially apparent. The structure of our analysis, designed to calculate the ROI for various alternatives rather than produce a list of prescriptive recommendations, proved to be illuminating to the stakeholders, particularly within the IT department. Our client’s preferred cloud alternative at the beginning of the process had been an internally hosted “private cloud” solution, but when presented with the ROI of the alternatives, the multi-vendor hybrid system clearly offered the best potential return. The operations team most likely favored the private cloud alternative because they feared a loss of control over the systems. However, once they participated in the analytical process and were presented with the business case for the various alternatives, they were able to see and appreciate the clear costs and benefits of the different alternatives and choose an alternative accordingly.

**Conclusion**

Organizational thinking about data management has evolved rapidly over the last few decades. IT departments that once managed growing quantities of data by stacking up racks of servers now consider the possibility of completely outsourcing the storage and management of that same data.

While the cloud offers unlimited promise for sharing information and developing new, collaborative ways of working, one-stop shopping for cloud solutions does not make sense from a business standpoint. Every organization needs to develop a robust methodology to determine whether and how implementing various cloud solutions will help them. Agencies that do not perform the legwork up-front to understand what a move to the cloud will mean for their organization—from top to bottom—rarely feel like they have gotten their money’s worth. They expect a seismic shift and end up with something closer to a tremor. In some cases, they fail to account for recent investments in legacy systems. In others, they underestimate the potential for productivity gains, electing instead to focus only on cost savings.

It is easy to get excited by the possibility of immediate cost savings from outsourcing data management. However, the greatest rewards are further out, as the cloud helps reorganize work processes and produces meaningful productivity gains. A transition to cloud systems rarely yields a positive ROI when the move is based on cost savings alone. Only when organizations take a comprehensive and forward-thinking look at the potential for productivity gains will the return begin to yield the sort of benefits that justify the transition.

See our ideas in action at [boozallen.com/cloud](http://boozallen.com/cloud).
About Booz Allen Hamilton

Booz Allen Hamilton has been at the forefront of strategy and technology consulting for nearly a century. Today, Booz Allen Hamilton is a leading provider of management and technology consulting services to the US and international governments in defense, intelligence, and civil sectors, and to major corporations, institutions, and not-for-profit organizations. In the commercial sector, the firm focuses on leveraging its existing expertise for clients in the financial services, healthcare, and energy markets, and to international clients in the Middle East. Booz Allen Hamilton offers clients deep functional knowledge spanning strategy and organization, engineering and operations, technology, and analytics—which it combines with specialized expertise in clients’ mission and domain areas to help solve their toughest problems.

The firm’s management consulting heritage is the basis for its unique collaborative culture and operating model, enabling Booz Allen Hamilton to anticipate needs and opportunities, rapidly deploy talent and resources, and deliver enduring results. By combining a consultant’s problem-solving orientation with deep technical knowledge and strong execution, Booz Allen Hamilton helps clients achieve success in their most critical missions—as evidenced by the firm’s many client relationships that span decades. Booz Allen Hamilton helps shape thinking and prepare for future developments in areas of national importance, including cybersecurity, homeland security, healthcare, and information technology.

Booz Allen Hamilton is headquartered in McLean, Virginia, employs approximately 25,000 people, and had revenue of $5.86 billion for 12 months ended March 31, 2012. Fortune has named Booz Allen Hamilton one of its “100 Best Companies to Work For” for eight consecutive years. Working Mother has ranked the firm among its “100 Best Companies for Working Mothers” annually since 1999. More information is available at www.boozallen.com. (NYSE: BAH)

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## Principal Offices

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