IT governance and the emergence of cloud computing: using project and portfolio management to make effective cloud decisions

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executive summary

Challenge

Cloud computing is dominating today’s IT conversations. Information about what the cloud is and what it means is coming from every imaginable direction. Though there are many questions to be answered, the promise of cloud computing leaves little doubt it will have an enormous impact on organizations of every shape and size. Enterprises will face countless decisions about how, where, and when to deploy cloud-based solutions and services. More than ever, governance of these decisions will require sound project and portfolio management (PPM) processes to ensure they are ultimately in the best interest of the organization.

Opportunity

This white paper provides a high-level overview of the emergence of cloud computing, its potential impact, and the need for enterprises to ensure sound governance practices, including project and portfolio management, are in place to support reasoned and rational cloud decisions.

Benefits

Project and portfolio management enables business leadership to clearly demonstrate the value and benefits of cloud computing investment to shareholders, owners and stakeholders.
Section 1:
Understanding cloud computing

Cloud computing is easily the hottest information technology topic today. Interest and discussion abounds from every imaginable source and from every possible direction. There has been a flurry of theory, fact and fantasy, which seems to accompany anything and everything new when it comes to IT. One of the greatest fallacies is the assertion that cloud computing is complex, confusing, or difficult to understand.

In actuality, cloud computing can be explained quite simply. Peter Mell and Tim Grance at the National Institute of Standards and Technology (NIST) have provided one, if not the best, overview. They define cloud computing as follows:

“Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

In addition to this thorough definition, they provide an uncomplicated “5-3-4 model” to capture and convey the various aspects of cloud computing:

- 5 Essential Characteristics
- 3 Service Models
- 4 Deployment Models

**Cloud computing characteristics**

Cloud Computing has five essential characteristics:

1. **On-demand self-service.** A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service’s provider.

2. **Broad network access.** Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).

3. **Resource pooling.** The provider’s computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.
4. **Rapid elasticity.** Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

5. **Measured service.** Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

**Cloud computing service models**

Cloud computing is composed of three service models:

1. **Cloud Software-as-a-Service (SaaS).** The capability provided to the consumer is to use the provider’s applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

2. **Cloud Platform-as-a-Service (PaaS).** The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages 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 application hosting environment configurations.

3. **Cloud Infrastructure-as-a-Service (IaaS).** The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

**Cloud computing deployment models**

Cloud Computing is composed of four deployment models:

1. **Private cloud.** The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise.

2. **Community cloud.** The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on premise or off premise.
3. **Public cloud.** The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

4. **Hybrid cloud.** The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

**Cloud computing standards**

Though at present there are no official or sanctioned standards, the NIST definition is the most widely cited and applied. NIST will undoubtedly influence and participate in the development of national as well as international standards.

**Making reasoned and rational cloud decisions**

Cloud computing provides additional technology provisioning options and faster provisioning of those options to business and organizations of every shape and size and reduces or removes barriers to entry for new systems and applications. A credit card and Internet access is all that is needed to make an information technology investment.

The perception of instant access to cloud computing with direct access to the provider may allow governance processes to be bypassed. This exposes the organization to multiple risks from multiple investments in the same functionality such as lack of integration across the estate, ignoring data security and privacy laws or appropriate management of the organization’s investments in business-enabled technology.

Effective governance processes are established to ensure all investment decisions are reasoned and rational and right for the enterprise. The benefit of easy provisioning could easily be outweighed by the lack of business value or unexpected or unanticipated risks. Enterprises with good IT governance (or more appropriately, business governance of IT) have established processes to incorporate IT considerations rather than simply bypassing IT.

Effective IT governance fosters a cooperative relationship between IT and the business and at its pinnacle will first blur and then eventually eradicate the distinction between the two organizations. This is accomplished by realizing the principles of IT governance:

- Ensure IT is aligned to the business drivers and outcomes
- Ensure investments in information technology deliver appropriate value to the business
- Ensure risks are appropriately managed
- Ensure information technology resources are appropriately managed
- Ensure information technology performance is appropriately managed
Enterprises lacking sound IT governance won’t be the only ones faced with significant challenges. Organizations with the governance in place to prevent or discourage the business from making unilateral technology decisions will also face difficulties with the emergence of disruptive technologies such as cloud computing. For organizations where the business and IT have established the vision for the end-state and garner the executive sponsorship required to invest in cloud computing, the resulting “transformation of IT” will be a huge challenge. Major, multi-dimensional change in enterprises with numerous stakeholders and competing priorities will inevitably test existing governance constructs. These mechanisms need to be capable of continually striking the balance between rapid progress and minimal disruption.

Most organizations do an adequate job of establishing decision-making bodies and committees, but many fail to properly design, implement, and manage governance. Effective governance mechanisms require the development, use and measurement with appropriate role structures and processes.

The governance program required for cloud computing must incorporate the following components:

- Integrated business & IT planning—determine cloud strategic fit into the enterprise
- Architecture management—determine cloud architectural fit and the engagement model for cloud
- IT investment assessment, prioritization, funding & benefits realization accountability (PPM)—ensure cloud computing investment decisions are reasoned, rational and deliver appropriate value
- IT financial & resource allocation—address and manage the myriad of cloud-related financial and resource ramifications including comparison to alternative approaches
- Project execution & decision-making (PMOs/PM)—manage cloud-related projects
- Emerging technology evaluation & adoption—determine appropriate cloud service and deployment models to adopt and when to adopt them
- Client relationship management—liaison between the cloud user and cloud provider and active management of the relationship
- Building & maintaining applications & infrastructure—determine if and when to develop/deploy on premise vs. defer to the cloud
- Provisioning of IT services—facilitate and manage service provisioning in the cloud
- Outsourcing services—manage cloud contracts and manage critical SLAs and costs
- Audit & risk management—address and ensure security and compliance including audit processes
The critical role of project and portfolio management
Project and portfolio management is the process that provides the greatest contribution to delivering the principles of IT governance. While each of the governance processes plays a significant role in establishing, managing and administering enterprise cloud computing, effective PPM is required to ensure the organization makes appropriate investment decisions. PPM ensures that all investments are identified, prioritized, authorized, managed, and controlled to achieve specific strategic business objectives. This includes investments in cloud computing. One of the primary challenges that PPM solves is to ensure that investments in IT-enabled business change are delivered based on business required balanced against the organization’s risk tolerance models.

Most organizations, however, lack adequate PPM capabilities. Study after study show this critical and strategic business process remains immature in the vast majority of organizations. Technology investment decisions are frequently undisciplined, mismanaged, and too often wrong (50% of the time according to almost every IT project success rate study over the past 20 years).

Many enterprises suffer today with immature PPM processes due to a number of factors including:

- Lack of appropriate executive sponsorship
- Scope at the business unit level instead of the enterprise level
- PPM not executed in connection with the overall governance framework
- IT-driven with inadequate business leadership involvement and participation
- Enterprise business process management deficiencies and lack of capabilities to deliver
- Prescriptive or one-size-fits-all approaches
- Archaic tools and lack of automation

A poorly executed PPM program will leave a huge chasm between the business and IT and many enterprises will view cloud computing as a panacea to this deficiency. The outcome will be that they will go directly to cloud providers to make investments in technology. While this strategy may ensure the delivery of technological solutions, will those technology investments be aligned with the business, deliver appropriate value, take on too much risk, make the best use of resources or perform as desired? Will these technology investments be the right decisions?
Section 2: Using Project and Portfolio Management effectively to manage cloud innovation

Enterprises with sound IT Governance and PPM will simply continue to ask and answer each of the critical questions listed above. Governance processes including PPM, enable reasoned and rational decision-making and dramatically increase the ability to realize the most value from technology. Cloud computing simply becomes another option for delivery of technology enabled business investment.

For instance, one large financial organization with mature PPM processes is successfully leveraging Cloud Computing as an option for the development and delivery of services. Cloud Computing has been included as an option for the development of new solutions. Cloud Computing is used for the development and delivery of applications with the policy that critical customer data is not stored except within the enterprise due to the security and risk profile. The PPM processes identify likely candidates early in the options evaluation and dramatically increases the time to delivery and enhance the customer satisfaction of IT.

Conversely, enterprises with immature or inadequate PPM capabilities will need to quickly overcome this deficiency if they are to have any hope of ensuring cloud computing investment decisions are in the best interest of the organization, otherwise they may experience competitive issues.

Business objectives of PPM

Defining business objectives is the first step in establishing an effective business process and PPM is no exception. The Project Management Institute (PMI) provides one of the most comprehensive views of PPM. The following is their definition taken from their Standard for Portfolio Management:

“Portfolio management is the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives.”

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This definition is one of the most comprehensive because it includes all of the activities PPM should address. An organization may use PPM to solely enable executive leadership to authorize and prioritize investments, leaving oversight of management and control of project and programs to operational groups. Another organization may use PPM for investment ideation and approval, without addressing prioritization, management and control.

The most effective and successful instances of PPM address each of the activities listed in PMI’s definition. In doing so they provide the roles and processes to ask and answer each of the following essential questions:

- Should we?
- Can we?
- Are we?
- Did we?
The ability to address these questions becomes even more critical when venturing into the new and complex world of cloud computing.

- **Should we?** Is the investment in cloud computing in the best interest of realizing our strategy? What impact will moving to cloud applications, platforms, services, have on our service portfolio to the business? Have we agreed upon the risk issues and established the parameters for the use of the cloud?

- **Can we?** Does our organization have the capacity and capability to undertake the cloud computing investment and do we have the right prioritization and sequencing of projects given that capacity?

- **Are we?** Once approved, are we making the progress required to realize the projected value of the investment in cloud computing?

- **Did we?** Once completed, did the investment in cloud computing deliver the expected value? Do we have the correct measurement processes in place to judge that we are continuing to receive the value?

Thoughtfully designed and thoroughly implemented PPM processes answer each of these vital questions and the secret is to implement these commensurate with the investment. Sound PPM processes will provide those accountable for information technology investment governance the confidence to make complex cloud computing decisions. They will also have the means to receive the information necessary to monitor the result of their decisions and respond to anomalies and potential changes in strategy.

**Cloud computing investment governance capabilities provided by PPM**

Using PMI’s definition of PPM, the following is a high-level description of the cloud computing investment governance capabilities provided by PPM:

**Ideation**
PPM provides the means to identify, categorize, and evaluate cloud computing investment opportunities.

**Authorization**
PPM provides the means to assess cloud computing investment value potential and risk for the purpose of selecting the investments that best serve enterprise strategy.

**Prioritization**
PPM provides the means to identify and compare cloud computing investment opportunities and rank them within their strategic or funding category.

**Managing**
PPM provides the means to understand resource requirements and balance capacity and capability in relation to the demand created by cloud computing investments.
Controlling
PPM provides the means to monitor cloud computing efforts and potential changes in strategy for the purpose of making the adjustments necessary to optimize cloud computing investment portfolio performance.

Benefits realization
PPM provides the means to raise the potential of achieving optimal value for cloud computing investments and understanding and correcting benefits erosion and project failures.

An organizational decision to transform the business leveraging cloud will also change the focus on option selection. The processes involved in the selection of a third party will alter from simply monitoring the development of code to the sourcing, selection, monitoring and management of cloud suppliers for delivery.

For example, a large global manufacturing organization leverages the effective PPM steps to ensure effective decisions on investments in on-premise, cloud computing, outsourced or hybrid solutions based on a combination of business drivers including time –to-market, risk and investment capabilities. Cloud computing is simply one delivery vehicle available and the decision on when to use cloud computing is made leveraging the PPM processes. For projects where cloud computing is appropriate the project manager allocated to the project will change from monitoring the delivery of code to management of the cloud provider.

Section 3:
Making reasoned and rational cloud computing investment decisions with confidence

Project and portfolio management enables business leadership to clearly and transparently demonstrate the value and benefits of cloud computing investment to stakeholders by:

• Providing the foundation for necessary communication and collaboration to serve the multi-dimensional cross-organizational business partners and stakeholders participating in the “pooled decisions” inherent to enterprise cloud computing

• Ensuring cloud computing investments are made in relationship to the existing service portfolio and are aligned with organizational goals, strategies and priorities

• Providing the means to select the right cloud computing investments (“Should we?” and “Can we?”) and make the tradeoffs necessary to accomplish overall goals

• Involving top management in overseeing the portfolio of cloud computing investments (“Are we?”)

• Providing the mechanisms to measure the actual business value delivered by cloud computing investments (“Did we?”)
Section 4:
Conclusions

The promise of cloud computing and its ability to deliver IT-enabled business service rapidly, reduce costs and deliver agility are having an enormous impact on the future of IT. As with all other technology choices, effective governance is critical to ensure decision-making processes are not only adhered to, but also compliment the organization’s ability to consistently make the correct choices to deliver the most value-added services to the business.

- Cloud computing is in its infancy, but expect it to grow up fast. The potential of cloud computing is mind boggling and the technology and business options will increase exponentially. This will necessitate the need for enterprises to make the right technology investment decisions faster, which will only be achieved through optimized decision-making constructs that enable the correct technology solution including cloud computing.

- For organizations lacking effective decision-making capability born of IT governance and PPM, cloud computing could simply mean they’ll make their flawed technology investment decisions faster and more frequently.

- Enterprises with sound IT governance will look to the cloud and imagine one possibility after another. Those without it will likely have IT organizations viewing the cloud as a tempest and will eventually discover they are ill prepared for the coming storm.

- It is recommended that if your organization doesn’t have effective PPM processes in place that you move to immediately implement. Cloud computing will require an appropriate risk acceptance model that also changes the guidance for project portfolio managers to manage cloud providers.
Section 5:

About the authors

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Steven Romero serves as an IT Governance Evangelist at CA Technologies, Inc. His mission is to help enterprises realize the full potential of their IT investments for strategic and competitive advantage. In this capacity, he acts as a strong advocate for the customer, speaking around the world to users, prospective clients, industry organizations and IT luminaries to identify and communicate leading advances in Corporate Governance of IT.

Romero is an innovative, passionate IT professional with over 30 years experience working in almost every area of IT. For the past 15 years his career has focused on helping large enterprises transform their IT organizations from cost centers to strategic assets. Steve is a recognized expert in Corporate Governance of IT, Project and Portfolio Management (PPM), IT/Business processes, and business process management. He is a Certified Project Management Professional, a Certified Information Systems Security Professional, ITIL Foundation Certified, a Certified Process Master, and a Certified Computer Professional.

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