HOW THE CLOUD ACCELERATES INNOVATION

A White Paper written by:
John Engates, Chief Technology Officer

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Introduction

How can IT effectively support innovation? The right way to support innovation varies dramatically depending on the context. Innovation in medicine or oil exploration begins with research and proceeds through a lengthy process of development and testing. IT can support this sort of innovation, but the basic research is the main event.

The bulk of innovation we hear about today is much easier than the kind of long-term innovation just described. For most businesses, innovation means first gaining an improved understanding of product offerings or key processes, then what to change to get a better result. The implementation of the innovation almost always becomes an IT project. In other words, the last mile of most innovation that makes a difference goes through IT. Often innovations are perfected in many short increments using agile methodologies, which again makes the malleability of IT a crucial factor.

Leading organizations have recognized this linkage. They have asked: How long does it take to provision new servers, data centers, and applications? How much will that cost? Can we afford to add IT personnel and equipment to support short-term experiments?

It stands to reason then that if IT can be deployed, configured, and adapted faster, it will spur innovation. Adopting cloud-based IT in various forms is an important factor in accelerating innovation.

Today's most innovative companies encourage curiosity and ingenuity at a low cost by exploiting the flexibility of cloud computing. Building a new data center is cost-prohibitive, but the cloud lets you scale economically. With a self-service model enabled by the cloud, users can innovate and solve their own problems, empowering themselves and freeing IT for more strategic tasks.

You can spend a lot more time innovating new products when you don't have to spend time provisioning, managing, and maintaining infrastructure. Increased adoption of cloud computing accelerates innovation.

In this paper, we'll show you the many ways the cloud makes IT more responsive to innovation in different parts of the innovation cycle:

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- Eliminating IT Roadblocks
  - The cloud helps you innovate faster. Computing resources are available in a snap.
  - Business users don't have to wait for IT to provision infrastructure for their initiatives—they can get started in minutes, instead of weeks or months.
- Emancipating IT, Increasing Agility, Attracting Talent
  - The cloud reduces the effort to maintain IT systems. When you host email and file sharing in the cloud, IT staff can focus on more strategic projects.
  - Because cloud hosting companies focus solely on managing IT assets, they often provide better visibility into performance than in-house hosting can.
  - Because the cloud is clearly on the rise, adopting cloud technology can increase your ability to attract top talent.
- Supporting Success through Access to Elastic Resources
  - The cloud provides access to scalable computing resources, such as processor power, RAM, and disk space, allowing you to handle traffic spikes confidently.
  - When an innovation is successful, there is a clear path to massive scalability.
- Increasing Choice, Leveraging Ecosystems
  - Recent initiatives around creating open-source cloud software are clearing the decks for innovation without fear of vendor lock-in.
  - Open standards are shedding light on new approaches to creating lightweight, more stable, and better performing applications.
  - Your organization can benefit from the collective innovation of all the companies that are hard at work coming up with new ways to make the cloud more useful.

Eliminating IT Roadblocks

The cloud is a new way of delivering IT. It shifts technology tasks that keep the company humming—but don't add value—off the shoulders of the IT department. When developers and users diagnose server malfunctions instead of designing new products, that's a lost innovation opportunity. When IT infrastructure bottlenecks slow development access to new resources, you lose competitive edge. Nearly 75% of IT budgets just support the status quo.[1] The more you reduce that percentage, the more time and money you have to change the game.

By moving to the cloud, with the same budget and resources, you can experiment with a longer list of ideas. If you transfer key segments of your IT estate to the cloud, where it can be run by vendors whose business model revolves around it, your best minds can get back to doing what you hired them to do—turning on light bulbs over their heads, not just "keeping the lights on."

Nearly 75% of IT budgets just support the status quo. Move to the cloud, and with the same budget and resources, you have room to experiment.
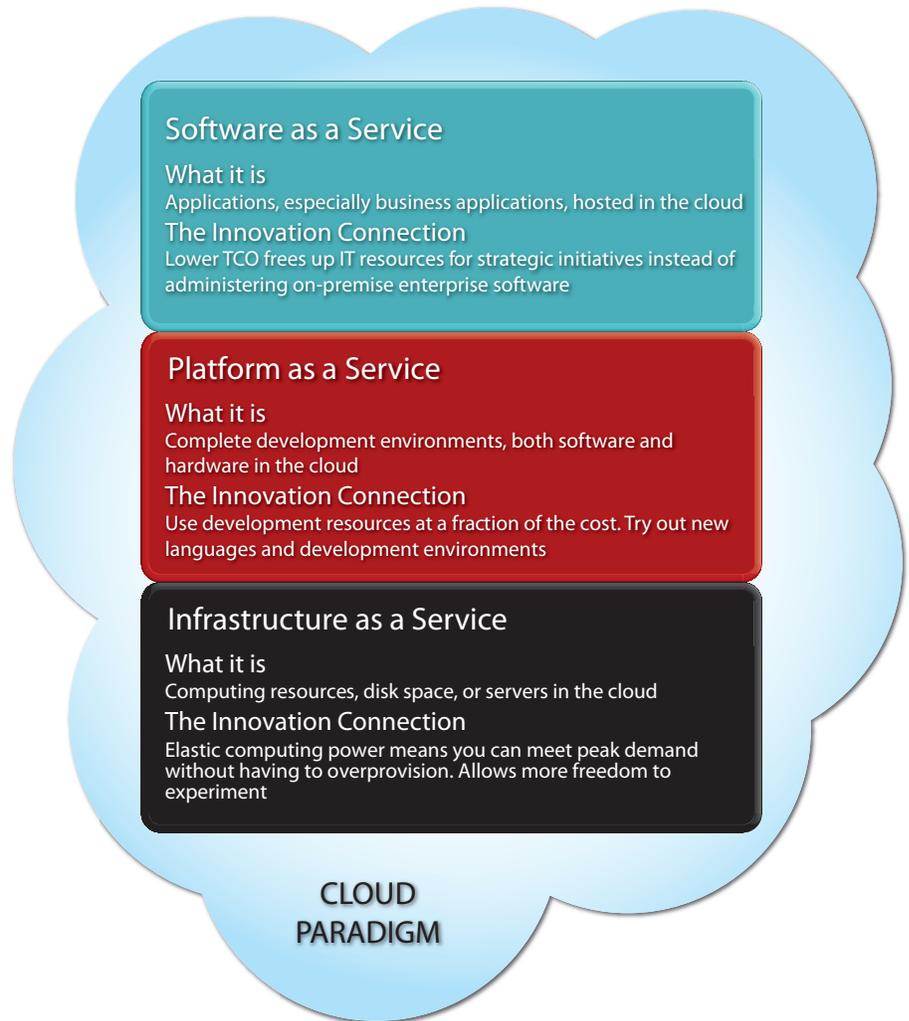
1 V. Yeo, "Dell touts hefty savings from IT efficiencies." ZDNet Asia, March 3, 2010: http://www.zdnetasia.com/dell-touts-hefty-savings-from-it-efficiencies-62061584.htm

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Speed Deployment, Development, and Testing

The cloud lowers barriers to experimentation and can speed deployment and testing of new projects that otherwise might have died on the vine.

Software as a Service

What it is
Applications, especially business applications, hosted in the cloud

The Innovation Connection
Lower TCO frees up IT resources for strategic initiatives instead of administering on-premise enterprise software

Platform as a Service

What it is
Complete development environments, both software and hardware in the cloud

The Innovation Connection
Use development resources at a fraction of the cost. Try out new languages and development environments

Infrastructure as a Service

What it is
Computing resources, disk space, or servers in the cloud

The Innovation Connection
Elastic computing power means you can meet peak demand without having to overprovision. Allows more freedom to experiment

CLOUD PARADIGM

Software as a Service (SaaS) affords the benefits of running an application from a central location on a one-to-many model—everyone who needs to use it can access it from the Web, without the need to deploy to individual machines. Users and IT don't need to worry about patches and upgrades. Because only one version exists, managed by a single company, the application can evolve faster and it runs better because needed expertise is centralized.

Platform as a Service (PaaS) provides a set of APIs and a development environment for building cloud-based applications. It can be used to design, test, and deploy applications

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without the cost and complexity of buying and managing the underlying hardware and software, which means deployment moves faster. Users can create, deploy, scale, maintain, customize, and test web-based applications without heavy IT involvement.

One layer below, **Infrastructure as a Service (IaaS)** allows the raw materials of computing to be created, used, paid for, and retired on an as-needed basis. Resources such as servers, software, storage, data center space, and network equipment can be provisioned through web interfaces or APIs. The elastic computing power of IaaS allows you to meet peak demand, without having to overprovision "just in case." When infrastructure provisioning and use is this straightforward, there is much more room to innovate at a much lower cost.

Emancipating IT, Increasing Agility, Attracting Talent

Through the cloud, IT can provide high-performance computing to users, without the heavy lifting of on-premise provisioning. The cloud also takes away some of the responsibility of creating applications from IT.

In addition, cloud services provide more transparency into the consumption of computing resources than on-premise architectures, making it possible to see who is using what resources and better understand their usage patterns.

The on-premise IT model comes with the following constraints:
- Limited flexibility to roll out new services
- The pressure to fix broken applications and tend to technical problems, which made it difficult to find time to develop new, value-added business applications
- The grind of managing contracts with providers and maintaining software and hardware

Because the cloud removes these constraints, IT is freed up to co-innovate with business users, building applications and solutions that truly differentiate the organization and bring real value.

Manage Complex and Fast-Changing Resources

The cloud makes it easy to manage a complex application portfolio. Because apportioning and managing resources on-premise is no longer an issue, applications can be deployed more easily, reducing the cost of trying new things. Additionally, upgrades, patches, and changes to commercial software become the responsibility of the cloud vendor. Cloud vendors can automate deployment and management of basic apps while your team works on new apps that provide differentiation. Further, some cloud vendors can track application usage, storage and memory requirements, and CPU loads. They offer monitoring solutions that can help with security issues and alert you when resources are becoming overtaxed. Because of the way cloud architecture is instrumented, more information may be available in the cloud than on-premise.

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Here are a few examples of rudimentary tasks that can be transferred to the cloud:

- **Email.** Hosting email in the cloud can help provide continuity for users, reducing the risk of downtime. Let's face it: no one distinguishes themselves based on how well they host email.
- **Backup.** Storage and backup needs are increasing. Maintaining on-premise file servers is expensive and offers little differentiating value. Cloud-based storage allows you to share and sync data with the cloud without maintaining file servers. It moves data offsite, which also supports disaster recovery.
- **File sharing.** Many enterprises use file-sharing applications such as Microsoft® SharePoint® to manage documents and collaborate. In the cloud, a SharePoint installation can be proactively monitored and maintained by experts.

Pooling of Expertise

With cloud adoption, you stand to benefit from the collective innovation of all the companies that are hard at work coming up with new ways to make the cloud more useful for both the most ordinary and extraordinary computing circumstances.

When you detach your own product and service innovation from the grind of maintaining infrastructure resources, it might be tempting to forget that innovation is still happening on the infrastructure side—but it is, and that's important. Cloud vendors bear the cost of upgrades to systems, leaving more of your money for innovation. They routinely find new ways to make cloud infrastructure more efficient, while staying on top of current issues. When it's time to make a change, automated updates, security patches, and version upgrades happen seamlessly, making the transition invisible to the customer. Yet the benefits soon become obvious: speed, lower costs, easier access, and the elimination of the upgrade and versioning hassle.

Attracting Talent

The trend toward cloud adoption is no secret. The most talented engineers and developers are seeking to increase and develop their skills. A declared strategy to make the most of the cloud can help IT departments attract the best talent, who then can help accelerate innovation.

Supporting Success through Access to Elastic Resources

> The cloud lets you scale and innovate using heavy-duty computing power without having to buy it or lease it long-term.

The ability to consume resources in short bursts is vital for many companies, particularly as business fluctuates episodically through seasons, economic conditions, or events. With the crush of "big data" from thousands of information sources powering applications that support decision-making and new product development, many companies find themselves in need of more computing power—fast. Many businesses can't afford to buy more servers to meet peak demand. The cloud lets you scale and innovate using heavy-duty computing power without having to buy it or lease it long term.

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Consider AgencyNet, a digital content agency that specializes in creating marketing plans. In 2011, AgencyNet developed a Facebook application for the Nickelodeon Channel's Kids' Choice Awards. The chief currency of the Nickelodeon world is "slime," a gooey concoction flung at game-show winners and guest celebrities. As the host of the KCA, AgencyNet needed to accommodate a potentially huge traffic surge, with fans slinging virtual "slime" on their favorite videos and websites. AgencyNet estimated that the traffic could comprise 20% of its total volume.

The company turned to Rackspace to host its Facebook app because of its ability to provide on-demand, scalable support for cloud applications. Not only did Rackspace's web servers help the app take off like a shot, earning 25 million impressions; AgencyNet also used Rackspace's CloudKick monitoring and management service to access all the monitoring data so that they could spin up more Cloud Servers if there was an unexpected traffic spike. AgencyNet used Rackspace's storage capacity to record the feedback. Site response times were extremely fast, despite the traffic spike. And, when the contest ended, AgencyNet could stop renting the servers, providing substantial cost savings.[2]

Increasing Choice, Leveraging Ecosystems

IT departments must be careful as they adopt the cloud in support of innovation. Selecting the wrong platform could result in less choice, not more innovation. In other words, the specter of lock-in still looms when adopting cloud infrastructure.

Open clouds increase the choice of vendors to help your organization build and maintain new applications. With open-source technologies such as OpenStack™, which enables any organization to create cloud-computing services on commodity hardware, the collective development efforts of the cloud community offer rich possibilities. The move to open source the cloud is sparking a revolution on par with the rise of open source software.

The open cloud has a long-term effect on innovation. Because more energy from more vendors is applied to an open ecosystem, new capabilities arrive faster than with proprietary alternatives. The rise of the open source Linux operating system illustrates this clearly.
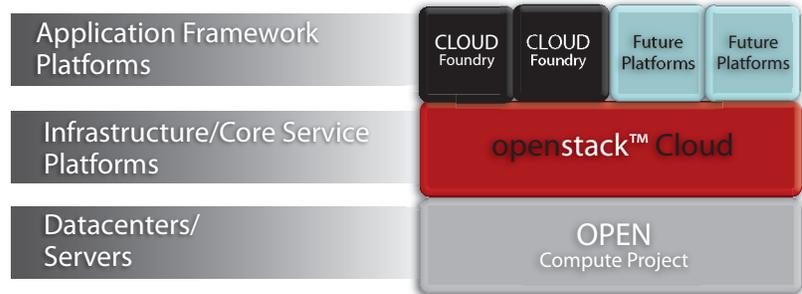
Open standards also lead to interoperability, which increases the ability to mash up many different services to meet new needs.

Open Cloud Initiatives

There has been a recent increase in cloud vendors' willingness to share innovations through open standards. NASA, Rackspace, and 20 other organizations joined to form OpenStack project, an open source community devoted to building a cloud operating system. A wave

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2 AgencyNet Case Study, Rackspace, 2011.

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of open standard innovation projects have also emerged, such as Facebook's launch of the Open Compute Project, a community effort to create low-cost, green data centers. VMware followed later with Cloud Foundry, a multi-language, multi-platform service for building scalable cloud solutions, whose code has been released to the Apache 2 developer community. Now, OpenStack community members are working on ways to tie all of these components into one system. These and other initiatives are driving a new paradigm of innovation around the cloud, creating new products, services, companies, and jobs.

Application Framework Platforms	CLOUD Foundry	CLOUD Foundry	Future Platforms	Future Platforms
Infrastructure/Core Service Platforms	openstack™ Cloud			
Datacenters/ Servers	OPEN Compute Project			

Leveraging an Ecosystem

The sort of ecosystems that form around cloud-based IT have several positive effects on innovation. First, the ecosystems attract services partners, who can help put cloud technology to work. Second, if the cloud-based IT is based on open source, independent software vendors provide missing features and functions. Third, a cloud ecosystem can be come the focus for the energy of numerous companies, who can work together to make the offering better at a speed none of them could achieve working alone.

As an example, the OpenStack community includes some of the largest and most significant computing vendors. Each provides technology that can help enterprises start innovating in the cloud, faster:

- Microsoft contributed support for the Hyper-V server to help migrate enterprise virtualization projects to the cloud.
- Citrix added support for XenServer and will soon support VMware ESX.
- Dell, Intel, and AMD are optimizing their hardware to run the OpenStack platform and determining the best specifications to run an OpenStack cloud.
- NTT DATA Group added support for IPv6.
- Opscode is writing automation scripts to more easily launch projects and assign resources to the cloud.

These participants and others are helping integrate the OpenStack platform at the enterprise level. Just as the cloud, in general, removes the bottlenecks to innovation imposed by the on-premise IT model, the OpenStack community is doing its part to ensure that commercial cloud vendors don't present roadblocks to innovation. If enterprises can avoid being "locked in" by a vendor's upgrade path or compatibility with other vendors' products, the road to innovative software in the cloud becomes less like a bumpy towpath and more like an airport runway—smooth and cleared for takeoff.

Conclusion

Adopting cloud-based IT doesn't guarantee that your company will invent the next touch pad. But it can eliminate the most preventable IT roadblocks to innovation. In this way, cloud-based IT shifts time and money away from business-as-usual and toward game-changing innovation. Business users and developers can scale resources up and down as needed, freeing IT to spend more time creating and less time configuring. IT is enabled to better manage widening portfolios of applications while users are free to experiment within limits set by IT. In the cloud, the new IT paradigm is simplicity and flexibility, and your people can illuminate new ideas, not just keep the lights on.

John Engates joined Rackspace in August 2000 and currently serves as Chief Technology Officer. John is an internationally recognized cloud computing expert and a sought-after speaker at technology conferences, including CA World, the Goldman Sachs Techtonics Conference, and Cloud Expo. He speaks on the future of cloud computing, enterprise cloud adoption, data center efficiency, green data center best practices, and more.

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