Should You Build An Internal Computing Cloud?

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Executive Summary

Should a firm build an internal computing cloud or use an external cloud services provider?

If the primary concerns of CEOs are considered, namely, reducing complexity, driving innovation, focusing on core competencies and cost control, the reasons touted for building an internal computing cloud cannot be supported in a rational analysis.

An internal computing cloud misses the whole point of cloud computing and delivers very few business benefits.

Cloud computing should be viewed in the same decision-making framework as other non-core services such as logistics.

It is the irrational, but perfectly predictable, elements of human nature which offer the greatest barrier to the adoption of an external computing cloud.

Although firms may proceed to build an internal computing cloud for non-rational reasons, this paper will help to determine the opportunity cost to the firm of doing so.

Target Audience

This white paper has been written for CEOs, CFOs, CIOs, business owners and others who make investment and policy decisions with respect to information systems. Any technical terminology used is explained in business terms.

Author

Dr Michael Snowden has founded three entrepreneurial IT companies during the past twenty-seven years, namely, Financial Systems Limited, a systems integrator, The Great Elk Company Limited, a global CRM software company specialising in multinationals, and OneNet Limited, a pioneer and market leader in cloud computing. Michael was an early pioneer in cloud computing. A SaaS version of the The Great Elk CRM system was launched in the USA market in 1999.

Michael completed BA, MCom and PhD degrees at the University of Auckland, New Zealand and lectured part-time for several years in the Business School. Michael also completed the Owner/President Programme at the Harvard Business School.

Michael is the author of The CEO's Guide to Cloud Computing.

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Introduction

The original concept of cloud computing was, in essence, the provision of computing services by a third party service provider. The term "cloud" is a metaphor for the Internet and services are provided over the Internet.

This early concept of cloud computing has been "hijacked" by traditional IT vendors, systems integrators and many internal IT departments to label traditional IT as "cloud computing" to preserve the status quo and protect their respective market and career positions.

What is an internal computing cloud?

The idea of an internal computing cloud is that a business or government agency could deploy the same technologies that an external cloud provider uses to build a computing cloud **inside** the organisation's own security perimeter, or firewall.

This contrasts with an external computing cloud which is delivered by a third party cloud computing services provider.

In essence, if the computing cloud is behind the firm's own security perimeter firewall then it is an internal cloud. If it is provided by a third party outside the firm's firewall then it is an external cloud.

This distinction of external and internal clouds avoids the unclear and ambiguous definition of private and public clouds.

The marketing efforts of established IT providers to position traditional internal IT, with relatively few enhancements, as cloud computing has served their "rear guard" purpose of generating confusion and uncertainty, thus delaying the inevitable transformation of computing.

In this white paper we shall explain why, in our view, building an internal cloud misses the whole point of cloud computing and delivers few business benefits.

Will building an internal cloud lead to success or failure?

What Are The CEO's Main Business Issues?

Before we can answer the question of whether or not an organisation or firm should build an internal computing cloud, it is firstly necessary to understand what the firm's CEO's main issues and drivers are likely to be as this will help to provide a framework for the decision.

While we cannot know exactly what any particular CEO's main issues may be, we do know, in summary form, what 1,500 CEOs of large and small companies located worldwide told IBM in face-to-face interviews in 2010.[1]

The CEOs surveyed were concerned about at least four key issues, namely, complexity, innovation, core competencies and cost control.

CEOs foresee complexity accelerating

Complexity

The conclusion of the IBM CEO survey is that CEOs across the globe consider that complexity within their firms is their greatest single challenge.

Not only is the current level of complexity they face considered to be their major issue but they also expect complexity to continue to increase. More interestingly, they also expect the rate of change in complexity to accelerate.

Many CEOs are clear that their enterprises are not equipped to cope effectively with complexity both within their firms and within the business environment they compete in.

They also see the business challenge as not just taming complexity inside their organisations but, perhaps more importantly, as finding ways to hide complexity in their products and services from their customers and clients.

Business Model Innovation

A business model describes how each business operates and competes within its marketplace, while business model innovation describes the development of new ways for the firm to compete.

Competing through new business model design is very relevant as new opportunities generated by technological advances, new customer preferences and deregulation open up expanding possibilities for new markets and new methods of serving them.[2]

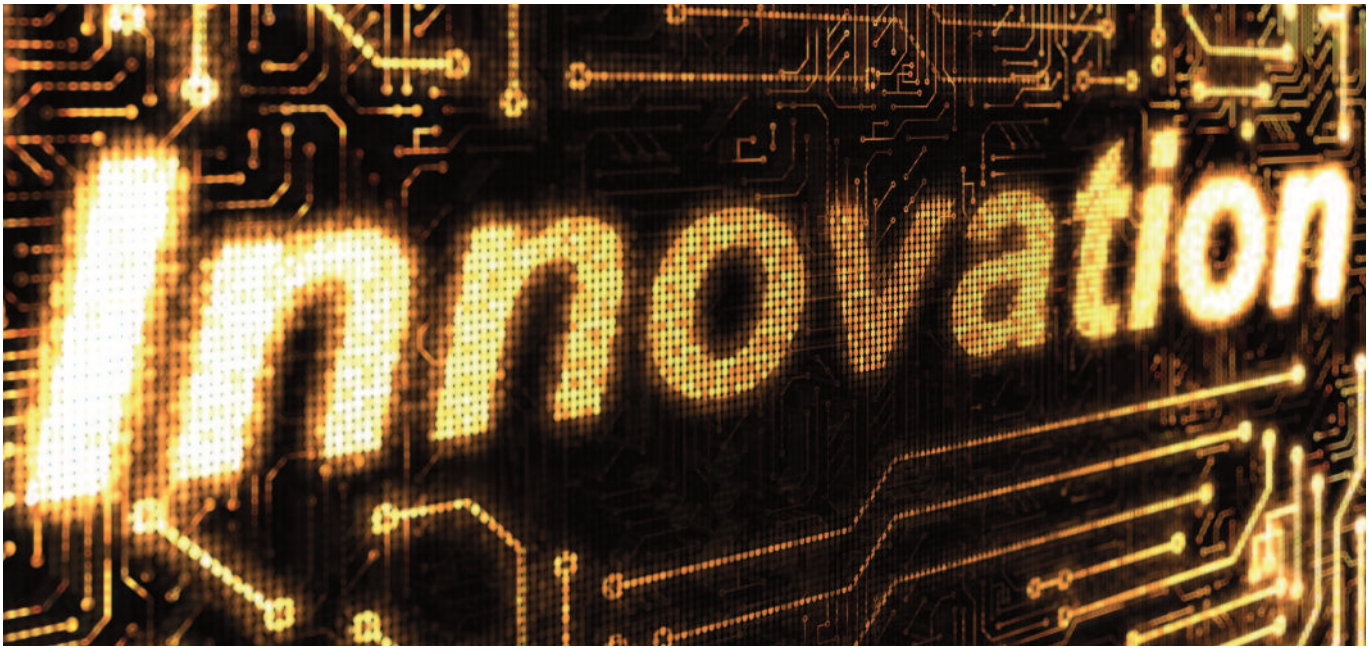
The 2010 IBM CEO survey describes "creativity" as the number one leadership competency. This is reflected in the need for constant business model innovation.

IBM's 2006 and 2008 Global CEO Studies revealed that top management in a broad range of industries were "seeking guidance on how to innovate in their business models to improve their ability to both create and capture value".[3]

These findings are also supported by The Economist Intelligence Unit survey published in 2005.[4] More than 60% of executives believed that future competitive advantage would be based on business model innovation rather than on new products and services.

In a recent McKinsey Global Survey, 84% of executives said that innovation is "extremely or very important to their companies' growth strategy".[5]

In the context of information technology, business model innovation may include the embedding of sensor devices or software into current or new products and services or, alternatively, delivering them in new ways.



Business model innovation finds new ways to compete

Core Competencies

A core competency is critical to each firm's ability to generate unique value for its customers and clients.

Core competencies are generally knowledge-based rather than dependent on a particular set of physical assets.

It is the specific skills that a firm must have to create value for its customers and clients that counts.

For the necessarily small number of core competencies that a business selects, it must maintain absolute dominance in them.

Each business, in order to maximize its returns, will generally focus on what it does best and seek alternative providers for the functions for which it cannot gain any competitive advantage.

Firms need to focus on what creates unique value for their customers

Cost Control

Cost control within the firm has almost always been a primary concern of CEOs. This focus has been amplified during the Great Recession and it is highly likely that, for many years into the future, cost control will continue to attract close CEO attention.

Cost control is a CEO's enduring concern

Summary

In summary, CEOs want to:

- **Tame complexity inside the firm and deliver simplicity in products and services to the firm's customers and clients.**
- **Be creative in innovating with new business models**
- **Focus on the small number of core competencies that create unique value for the firm's customers and clients.**
- **Control costs.**

"It does not make sense to take computing out of the cloud and still call it cloud computing" [7]

Why Would You Want To Build An Internal Computing Cloud?

Multiple surveys of CIOs, or Chief Information Officers, principally in the USA, typically provide four principal reasons for a firm to build its own internal computing cloud, as follows.

- Security

If company data and computing is kept in-house, then it will be safe and secure.

- "IT-as-a-Service"

Internal information technology, or IT, resources can be repositioned as "IT-as-a-Service" and deliver similar benefits to an external cloud provider.

- Improved IT Agility

An internal computing cloud would allow easy and cost-effective up and down resource scalability.

- Reduced Complexity

An internal computing cloud would help to reduce IT complexity and, therefore, overall complexity within the firm.

We shall consider below each reason for building an internal cloud.

Computer security is elusive

Security

In virtually every survey conducted about the likely adoption of cloud computing, security appears as the number one reason to not go to an external cloud.

Of course, security should be high on everyone's list of concerns with respect to using "the cloud". However, it is important to recognize that there is no single external computing cloud and there is no single uniform external cloud service.

The external cloud computing market is made up of many different providers. To treat them equally as "the cloud" is simply not correct.

While concerns about IT security are perfectly legitimate, many "knee-jerk" security objections to an external cloud computing often mask other hidden objections such as a threat to one's job, status and future career prospects.

How is computer security defined? Security means different things to different people but usually includes environmental protection, data loss prevention, processes to reduce internal user mischief and barriers to external hackers.

In considering the relative strength of external and internal cloud computing security it is important to remember that most security breaches come from inside the organisation.

An internal IT team faces many of the same security challenges as an external cloud computing provider but is often less focused and resourced to address them.

Accordingly, most organisations will get stronger security from a competent external cloud provider than they provide for themselves.

Let us consider why that is so.

If a survey of firms of different sizes were conducted to determine a single number which reflected each firm's overall IT security and the results were plotted as strength of security against size of organisation, we would have a conceptual graphic similar to the one entitled *Comparison of IT Security to Size of Firm*.

We would expect to find outlier exceptions, such as a small defence contractor in the top left hand corner of the 2x2 grid or a large, lazy organisation in the bottom right hand corner of the grid.

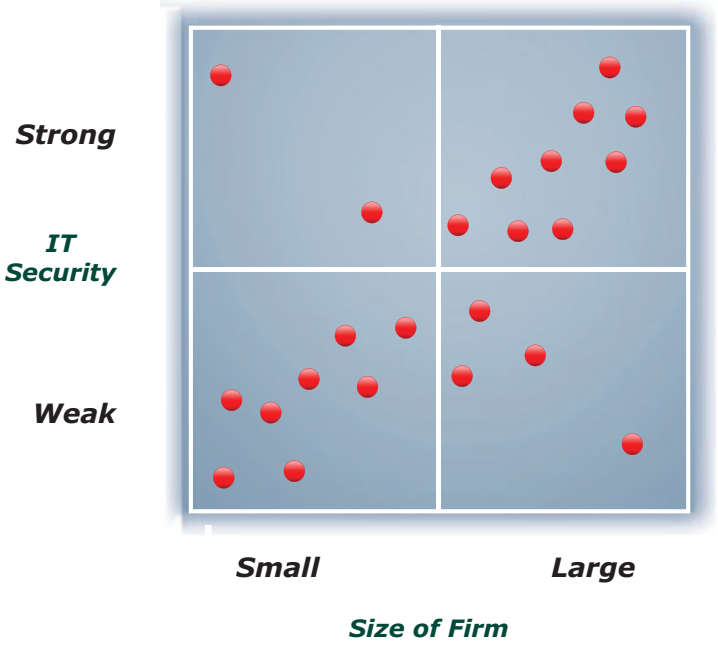
Generally speaking, the larger the organisation, the stronger the level of IT security one would expect to find. This makes obvious sense.

The larger the organisation, the more resources there are to focus on IT security, the greater the number of stakeholders and governance requirements involved, the more stringent compliance requirements are likely to be and there is simply more at risk.

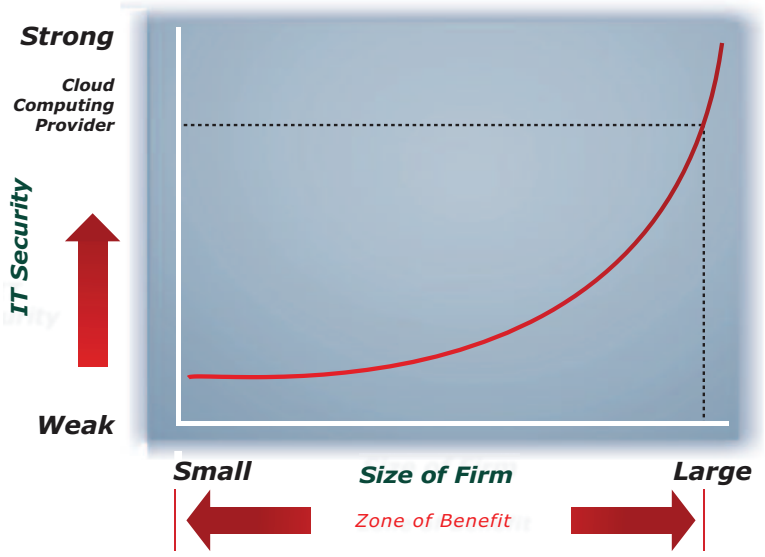
If the data portrayed in the 2x2 grid were plotted as a single line we would likely view a conceptual graph similar to the one entitled *External Clouds Provide Stronger Security*.

The graph illustrates the point that since an external cloud computing provider operates at a scale which is much larger than the IT departments found in most organisations, it is likely to offer much stronger security than smaller firms can provide for themselves.

Comparison of IT Security to Size of Firm



External Clouds Provide Stronger Security



Smaller organisations may benefit enormously and the highlighted section described as the "zone of benefit" means that firms employing a competent external cloud computing service provider may enjoy the same or, quite conceivably, stronger IT security than much larger firms.

Why is this so? Quite simply, the external cloud computing provider considers security to be a core competency. Security must be something they become very good at in order to survive in the marketplace.

IT security is bound by a risk and return tradeoff, whether internal or external. An external provider would be more likely to view a security breach as having a much higher penalty than an individual firm, as it is a core element in their value proposition.

In addition, the focus of highly skilled resources on the cat-and-mouse and ever-moving security challenges, with the costs being spread over all of an external cloud service provider's clients, provides very effective "economies of skill".

Compare this approach with all but the largest organisations. Many firms treat IT security as a part-time activity and often have a "set-and-forget" approach until there is a breach or scare and the security game is lifted again.

Most of the valid objections to external cloud security relate to the opaqueness of providers' service offerings. Unless the external provider is willing to allow independent security audits, transparency into the systems and processes the client operations involve, provide enforceable contractual terms with appropriate service level agreement (SLA) compliance tests, caution should prevail.

If acceptable due diligence may be conducted, it is highly likely that a competent external cloud computing provider will satisfy any reasonable demands for security compliance.

In conclusion, a firm using a competent external cloud computing service provider is likely to get stronger IT security than they would arrange for themselves.

"An internal computing cloud is just internal IT by another name"

"IT-as-a-Service"

The idea of internal "IT-as-a-Service" is that an internal IT team could deliver IT services to a firm's users in the same way that an external cloud provider would. At first glance, this sounds appealing.

However, the benefit of having a firm's own users self-provision new IT resources must be weighed up against the costs of setting up an internal cloud.

Only large firms are likely to be able to justify a pool of IT resources which can easily and quickly be scaled for projects.

The majority of any firm's IT resources is invariably dedicated to line-of-business applications and internal variability of demand is relatively small.

Accordingly, while the concept of an internal IT department offering "IT-as-a-Service" has an inherent appeal, there will be few real business benefits to be realised for all but the largest of firms.

Can an internal cloud deliver IT-as-a-Service?

"Running internal IT assets is not a core competency service for most companies"

How much shall I charge?

An internal cloud has the added benefit of generating detailed usage data which could provide for an accurate "chargeback" system. Chargeback describes the process in which a firm's IT costs are charged back to business units.

The primary benefit of IT chargeback is that business unit leaders would gain a better understanding about the IT resources they are using and what their cost is.

However, IT chargeback challenges have been around for many years and few organisations consider that they have done it well. Several questions emerge. How should technical terms describing usage be translated into business terms that line managers can make sense of? Will IT chargeback actually change behaviour? Does the firm's culture encourage the principle of chargeback?

IT chargeback has been described as 20% accounting and 80% politics. It is easy to view IT chargeback as a double-edged sword. Once business unit leaders see their IT costs in detail, they are likely to quickly compare internal IT costs to what an external provider would charge for the same services.

If fully transparent internal IT costs are not as low as the fees an external provider would charge, tension will be created between the business unit and the internal IT team. This tension will likely lead to a good outcome for the firm because internal IT service providers would face rigorous competition from external providers.

The most critical point in this regard is that a firm typically has captive users with few options for sourcing services externally. Without competition and transparent internal pricing there are no commercial drivers acting to force a firm's IT costs downwards and quality upwards.

Finally, internal IT is still a semi-fixed cost to the firm, no matter how clever the chargeback accounting system is. Any perceived benefit from a variable cost or "pay-as-you-go" price offering from an internal cloud to a firm's business units is dwarfed by the reality that, within the firm, IT costs are largely fixed in nature.

Improved IT Agility

There are three distinct types of agility, namely, strategic, portfolio and operational which help firms deal with turbulence. Several academic studies have shown that volatility at the firm level, measured by several criteria, increased between 200% and 400% in the period from the 1970s to the 1990s.

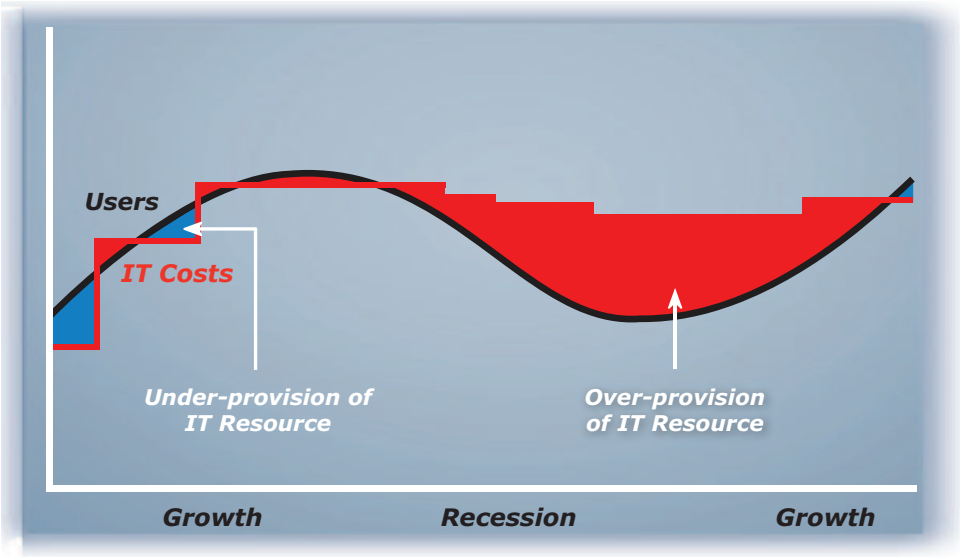
Internal IT fits into the operational agility category, which may be described as "a firm's ability to exploit both revenue-enhancing and cost-cutting opportunities within its core business more quickly, effectively, and consistently than rivals do".[6]

The perceived benefit of improved IT agility is that an internal cloud would allow almost instant end-user provisioning of IT resources and that rapid increases and decreases in IT resources will be easily achieved.

The most important point here is that the firm in aggregate has not avoided the perennial problem of over or under-provisioning of IT resource.

Will an internal cloud really improve agility?

Internal Computing Cloud Costs are Semi-Fixed



The graphic entitled *Internal Computing Cloud Costs are Semi-Fixed* depicts the issue of under-provisioning IT resources during periods of economic growth and the opposite, but more intractable, problem of over-provisioning during an economic downturn.

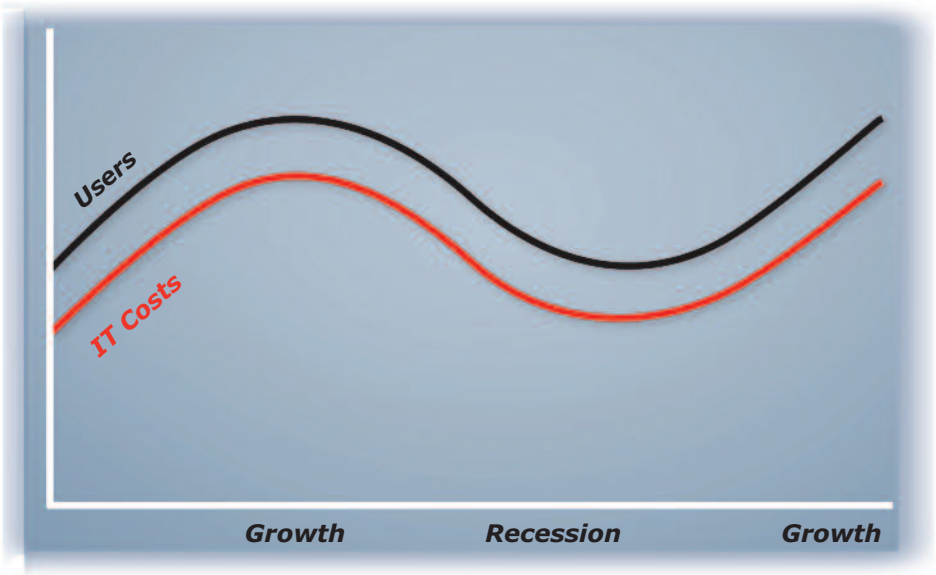
It is often difficult to rapidly provision new IT resources and this is a key benefit touted by advocates of an internal cloud. The capital expenditure application to commissioning cycle can often extend to several months. An internal cloud could have sufficient capacity to provide computing resource, on demand, whenever it may be required.

To achieve this state of on-demand provisioning utopia sufficient excess IT capacity must, of course, be built into the internal computing cloud to allow this to happen. This leads to the same problem of over-provisioning.

As economic conditions or other business imperatives dictate cost or resource reductions, an internal computing cloud becomes just a collection of IT resources and semi-fixed costs which are virtually impossible to reduce in the short term. This leaves the firm "high and dry" with respect to IT costs because they are semi-fixed until leases run out, depreciation is fully recovered and salaries are reduced with employee attrition and redundancies.

This situation compares starkly with the cost and resource agility provided by an external cloud. An external cloud service provider holds reserves of computing resource to be doled out to its client user organisations and taken back, on demand, according to those users' requirements. In addition, the cost structure is variable and is the core of the "pay only for what you use" concept.

External Computing Cloud Costs are Variable



Economic Conditions

This principle is illustrated by the graphic entitled *External Computing Cloud Costs are Variable* which demonstrates that IT costs will go up and down in direct proportion to usage when an external cloud provider is employed.

Accordingly, operational agility is, arguably, actually reduced significantly with an internal computing cloud. The need to maintain total IT resource at the forecasted peak load to address most or all unknown internal computing demands means that a "high-water mark" of IT resource investment and cost structure must be maintained.

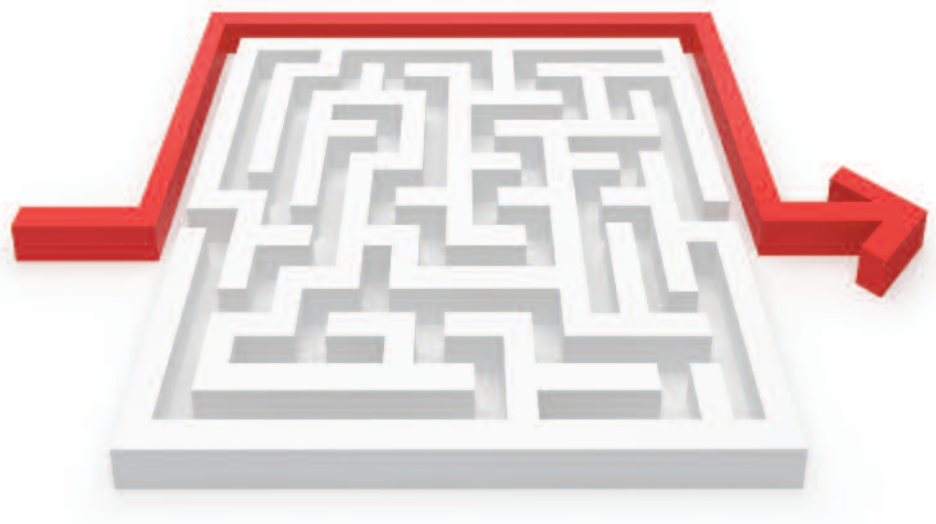
This resource and cost structure is not easy to reduce for the firm as a whole, as opposed to the position of internal business unit cloud "clients".

By contrast, an external cloud provider may reduce IT resource and cost for the firm, usually, at will.

Simplicity

The fourth primary reason to create an internal cloud is that it will help to achieve IT simplicity. How would this work? The same or similar software that an external cloud services provider uses would be deployed on the firm's existing, if compatible, and new hardware assets.

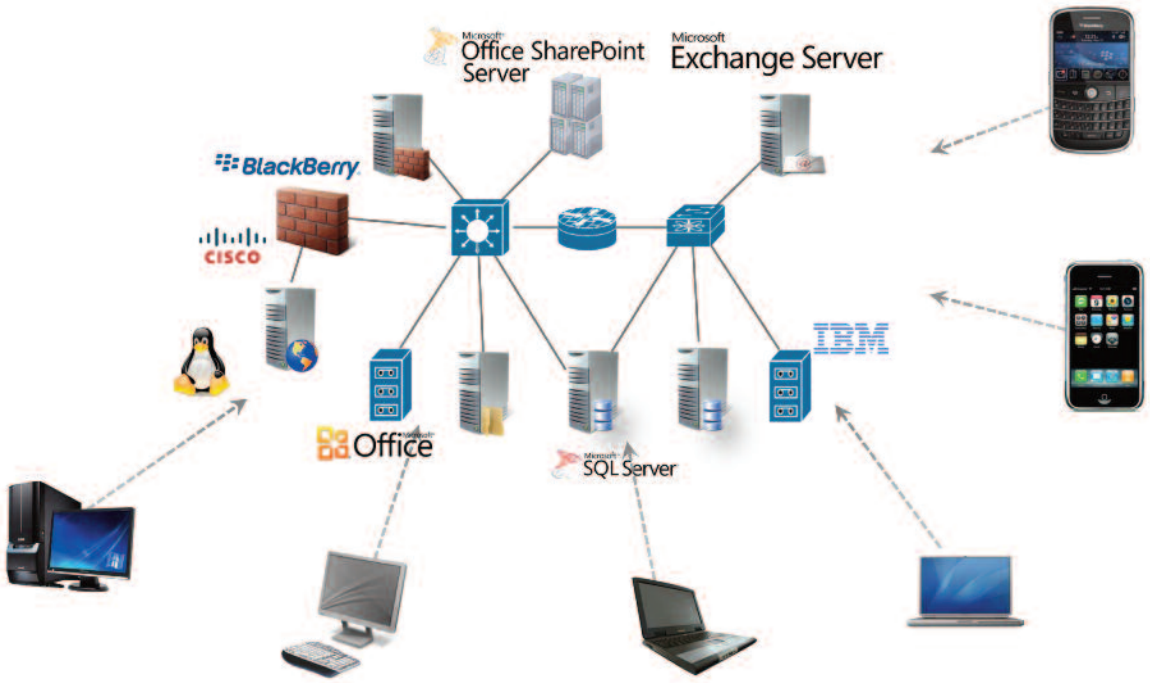
We may view the impact of implementing an internal computing cloud on IT complexity in a series of graphics.



Does an internal cloud really reduce complexity?

The first graphic, entitled *On-premise IT Complexity*, depicts a relatively simple network diagram of an organisation's traditional on-premise IT. This reflects a typical firm's applications spread over several servers, together with the associated networking and security systems.

On-premise IT Complexity



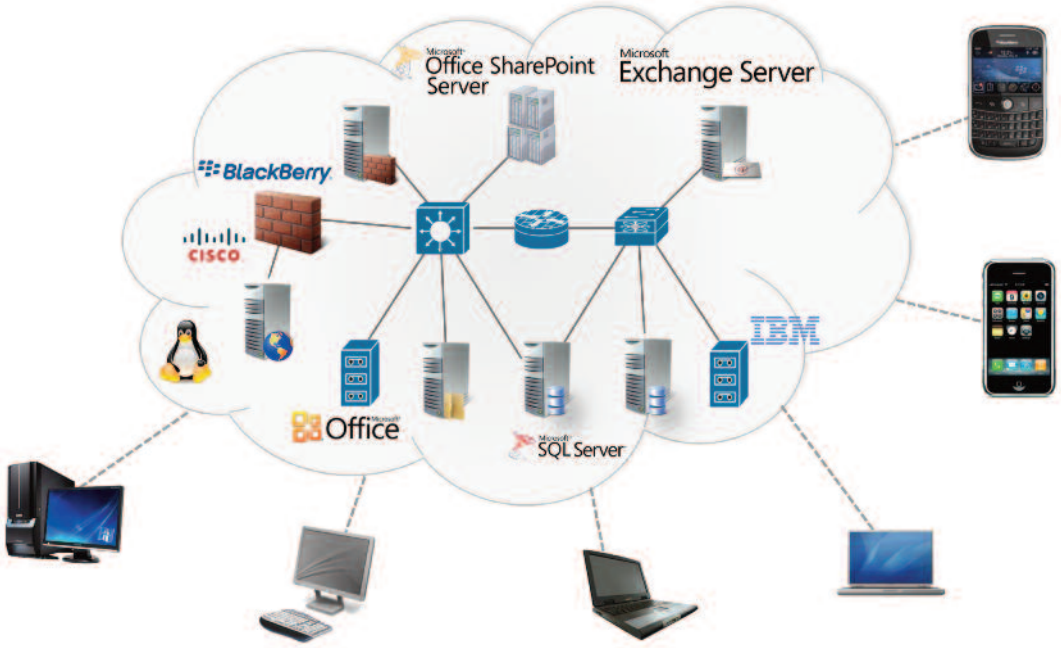
"A business cannot derive competitive advantage from owning and running computer infrastructure"

The second graphic, entitled *An Internal Cloud Is Created*, shows what happens when an internal computing cloud is created. The cloud diagram surrounds almost exactly the same internal IT infrastructure. What has actually happened?

There is almost no IT complexity removed. The gains in user self-service provisioning are overwhelmed by the incremental costs of implementing an internal cloud.

An internal cloud keeps almost all of the existing IT complexity within the firm because the various application servers and associated IT resources still remain.

An Internal Cloud Is Created

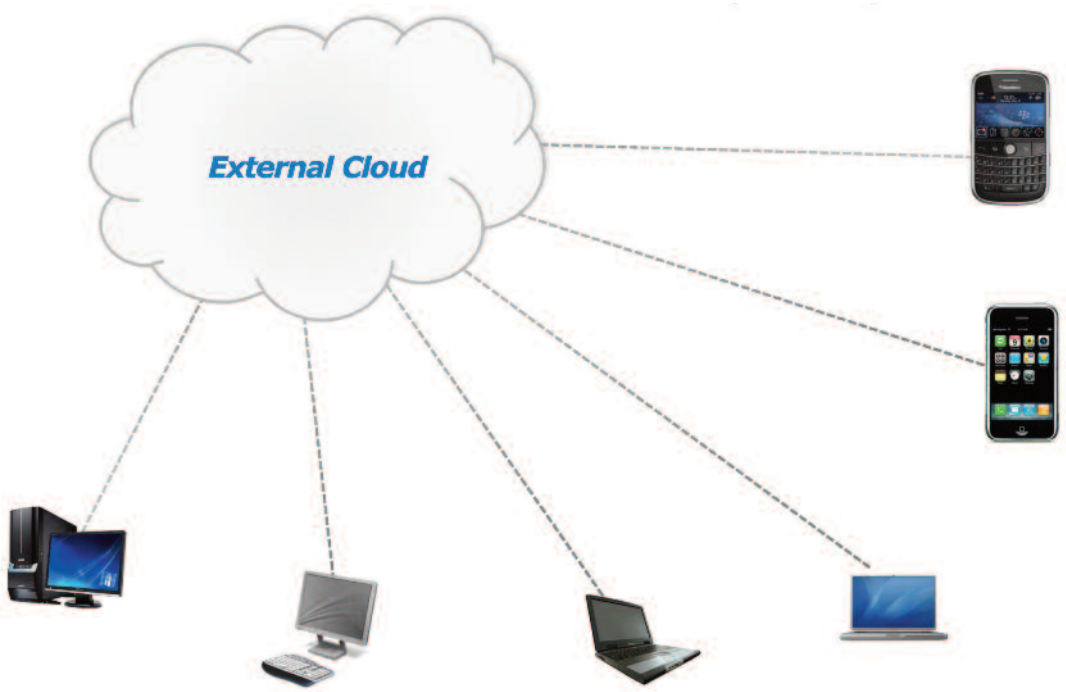


"An internal cloud misses the whole point of cloud computing and generates few business benefits"

In contrast, the third graphic, entitled *External Cloud Simplicity*, depicts the net effect of an external cloud. In this case, all of the IT infrastructure complexity disappears into the external cloud service provider's own computing cloud. The firm's users notice little difference after the transition to an external cloud but the firm benefits enormously from a massive reduction in IT complexity.

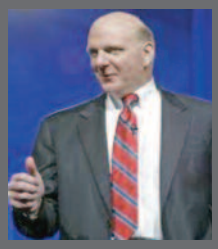
In essence, an external cloud exchanges simplicity for complexity.

External Cloud Simplicity



Conclusion

As we have considered above, the four most compelling arguments advanced for an internal computing cloud do not stand up to a rational and logical analysis. We will consider the non-rational arguments in a later section.



"For the cloud, we're all in. Literally, I will tell you we are betting the company on it"

March 2010

Steve Ballmer, CEO, Microsoft Corporation

Cloud Computing Is A Business Model Innovation

It is important to recognize that cloud computing is fundamentally a business model innovation and not a technology innovation.

There is very little new technology involved in cloud computing when we consider information technology innovation waves in terms of the evolution of mainframes, minis, PCs and the Internet.

The fundamental business model innovation relating to cloud computing is the transformation of products into services.

Instead of a firm owning and managing resources, the "as-a-service" business model innovation means that a third party owns and takes responsibility for delivering the performance of the assets.

The firm can take it or leave it and only pay for what is actually consumed.

Many commentators in the cloud computing marketplace often appear to view the cloud computing "as-a-service" business model innovation as applying narrowly to the infotech industry.

This is simply not the case. Consider another well understood variation of the "as-a-service" business model innovation, namely, third party logistics.

Third party logistics, or 3PL, means that an external logistics specialist provides physical warehouse and distribution services to its client firm, instead of the business doing it themselves.

"Third party logistics" could just as easily be described as "Logistics-as-a-Service". The parallels between third party logistics and cloud computing are intriguing.

Third Party Logistics or "Logistics-as-a-Service"

The idea of third party logistics will be familiar to many. With this business model a third party service provider, such as Fedex and UPS in the USA or Mainfreight and others in New Zealand, takes responsibility for the storage and distribution of a firm's physical products, whether raw or finished goods.

If a business has a traditional in-house, or do-it-yourself, logistics operation it must answer at least the following questions.

How many warehouses do we need? Where should they be located? How big should they be? How many personnel do we need? What stacking systems should be used? What systems, physical and IT, are needed? Can we scale up and down easily? Are we locked into long property leases and other fixed costs? Can we run our own logistics better than a third party logistics provider? Are our own in-house logistics skills and systems equal to or better than our strongest competitor?

"Logistics-as-a-Service"

If a business runs its own logistics, it will face the following business problems:

- **Over and under-provisioning of storage space, human resource and goods handling equipment.**
- **Almost certainly will not be using the best available service.**
- **The firm has captive users, namely its own employees, and there are no commercial drivers to push costs down and raise service levels upwards. In comparison, external logistics providers must continually innovate to compete on cost and quality to remain in business, thus providing major benefits to the firm.**
- **There will likely be higher costs which are mostly fixed in nature, often for long terms with property leases.**
- **On-going and often uncertain capital expenditure.**
- **An internal logistics operation is likely to be less responsive as there are few disincentives for poor performance.**
- **Continual challenge of attracting and retaining scarce logistics skills within the firm.**
- **Enduring and unnecessary complexity in the business.**
- **Waste of time and resources on an activity that is not a core competency and cannot create any competitive advantage.**

The key question to ask is whether running logistics is a core competency the firm must have to compete effectively or whether it is an essential function. For most businesses logistics is not a core competency.

All of the business challenges listed above in terms of logistics also apply to internal IT. While IT is an essential function, owning and running IT infrastructure cannot create any competitive advantage for the business.

If the essential logistics or IT function can be provided by a third party at a lower cost with greater security and a more flexible solution, then the business will be very attracted to both third party logistics and an external cloud.

"A business should reject the idea of building an internal cloud unless it has more capital than sense"

What Are The Non-Rational Barriers To Adopting An External Computing Cloud?

We have considered above the primary motivations for building an internal computing cloud and dealt with the rational and logical issues involved.

Life is much more complex than a rational analysis would suggest and human nature plays a dominant role in all decision making. We canvass below several non-rational barriers to firms employing external clouds. While each barrier is irrational, they are predictable elements of human nature.

What are the non-rational barriers to adoption?

Control

There is a natural cultural bias against letting go of important functions within a firm to a third party which is not under the direct control of the firm's management.

The history and rapid growth of outsourcing IT services by large organisations and government agencies to third party independent service providers simply reflects the reality that this is a well accepted business arrangement in large organisations.

I want to maintain control

Smaller companies with limited IT resources are adopting external cloud services at a faster rate than larger ones, primarily because of the compelling economics.

It is the mid-range sized firms which currently have the greatest resistance to using an external cloud. Often the barrier of loss of control reflects a deep-seated fear that the incumbent CIO's team will be downsized or eliminated with the move to an external cloud.

The barrier to moving to an external cloud is not usually found among the firm's users. Internal users have never had much control over IT so they are not giving it up. This is not the case for the IT department.

The commercial implication of captive internal users is that there is no cost or quality pressure exerted on the internal IT department's performance. If there is no commercial pressure placed on performance, captive users must put up with what they get, even though there are likely to be lower cost and higher quality service alternatives available from external sources.

Another variation of the control barrier to external clouds is the presence of "server-huggers". The pejorative term "server-huggers" refers to infrastructure engineers who are wedded to the server and other IT hardware the firm uses.

A "server-hugger" generally exhibits an irrational, and sometimes unhealthy, obsession with maintaining close physical contact with the IT infrastructure.

The idea of having the firm's IT infrastructure provided by an external cloud is simply anathema to them. "Server-huggers" are usually very strong opponents to the use of an external cloud.

Captive users means no competition for performance

"Server-huggers" are a major barrier

Skills

At an individual human level, the thought of one's technical and professional skills being made superfluous by a transformation of internal IT to an external cloud provider means that resistance will be strong to the adoption of an external cloud.

Conversely, if an internal cloud were to be implemented, the individual would gain new skills in a rapidly growing market. What would such an individual do? The bias against the adoption of an external cloud is likely to be very high.

Career

For the reasons stated in the skills section, internal IT team members will enhance their career opportunities by jumping on the cloud computing bandwagon. The adoption of an external cloud will not allow this.

The irony is that the rapid growth in cloud computing has created a severe shortage of skills in the area and a firm planning to implement an internal cloud will be faced with rapidly rising salary costs for scarce technical staff.

An internal cloud demands new skills

Building an internal cloud will enhance career prospects

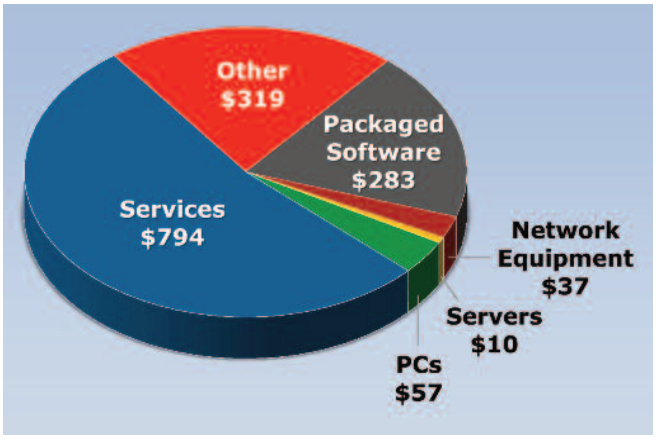
Status

An external cloud will impact on status

Status means different things to different people. In this context it might be that an incumbent CIO seeks status among his or her peers in terms of, say, "We are early adopters of cloud computing. We are doing it ourselves".

The drive for status may be, say, "The cloud is hot and I want one". The fear of reduced personal status may also play a part in the sense of reduced staff levels or the removal of complex technology from the firm, which may otherwise support a "priesthood" aura of IT knowledge.

Traditional IT Vendors



Traditional IT vendors are a major barrier

Traditional IT providers are a primary non-rational barrier to the adoption of external cloud computing.

Cloud computing, in its true economic sense and reflected in the concept of an external cloud, is a powerful and fast-moving disruptive force threatening the business models of traditional IT suppliers, systems integrators, consultants and other providers.

We have seen in recent months major IT players such as HP, IBM, CA, Oracle and Dell make multi-billion dollar acquisitions of smaller cloud computing companies to reposition their traditional business into the rapidly emerging cloud services market.

"If a firm is determined to build an internal computing cloud first calculate the significant opportunity cost of doing so"

In the interim, these traditional providers are playing a "delay-the-market" game. How do they do this? The best way to delay the business impact of external cloud computing on their established market positions is to create confusion in the marketplace with obfuscation, fear, uncertainty and doubt.

If there is no clear path forward, decisions will invariably be delayed until more certainty emerges.

A prime example of the defensive behaviour of traditional IT vendor firm in this regard is the prevalence of "cloud-washing".

The phrase "cloud-washing" is a variation of the common term "white-washing" which, of course, describes a situation in which the dark truth is glossed over by a veneer of white, thus reflecting purity.

Cloud-washing in this context means that traditional IT providers stamp the words "cloud computing" on their existing wares, with little change in function or capability.

Many traditional third party service providers, including distributors, resellers and systems

Many traditional IT products are cloud-washed

integrators are similarly motivated to protect their existing business models. This group also has a strong interest in maintaining the status quo and is motivated to endorse the idea of an internal cloud.

An incumbent CIO is also likely to follow the line of least resistance when he or she is advised on new technology trends by traditional IT providers.

Federal agencies must "shift to a cloud-first policy" By 2011, federal agencies not using cloud computing or making cloud computing part of new IT projects must explain why. **April 2010**

Vivek Kundra, CIO, US Federal Government

Status Quo Bias

There is a well established body of knowledge known as behavioural economics which has demonstrated beyond doubt that humans invariably do not make rational economic decisions.

The graphic depicting the uneven scales is intended to represent this bias. The psychological idea that is relevant in the internal cloud context is described as status quo bias. This means that there is a strong human resistance to new ideas and products.

This is also described as an endowment effect. Repeated studies have established that individuals will value what they already have, in terms of products or beliefs, up to three times more than a rational analysis would suggest.

This means that there is an irrational barrier to the adoption of new products and ideas. This applies to all walks of life, both personal and professional.

There is a corresponding over-valuation of the product and idea experienced by the vendor of up to three times the rational value.

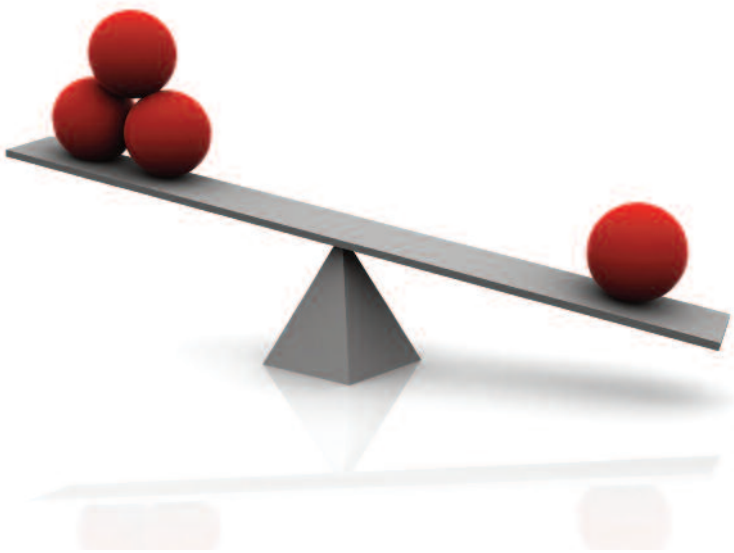
Accordingly, there can be up to nine times difference in the rational value between the buyer and the seller. This phenomenon helps to explain why most new product introductions either fail or take much longer to be accepted than marketers first think.

With respect to the question of whether to develop an internal computing cloud or use an external cloud provider, the status quo bias plays a large role.

New ideas always come up against the barrier of "this is the way we have always done things". Significant effort is required to break through legacy inertia.

CIOs will likely be more comfortable following their own traditional path of maintaining internal control of IT until they have become accustomed to the idea of an external cloud.

The self-serving behaviour of traditional IT suppliers and their systems integrator partners will only reinforce this effect.



We do not make rational decisions

How Can You Adopt Cloud Computing?

What is a suitable path to the adoption of an external cloud? The graphic entitled *On-premise versus External Cloud Software Delivery* provides an illustration of the adoption cycle a firm may proceed through in stages from a position of zero adoption to complete adoption.

There would be few firms of a reasonable size which do not currently have some cloud activity, which may be a software-as-a-service application purchased by credit card. The IT department may not even be aware of this.

Once a business begins to use any form of external cloud service, the notion of a "hybrid cloud" emerges. A hybrid cloud may, like many other terms in cloud computing, be defined in a number of ways. If an existing internal IT resource, described as an internal cloud in this paper, is linked to an external cloud service, then it may be described as a "hybrid cloud".

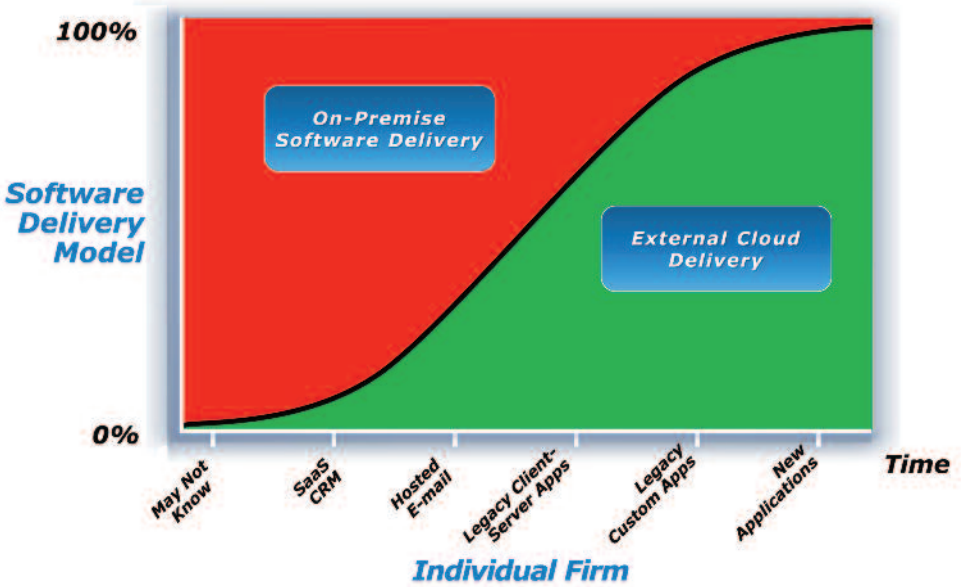
The first use of cloud computing is often CRM or customer relationship management software, delivered as a service.

Following acceptance of this software delivery model the next step, or equally often the first step, is for a firm to move email to the cloud. For most organisations, email is an essential but not critical service.

Delivering email from internal IT resources cannot build any competitive advantage for the firm, and it could easily be argued that it is a competitive disadvantage if a less expensive and more robust alternative is available.

The next two steps are often not even considered to be cloud-ready opportunities. Not many cloud computing providers relish the opportunity to host legacy software systems, particularly when accompanied with custom-written software.

On-premise versus External Cloud Software Delivery

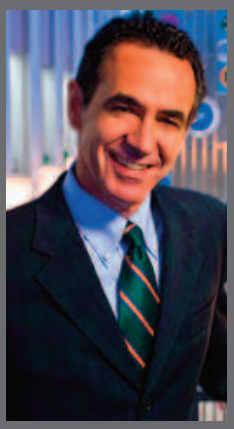


However, external clouds can deliver the applications to the firm's users and the firm gains all of the benefits of cloud computing with respect to IT infrastructure.

Finally, as the firm selects new software applications to add to its portfolio, it may ignore the delivery model the software vendor offers. It will not matter whether the application is offered "as a service" or as a "perpetual license" in the traditional manner.

Accordingly, the business may adopt external cloud computing gradually and in discrete stages. The software applications the firm employs may be delivered as a service to the firm's users, irrespective of whether they are owned by the firm or not, or whether they are standard or heavily customised and integrated to other systems.

The firm's own servers do not need to be virtualized (virtualization is a technology building block in cloud computing) as a first step in this arrangement as the external cloud provider does this when the software applications are migrated from an on-premise delivery model to the external cloud delivery model.



"To free up resources - and time - for their new-found strategic roles, CIO's are farming out IT drudgery.

Passerini has repurposed IT guys as business-unit consultants who dream up ways to make better products and sell more of them."

Fortune, June 14 2010

Filipo Passerini, CIO, Proctor and Gamble

External Computing Clouds

There is widespread belief that external public clouds are not sufficiently secure to trust the placement of a firm's applications and data. As noted above, every computing cloud is different as each cloud is offered by a discrete cloud service provider.

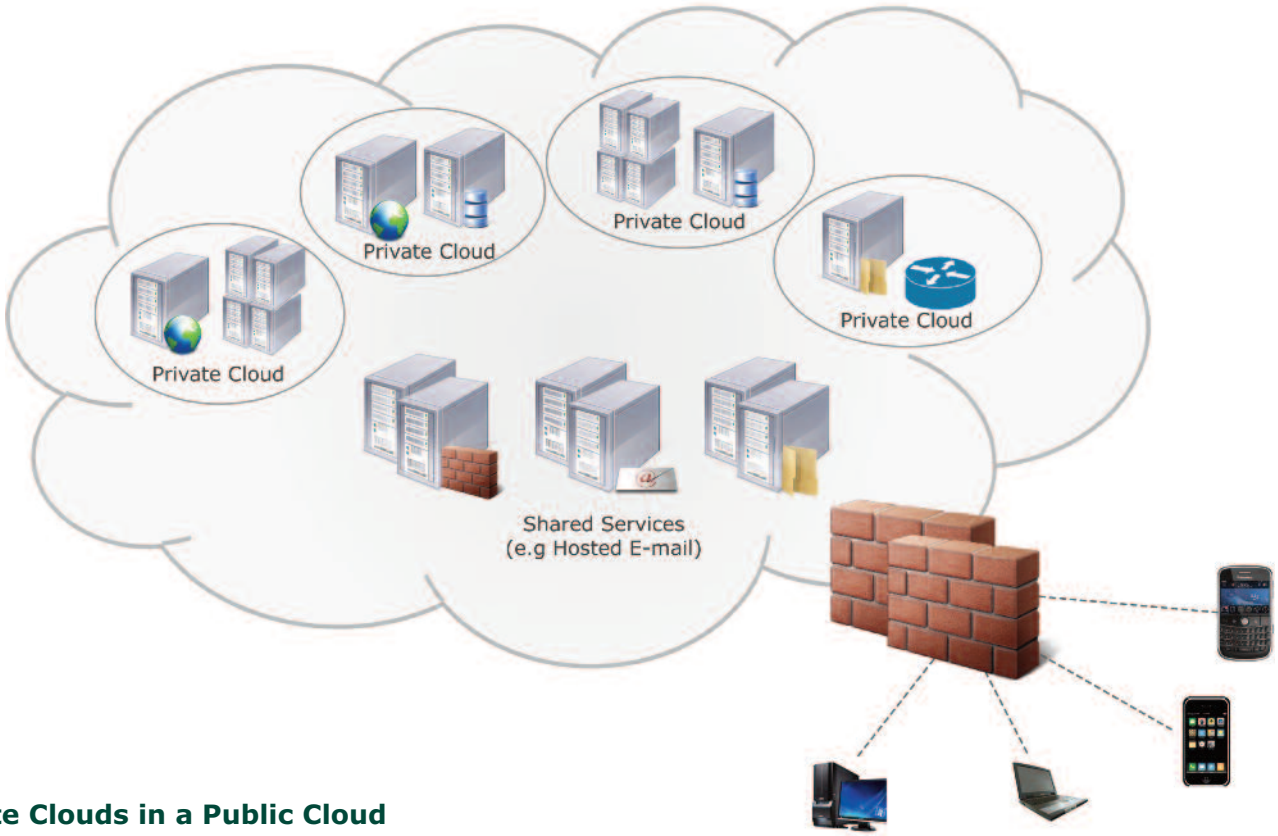
The way that competent external cloud providers address security concerns is by creating a "private" cloud dedicated to a specific client's software applications and data. Each private cloud is partitioned by a firewall, or security perimeter, just as if the IT infrastructure were located on the firm's premises.

The firm benefits from the reduction in complexity and skill requirements while gaining from lower costs, stronger security and greater agility.

In addition, the firm gains from the shared infrastructure resources which may deliver Microsoft email, for example. Security between organisations is built into the software itself in these cases and the firm gets the best of both worlds.

As noted in the beginning of this paper, the definition of a "private cloud" has become muddled with internal and external clouds. It is important to clearly define the terms being used before an intelligent assessment of options may be considered.

The "private cloud" arrangement described above is illustrated by the graphic entitled *Private Clouds in a Public Cloud*. Each firm's private cloud containing line-of-business software and data is segmented by security firewalls from one another while the shared infrastructure delivers shared software such as email and collaboration software.



Private Clouds in a Public Cloud

Conclusion

Media hype and traditional IT vendor self-serving behaviour have masked the true meaning of cloud computing. The word "cloud" has been hijacked by those organisations and individuals who wish to protect their market "turf" and benefit most from maintenance of the status quo.

It simply does not make sense to take computing out of the cloud, and still call it cloud computing.[7]

An internal computing cloud is just internal IT by another name. Running internal IT assets is not a core competency service for most companies.

A business cannot derive competitive advantage from owning and running computer infrastructure.

An internal computing cloud:

- **Keeps users captive and there are no competitive drivers to reduce internal IT costs and raise quality**
- **Maintains a fixed cost IT structure**
- **Perpetuates the problem of over and under-provisioning**
- **Continues IT capital expenditure unabated**
- **Likely has weaker IT security**
- **Still requires scarce and expensive IT skills**
- **Expands complexity, the most important CEO issue**

In conclusion, an internal cloud misses the whole point of cloud computing and generates few business benefits.

A business should reject the idea of building an internal computing cloud unless it has more capital than sense.

If a firm is determined to build an internal computing cloud in spite of business logic to the contrary, this white paper serves to help assess the significant opportunity cost of doing so.

" We will never buy another rack or server or storage device or network device again"

July 2010

Michael Harte, CIO, Commonwealth Bank of Australia

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Why OneNet?

OneNet is a pioneer and market leader in the new computing paradigm of cloud computing. We have established best practices and a proven history over more than twenty-five years of introducing new information technology to support a wide range of organisations, from entrepreneurial firms to global multinational corporations, in leveraging emerging information technology to drive their market success.

We approach cloud computing on the premise that firms seeking to lower their IT costs, gain stronger IT security and build a more flexible and agile future, will seek a trusted and experienced technology business partner who is competent and experienced in delivering outstanding results.

We focus on building a highly resilient, secure and scalable computing infrastructure foundation to leverage the economies of scale of technology and scarce IT talent, to deliver enterprise-class computing, one user at a time, to firms of all sizes.

OneNet values the high market reputation it has earned from solving technical challenges and delivering exceptional value to its clients over the past ten years of its cloud computing history. This heritage extends the same strong enterprise client reputation that OneNet's shareholders and directors built with Financial Systems Limited and The Great Elk Company Limited in earlier years. This more than twenty-five year lineage and pedigree reputation provides security and comfort for CEOs considering dipping their toes in the new ocean of cloud computing.

Cloud computing is a new and rapidly emerging computing model. Accordingly, OneNet works closely with its clients to ensure that risks, security, regulatory requirements and governance concerns are fully addressed. OneNet, paradoxically, adopts both a conservative and an innovative approach to new information technology, ensuring clients gain the maximum benefit from their solution, while limiting any potential risk.

We continue to learn, develop and build on our role as a trusted partner to help our clients succeed in the new and exciting field of cloud computing.We invite you to join us on that journey.

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