

## Gaining a Competitive Lead Through Selective Corporate Cloud Sourcing

Much has been written about cloud computing – often rather in an attempt to exploit the attention the topic currently enjoys in the media than treating it as what it really is, a new delivery model for external data centers that promises companies on-demand access to virtually unlimited computing resources paid for according to actual usage. In this note, Ginkgo investigates the benefits and risks inherent to cloud computing from the CIO’s perspective and concludes how companies can gain a temporary but sizeable competitive advantage through early and sound preparation for this new sourcing option.

### Definition from the CIO’s Perspective

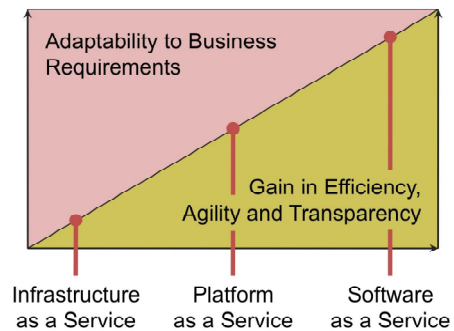
Rather than an isolated technology in itself, cloud computing is a concept that combines numerous loosely related technologies and methodologies, including most prominently virtualization and hypervision, i.e., virtualization management solutions. Because of this, it is rather difficult to refute any of the various, often biased, cloud computing definitions provided by, for instance, data center operators, outsourcing service providers or virtualization software developers. In an effort to place the CIO and his/her company’s interests at the center of attention, Ginkgo offers its own definition in the following.

- **Shared External Resources.** Multiple customers consume externally provided, virtual computing resources via fully automated web-interfaces.
  - Consumed virtual computing resources can be infrastructure, platforms or entire applications.
  - Underlying physical computing resources are shared among customers without their notion.
  - Quality and other properties of the provided resources are configured, not negotiated.
  - Beyond configuration, consumers have no control over how exactly resources are provided.
- **Elasticity.** Resources are provided on-demand, i.e., customers do not need to plan their demand in advance but can tap or release virtually limitless resources as needed and almost in real time.
- **Pay per Use.** Billing is closely tied to a customer’s actual consumption of virtual resources; computing, thus, becomes an operational expenditure that does not require any upfront investments.

While the individual technologies and methodologies underlying cloud computing have been around for years or even decades, practical real-life cloud service offerings can still be considered to be in their infancy. Amazon’s *EC2* is an example for a cloud service that offers on-demand computing infrastructure, Google’s *App Engine* and Microsoft’s *Azure* for services that offer on-demand computing platforms. Salesforce’s Customer Relationship Management software is a prominent example for a full-blown application that is provisioned in a cloud computing fashion. One reason for the recent surge of practical cloud computing services is the increasing maturity of the several key

technologies that are driving it. The soaring prevalence of broadband Internet access is another.

**Exhibit 1: Cloud Sourcing at Different Abstraction Levels**



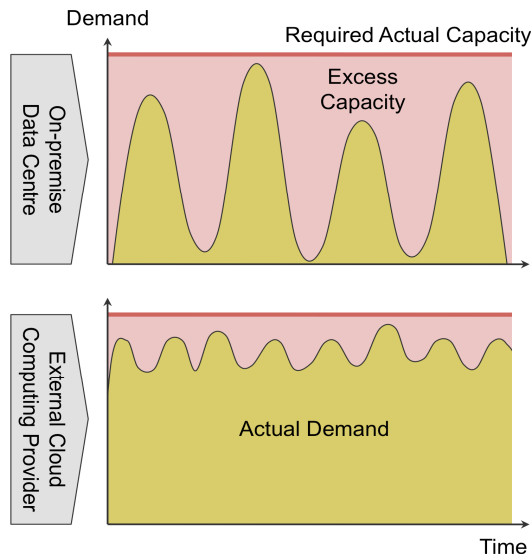
### Potential for Substantial Mutual Benefits

The magnitude of the hype about cloud computing has left many involved with IT skeptical of its true merits. But shrugging it off as just another passing fad, an old technology in a new dress, dismisses one promising and hard to refute fact. Demand for computing resources at *individual* companies usually is anything but balanced. The need to prevent congestion during peak times hence causes the utilization of corporate IT facilities to average an abysmally low three to ten per cent. Even a huge company with a customer base as vast and globally distributed as Google’s reaches a utilization of only about forty per cent. The *collective* demand of a large number of geographically dispersed companies, however, can be expected to be a lot less erratic. As cloud computing providers serve large numbers of customers that all share the same physical infrastructure, they are well positioned to guarantee each customer the uninterrupted availability of sufficient resources at any time without having to maintain equally deplorable levels of excess capacity.

- **Economic Efficiency.** The cost advantage due to higher utilization of physical resources alone is already large enough to render cloud sourcing an attractive sourcing option for companies that leaves providers with enough room for comfortable margins. But the necessity to maintain huge excess capacity is not the only reason why on-premise hosting of computing resources is bound to be more

costly than cloud sourcing. The relative number of staff required to keep a conventional on-premise data center up and running is also significantly higher than that needed to operate a cloud computing facility as the latter benefits from highly automated processes and substantial scale effects.

**Exhibit 2: Excess Capacity Requirements**



- **Business Agility.** But sourcing computing resources via fully automated web interfaces not only results in reduced staffing costs. With little to no human interaction required, it also raises the efficiency and reliability of processes that are related to computing resources. Hardware ordering cycles, for instance, are often reduced from months to minutes. This means an enormous agility gain that can immediately be utilized for the good of the business.
- **Cost Transparency.** With billing closely tied to actual consumption, cloud computing makes it easier for IT controllers to accurately assess the total cost of ownership for business processes that depend on IT. As there is no capital expenditure but only operational cost, cloud computing also facilitates precise ROI calculations, comprehensible charge back mechanisms, transparent budget planning and improved IT financial management in general.

### Selective Corporate Cloud Sourcing

There is a price, however, that companies have to pay in order to enjoy the benefits that come with cloud computing. Cloud sourced resources can be customized only by means of configuration – as opposed to negotiation – with the total number of possible configurations being rather limited as customization, af-

ter all, has to happen via standardized web-interfaces. Above all, customers must not be given the option of not sharing the physical resources underlying a cloud offering. Otherwise cloud computing could not unfold its benefits. Therefore, companies need to assess diligently what components of their enterprise architectures qualify for cloud sourcing and what should be kept on-premise.

- **Competitive Advantage.** Components that are crucial for a company’s competitiveness generally do not qualify for cloud sourcing as the latter would require compromises with respect to the exact shape and nature of these components; commodity components, in contrast, are natural candidates for cloud sourcing.
- **Operational Criticality.** Components that do not help a company distinguish itself from competitors but are critical for its operations are likely to remain on-premise for the foreseeable future; cloud computing providers are not expected to enter this substantially smaller, significantly more difficult market anytime soon.
- **Expected Benefit.** Components that are neither sources of competitive advantage nor critical for a company’s operations but can be sourced in-house at competitive cost and with sufficient quality do not need to be rushed into the cloud; the in-house solutions’ competitiveness, however, is likely to deteriorate over time as cloud offerings mature.

After all, cloud computing is only one additional option for sourcing corporate computing resources. In order to gain the highest possible advantage from cloud computing, regular evaluation of costs, benefits, risks, and sourcing alternatives is as much required as its close alignment with a company’s enterprise architecture and overall IT strategy.

### Risks Expected to be Mitigated Over Time

As much as it is praised, cloud computing also receives strong criticism for a number of risks reputedly inherent to the concept itself. Ginkgo has investigated the risks that are most frequently held against cloud computing and found that many critics fail to acknowledge one simple but pivotal fact. Cloud computing promises substantial rewards to *both* customers and providers. Consequently, both parties can be expected to undertake everything in their powers in order to eliminate the constraints that currently prevent them from reaping the manifold benefits cloud computing offers. While, for instance, security concerns are likely to remain a serious issue in the foreseeable future, many risks that appear prohibitive today are likely to be mitigated through technological advances and the introduction of open standards.

- **Vendor Lock-in.** While there is hardly any interoperability among today's commercially available cloud computing offerings, providers are well aware that open standards are a prerequisite if they want to grow the market to a size that allows the concept to unleash its many benefits. Widely supported organizations and committees aiming to establish practical open standards include the Open Group, the Object Management Group and the Open Cloud Consortium.
- **Loss of Control.** Many critics mention the loss of control over how exactly resources are provided, but fail to concretize the benefit of remaining in total control. In fact, optimal sourcing requires accurate knowledge of what is needed exactly. Once companies have figured this out, providers can be expected to try hard to answer these calls by adequate means of configurability. Google, for instance, allows its customers to configure the country their data is held in, a requirement often stated by cloud computing critics.
- **Immature Industry.** The cloud computing industry, without doubt, will see many waves of consolidation over the years to come. And with every acquisition of a cloud provider, there is a danger that its customers will see service disruptions. Aforementioned open cloud computing standards as well as market forces, however, are likely to minimize this risk. That said, companies of course should choose their cloud providers with equal diligence as they would apply when selecting their traditional outsourcing partners.
- **Data Separation.** The mere thought of sharing physical devices with other companies, perhaps even with competitors, understandably leaves many IT decision makers scared. They fear accidental – if not intentional – violations of the clouds' virtual borders. But protecting these borders is not a new problem in the world of information technology, and effective concepts for antidotes are already available in the form of the various VPX technologies, encryption and rapidly advancing virtualization techniques.
- **Data Vulnerability.** Cloud computing providers serve scores of customers. Their data centers, therefore, contain data of immense interest for hackers and industry spies who can be expected to concentrate their forces on them. But unlike their customers, cloud providers regard the protection against external attacks as a core competency of theirs. Although never as safe as an on-premise data center that is completely shut off from the outside world, it can be expected that data stored in the cloud is adequately safe for a majority of purposes.

#### Background Information

#### Cloud Computing Benefits and Company Size

The actual benefit a company draws from cloud sourcing depends chiefly on the size of its IT operations (see table below). While a small company with operations only in a single country is likely to profit substantially from not having to maintain an underutilized on-premise data center, large companies that are active on a global scale can already reach comparatively good levels of utilization by fully exploiting virtualization and consolidating their worldwide data centers. Large companies, however, often suffer from vast administrative processes and, thus, are likely to benefit greatly from the agility offered by cloud sourcing. A gain in cost transparency, however, can be expected to be welcome at any company, no matter its size.

Company Size	Economic Efficiency	Business Agility	Cost Transparency
Small	●●●	●	●●●
Medium	●●	●●	●●●
Large	●	●●●	●●●

#### Prevailing Threats and Uncertainties

While certainly not exhaustive, the above list of concerns summarizes a general trend to discuss cloud computing somewhat unfairly from a perspective focused solely on offerings that are available already today as opposed to what will be available in the future. There are, however, a number of valid threats and uncertainties that *cannot* be tackled with standards or technology and cloud computing providers, therefore, cannot control. Arguably, each of these issues has the potential to dampen the actual benefits that can be expected from practical cloud computing offerings, but none of them seems strong enough to threaten the concept in its entirety.

- **Uncertain Prospects.** Cloud computing reduces the need for excess capacity as multiple companies' collective demand for computing capacity is distributed more evenly than that of any individual business. Just how much more evenly is yet to be seen. Google's data centers, for instance, reach a utilization of roughly forty per cent. But can Google's customer base, mostly private consumers, serve as a benchmark for companies, whose computing demand is considerably influenced by factors such as office hours, production cycles and reporting schedules?

- **Imbalanced Global Demand.** As the previous point already suggests, it is important for cloud computing providers to serve customers across all time zones in order to maximize the utilization of their hardware. Starting out as a truly global cloud computing provider is certainly not an easy feat but possible for companies that already have a presence as global as that of, e.g., Amazon, Google or Microsoft. It will, however, take considerable time until computational demand will be truly balanced all over the globe, if ever.
- **Vendor Dependency.** For cloud computing to deliver the highest possible benefits, providers need to be huge and active on a global scale. The industry, thus, can be expected to undergo several waves of aggressive consolidation until only a small number of competing cloud computing providers is left. This will – despite open standards – effectively limit the number of viable alternatives customers can choose from.
- **Legal Obstacles.** Prevailing laws in many countries render aspects of cloud computing illegal, requiring, for instance, that data is stored within national boundaries and, if belonging to separate legal entities, even on separate physical devices. Such legislation, of course, is not restricted to cloud computing. Cross-border data center consolidation activities, for instance, are equally affected. Altering such jurisdiction requires time and arduous lobbying from providers and customers alike.

### Summary and Implications for the CIO

Cloud computing is here to stay – too promising are its benefits both for customers and providers. By developing open standards and applying advanced technologies, providers are expected to gradually mitigate most of the risks that are frequently held against corporate cloud sourcing. Those risks proving resilient to these efforts might potentially limit the extent to which cloud sourcing can be applied at companies, but they are unlikely to prohibit its application entirely. For the reasons below, Ginkgo encourages CIOs to thoroughly evaluate the early adoption of the concept of cloud computing by gradually transforming parts of their enterprise architectures into private clouds, i.e., into architectures that rely in part on resources sourced from virtual clouds that are provided on-premise and by the companies themselves.

**Best Practices.** Cloud computing is a compilation of related technologies and methodologies, most of which have been around for years and are regarded as best practices. At many companies chances are that numerous of these technologies and methodologies are already in place. Many applications, for instance, are already implemented as Service Oriented Archi-

tectures, and the hardware utilization of many on-premise data centers gets already boosted via virtualization technology – both huge steps towards an enterprise architecture that is ready for the cloud. Technologies and methodologies that are not yet available need to be implemented. As all of these are accepted best practices of proven merits by themselves, their introduction alone is already likely to provide many independent benefits for most enterprise architectures. Of course, none of these benefits are guaranteed and need to be thoroughly evaluated in the context of each company’s individual enterprise architecture.

**Competitive Advantage.** Rife with undeniable benefits, public cloud computing is bound to make its way into corporate IT. If a company prepares its enterprise architecture for sourcing from external clouds by transforming it into a private cloud as laid out above and then keeps a close eye on conformance with the rapidly developing cloud computing standards, it is in a strong position for a smooth and gradual move to external cloud offerings. Doing so early can leave a company with a sizeable, albeit temporary, edge over competitors that fail to prepare for external cloud sourcing and, thus, will have to rework major parts of their enterprise architectures later, if they don’t want to risk being left behind in terms of the efficiency, agility and transparency of their IT operations.

**Exhibit 3: Stages of Enterprise Architectures and their Benefits**

Enterprise Architecture	Economic Efficiency	Business Agility	Transparency	Security/Control
Traditional				●●●
Virtualized	●●	●	●	●●●
Private Cloud	●●	●●	●	●●●
Public Cloud	●●●	●●●	●●●	●

### About Ginkgo Management Consulting

Ginkgo Management Consulting specializes in strategy development and execution with a distinct focus on business technology. Our clients include leading global corporations in the automotive, manufacturing, telecommunication, logistics and financial sectors.

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