

Cloud Computing: An Assessment for ISVs

Opportunities and Threats from the Current Strategic
Shift in IT Markets and Customer Behaviour

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► EXECUTIVE SUMMARY

Reliable industry estimates indicate the highest growth in spending on enterprise IT during the next few years will be in the area of cloud computing. Outstripping growth in spending on on-premise IT fivefold, the majority of this spending is forecast to be on business applications. This White Paper outlines how Independent Software Vendors (ISVs) can readily benefit from this major opportunity for revenue growth.

With limited commitment, cloud computing will enable ISVs to extend their addressable markets and provide new services to customers more easily, while making considerable operational savings over traditional means of distribution and customer service. Those prepared to invest more can enhance the user appeal of their applications, offer new charging models, and cut product development costs while incurring no interruption to established revenue streams from sales of on-premise software. Low-investment adoption, and easily scalable deployment, are both strong characteristics of cloud computing which appeal to ISVs and their customers – not least because they illustrate alignment with major business drivers during times of economic uncertainty and substantial change.

► WHAT IS CLOUD COMPUTING?

Service-oriented IT

Within the last decade or so, a fundamental shift has started to come about, against the background of the ubiquity of computing devices in users' business and personal lives and the deployment of IP networks and the distributed architecture they have enabled. IT *per se* is becoming commoditised, and the computing element of designers' requirements are shifting to a service paradigm, delivered over networks to which user access is faster due to widespread broadband availability. Cloud computing is merely the next step in the further migration of IT delivery towards a service-based approach. Abstraction of actual resources within the infrastructure is a key approach to achieving the flexibility afforded by cloud computing, but an understanding of how real-world resources underpin cloud computing, and how elements have come to combine as marketable services, is useful background (see Figure 1).

Infrastructure elements such as servers, storage, network equipment, and others (which can be at lower levels, such as power and cooling) are generally held to form a layer known as Infrastructure-as-a-Service (IaaS). The layer that adds application platform capabilities such as development and integration services, and perhaps database services, is referred to as Platform-as-a-Service (PaaS). The application layer, and related services such as collaboration and content services, are those that are generally best understood, and referred to as Software-as-a-Service (SaaS). Each of these can be offered, or consumed, as a service. Most scenarios referred to as cloud computing are either IaaS or PaaS offerings, or a combination of those. The term SaaS is generally used for business-level offerings such as salesforce.com.

It is important also to take into account some general characteristics that apply to all three aspects of this model of 'layers' around cloud computing:

- All user access is browser based and via the Internet, maximising delivery flexibility to different types of end-user device.
- Underlying infrastructure resources are not constraints, but instead appear to offer infinite scalability. Flexibility is only constrained commercially, and can allow for resource to be added in granular units and levels of elasticity to cater for variable demand.

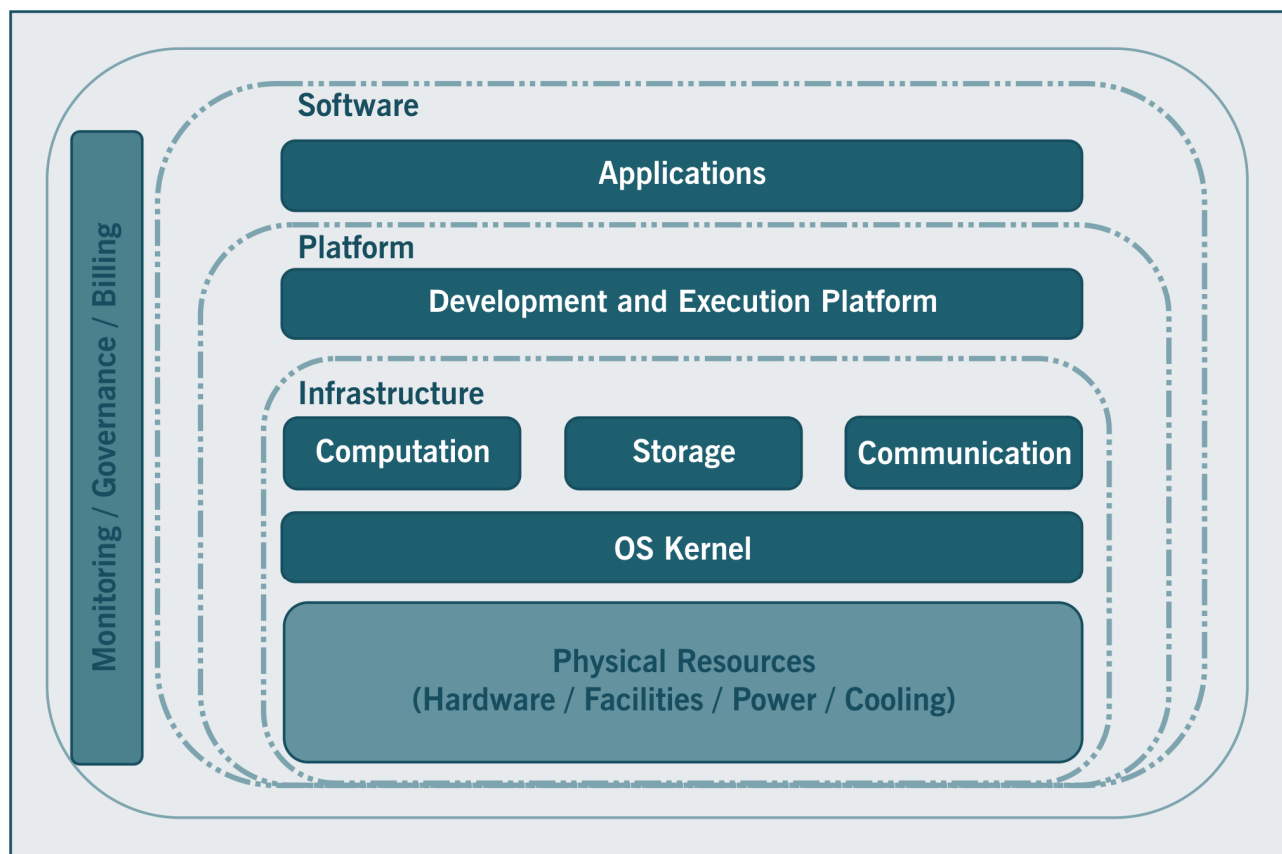


Figure 1: Infrastructure Underpinning Cloud Computing (Source: Butler Group)

Key behaviour changes around cloud computing

After successive phases of commoditisation, IT has reached a stage of maturity at which it can be seen as 'industrialised'. There is now very little advantage available from ownership and operation of infrastructure-level IT. Correspondingly, accepted norms of business practice would argue for the requirement to be satisfied from external parties as a bought-in service, in order for the organisation to focus on its core, value-adding capabilities.

In this context, the leap forward to cloud computing is not as large as it may seem at first sight. For large organisations today the data centre is often located at a remote site, accessed over network connections; it is also becoming highly virtualised, breaking down the direct relationship between particular applications, servers, and storage. Considered at a high level, there is relatively little difference between this and the cloud computing model, and it is likely that we will see a blending of the two models – although closer consideration finds the costs to the organisation using cloud computing are more likely to be proportional to demand, and more responsive to flexible workloads. For many organisations, trust will be an important factor in the decision to source their IT capabilities externally, and this is likely to bring about the establishment of 'internal' or 'private' resource clouds (for those organisations large enough to make this approach worthwhile). Private clouds can be thought of as equivalent to Intranet sites in affording the organisation more control than an Internet site (that being the equivalent of the external, or 'public' cloud). Organisations may indeed choose to develop their own internal cloud infrastructures, and supplement their existing capacity with external cloud services.

This approach to IT infrastructure will also be mirrored at the application level, with SaaS adoption. Here also, there is little commercial advantage to be gained from operating specific application software in areas of non-differentiating capability such as sales management, customer relationship management, human resource management, and others – and certainly none that depends on ownership of such assets. Now that functionally strong SaaS offerings offer alternatives to software ownership, the decision to source the capability externally is just as likely to be based on the reduced need for capital expenditure within the structure of ownership costs (especially in straitened times such as at present). This is equally true for IaaS and PaaS, areas where savings in capital costs can be significant.

► WHAT DOES CLOUD COMPUTING MEAN FOR ISVS AND THEIR CUSTOMERS?

General market characteristics brought about by service-based delivery

Although cloud computing is often discussed in terms of its technical components, this is usually only in order to share understanding of ways in which it is a different concept from other IT practices. In fact, there are many ways in which cloud computing is similar to some more-established IT practices – predominantly those in which delivery of some kind of focused service provision is the primary objective. This is useful to consider because it helps to illustrate that many of the benefits of cloud computing are proven as characteristics of service-based delivery. Amongst these are the following:

- **Greater scalability and flexibility** – breaking with any need to define the infrastructure that is used to deliver the service. The needs of the customer can be expressed contractually in terms of levels of business demand, rather than IT-related factors. If scalability and flexibility are key requirements from a business viewpoint, the service provider can prioritise accordingly and provide a key benefit in increased business agility. Cloud computing makes these benefits easier still to attain than do other forms of service-based delivery.
- **Minimised fixed costs** – detaching from ownership of the IT foundation of a service frees organisations from fixed, recurring, IT-related costs such as those relating to licences and hardware and to software-related support and maintenance fees.
- **Costs related more directly to demand** – costs can be more directly connected to business demand via the variable-cost, usage-based cost models that typically underpin service-oriented delivery mechanisms such as cloud computing.
- **Reduced longer-term ownership costs** – as the adoption of software upgrades involves less commitment of resources.
- **Accessibility for Small to Medium-Sized Enterprises (SMEs)** – as mechanisms such as cloud computing enable enterprise-strength reliability and functional breadth of IT and applications to become more widely available, SMEs are particularly likely to be attracted by the reduced costs and ease of adoption. This ‘democratisation’ effect – the increased choice which was formerly only available to larger organisations now cascading to SMEs – could be significantly disruptive on the supply side. Butler Group expects the PaaS and SaaS models to have the greatest appeal for these organisations.

Opportunities and other effects relating to ISVs

There are a number of important factors to consider for ISVs with respect to the likely increase in adoption of cloud computing. The characteristics of flexibility and scalability already described translate into the ability for ISVs to use units of infrastructure in direct response to fluctuations in customer demand, thereby transforming formerly fixed costs into variable costs that have a direct revenue-generating outcome. Additionally, ISVs should consider a number of opportunities for their business models:

- **Broadening of addressable market** – ISVs whose application has formerly had to be installed on customers' hardware can extend their reach into the mid-market and below via direct sales. Avoiding a dependence on resellers has advantages of improved margin retention and the possibility of better on-sell or developing customer participation and intimacy.
- **Improved operational efficiencies** – One area of improvement is the support of different operational versions of ISVs' products. Retaining the capability to support customer issues, for customers reticent to upgrade their installed software to more up-to-date versions, has long left ISVs in the position of having no strong control over the extra costs involved. Delivering software as a service via cloud computing, however, enables ISVs to force the issue of upgrades by limiting the range of versions that are accessible. A common approach is to offer a 'rolling' sequence of options (i.e., the previous and current versions of the live offering, along with a 'next' version when an upgrade is available) to which customers can log in, and to publicise strongly any new releases of the current service in order to encourage customer take-up of upgrades.
- **Enhanced user interface** – Many end users' expectations of the user experience from applications have risen due to familiarity with Web 2.0 applications like Facebook and eBay. Customers are demanding richer user experiences, and ISVs have struggled with how to deliver that on all the different platforms customers are using. On launching their software as service-based offerings (and sometimes as part of the necessary re-architecting) any ISVs remodel their user interface (UI) to an up-to-date look and feel, with the objective of users enjoying the experience more and therefore being retained. When ISVs have taken this approach, using Rich Internet Applications (RIA) technologies such as Ajax or Silverlight, many have found the development path to be unproblematic. Often they have reaped an extra return on their investment as the more useable UIs also lead to a reduction in the number of support issues raised: quite simply, users can better understand the improved UIs, and therefore have fewer problems.
- **Incorporate a demand-based model** – Looking ahead, Butler Group forecasts that the popularity of the legacy enterprise IT model, in which ownership and licensing of software to be installed on customer sites is the norm, is likely to dwindle rapidly during the next few years. In this climate, ISVs are ill advised if they fail to consider how to enable service-based delivery of their offerings. Cloud computing should be considered an innovative yet easy means of doing so.
- **New revenue opportunities** – Examples include potential revenues from page space given over to advertising, and opportunities for revenue streams arising from ISV software component reuse via, for example, mashups (i.e., use of disparate software components in concert in order to compose new Web-based applications), and 'application stores' (e.g., iTunes). Butler Group believes these should be areas of strong focus for ISVs, as the foundation of cloud computing on usage-based revenue streams translates into less predictable income. Furthermore, customers will be able to react more flexibly to price differentials when they use software that is delivered via cloud computing, driving down margins.
- **Expansion of new services** – Cloud computing will allow ISVs to extend their application functionality, using mashup techniques to integrate with value-adding third-party components. As a service-based platform, cloud computing is also suitable for adding flexibility and convenience for customers with new billing options such as charging on a pay-per-click basis, or for usage time.
- **Savings on development and testing costs** – Applications for the cloud can be developed and tested using cloud-based tools, which extends the savings accrued from avoiding technology ownership into an earlier part of the application lifecycle.

Benefits for end-user customers

The other side of the coin from looking at the effects on ISVs of a shift to cloud computing as a delivery mechanism is the viewpoint of their customers. Largely speaking, this body comprises organisations that would not see their future determined by the latest turn on the journey of IT architectural practice, and so would need to be convinced of sound business reasons (alongside appropriate technical assurance) for adopting cloud computing as a foundation for business operations.

The benefits for customer organisations arise from the same characteristics of cloud computing as have already been described – indeed, some are more likely to accrue for customers than for ISVs. The deployment-related savings from not requiring new hardware, licences, or support arrangements will be appreciable features in any corporate business case that compares a solution delivered via cloud computing with a premises-based alternative. Even small organisations typically use a back-office server to manage and connect front-office PCs and provide their Internet connectivity, but many would welcome an alternative.

Even a small extent of hardware, software, and infrastructure equates to complexity that they cannot manage (also including ownership issues such as upgrade implementations), and cost that is extremely unwelcome. However, end-user organisations may well also benefit from the expected shift of the software market towards service-based delivery via cloud computing, as greater competition on cost will drive down prices.

Further advantages will be seen from using or offering more dynamic applications, with the capacity to incorporate new features more readily. As consumers, organisational end users have become accustomed to online services releasing upgraded features at short intervals, relative to the lengthy timescales between any improvements implemented in corporate applications. With the ease of implementing upgrades via delivery based on cloud computing, end users will be more attracted than before by the experience of their workplace IT usage, and from the corporate perspective there will be minimal appreciable costs of adoption.

► HOW CAN ISVS ADOPT CLOUD COMPUTING WITHIN THEIR BUSINESS MODEL?

Which type of cloud to alight on?

We have expounded above the general value and benefits of cloud computing as a platform for enterprise IT facilities and applications, and how ISVs are in a position to benefit from making this happen for their customers. Doing so entails ISVs making a decision on how to participate in the cloud computing market place. Cloud computing is set apart from most models of IT consumption due to the total abstraction of assets, and the absence of the need to identify the properties of individual, physical, resource-providing services. Nevertheless, ISVs' services must be based somewhere in order to be on offer, and the market provides a number of options in this regard.

ISVs and end-user organisations will have the choice of running their own cloud computing infrastructures. It is also conceivable that enterprises will collaborate through jointly operated cloud infrastructure ventures, accessible only to members of a given consortium. Such options, which limit the accessibility of the resources underpinning the cloud infrastructure, are known in the market as 'private clouds', as opposed to services offered more widely which are known as 'public clouds'. ISVs that have in the past offered hosted services, or used an ASP model for their application offerings, could perhaps blend their owned, self-managed IT resources with externally provided cloud services to some extent.

The issue of private and public clouds is perhaps best understood as being analogous to the distinction between the Internet and intranets. Intranets are instantiated using the same technologies as the Internet, but with the deliberate addition of access restrictions. While organisations may benefit from the degree of control over access that an intranet provides, intranets cannot replicate many of the benefits of a broader network, or the cost-saving advantages of greater scale.

Much in the same way, enterprises running their own cloud infrastructures may not be able to extract the same advantage of scale that specialised public cloud providers can. The costs of operating a private cloud would have to be balanced by the expectation of significant volumes of business, in order to avoid a resulting uneconomic unit cost, because of a fixed element relating to technology ownership.

Choosing between public Cloud providers is another adoption step for ISVs. A number of big names such as Amazon and Google already offer services, and others (such as Microsoft's Azure) are coming. The decision criterion for ISVs looking for the optimal delivery platform might be technology (e.g., Amazon might be seen as best for Java, and Azure as best for .NET applications). Alternatively, provider location might be an important factor, if data privacy considerations make it preferable for the provider to have hosting available in the geographical area of the ISV's target market. Other decision factors might include the charging models incurred (as these will directly influence ISVs' pricing), or the Service Level Agreement (SLA) available.

Cloud provider lock-in is a major concern and inhibitor for end users (and therefore ISV customers) moving to a cloud-based model. Using a proven cross-platform, cross-cloud solution from Micro Focus addresses those issues. It provides a runtime environment for COBOL-based applications, enabling new applications to be cloud-based, or facilitating the migration of COBOL-based applications from legacy infrastructure environments (which often incur undesirable costs of ownership, or levels of risk) to the cloud.

Re-architecting software for the cloud

Strategic planning for use of the cloud computing market model is often a driver for upgrading the architecture of software assets, so that the value of past investments in software is maintained within a new technical environment. There are a number of important considerations to make in order to migrate an existing application and fully exploit the opportunities of the cloud computing platform:

- Cloud application architectures are based on Internet architectures of HTTP, Representational State Transfer (REST), and other protocols and standards which inherently involve a different mode of operation from legacy stand-alone, or client/server, applications. The best applications to exploit the cloud will have clearly delineated elements for the UI, business logic, and data within their architecture, with the layers communicating via lightweight Web services. Undertaking re-architecture of existing applications can be costly and potentially risky, and tools such as those available from Micro Focus are able to help with modernising existing COBOL applications ready to exploit Service Oriented Architecture (SOA) and the Internet. There, the return on investment can include re-architected assets being ‘pushed’ in their own right to where users are demanding applications (e.g., Facebook), or as components in potentially revenue-earning mashups.
- Applications with UIs based around simple terminals (“green screen” mode) do not fit into Web architectures satisfactorily, and end users have higher expectations of what UIs should deliver. It is notable that television advertising for some online services now focuses almost exclusively on ease-of-use in industries such as insurance, where it is well known that back-end functionality has not changed fundamentally in decades. This strongly illustrates the perceived value of a modern UI. The immediate perception created by a UI is likely, in future, to be a potential revenue-earning factor.
- Modernisation of data design may be needed, as the highly scalable and redundant nature of cloud hosting environments is very different to traditional Virtual Storage Access Method (VSAM) or Relational Database Management System (RDBMS) models.

The extent to which these require work within each organisation, or pertaining to individual applications, will vary. These key challenges are the focus of too little attention at present, as cloud providers tend to only address new application development. Micro Focus is an early market mover, having established support for customer requirements to modernise applications for the cloud environment using a modernisation lifecycle approach. This first helps to assess areas where improvements are necessary, and enables code migration and testing which also use cloud-based resources, hence bringing the advantages of avoiding investment in infrastructure to ISVs and end-user organisations within the development lifecycle. The tools enable converted applications to be deployed using either the runtime cloud-based facilities which Micro Focus offers (as mentioned above), or the Microsoft Azure cloud environment.

► RECOMMENDED ACTION

Butler Group firmly believes that ISVs should already be considering, or already be active in, enabling their software offerings to be available as an online service. Cloud computing is likely to be the most flexible and viable means of doing so during the foreseeable future. ISVs themselves can benefit from opportunities to address new market areas directly without significant investment, and overall from savings in fixed costs, and support costs. Upfront investment in re-architecting software assets is merited to help gain the benefit of reduced support costs, but also to enhance its appeal and maximise the revenue-earning potential from opportunities, such as mashups and Facebook users incorporating ISVs’ software once it is sited accessibly via the cloud.

These opportunities will help to counter a number of threats to software-related revenues that can be expected to arise in forthcoming years – but these and other threats will hit ISVs that fail to take advantage of the potential of cloud computing, as well as those that do.

Consequently, we recommend that ISVs plan to take the following steps:

- Assess asset inventory to determine what software could be implemented with a cloud computing environment most easily, and with most benefit.
- Understand dependencies on third-party components that would need to be accessible via the cloud for functional integrity.
- Assess the suitability of various providers and partners in the cloud computing space, and their relative strengths and weaknesses.
- Consider how business processes can be changed to accommodate new charging or revenue models.
- Undertake service-oriented re-architecture for software that is to be migrated to a cloud computing environment.

Micro Focus provides tools to assist migration of COBOL-based software to be 'cloud ready', and also offers cloud-based runtime environments which can form the foundation of ISVs' cloud computing offerings. For ISVs with an investment in COBOL technologies, the Micro Focus model provides:

- The means of taking a relatively easy step and gaining the advantages of future revenues from operating in the cloud.
- Enterprise-strength, platform-agnostic, long-term support from a strong player in the industry that has made a decisive move into this new space.

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