# The Future of Software Delivery

## The opportunities and challenges of emerging software delivery models

**By Victoria Furness**

*The way companies perceive and purchase their software is starting to change. Organizations no longer have to buy an on-premise application and host it on site, they can have it delivered on-demand, as a service or hosted by the software provider or a third party. But while these new models offer more choice in how they pay, receive and use applications, the proliferation of terms has led to some confusion amongst organizations about what they are and what they constitute. 'The Future of Software Delivery: The opportunities and challenges of emerging software delivery models' is a new report published by Business Insights that examines the market conditions that led to the emergence of these new models and the benefits they offer over traditional delivery types. This report also examines future market opportunities for software delivery models and how they may be extended to hardware platforms in the future.*

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# Executive summary

## New software delivery models

- Software as a Service (SaaS) is a model of software licensing and delivery where a vendor provides access to applications, as well as the applications' associated support and maintenance, on-demand, usually over the Internet.

- Differences between SaaS and on-premise software delivery models concern ownership, location, payment and tenancy.

- Originally some industry commentators predicted SaaS would not expand beyond SMBs into larger organizations. However, there are signs that enterprises with revenue of more than $1bn are also adopting more SaaS applications.

- Hosting is a different model to SaaS, due to the persistence of traditional forms of licensing and the absence of a multi-tenant architecture.

## The changing IT landscape

- Reliable and ubiquitous broadband access, successful take-up of service delivery models (like SaaS) and significant investment in the next-generation IT and Telecommunications architecture is accelerating enterprise adoption of the Software as a Service paradigm.

- The wane in popularity of the on-premise model has also helped other software models rise in prominence. Hidden costs, lengthy implementations and the time and cost burdens of supporting and maintaining applications on site have all helped SaaS and on-demand vendors build a business case for their method of software delivery.

- The benefits of SaaS and on-demand software delivery center on a core feature of these models: flexibility.

- A study by Triple Tree and the Software and Information Industry Association (SIIA) found that on-demand deployments were 50 to 90% faster, with a total cost of ownership five to ten times less than installed software.

- As the SaaS model matures, fewer enterprises will need to deploy middleware in order to string together disparate pieces of business applications, legacy or otherwise. The onus of providing vital application integration capabilities

is expected to shift to service providers, which will, in turn, rely on economies of scale as they look instead to provide these capabilities as a service.

## Future opportunities

- SaaS looks set to continue pervading the enterprise, whether through those application areas that suit Internet-based delivery such as web conferencing and collaboration tools to those that have been previously considered as necessary to be kept behind the firewall: helpdesk, back-up software, word processing, spreadsheets, slideshows, content management and even supply chain management software.

- What brings the Hardware as a Service concept up to date is the reduction in the costs associated with hardware ownership, new technologies like virtualization that significantly cut the cost and complexity of scaling hardware capacity at short notice, not to mention the popularity of the SaaS model and increasing familiarity with usage-based pricing models.

- While historically the higher education sector has been reluctant to adopt hosted or on-demand delivery models for technology, many institutions will have a change of heart and perceive them as a valuable strategy for adding sophisticated technology solutions while holding IT and Telecoms budgets relatively constant.

## Pitfalls of new software delivery models

- Customer concerns about new software delivery models focus on security, infrastructure, service levels and culture.

- An on-demand application needs to be worked into the enterprise security framework that the business uses. Poor enterprise security can mean poor application security, whether on-demand, or on-site.

- Some organizations believe that by engaging a third-party services provider, their regulatory obligations might come into question, or be less rigorous in their management.

- Technology vendors must emphasize that providing their applications in a secure environment is part of their core mission and, therefore, are much more capable of ensuring the security of sensitive data better than the typical institutional IT/Telecoms department.

- Some organizations are concerned about the extent to which they are able to configure a SaaS solution to their own specific business issues.

- Prior investment in business solutions may preclude the adoption of a (potentially more appropriate) on-demand solution. This is particularly the case for ERP or SCM applications, which are relatively mature technologies.

# 1 Introduction

## Definitions

### Application service provider

Third-party application provider delivering an application to an organization over a network. ASPs provide support, maintenance and upgrades and the application can be delivered using the hosted or software as a service delivery model.

### Hosted applications

A software application delivery model where a software vendor develops an application and hosts and operates (either independently or through a third party) the application for use by its customers over the Internet. Customers own the software by paying regular license and maintenance fees.

### Managed application hosting

A form of managed service provision where a service provider remotely hosts a dedicated application, which end users access in an on-demand fashion and the organization (rather than service provider) owns the application licenses.

### On-demand

On-demand is a software application delivery model where a software vendor develops a web-native software application and hosts and operates (either independently or through a third party) the application for use by its customers over the Internet. As such, the application runs on a server outside the firewall and is delivered through an Internet-enabled thin client application, usually a web browser. Customers pay not for owning the software itself but for using it on a regular (monthly, bi-annual, annual, etc.) basis. On-demand applications reside with the vendor and allow multiple organizations to access the same instance of the application remotely.

## On-demand subscription fees

On-demand vendors generally charge subscription fees for a fixed period (yearly, quarterly, monthly, etc) per user, typically with a requirement for a minimum number of users. On a notional level, on-demand subscription fees include a license subscription, maintenance subscription and support subscription.

## On-premise applications

This is the traditional software application delivery model, whereby a vendor develops a software application, which is deployed on customer premises. Customers pay for owning the software and for its ongoing maintenance.

## Service-oriented architecture (SOA)

This term describes an architectural concept for enterprise IT that uses loosely coupled services to support the requirements of business processes and users. Resources on a network in an SOA environment are made available as independent services that can be accessed without knowledge of their underlying platform implementation.

## Software as a service (SaaS)

Software as a service is a model of software licensing and delivery where the vendor provides access to applications, as well as the applications' associated support and maintenance, on-demand, usually over the Internet. Customers pay a subscription or per-usage license.

# 2 New software delivery models

## Summary

- Software as a Service (SaaS) is a model of software licensing and delivery where a vendor provides access to applications, as well as the applications' associated support and maintenance, on-demand, usually over the Internet.

- Differences between SaaS and on-premise software delivery models concern ownership, location, payment and tenancy.

- Originally some industry commentators predicted SaaS would not expand beyond SMBs into larger organizations. However, there are signs that enterprises with revenue of more than $1bn are also adopting more SaaS applications.

- On-demand is often used interchangeably with SaaS, but it's also a bigger concept in its own right, referring to a new way for organizations to respond faster to customer demand, build new partnerships or react to market changes.

- As a software delivery model, on-demand refers to a web-native software application hosted and operated (either independently or through a third-party) for use by customers over the Internet.

- Hosting is a different model to SaaS, due to the persistence of traditional forms of licensing and the absence of a multi-tenant architecture.

- As a result of some misunderstanding in the market, SaaS providers would be well advised to spend time educating organizations on the differences between the traditional ASP model and today's SaaS software packages.

- While SaaS, on-demand and hosted applications refer primarily to the delivery of software applications, cloud computing is a broader concept defining the use of the Internet to deliver software and data over the Internet.

## Introduction

Software as a Service (SaaS), on-demand, application hosting… the number of different software models has proliferated in recent years. Now, organizations no longer have to buy an on-premise application and host it on site, they can have it delivered on-demand, as a service or hosted by the software provider or a third party.

But while these new models offer organizations more choice in how they pay, receive and use applications, the proliferation of terms has led to some confusion amongst organizations about what they are and what they constitute. This chapter will look at each of the concepts in turn and how they differ from one another.

## Software as a Service

Software as a Service (SaaS) is a model of software licensing and delivery where a vendor provides access to applications, as well as the applications' associated support and maintenance, on-demand, usually over the Internet. Customers pay a subscription

or per-usage license, rather than a one-off payment as used in the on-premise software delivery model. There are some other differences too:

***Table 2.1: A comparison of on-premise and SaaS delivery models***

| | On-premise | SaaS |
|---|---|---|
| Application type | Built to operate on customer's systems; often not Web-native. | Built specifically for the Web. |
| Payment | A one-off software license fee, possibly with some annual maintenance costs. | An ongoing subscription, paid for on a transactional or access basis. |
| Ownership | Owned by the end-user organization. | Owned by the software provider who 'rents' out use of the application. |
| Hosted | On the customer's site. | On the servers and systems of the software provider, usually delivered over the Internet, which means applications can be accessed remotely from various locations rather than one central resource. |
| Installation | Installed and configured by the buying organization, not service provider. | No need to install as application is hosted remotely; however, ensuring the day-to-day performance and availability of the application is down to the software provider, which manages it remotely (according to agreed SLAs). |
| Maintenance | Ongoing software updates delivered by software provider but the organization is responsible for maintaining the application on site and on users' computers. | It is the software provider's responsibility to oversee upgrades and maintain the software, according to agreed SLA definitions. This means that upgrades are managed centrally, removing the need for the IT team to oversee upgrades on each user's computer. |
| Customization | Customer free to adapt or build the software to its own requirements. | No opportunity to customize the application, although some software providers now offer a 'core' product with the opportunity to configure the application to a certain extent. |
| Architecture | The software is built to be used by the customer, rather than multiple | Built to offer multi-tenancy, which means different customers (and their many users) can use a single instance |

| | | |
|---|---|---|
| | customers across multiple regions. | of the application hosted by the service provider. |

*Source: Business Insights*

## Characteristics of SaaS

SaaS delivery models have several key components that differentiate them from other solutions such as on-site technology. These components are:

### *Ownership*

SaaS solutions are owned, hosted, managed remotely and delivered by a combination of one or more third parties. It is not conducted by the organization buying the software.

### *Location*

SaaS solutions are generally not hosted on the end user's site, however there has been a slight emergence of SaaS solutions being implemented in end user data centers. In this case, the solution is still fully managed by the service provider and utilizes the same off-site functional model.

### *Payment*

There is no upfront payment made by the customer, rather the engagement is based upon a subscription fee that might be determined on a transactional or access basis.

### *Tenancy*

Typically, SaaS technology is deployed using a multi-tenancy model. In practice, that translates to several customers using a single instance of an application or software deployment hosted by the service provider. Multiple instances can be run for different customers, however, the versioning and upgrade path are common across all instances. This newer initiative, driven by companies such as Oracle, is based upon a more modular approach to SaaS delivery.

### *Configuration, not customization*

Previously, technology solutions delivered on-demand centered on single instances of a solution hosted by a service provider, which had been heavily customized. To accomplish this, service providers took a base software or infrastructure 'package' and wrote in customer-specific code to meet the end user's needs. This allowed companies to move towards a subscription model, while at the same time retaining a level of control over the actual software itself.

The downside to this application for end users is that the time taken for implementation is considerably longer. Because of the coding required adapting the core package to a customer's specific needs, service providers took more time to bring the solution online. The return on investment (ROI) was, therefore, delayed. At the same time, the cost associated with managing single customized instances of solutions for service providers increases. It should come as no surprise that once a software package has been altered for a specific customer, considerably more effort is required to implement upgrades and fix bugs. This cost is typically passed on to the customer, which can detract from an investment decision.

The multi-tenancy model used by SaaS removes the possibility of customization for specific customers. Instead, vendors have developed configuration options that allow companies to adapt the core software to their business processes. Critically, the underlying software solution is not altered, making upgrading and maintenance significantly more efficient and effective.

Adding in configuration for specific customers is not always the easiest task for service providers and requires constant development of the core package. Companies such as RightNow Technology have placed configuration capabilities as one of the core advantages of their solution to try and find the balance between a company's need for specific functionality and the utilization of a multi-tenancy model. As SaaS grows in popularity, service providers will need to put in place cohesive and effective configuration strategies to accommodate a wider range of businesses using a single instance.

## Growth in the SaaS market

While the SaaS delivery model has been around for some time now in one form or another, it is only in the last twelve to twenty four months that investment has started to increase noticeably, vendors have developed more cohesive strategies and functionality has been enhanced.

This has in part been driven by a renewed focus on the small-to-medium (SMB) market by larger vendors such as SAP and Oracle. At the same time, pure on-demand vendors such as Salesforce.com have been increasing their revenues considerably. At a high level, there is currently the right mix of customer demand and current SaaS functionality to see an increased level of investment in this area. Vendors should, therefore, be positioning themselves accordingly to attract customers and drive revenues.

## The market opportunity

When discussing the market opportunity for SaaS solutions, it is important to differentiate between SaaS for the enterprise market and SaaS for the SMB market (defined in this report as companies with fewer than 1,000 employees).

Currently, most of the discussion within the IT industry has focused on SaaS as a solution for the SMB market, except perhaps for CRM. As such, a considerable

proportion of SaaS development and investment by vendors has focused on providing solutions to smaller companies. Yet while the core approach of the SaaS model does not differ between the two markets, vendors should be approaching each with different strategies.

The key elements of the SMB SaaS market, when compared to the enterprise market, include solutions that are:

- Expansive when compared to enterprise solutions (i.e. they are more suite-oriented) thereby covering a relatively wider range of business processes;
- More mission-critical to core operations;
- Implemented to support greater future scalability of operations;
- Significantly cheaper than enterprise versions;
- Less configurable given the greater process complexity of enterprise customers.

Because solutions adopted by SMBs will have a higher coverage of key processes, these vendors are less likely than their enterprise peers to adopt a hybrid approach where SaaS comprises a minority of implemented technology. Vendors need to be aware of this and the above elements of SMB implementations to ensure that core SaaS offerings target the correct pain points within the SMB target audience.

A further interesting point is the growing take-up of SaaS solutions by larger enterprises. Originally some industry commentators predicted SaaS would not expand beyond SMBs into larger organizations. However, there are signs that enterprises with revenue of more than $1bn are also adopting more SaaS applications.

## On-demand

On-demand is often used interchangeably with SaaS, but it’s also a bigger concept in its own right. IBM’s CEO, Sam Palmisano is credited with initially using the term in relation to IT. In a speech to the IBM Business Leadership Forum in November 2003, he based his definition of on-demand on three ideas or characteristics:

- On-demand starts with an enterprise's business model and business design. Future business models will horizontally connect all the processes that make up an enterprise, and extend out to that enterprise's partnerships;
- The underpinning infrastructure needs to be architected differently to support new business models;
- Finally, given all these shifts, clients are going to insist on different ways to access, manage and buy technology.

Hence, it's a way for organizations to respond faster to customer demand, build new partnerships or react to market changes. As a software delivery model, on-demand refers to a web-native software application hosted and operated (either independently or through a third-party) for use by customers over the Internet. The application runs on a server outside the firewall and is delivered through an Internet-enabled thin client application, usually a web browser. Customers pay not for owning the software itself but for using it on a regular (e.g. monthly, bi-annual, annual, and so on) basis. On-demand applications reside with the vendor and allow multiple organizations to access the same instance of the application remotely.

With these characteristics, on-demand applications enable organizations to turn on and off application usage as they require, removes unnecessary, non-core functions (maintaining the application or implementing web servers to host the application, for example) and only pay for what they use.

***Table 2.2: Features of the on-demand delivery model***

| | |
|---|---|
| Delivered from outside the customer's network | This does not exclude situations where the service provider and customer may utilize a VPN to communicate or use a dedicated line. |
| Runs on someone else's hardware | It's possible to use a hosted solution but 'own' the software (as is the case with part of Oracle's offering). Owning the hardware but renting the software running on it doesn't count as a true on-demand instance. |
| Non-traditional software licensing | Owning the software in the traditional way cannot be counted as a genuine on-demand solution. This does not mean that the service has to be purchased on a monthly, or per transaction basis; other methods – such as longer leases – are a perfectly valid, non-traditional way of accessing a business solution. |
| Scalability | The ability to switch on – and off – capacity (users, for example) as the need arises. |
| Multi-tenancy architecture | A characteristic of the SaaS delivery model – rather than individual application 'houses' for each customer, a multi-tenanted application provides one big application 'building' but still allows the customer their individual 'apartment'. |
| Instantly 'on' | The extreme example of this functionality can be found with vendors like Saleforce.com where customers can, using a credit card, sign-up on the website and instantly access the solution. |

*Source: Business Insights*

## Growth opportunities for on-demand

On-demand look set to play an important role in the way that businesses access and use business applications. There is huge potential in this market; for example, the growth rates for on-demand CRM and ERP application markets are significantly higher than for the premise-based market. Indeed, as we shall explore in chapter four, on-demand CRM has so far been the flag bearer for the on-demand world, but that's not to say opportunities are only restricted to this area.

# Concluding thoughts

It is important to note that ultimately, SaaS, on-demand and hosted applications are just delivery models for software or other technology solutions employed by service providers to solve specific business issues at companies. While this report describes the SaaS industry, for example, as a 'market', in reality, it is a sub-segment of several overarching technology markets. As such, if a technology such as customer relationship management (CRM) is considered, the wider market will include a combination of on-site licensed software, software delivered from an application service provider (ASP) and SaaS solutions. The same can be said for other technologies such as supply chain management (SCM), enterprise resource planning (ERP) and infrastructure technology.

Critically, the actual functionality and process support offered by current SaaS and on-demand applications can be relatively niche at times. While CRM offerings have in the past been rich in functionality, other areas such as sourcing or procurement can be rather more constrained in their offerings. As such, many companies will adopt a SaaS solution to solve specific business issues. In this case, technology delivered via a SaaS model can often complement existing or future on-site technology.

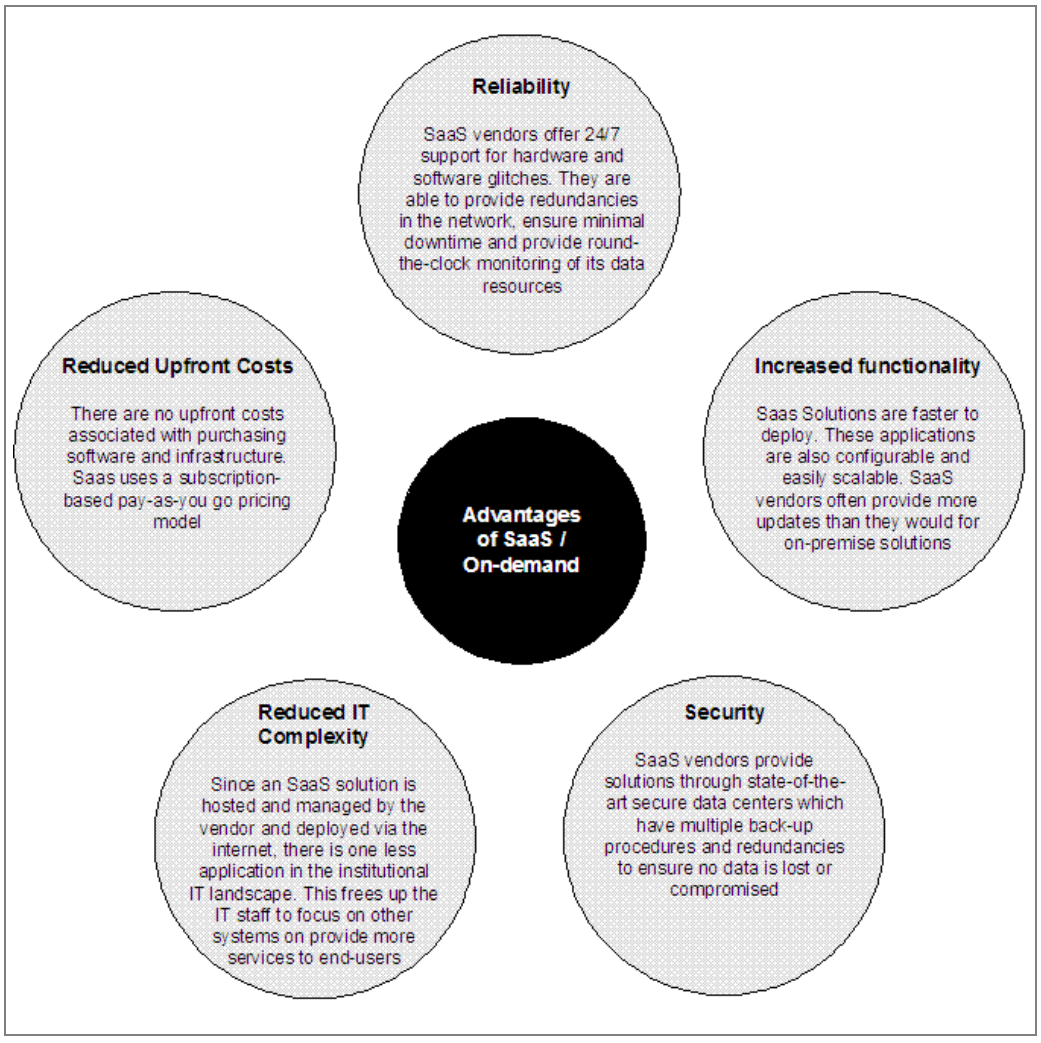
It may be the case that a 'pure' on-demand deployment does not suit every customer. Likewise, prior investment in on-site software is not going to be simply 'trashed' if it's helping solve the business need. Equally, an enterprise may be subject to legislation, which requires that its customer data be held in a particular place, therefore, making some on-demand solutions unsuitable.

Therefore, co-existence, and importantly, integration, is likely to be a key element of many SaaS and on-demand solutions in the near-term, at least.

# 3 The changing IT landscape

## The benefits of new software delivery models

***Figure 3.2: Advantages of the SaaS and on-demand delivery models***




*Source: Business Insights*

The benefits of SaaS and on-demand software delivery center on a core feature of these models: flexibility. The ability to access, pay for, scale and adapt the solution in a flexible way is a powerful driver to adoption.

## More manageable costs

The payment on a subscription and per-use basis turns application investment into an operational, rather than capital, expenditure. Moving away from heavy, upfront investments towards more manageable monthly operational expenditure is a core focus for businesses the world over.

## Familiar pricing model

Pricing that actually reflects usage is the norm in consumer markets. So why shouldn't organizations expect the same level of flexibility and realistic pricing everyone else does?

## Faster and easier implementation

Compared with deploying servers and other on-site hardware with the complex integrations and physical disruption this can cause, an on-demand or SaaS model is plug and go by comparison.

## Less software needed

As the SaaS model matures, fewer enterprises will need to deploy middleware in order to string together disparate pieces of business applications, legacy or otherwise. The onus of providing vital application integration capabilities is expected to shift to service providers, which will, in turn, rely on economies of scale as they look instead to provide these capabilities as a service.

## Easier upgrades

Even minor upgrades can cause version, integration and customization issues in on-site deployments. A true on-demand solution provides new functionality and issue resolution with no end user impact. As upgrades are carried out by the software provider automatically, the IT team knows that all users have the latest version installed on their computer.

## Faster time to value

Reducing the time taken to deploy and customize means SaaS and on-demand solutions generally realize a faster ROI.

## Greater access to new applications

Many small companies simply cannot afford the latest solutions or the functionality they offer. SaaS and on-demand solutions offer a lower-cost, easy-access route to some of the latest business applications without pricing smaller firms out.

Instant on is perhaps most important in the world of small to mid-sized businesses. Simple sign-up and go on-demand applications mean users who weren't able to access the functionality of a particular solution before (perhaps because it was cost prohibitive) can do so in the quickest possible manner.

For larger companies, while it may be the case that divisions require rapid access to functionality, it may also be the case that existing IT resources are not responsive enough to accommodate these needs. A SaaS or on-demand application may provide the answer in these circumstances.

## Stronger ties between IT and business goals

Adoption of the IT as a Service philosophy will enable enterprise IT functions to reduce their role in asset ownership and management, and focus instead on strategic alignment with core business goals. Enterprises will be able to focus their efforts on their core competencies, without sacrificing the power of IT as a business enabler.

## Easier to manage

The use of the Web as the application interface can make it easier for employees to access the application remotely or while mobile.

## Scalability

If an organization grows or shrinks in size, a SaaS or on-demand application should be easier to scale up or down, as there is no additional infrastructure to provide and the multi-tenancy architecture simplifies the process of signing up new users to the application.

## Disaster recovery readiness

A string of natural and man-made disasters over the past few years have made many organizations question their readiness for ensuring the continuity of their operations in the event of a catastrophe. Events such as hurricanes, 9/11 and the California wildfires have increased the priority for investing in disaster recovery plans. Many institutions, though, do not have sufficient funds to allocate towards this much-needed system, as it would involve the purchasing of significant infrastructure and hardware, and would also require additional staff to maintain these new data centers.

Therefore, many organizations have turned to SaaS technology providers who already have the necessary infrastructure and disaster recovery plans set in place. They also have significant redundancies within their networks to ensure that institutions experience minimal or no downtime in the event of a major catastrophic disaster. While disaster recovery and business continuity planning is unlikely to be a primary driver of the migration to alternative delivery models, it provides an important transitional or intermediary step between on-premise and SaaS or on-demand.

## Conclusions

SaaS and on-demand services rely on economies of scale and, as such, are particularly suited to application areas that are relatively commoditized, rather than those niche areas that give an organization its competitive edge. So in the same way that organizations are unlikely to rip out legacy systems and replace their on-premise applications with SaaS or on-demand software, vendors should consider carefully what an organization's IT/Telecoms need is and suggest a delivery model that best fits that need.

As such, nobody is going to wake up tomorrow to a completely on-demand world. Ultimately, we expect most organizations will use a hybrid of delivery mechanisms to suit their particular requirement in that application area.