Primary Research Report

In association with

The Enterprise Cloud Imperative

Time to shake things up a bit?

Freeform Dynamics, 2017

Introduction

While cloud computing in one form or another has been around for a very long time, it has far from overtaken the world of Enterprise IT.

It's sometimes hard to think back to the days before 'cloud computing' was coined as a term in the IT industry. At Freeform Dynamics, we first started using the word 'cloud' in our coverage of the IT industry in 2008. Many of the fundamental concepts underpinning cloud as we know it today, however, were being discussed in relation to 'utility computing', 'grid computing' and 'advanced virtualisation' way before that date. And if you are old enough to have enjoyed the dot-com rollercoaster ride back in the late 90's and early 00's, you will undoubtedly remember the emergence of Application Service Providers (ASPs), those early pioneers of Software as a Service (SaaS).

The point is that cloud computing in one form or another has been around for a very long time. It must therefore now be an integral part of everything you do in IT – right? Well the truth is that, regardless of evangelist and special-interest rhetoric, cloud has far from overtaken the world of Enterprise IT, especially in its hosted or 'public' form. Reasons for this range from questions over security and compliance, to concerns about loss of control, runaway costs, lack of market maturity, vendor lock-in, and a whole host of other fears, uncertainties and doubts.

Yet cloud clearly comes with a lot of potential benefits, and has reset expectations of what can be achieved with technology.

Even so, cloud clearly comes with a lot of potential benefits, which many have discovered as they have gained experience. And as a by-product of adoption, cloud has even reset expectations of what can be achieved with technology, changing mind-sets along the way.

With technology and services continuing to evolve, however, the question is whether cloud investments to date have laid a good enough foundation for the future, or whether it's potentially time to shake things up and look at new options. This question is explored in the remainder of this report with the help of input from 668 IT professionals who generously gave us their views and insights in a recent online survey (see Appendix A).

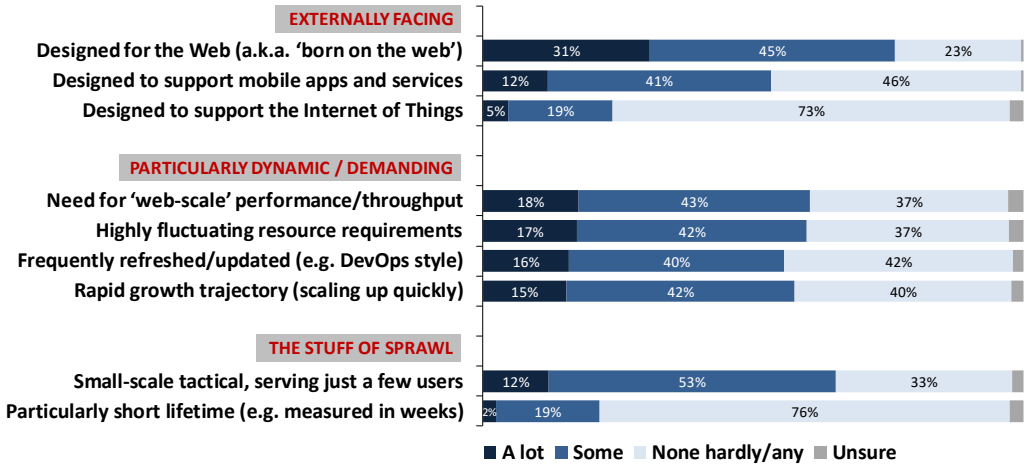
Various classes of 'natural' cloud applications are becoming commonplace.

The cloud story so far; where are we up to?

When pundits tell us that cloud is the way forward, what's the rationale for this? Well, at the 40,000 ft level it's simply because various classes of application are becoming more commonplace that are difficult and/or costly to deploy, operate and manage on traditional static, siloed system stacks (Figure 1).

Figure 1

How many of your organisation's applications and workloads have the following characteristics?



Demands for flexibility, scalability and resource optimisation have been growing for years.

Demands for flexibility, scalability and resource optimisation that are implied by the above have been growing for years, and over the course of the last decade, more and more organisations have recognised that cloud provides a lot of the answers.

Clarity on cloud options

Before going any further, however, it's important to distinguish between the various forms of cloud that we hinted at a couple of times already. When categorising cloud options, there are basically two dimensions to consider:

- The level the solution or service maps onto in the systems stack: Infrastructure, platform or application
- Where hardware and software physically resides: Hosted by a service provider or installed in your own datacentre

More organisations have recognised that cloud provides a lot of the answers.

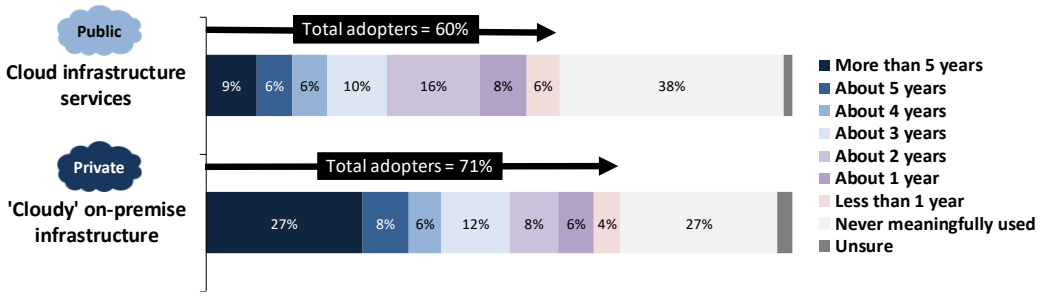
Some would argue that this is an oversimplification, but it's good enough for our discussion here. From this point onwards, everything we say relates to the infrastructure level, i.e. the delivery of compute, storage and other core system resources. However, a big part of our discussion will compare and contrast the so-called 'public' and 'private' cloud approaches in which infrastructure is hosted by a service provider or resides in your datacentre respectively. We'll also be covering 'hybrid' cloud, which is about using both public and private cloud resources in a coordinated and efficient manner.

Adoption and experience

The survey data suggests that while most organisations are now active with cloud, the length of experience varies considerably, and a significant number are yet to start their cloud journey in any meaningful way (Figure 2).

Figure 2

How long has your organisation been using 'cloudy' on-premise infrastructure or cloud infrastructure services, if at all, in any meaningful way?



The other big observation from Figure 2 is that organisations, on average, say they are further ahead with on-premise solutions compared to external cloud services. Note, however, that we deliberately used the term 'cloudy' in relation to on-premise infrastructure, as we have found over the years that IT pros taking a pragmatic view tend not to distinguish between advanced, dynamic virtualisation platforms, and what a purist would consider to be 'cloud proper'. As the old saying goes, "If it looks like a duck, swims like a duck, and quacks like a duck, then it probably is a duck." Obviously much of the early activity would have related to virtualisation platforms offering cloud-like capability.

Organisations are further ahead with on-premise solutions compared to hosted cloud services.

We'll return to this later as, to stick with our duck analogy, it's not just about what you can see on the surface; it's also important to understand the kind of paddling going on underneath. While a lot of 'cloudy' technologies and services apparently do the same thing – virtualise storage, allow you to provision virtual machines, etc – the underlying enabling technology can make a huge difference to the value they deliver.

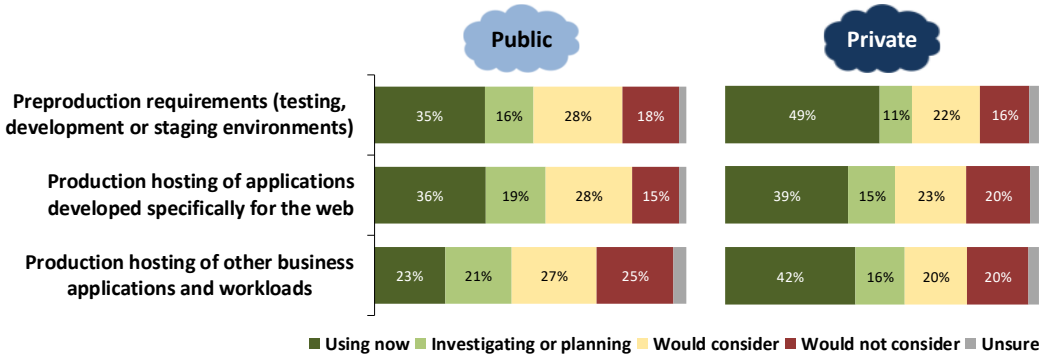
Application targets to date

Private cloud activity is both higher and more evenly spread than public cloud.

Turning to applications and workloads, public cloud activity is currently skewed towards use for software development and testing, and deployment of production solutions that have been specifically designed for the web. Right now, organisations are significantly less likely to be running their broader portfolio of other business applications in a hosted cloud environment. Meanwhile, private cloud activity is both higher and more evenly spread across the three categories (figure 3).

Figure 3

Are you using or would you consider cloud for the following?



Any conversation around cloud computing only makes sense if you are considering both public and private options.

As a word of warning, online surveys like the one reported here tend to attract respondents who have more involvement with the area being investigated. The absolute percentages shown for cloud adoption are therefore probably a little higher than in the general business population. Nevertheless, this data tells us that the centre of gravity for activity at the moment lies with on-premise infrastructure, so any conversation around cloud computing in an enterprise context only makes sense if you are considering both public and private options.

With that, let's delve a little deeper into perceptions of survey respondents about some of the pros and cons of cloud delivery models.

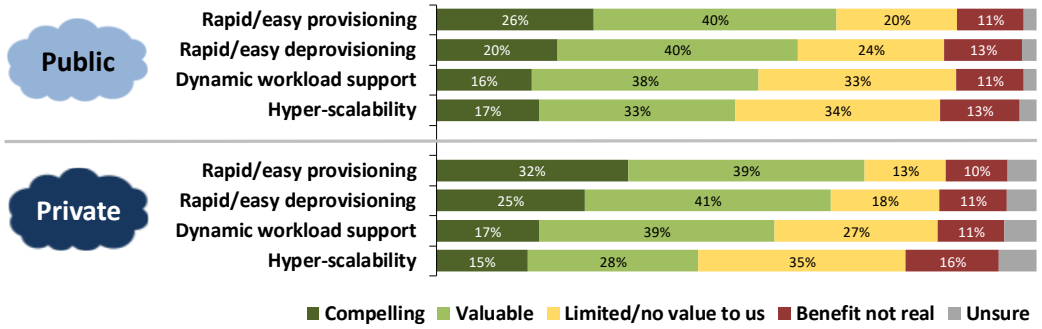
Public vs private; similar but different

One way to think of private cloud is about delivering the same set of core public cloud benefits, but through infrastructure installed in your own datacentre.

Even if you have limited first-hand experience of cloud services such as Amazon's AWS and Microsoft's Azure, you will undoubtedly be familiar with the basic proposition that revolves around speed, convenience flexibility and scalability. Against this background, one way to think of private cloud is about delivering the same set of core benefits, but through infrastructure installed in your own datacentre. What's interesting from the survey, however, is that some of these benefits come through more strongly in relation to the on-premise option, albeit to a marginal degree (Figure 4).

Figure 4

How would you sum up the following commonly cited benefits (or potential benefits) of cloud options in the context of your business?



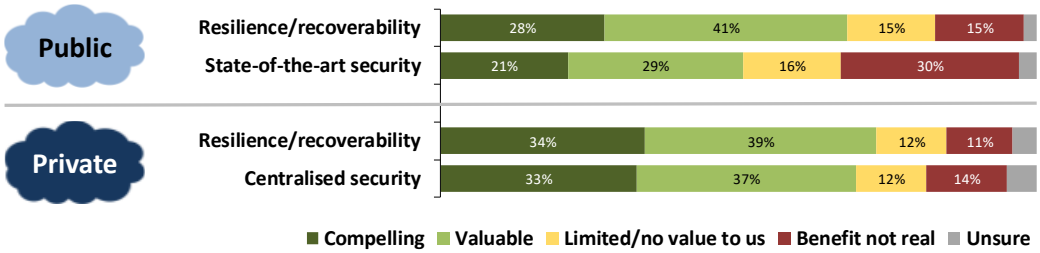
On balance, private cloud is viewed to have the edge over public cloud when it comes to risk management.

That last chart also reminds us not to run away with the notion that every organisation finds every aspect of the cloud proposition compelling. As you can see, enthusiasm varies considerably, not least because the majority of applications and workloads in most SMB and enterprise environments are actually quite predictable and static. Where speed, flexibility and scalability matter, however, the takeaway here is that requirements can often be fulfilled equally through either the hosted or on-premise route.

Where we start to see a difference between public and private cloud, is when we turn our attention to a couple of key aspects of management. Here, on balance, the on-premise option is viewed to have the edge, with quite a few rejecting the notion of there being any benefit to public cloud from a security perspective in particular (Figure 5).

Figure 5

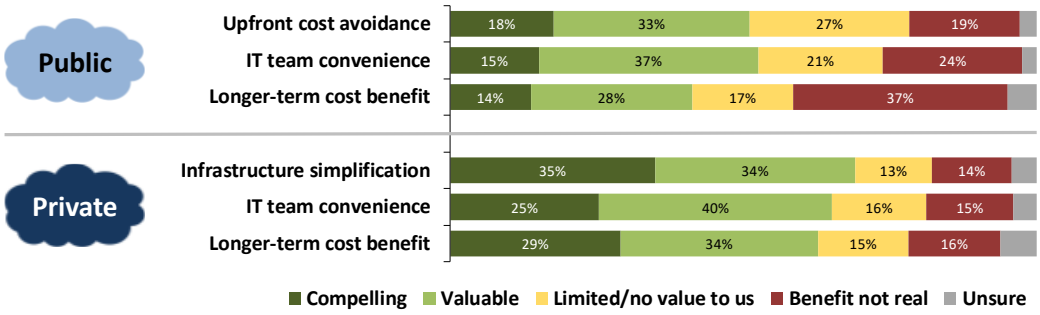
How would you sum up the following commonly cited benefits (or potential benefits) of cloud options in the context of your business?



Counter to the general industry narrative, we then see even bigger differences in relation to cost and overhead, again in favour of private cloud (Figure 6).

Figure 6

How would you sum up the following commonly cited benefits (or potential benefits) of cloud options in the context of your business?



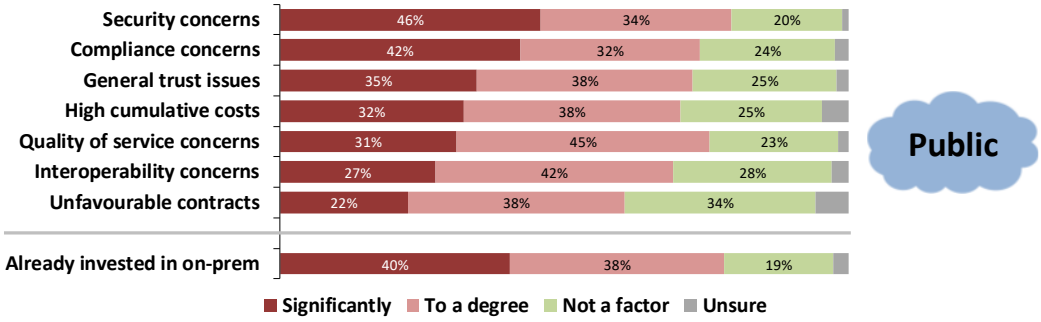
What's particularly notable here is a significant minority (37%) telling us that public cloud actually doesn't deliver better cost benefit over the longer term. Contributors here will include unfavourable rates and tariff structures catering poorly for many use cases, and simply the effort required to operate heterogeneous on-prem and public cloud environments. It is not uncommon for organisations to use multiple flavours of cloud in a fairly tactical and uncoordinated way, which can create a lot of headaches and overhead.

A significant minority (37%) tell us that public cloud doesn't deliver better cost benefit over the longer term.

These kinds of issues, along with a number of others, come through more explicitly when we look at public cloud inhibitors (Figure 7).

Figure 7

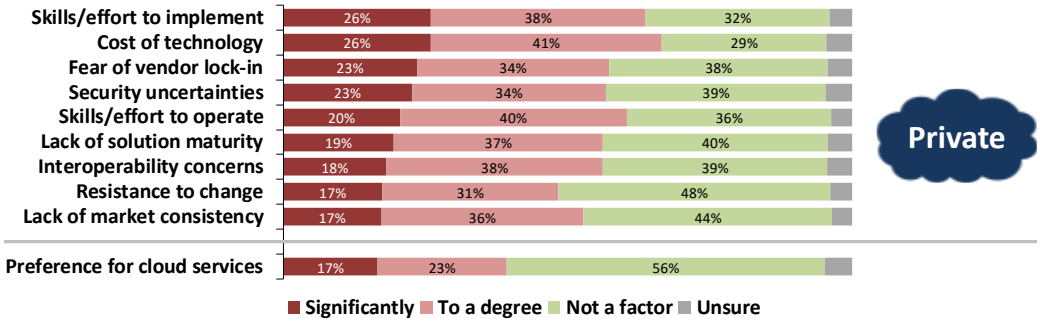
How much have the following inhibited or limited your use of cloud infrastructure services?



But while public cloud services don't represent a panacea, neither does private cloud infrastructure. Inhibitors to progress here include another long list of issues, even if they aren't expressed as intensely (Figure 8).

Figure 8

How much have the following inhibited or limited your use of on-prem cloud infrastructure?



The bottom line from all this is that cloud computing is potentially a double-edged sword, so when making decisions, it's critical to understand what's important in relation to your specific environment and needs. With this in mind, let's take a look at what the research tells us about requirements for building an enterprise class cloud environment.

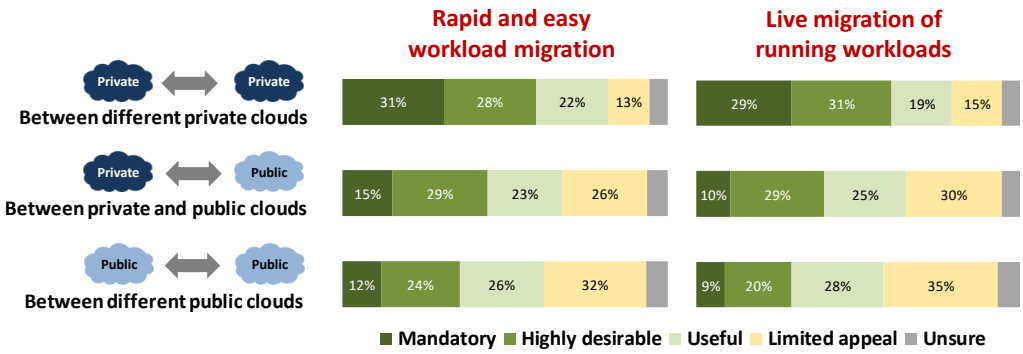
When making decisions, it's critical to understand what's important in relation to your specific environment and needs.

No cloud is an island; at least it shouldn't be

When you start looking at requirements, one of the things that comes through immediately is the desire for openness. Fundamental here is portability of workloads between clouds, and even the ability to live migrate so system and resource changes can take place without taking virtual machines off-line (Figure 9).

Figure 9

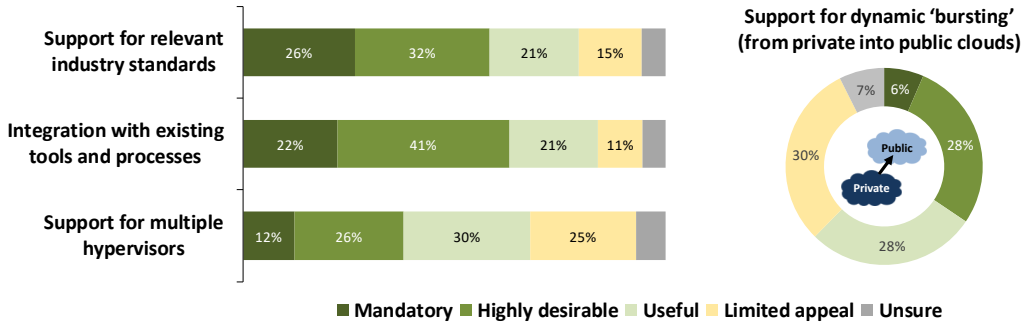
How important would you regard the following in relation to your enterprise cloud environment?



The openness imperative also comes through in relation to industry standards and integration with existing tools and processes (Figure 10).

Figure 10

How important would you regard the following in relation to your enterprise cloud environment?



What's notable from this chart, however, is that fewer prioritise support for multiple hypervisors. Arguably, if the right kind of standards, portability and integrations are in

place, even if it's based on compatibility with broadly used proprietary models and standards (e.g. Amazon AWS APIs, or VMware systems administration interfaces), then the exact nature of the hypervisor doesn't matter that much.

Support for multiple types and instances of cloud is important to deal with current and evolving needs.

The relatively low level of priority given to dynamic bursting between private and public clouds is another matter. While this use case is often highlighted when describing the rationale for hybrid cloud, the reality is that it's less common than the need to be able to manage workloads and resources on more of a proactive basis.

From piecemeal heterogeneity, to coordinated hybrid cloud

Standing back from the detail, it's clear from the research that support for multiple types and instances of cloud is important to deal with current and evolving needs. This could be as a result of legacy investments, requirements of specific applications, or a desire to take advantage of emerging capabilities only offered by a specific vendor or provider.

Living with a totally fragmented and disjointed environment isn't sustainable from an overhead, cost and risk perspective.

In practical terms, it would therefore not be uncommon for you to end up with some workloads running on AWS, others on Azure, and yet more on other public clouds; indeed, you may well be in this position at the moment. If it hasn't happened already, it will also be normal for you to accumulate multiple private cloud instances in your datacentre. These may be spread across Microsoft, VMware and open source stacks, for example, along with platforms based on emerging technologies from newer, more specialist vendors who often approach the same problems from a different direction.

While it's probably unrealistic in a larger environment to expect all of this cloud activity to be fully integrated across the board, the other extreme of living with a totally fragmented and disjointed environment isn't sustainable from an overhead, cost and risk perspective.

The trick is to think in terms of clusters of coordinated public/private cloud activity, within which workloads can move relatively freely while resources are managed efficiently and coherently. This is what we mean by 'hybrid cloud'.

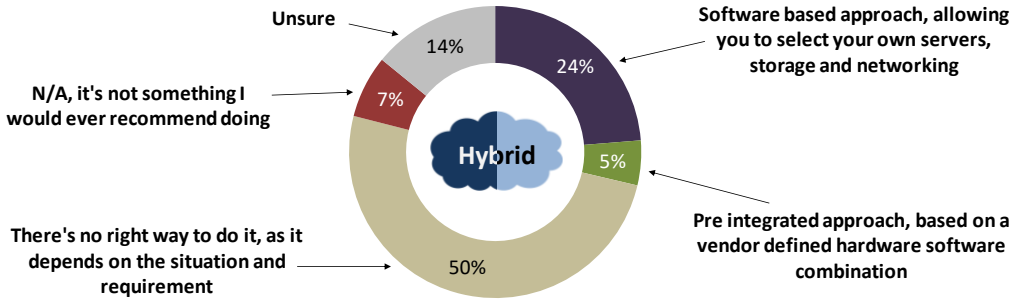
The trick is therefore to think in terms of clusters of coordinated public/private cloud activity, within which workloads can move relatively freely while resources are managed efficiently and coherently. This is what we mean by a 'hybrid cloud' environment, and at the time of writing, the control software and management tooling required to enable such an environment goes by many names. Some vendors position it as part of their 'software defined datacentre' proposition and others consider it an implicit part of their 'private cloud infrastructure' solution. As a nod to the sponsor of our study, however, we'll refer to 'enterprise cloud' platforms or environments in the remainder of this report.

So how do you build an enterprise cloud?

A key question when building an enterprise cloud is whether it should be viewed as purely a software requirement, or if you should think more in terms of the complete hardware/software stack. The most common view on this is "it depends" (Figure 11).

Figure 11

What's your opinion, of the best way to build your on-premise private/hybrid cloud environment?



Pure software vs integrated stack

The critical part of any enterprise cloud environment is the software that drives it, but it can frequently be very useful to acquire hardware and software as an integrated solution.

While it is true to say that the critical part of any enterprise cloud environment is the software that drives it, it can frequently be very useful to acquire hardware and software as an integrated solution. As 50% of the respondents indicate, whether it makes sense to go down the pure software route (and add your own server, storage and other resources depending on your preferences), or focus on appliances or prebuilt systems based on reference architectures, depends on your requirements.

The open software approach can make sense if you are building a more general-purpose environment that may grow and expand in unpredictable ways. It can be cheaper, safer and more convenient, however, to buy the whole stack as a single integrated solution if you have a specific mix of workloads in mind. If we consider the 'it depends' and the 'unsure' groups together, we can then infer a need for cloud solution vendors to provide options and guidance on when to use which approach. It is therefore no coincidence to see software vendors partnering with hardware manufacturers, and for suppliers in general to provide best practices and be willing to make consultants available pre-contract to ensure a good fit of solution with requirements.

Different technology routes to the same destination

Vendors with all kinds of backgrounds and heritages now offer private/hybrid cloud solutions.

As you research the area of private/hybrid cloud, it quickly becomes apparent that vendors with all kinds of backgrounds and heritages now offer solutions in this space.

An obvious group of players here are the mainstream virtualisation platform software vendors such as VMware, Microsoft, IBM, Oracle and other well established incumbents in the datacentre. We could legitimately add open source players such as Red Hat and Canonical to these, as what they all have in common is their evolutionary journey from basic virtualisation into the world of cloud over a decade or more. The big advantage represented by such players is clearly familiarity. Over time, many organisations have built up a good base of knowledge and skills around mainstream virtualisation platforms.

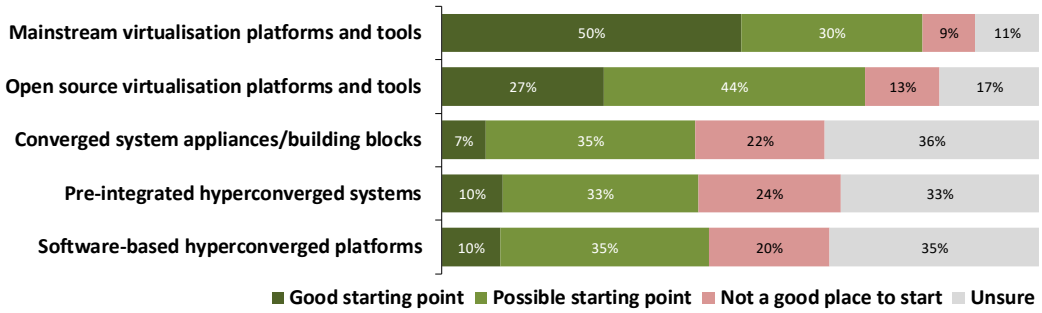
A group of vendors have been moving into the enterprise cloud space from the world of HCI, with a focus from the outset on scale-out architectures.

Meanwhile, in more recent years, another group of vendors have been moving into the enterprise cloud space from the world of hyper-converged infrastructure. Focused on the delivery of highly virtualised resources based on scale-out architectures from the outset, these players claim that their technology foundation provides a better starting point for building an enterprise cloud. The argument here is that they haven't had the drag of legacy thinking and the need to support legacy workloads and applications, so they have been able to build solutions that are highly optimised for the job at hand.

Of the two options outlined, it's clear which way our survey respondents are tending to lean at the moment (Figure 12).

Figure 12

How would you rate the following as a foundation upon which to build an enterprise class private/hybrid cloud environment?

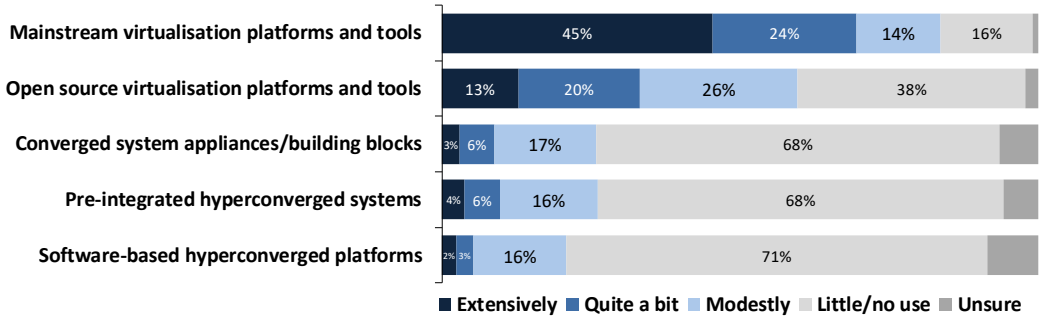


Uncertainty around emerging technologies stems from lack of familiarity.

What's notable on the above chart, however, is the high number of 'unsure' responses in relation to hyper-converged technology. The same is true for building out clouds based on a more traditional systems architecture using converged offerings. These can be more convenient, but servers and storage resources are not logically 'fused' as they are in hyper-converged. When we look at current adoption levels, however, the reason for the uncertainty is pretty obvious (Figure 13).

Figure 13

To what degree have you already invested in the following?

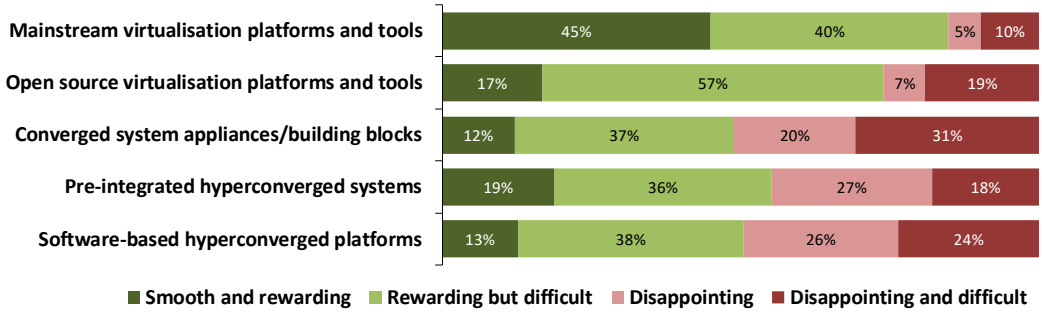


Comparing figures 12 and 13, the other conclusion we can come to is that many of the perceptions associated with converged and hyper-converged options are based on second hand knowledge rather than direct experience. The fact that many vendors have positioned HCI very firmly as primarily a storage offering will not have helped from a perception perspective when considering broader cloud requirements. As with all emerging technologies, there is also the challenge that early offerings have led to a mixed set of experiences. Focusing in on those who do have experience, it is clear that some have been bitten by problems arising from solution immaturity (Figure 14).

Some have been bitten by problems arising from solution immaturity.

Figure 14

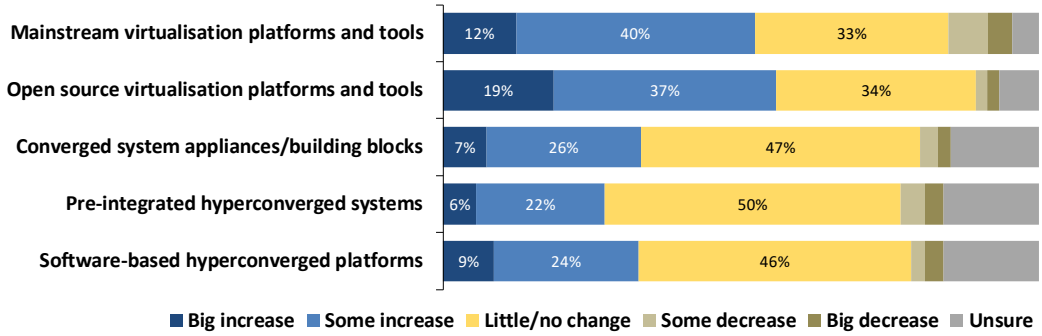
Generally speaking, how would you sum up your experiences with the following technologies? *(those with experience)*



Nevertheless, coming back to the overall study sample (as opposed to just those with experience) a significant number see an increase in the use of converged and hyper-converged solutions going forward (Figure 15).

Figure 15

And from a platform perspective, how do you expect your use of the following to change over the coming 5 years?



There is a hint here of change in the air, at least for some, which is worth exploring further.

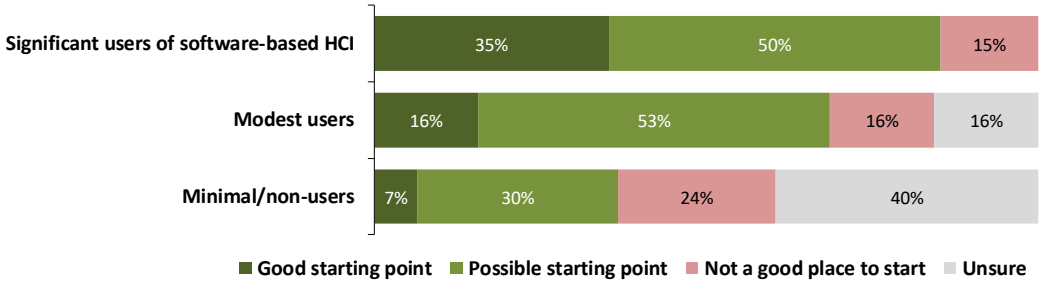
Experience breeds understanding and enthusiasm

Those with HCI experience are more likely to appreciate the benefits of solutions with alternative roots.

Drilling into some of the survey results in a different way, we start to get past the influence of familiarity that skews the top-level picture of perceptions. Using software-based HCI as an example, indications are that those with experience and familiarity are more likely to appreciate the benefits of solutions with alternative roots as a good starting point for enterprise cloud (Figure 16).

Figure 16

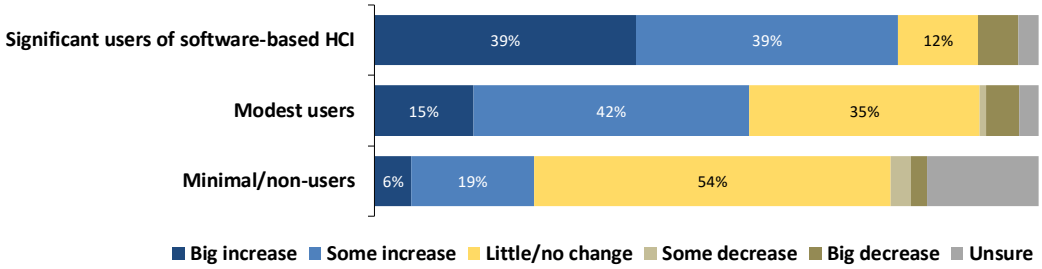
How would you rate [*software-based HCI*] as a foundation upon which to build an enterprise class private/hybrid cloud environment?



Considering some of the mixed experiences with early solutions, this picture is remarkably positive, and is reinforced when we look at the impact of experience on plans (Figure 17).

Figure 17

And from a platform perspective, how do you expect your use of [software-based HCI] to change over the coming 5 years?

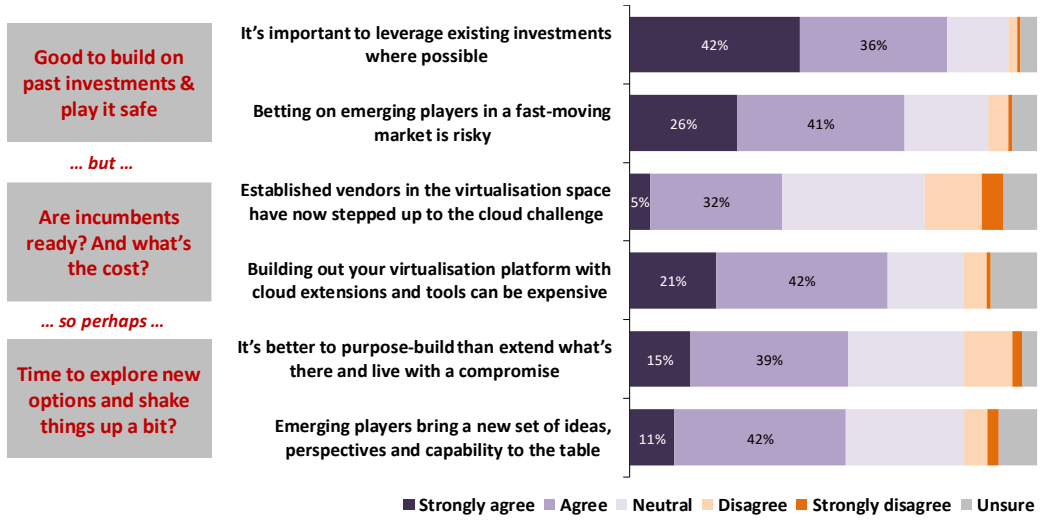


It's worth taking a look beyond the familiar incumbents.

While data like this is not strong enough to provide a recommendation to turn away from traditional vendors and drive down the alternative solution route, it does suggest that if you are reviewing your enterprise cloud requirements, it's worth taking a look beyond the familiar incumbents. With this in mind, one of the most interesting set of responses in the study was the question of what needs to be considered from a supplier investment perspective when reviewing options and making decisions (Figure 18).

Figure 18

How much would you agree or disagree with the following statements in relation to building an on-prem cloud environment?



There are no easy answers, but this sums up the thought process you need to apply.

Other considerations

Survey respondents highlighted a range of other potential impediments to progress.

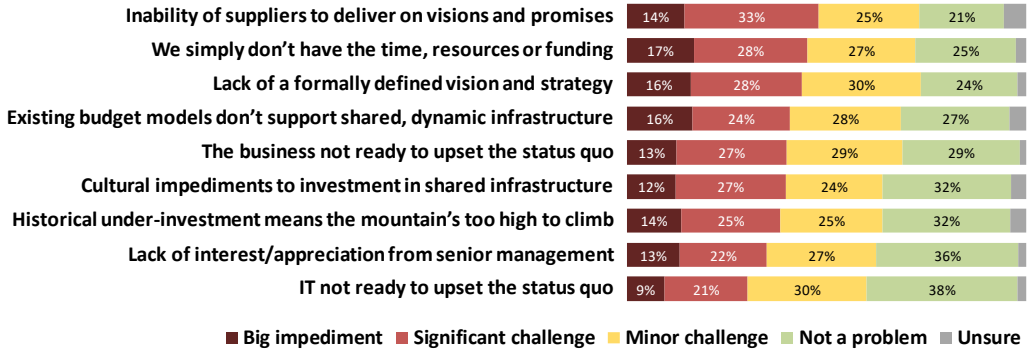
Our discussion so far highlights the need to think through the kind of technology and supplier choices you are faced with when making enterprise cloud decisions, but there are some over-arching factors that also need to be considered.

Challenges and impediments

Beyond issues to do with specific solutions and approaches, survey respondents highlighted a range of other potential impediments to progress (Figure 19).

Figure 19

How much are the following standing in the way of progressing towards the vision?



A lot of these will be very familiar to anyone previously involved in technology-related decisions at a strategic level, but the items listed serve as a good reminder of what you need to have covered.

You have to keep sight of some of the broader trends that will shape demand into the future.

Coming up a level, however, the prominent role cloud computing is likely to play in your plans and activities means that you have to keep sight of some of the broader trends that will shape demand into the future.

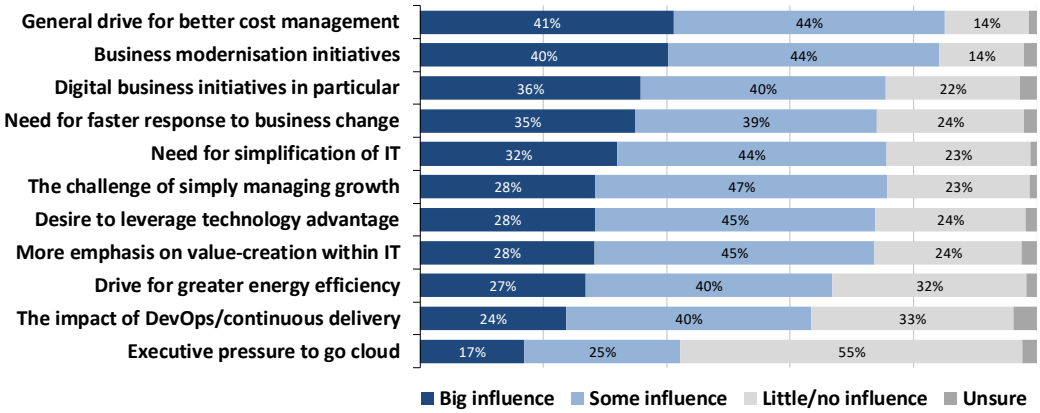
The all-important business and change perspective

You need to keep up from a technology perspective, as well as managing costs and risks.

The pace of change across IT and the business is accelerating considerably. New technologies are enabling new ways of working, new ways of engaging customers and new business models, and this in turn is fuelling the digital transformation trend that we hear so much about at the moment. Such transformation comes back around to further drive the technology imperative, i.e. as customer behaviour changes, B2B trading becomes more electronic, and markets transform and speed up, you need to keep up from a technology perspective, as well as managing costs and risks (Figure 20).

Figure 20

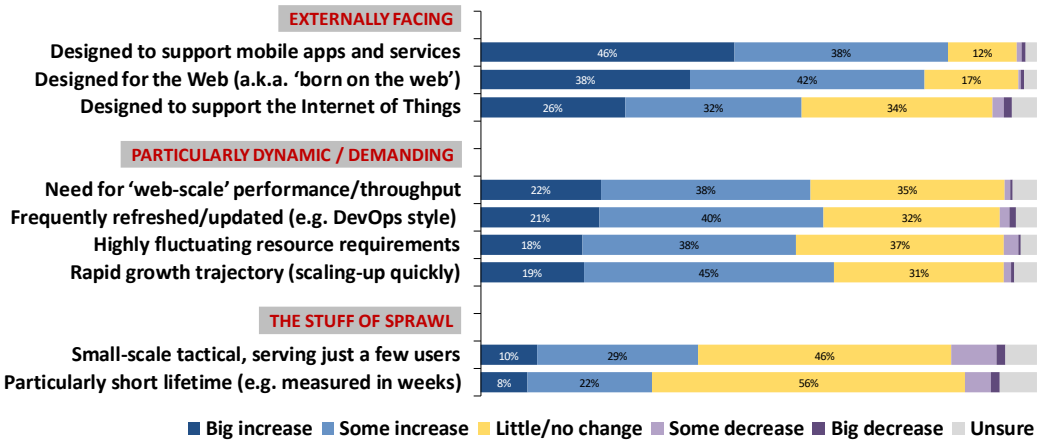
How much are the following likely to influence your platform and infrastructure agenda over the coming 5 years?



It's then no surprise to see an anticipated greater emphasis on the kind of 'natural cloud' applications we identified at the beginning, as increased demand for these naturally falls out of any digital transformation exercise (Figure 21).

Figure 21

How do you anticipate the number of applications and workloads exhibiting the following characteristics to change over the coming 5 years?



Bearing these trends in mind, the key question is whether it's safe to assume that changes in demand will continue to evolve steadily, or whether IT departments need to prepare themselves for some pretty major shifts in requirements going forward.

With most modern businesses now extremely reliant on technology to operate and compete, it makes sense to continually explore new options that will allow you to maintain the maximum possible agility, responsiveness and efficiency.

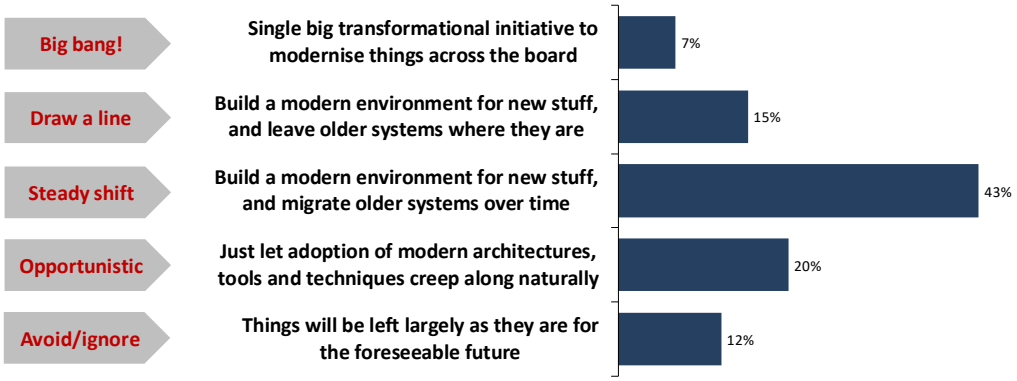
With some of the recent geopolitical developments that at the time of writing are already beginning to disrupt markets, trading relationships, and the flow of labour and money, who knows what will be asked of your IT infrastructure and application portfolio going forward. With most modern businesses now extremely reliant on technology to operate and compete, it makes sense to continually explore new options that will allow you to maintain the maximum possible agility, responsiveness and efficiency from an IT perspective. In the context of enterprise cloud, this may mean looking beyond incumbent suppliers to what's on offer from newer, more specialist players.

Defining objectives and setting the right pace

It is tempting to say that readying your IT infrastructure for the future through enterprise cloud technology is a marathon not a sprint. In reality, however, it's both. You need a suitable environment to deal with the fast-moving parts of your business, e.g. in areas such as digital customer engagement. The primary drivers here are typically speed and agility. Equally, however, for ongoing efficiency, cost and risk purposes, it makes sense to consider moving existing applications onto a cloud footing over time. This is reflected in survey respondent views of the best way of moving forward (Figure 22).

Figure 22

When it comes to driving towards the things we have been discussing, how is it playing out, or how do you think it's going to play out, in your organisation?



Final thoughts

Wherever you are in your adoption, the chances are that cloud computing will play an increasingly important role in your IT strategy over time. One of the biggest lessons from this research, however, is not to assume that this translates to moving all of your IT into someone else's datacentre. Public/hosted cloud clearly has a role to play, and represents a lot of value, so making the right decisions when evaluating services is extremely important. More critical, though, particularly in a larger enterprise environment, is laying the right cloud foundations in your own datacentre.

The objective is to provide the freedom and flexibility to mix and match different cloud technologies as business and application needs continue to evolve.

The objective here is to provide the freedom and flexibility to mix and match different cloud technologies as business and application needs continue to evolve. As you look to the future, you should therefore be prepared for a world in which you manage multiple private clouds, and exploit multiple public cloud services, in order to deal with rapidly changing and often unpredictable requirements.

Against this background, the aim is to create an enterprise cloud environment that allows you to make optimum and easy use of a disparate set of resources, while maintaining coordination and control. This is the difference between a heterogeneous multi-cloud landscape, and a coherent hybrid cloud strategy and approach.

It is tempting to just go with an incumbent supplier that has helped you along your previous journey towards infrastructure virtualisation, but it's worth casting the net wider when making key decisions.

As you look to make technology choices in this area, it may be tempting to just go with an incumbent supplier that has helped you along your previous journey towards infrastructure virtualisation. While private/hybrid cloud is arguably the next step on from this, those that have looked at alternative suppliers with more of a hyper-converged, scale-out solution heritage indicate that it's casting the net wider when making key decisions.

The recommendation we will leave you with is not to look for a 'single answer' given the rate at which cloud ideas and technologies are developing. It's often better to make tactical decisions, but bearing strategic considerations in mind, such as the kind of openness and portability prioritised by our study respondents. You can then make sure you have a modern platform in place to deal with the most pressing set of fast-moving web, mobile and IoT requirements, and build things out over time.

We hope the insights in this report will be useful to you as you continue along your own enterprise cloud journey, and we would like to finish by thanking all of the participants in our study for generously contributing their thoughts and experiences.

Appendix A: Research Sample

The study upon which this report is based was designed, executed and interpreted by Freeform Dynamics Ltd. Data was gathered from 668 respondents via an online survey completed in January 2017.

The sample distribution for the survey was as follows:

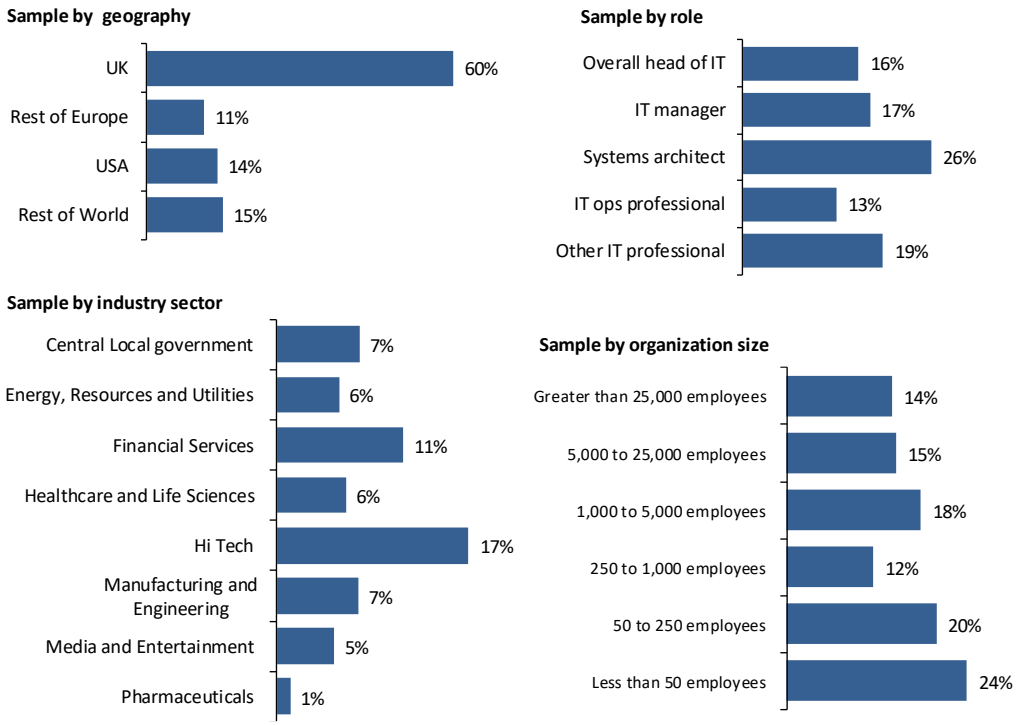


Figure 23

Composition of research study sample

Note on methodology

The survey was conducted via a questionnaire hosted on the Web, and respondents 'self-selected' into the study. We must therefore be aware of possible sample bias towards more advanced respondents who are generally more enthusiastic and more likely to respond to a research call to action. This does not affect the commentary or conclusions contained in this report, but should be borne in mind when considering the data in another context.

About Freeform Dynamics

Freeform Dynamics is an IT industry analyst firm. Through our research and insights, we aim to help busy IT and business professionals get up to speed on the latest technology developments, and make better-informed investment decisions.

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Nutanix makes infrastructure invisible, elevating IT to focus on the applications and services that power their business. The Nutanix enterprise cloud platform leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications.

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