Primary Research Report

In association with

Datacentre Strategy and Evolution

Putting the power management discussion into a business context

Freeform Dynamics, 2017

Contents

Management summary

With the advent of cloud computing, many claim that the demise of on-premise IT is inevitable. When the future of the datacentre was investigated in a recent research study, however, a different picture emerged.

IT teams are dealing with an elevated level of business demand

While there is nothing new in the notion of IT departments needing to keep up with and support business change, this requirement has recently become very acute. The impact of digital transformation, which puts technology front and centre when it comes to the implementation of new business practices, is creating an unusually demanding set of dynamics at the moment. Closely related to this, we have seen an increased focus on 24x7 availability across a much wider range of applications. The need is for speed of response, without compromising quality, robustness and reliability – all, of course, while managing costs effectively.

Cloud has a role to play, but the datacentre remains critical

There can be no doubt that public cloud services are finding their place in the IT delivery mix and now sitting alongside traditional hosting options. However, the prevailing view is that while cloud services have many benefits, they also bring with them a range of challenges and complications. As a result, few tell us that a wholesale shift to public cloud is on their agenda. Indications are that the future for the majority of enterprises will be defined by hybrid IT, in which the datacentre remains critical, and various forms of cloud and traditional hosting options are blended to cater for a wide range of ever-changing application and service needs. Against this background, it is important that the datacentre is capable of handling new IT delivery needs.

A number of priorities for the datacentre come through strongly

While external cloud services may not be destined to consume the whole of enterprise IT, many organisations aspire to deliver the same benefits of flexibility, efficiency and rapid response to change within their own datacentre environment. In effect, cloud has reset the expectations of many, there is no going back. With this in mind, a number of priorities are highlighted when it comes to datacentre evolution. The environment needs to become more change friendly, but also more inherently resilient, and this applies to both the core IT infrastructure and facilities such as the power and cooling systems that support it. Better control of costs goes without saying, and as part of this many highlight the need for better energy efficiency. The question of energy also arises in relation to regulation and both customer and shareholder perception. Some refer to a revival in their green and sustainability agenda.

Change and investment are required to meet evolving needs

Around half report that their core IT infrastructure needs strengthening, and this number is closer to two thirds when it comes to facilities such as power and cooling. Various modernisation initiatives are highlighted, including investment in private and hybrid cloud architecture, and this is in line with the general industry trend towards a more software defined datacentre environment. When it comes to energy, many allude to a changing game. Yes, the facilities infrastructure often needs upgrading to meet today's efficiency, reliability and flexibility expectations, but more profound than this is a common concern around skills availability. Whether it's designing for energy efficiency, managing consumption on an ongoing basis, or dealing with power-related failures quickly and effectively to avoid outages, the prevailing view is that the relevant expertise is difficult to acquire and retain. Against this background, modern software tools are increasingly being seen as a key enabler right through the power management process, from initial modelling, through ongoing monitoring and management, to a more orchestrated and automated response to incidents and failures to avoid outages. As in many other aspects of IT, power management will increasingly become a software defined activity over time.

Introduction

82%

Strongly agree or agree that

Most of our business critical processes are now dependent on IT

With a technology industry seemingly obsessed with cloud computing, and some predicting the end of on-premise IT, it would be easy to get the impression that everyone is gradually winding down their datacentres and waiting for the day to arrive when they can all be switched off.

This report provides an alternative view.

In the following pages we lay out a set of insights, comments and quotes arising from in-depth interviews with a range of experienced, senior people intimately involved in one way or another with IT and business strategy. As you read through the document you will also see reference in the left-hand margin to key statistics arising from a larger scale survey of 320 senior IT professionals on the same topic. An overview of the study methodology, which was designed and conducted independently by Freeform Dynamics, and sponsored by the datacentre facilities and power specialist, Eaton, is provided in Appendix A.

As we shall see, the findings demonstrate quite clearly that the enterprise datacentre is not only alive and well, but is increasingly being considered as critical to success in a fast-moving digital world. Quotes from study participants such as the following provide us with a good backdrop for our discussion:

78%

Strongly agree or agree that

The quality of IT service delivery directly impacts business success

> *"Our datacentres are no longer just places that house IT, they are strategic assets that help the business differentiate."*

> *"We regard our datacentres as critical business assets."*

As we explore the detail behind such high-level statements, we'll touch on some of the strategic drivers and imperatives, the common problems and challenges, and the kind of initiatives and measures that can help to drive the change that's often necessary.

At the request of our sponsor, we will be paying special attention to power management and energy efficiency along the way. As it turns out, this request was not hard to accommodate, as the topic came up quite naturally as IT leaders spoke about their datacentre environment and strategic agenda.

> *"Sustainability is a big consideration at group level, so we take energy efficiency very seriously. Customers and shareholders expect us to live up to these values; they want more than just talk and good intentions."*

74%

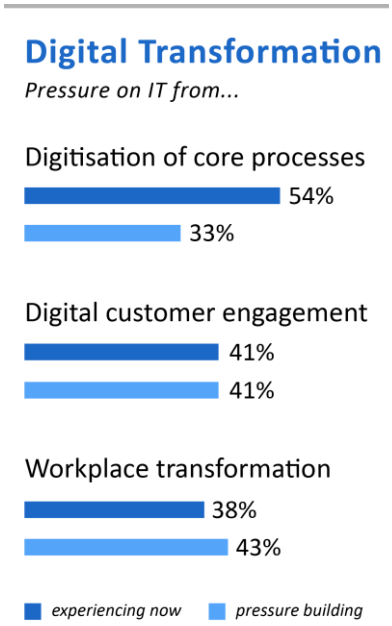
Strongly agree or agree that

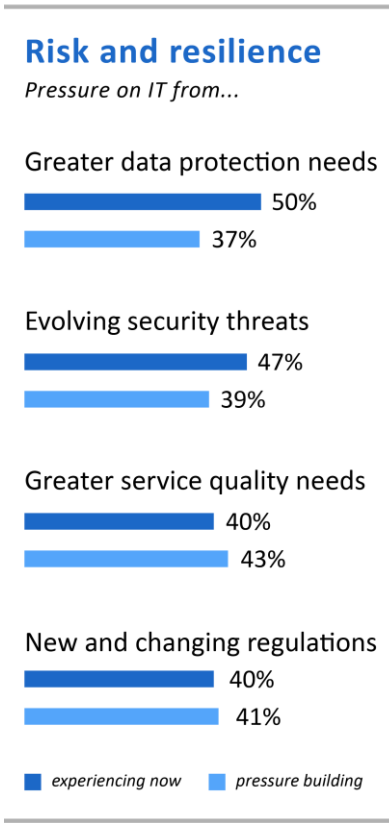
Prevention of significant IT outages is now an integral part of business risk management

> *"Most of the pressure for energy efficiency and transparency comes from investors rather than regulators. We now get a lot of questions from them in this area, often in a lot of depth. It's about being able to show our social responsibility credentials."*

We'll also see the topic of power management arising in relation to risk and resilience. In the meantime, however, it's worth taking a step back and considering the broader business context for our datacentre discussion.

The business context





The senior people we spoke with in our study generally came from the IT side of the house, but as conversations unfolded during interviews, it became clear that most of them had a very good handle on what was going on in the business. In a couple of cases, individuals were actually straddling the traditional IT/business divide.

> *"I'm responsible for datacentre strategy, but I am also part of the business management team, as the two are closely linked."*

On the topic of business drivers, the 'digital transformation' theme came through very strongly in relation to the core business, customer engagement and workplace transformation:

> *"We are seeing a huge transition to digital business."*

> *"Voice over IP and multimedia have led to a rethink of how we approach the datacentre networking and communications."*

Some of the other factors creating pressure on IT are a little less glamorous, but certainly no less important. Regulation is an example.

> *"It's often difficult to translate regulatory requirements into physical infrastructure. When you are told 'you should have sufficient resilience', what does that actually mean?"*

> *"Security is in some part driven by privacy regulation, but protecting the organisation's information and intellectual property is also a big deal for the business."*

That last comment highlights that while regulatory requirements need to be dealt with, much of what goes on in IT nowadays is directly linked to the question of business risk. A frequent area mentioned, which appears to be a challenge for many, is dealing with application availability in today's 24x7 digital world.

> *"The big challenge is how to manage application level SLAs."*

> *"We have a 24-hour service cycle – resilience isn't optional."*

> *"Disaster recovery is critical."*

Some of those interviewed were quite open about shortcomings in this area.

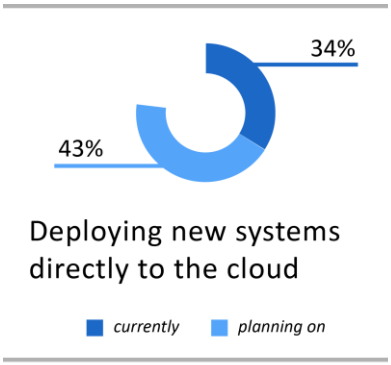
> *"Users don't want any service interruption, but our current infrastructure sometimes requires shutting systems down for maintenance. We have to improve availability."*

And in case you were wondering, yes, the question of money did come up.

> *"Taking cost out of the equation is important across the board."*

Given the above pressures, why not just get rid of all the datacentres and move wholesale to the cloud? Let's deal with that question now before going any further.

Is hosting and cloud the answer?



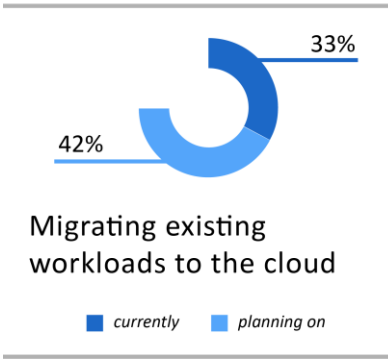
Infrastructure hosting and co-location services have been around for decades; the concept of running your IT in someone else's datacentre is nothing new. There can be no doubt that the use of such mature services is still attractive, to the extent that some organisations rely on them completely.

> *"We closed all our own datacentres and a computer room a few years ago. We now are fully virtualised and run our systems in 2 co-location facilities."*

The emergence of more contemporary cloud hosting options over the past few years has extended the market, and some have clearly concluded that driving fully down this route is another way of meeting their computing needs.

> *"We are in the process of moving everything to AWS."*

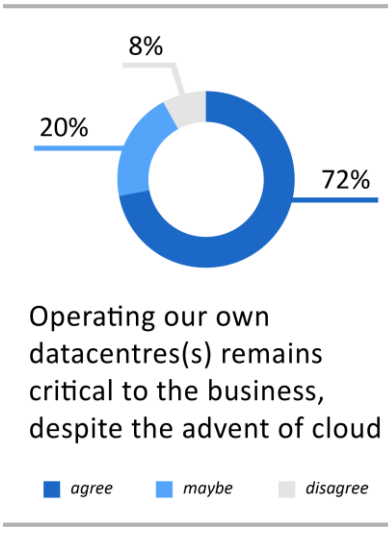
It has to be said, however, that this kind of extreme approach is relatively unusual among the mid-size and larger enterprises that were targeted in our study. This is evidenced by the fact that despite their use of cloud, 72% of those surveyed agreed that operating their own datacentre(s) remained critical to the business, with only 8% disagreeing with this notion. Having said this, the 20% who said a big switch to cloud and hosting was a 'maybe' for the future represent an interesting group, and we spoke with a couple of them during our in-depth interviews.



> *"The ERP system we use won't be supported after 2018. We may select a SaaS service to replace it, but we are still not sure whether it's feasible for most applications to go to the cloud."*

> *"It's shifting sands at the moment when it comes to the use of cloud, and it's harder to predict than you might think."*

So why the uncertainty? Well, the truth is that realising the cloud promise of greater agility, flexibility, efficiency, cost savings, and so on, is not a simple matter, particularly in a complex enterprise environment.

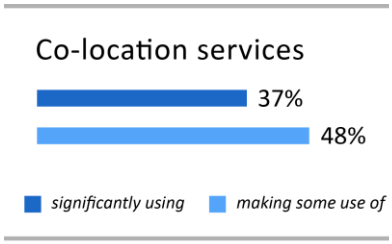


> *"The move to the cloud has overcome some challenges, for example it allows us to provision infrastructure very quickly. But it's not perfect. We are still working through some of the security and legal issues, and haven't yet come to terms with losing full visibility and control."*

> *"Working with the cloud is a game of trade-offs. Some things become easier, then you are caught out because you can't do things you would expect to be able to do. Not everything is automatically taken care of."*

Such comments suggest that while cloud computing use is generally on the rise, and can often deliver benefits when used in the right way at the right time, it is generally not seen as a universal panacea.

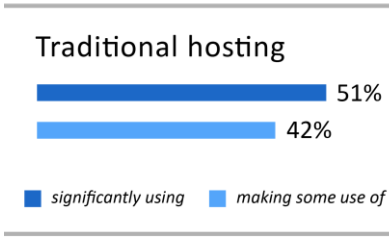
The future is hybrid



Corroborating the commitment to enterprise datacentres that we heard from those running them, a couple of senior managers from suppliers selling into the datacentre space told us a similar story.

> *"Far from tailing off, as some people feared it would as cloud became more popular, we are now getting more enquiries than ever for datacentre builds and refurbishments."*

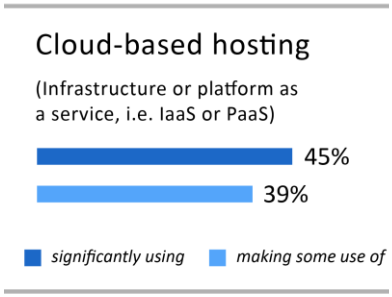
> *"We are still supplying lots of datacentres and co-lo facilities. The need for on-premise IT certainly isn't going away. But that doesn't mean that cloud isn't having an impact."*



What's interesting here is the reference to cloud having an impact despite on-premise IT receiving sustained focus. Coming back to enterprise participants in the study, the following comment says pretty much the same thing.

> *"Cloud is having an impact on our datacentre strategy, and hybrid IT is gaining some traction, but most of our investments are still connected with our own IT infrastructure."*

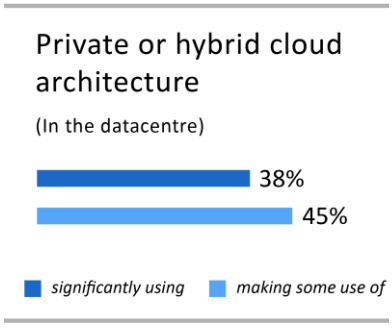
What people are getting at is that cloud computing has in many respects started to change the way we think about IT delivery in the broader sense. Even if you are not committed to doing everything in the public cloud, there is often a desire to emulate many aspects of it, not least switching to more of a service-centric mind-set and approach.



> *"Cross charging is now based less on machine ownership and use, and more on the cost of delivering an application service. We are adopting more of a SaaS philosophy."*

> *"We now think in terms of 'datacentre services' and 'cloud services', which changes how you design and manage the environment."*

What's being referred to is the notion of what some refer to as 'private cloud', i.e. creating cloud-like platforms that run within the datacentre itself. In reality, though, in recognition of the need to mix and match delivery models to deal optimally with different application requirements, what we are really talking about is hybrid architectures. Here are some of the needs they solve.

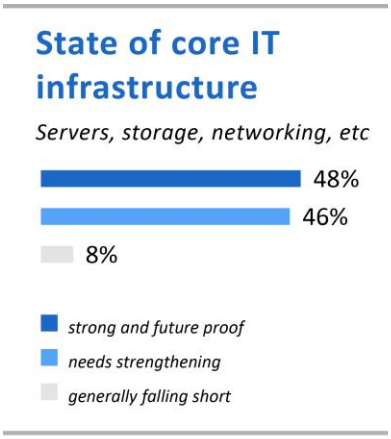


> *"We need to connect public cloud services in a way that allows us to keep control internally."*

> *"One of the big considerations is how to mix on-premise IT, private hosting and public cloud in a managed way."*

Enabling this, and dealing with some of the other pressures and imperatives identified earlier, is difficult if you are building on an aging infrastructure primarily designed to support the IT delivery models of the past.

The need for change and investment



Around half of the participants in the broader survey told us that their core IT infrastructure needed strengthening or was generally falling short, with the proportion replying similarly in relation to facilities being nearer two thirds.

Sometimes the state of the datacentre can fall behind because investments come in cycles; on other occasions, it's simply down to difficulties securing funding.

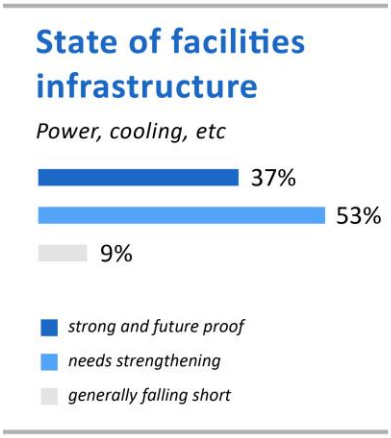
> *"We went through a big datacentre upgrade programme four years ago, but haven't done much since then."*

> *"It's hard to get investment even with a good business case. ROI needs to be within 3 to 6 months. 1 to 2 years is too long."*

Of course, sometimes expanding the datacentre footprint cannot be avoided in order to keep up with some of the pressures previously discussed.

> *"We are looking to build new datacentres as the regulator says we need to add resilience."*

> *"We are building two datacentres from scratch on our own premises to meet increasing capacity needs."*

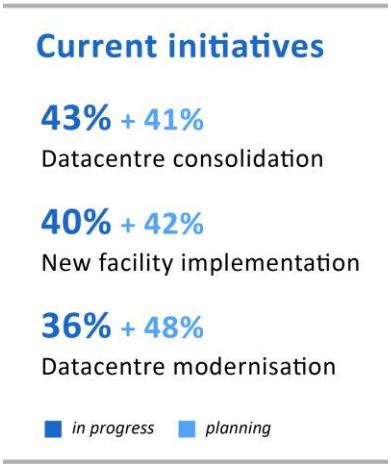


Some we spoke with are responding to increased demand, not by opening new facilities, but through investing to make the existing environment more efficient. Modern, virtualised IT systems allow you to pack more compute power, storage capacity, etc into a much smaller footprint, and cloud-based architectures drive up resource utilisation. While investment is needed to modernise, it's usually worth it compared to living with the costs and constraints of an older environment.

> *"We have no plans to expand the number of datacentres, but we constantly need to accommodate more applications, so the need is for greater efficiency."*

> *"Modernising costs money, but you need to do it."*

> *"Modernisation - replacing older equipment, refurbishing facilities, virtualising and automating wherever you can - makes it easier to consolidate and reduce operational costs to do with things like real estate, energy and manpower."*



But it's not just about core IT systems. As that last comment suggests investing in the supporting facilities infrastructure is important too.

> *"Facilities investments around power, cooling, racking, etc, are built into the business case for modernisation. This is important because of virtualisation and changes in equipment density, energy rating and increased resiliency requirements."*

This brings us onto taking a close look at datacentre power management, as promised at the outset.

Datacentre energy efficiency

From an energy efficiency perspective, pressure is coming from two directions. Firstly, as demands on the datacentre continue to escalate, managing power usage effectiveness (PUE), power-related costs, and the overall carbon footprint of the datacentre becomes more of a challenge. Secondly, we have pressure from the business, with many seeing a renewed focus on the energy efficiency question.

> *"The emphasis on green among our customers waned a while back, but this is now kicking up again, and that puts the focus back on energy efficiency as a competitive differentiator."*

> *"We are paying particular attention to power and cooling as energy efficiency is becoming more important to the business."*

Despite this backdrop, when it comes to the practicality of actually driving improvements, it's often hard to get attention, cooperation and funding.

> *"There are pressures from the business to reduce power consumption, but the application and IT folks do not regard this as their concern. They think it is someone else's problem."*

> *"I would like to improve energy efficiency and we have lots of possible actions we could take. But it's difficult to get investment even with an ROI case."*

If you can make the case, however, it does seem to be worth it.

> *"The TCO difference between a well-designed and poorly-designed datacentre is zero but power savings can be huge."*

> *"Modernising your datacentre power management facilities will pay back sooner than you think."*

But if efforts in relation to the core datacentre infrastructure are not going to be undermined, discipline is required elsewhere - not least within IT operations teams and among those involved in software development.

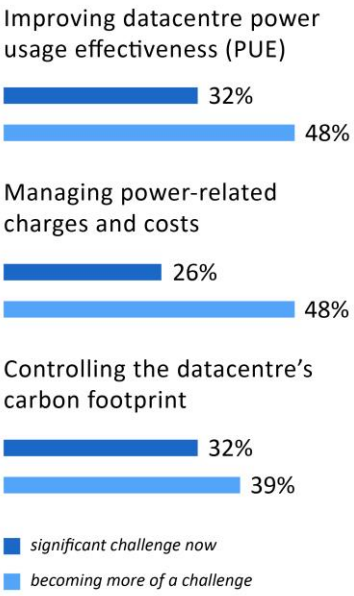
> *"Poorly thought-through installation of IT equipment can disrupt cooling efficiency, which consumes unnecessary power."*

> *"Many of our applications were built with no thought for efficiency, e.g. compute power consumed. This has undoubtedly led to us wasting a lot of energy over the years."*

Lastly, ongoing monitoring and management are clearly key to energy efficiency, so having the right tools is important.

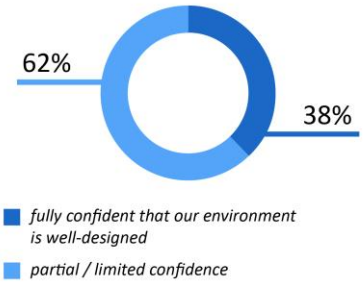
> *"Power monitoring and management tools are critical. Yes, they are an expense, but without them you are running with a lot more waste and risk than you need to."*

Common challenges



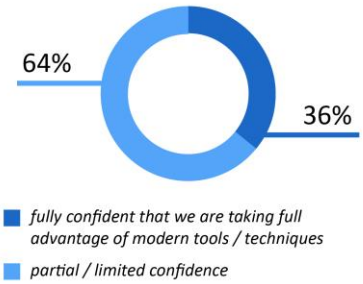
Datacentre design

In relation to power management



Management tools

In relation to power management



Power and resilience

37%

Have suffered a prolonged outage due to a facilities failure in the last three months

Beyond the question of energy efficiency, if your power management infrastructure is inadequate or out of date, the risk of failure and outages is high.

> *"Too many datacentre managers are using the same power management techniques as their fathers did before them."*

> *"Poor design doesn't only mean energy inefficiency, it also means more power-related outages."*

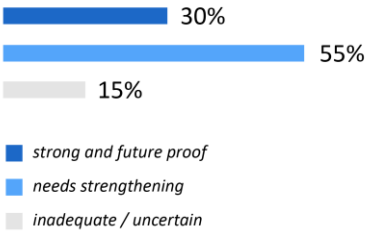
The thing that also came through strongly in our interviews, however, was the human dimension.

> *"One of the biggest issues is that teams don't communicate."*

> *"Skills is a challenge. I still don't have the team I would like. I use contractors, but they move on, so we always have gaps."*

State of facilities resilience and DR

Power, cooling, etc



Against this background, and with such a high current level of reliance on operator judgement, quite a few of our interviewees again mentioned the growing importance of modern software power management tools. These can help to prevent mistakes being made, e.g. through policy driven automation.

> *"Most power outages are down to human error, and most human errors are preventable."*

> *"The power side of things has historically focused on the physical infrastructure, but it's now moving towards building more intelligence into the system through software."*

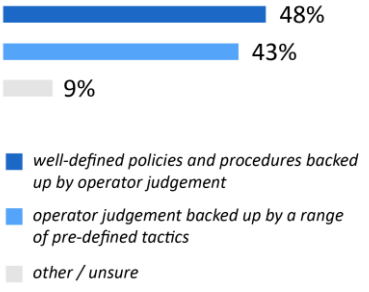
Unfortunately, this can create yet another skills gap that needs to be plugged.

> *"The increasing role of software has opened up a skills gap. The shift is taking power engineers out of their comfort zone. It's difficult to hire people with relevant skill sets, so we have to train people. They then need to gain experience on the job."*

> *"Lack of knowledge and training is an issue– people don't know what they don't know."*

Reliance on human judgement

Response to power-related incidents and failures



The consistent highlighting of skills and experience issues was something we didn't expect. We knew it would come up in our discussion, but not to the extent that it did. Addressing requirement here is clearly a high priority for many, especially as suppliers have not yet fully stepped up to help.

> *"Managed services around datacentre facilities are still mostly maintenance and break/fix, dealing with one aspect of the set-up, or even one type of equipment. As systems become more complex and integrated, I see a need for more of a total managed approach, but such services aren't easy to find."*

Discussion

One of the aims of this report has been to join the dots between some of the strategic changes and imperatives unfolding at a business level, and the kind of investments and developments that are needed in the datacentre to meet rapidly evolving requirements.

While doing this, we have been careful to avoid the temptation to look for magic bullets. While many pundits and others in the industry have put forward things like cloud services, the software-defined datacentre, and so on as the answer to every challenge, the reality is that enterprise IT is far too complex for such simplistic one-dimensional 'solutions' to work. In order to prepare for the future, and it is clear from the research that many have work of this kind to do, it's necessary to employ a range of strategies, techniques, technologies and services to create a flexible, robust and efficient operating environment.

As we have seen, such comments don't just apply to your core IT systems – the servers, storage devices, software, etc, that drive applications and bridge the gap between on-premise IT and public cloud services. It's also necessary to pay attention to the facilities infrastructure; the efficiency of power and cooling has a huge impact on operational costs, and the right tools and processes are critical to achieve application and service resilience. As part of this, a profound change that is taking place is a shift in emphasis to monitoring and management software that enables policy-driven orchestration and management. Apart from the benefits arising from enhanced visibility, control and automation, investments in this area also deal with the growing problem of skills and experience scarcity.

In terms of advice, as you look to modernise and improve your own datacentre environment, we would encourage you to do as we have done here and draw as clear a line as possible between infrastructure investments and those strategic business imperatives with which business executives are more familiar.

We hope our discussion in this report will help you as you do this.

Further reading

The following 'Datacentre Talking Point' documents generated from the research are available from both the Freeform Dynamics and Eaton websites (www.freeformdynamics.com or www.eaton.eu/IWI):

Datacentre realities in the digital age
How well are you keeping up with escalating business demands?

Datacentre facilities in the spotlight
How strong are the foundations supporting your IT infrastructure?

Datacentre power management
Does your approach need a rethink?

The power management skills gap
Do you have the knowledge and expertise to keep energy flowing around your datacentre environment?

Power and the 24x7 imperative
What's required to ensure business continuity in the datacentre?

IT service delivery models
Will the cloud make your datacentre redundant?

Appendix A

Overview of study methodology

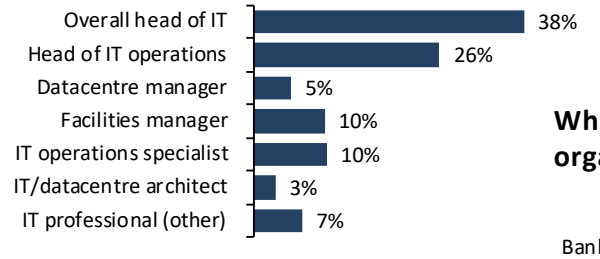
The research referenced in this document was designed by Freeform Dynamics with sponsorship from Eaton, and executed in two parts.

Firstly, we conducted a series of 14 in-depth interviews with senior people involved in IT and/or datacentre across a range of industries, including telecoms, financial services, retail, utilities, transport, professional services and public sector. Discussions were conducted by a senior Freeform Dynamics analyst on the promise of anonymity (to encourage a candid exchange), and the quotes embedded in the body of this document were derived from these interviews.

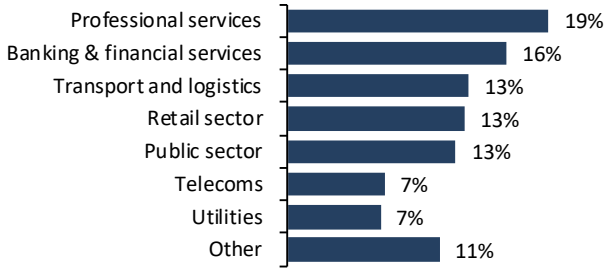
Secondly, input was gathered via an online survey of 320 datacentre professionals, and the ultimate sample composition for this was as follows:

RESEARCH SAMPLE

Which of the following best describes your role?

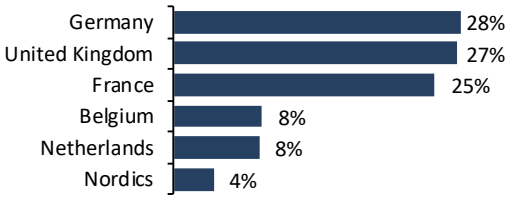


Which of the following best describes your organisation's core business?

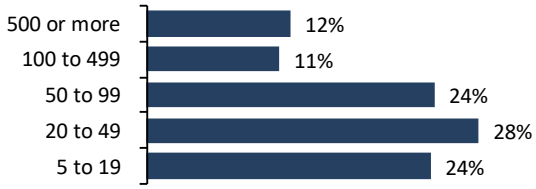


How many full-time employees work for your organisation worldwide?

Which country/region are you based in?



Approximately how many racks of equipment are installed in your datacentre(s) overall?



320 total respondents

Please note that the online methodology used tends to attract respondents who are more knowledgeable and/or interested in the subject matter being investigated. While every effort has been made to minimise this effect, the possibility of some degree of bias in the sample must be acknowledged. However, such limitations have been borne in mind when interpreting the research and are unlikely to have significantly impacted the observations and conclusions outlined.

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