VIRTUS
Data Centres

DATA CENTRE
MANAGEMENT
REPORT

Data Centre Management - analysing the skills needed for an evolving workplace
Report

VIRTUS Data Centres, the UK's fastest growing data centre provider, owns, designs, builds and operates the country's most efficient and flexible data centres. VIRTUS leads the industry with award winning innovation in hyper efficient, ultra-high density and highly interconnected facilities.

This report provides an analysis and forecast of the changing attributes and skills required for successful data centre managers in an evolving landscape and seeks to demonstrate how businesses can attract and retain these staff at all levels. It is based on an extensive consultation period with data centre managers and industry leaders across the UK.

Interviews for this report were conducted between April and August 2019.

If you'd like to find out more, visit www.virtusdatacentres.com.

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1. Foreword

For all the progress of more people going to university than ever before, the UK is facing a well-publicised skills shortage, where there aren't enough workers to meet the needs of employers. Inevitably, this has engendered a culture where businesses must fight to attract and retain the best talent, leading to inflated salaries, longer recruitment times, higher training costs and a rise in temporary staff as a short-term solution. It has also led to high profile efforts to tackle the situation, seeing businesses, academia and Government strengthen their working relationships to ensure that the next generation of talent has the right practical and technical skills to meet future demand.

However, there are disparities and important omissions in the skills discussion. While some areas of expertise - like science, technology and engineering - are well discussed, data centre professionals are often overlooked.

It's true that, for many, the data centre industry is largely invisible - people often don't realise that when systems and applications are running in the cloud, there's a robust physical infrastructure that makes it possible. It's also true that there is a legacy issue to overcome. The mighty mainframes of old data centres required a mere handful of specialist staff to manage, and so today the extensive employment opportunities presented in the sector aren't as well-known as they need to be.

As data becomes the most valuable asset to businesses and digital transformation thunders on, the role of data centre manager has become increasingly business critical - and, more of them are needed. We're in the midst of a turning tide, where data centres are finally becoming recognised as being the lynchpin for any digital business.

However, never have I heard anyone say "I'd like to become a data centre manager when I leave school [or university]". It's not a well-known career, and yet the growth in demand follows the steep trajectory of technological developments. Businesses need data centre managers more than ever, so we, as an industry, have a responsibility to build public awareness of the employment opportunities in this arena, and the importance of attracting and retaining staff in this critical role.

We've produced this report not just to highlight the extent of the potential skills gap and the impact that it could have on organisations and their employees (as much work has been done here), but importantly, to identify strategies for businesses to recruit effectively for this role, and to retain staff in their business.

Now in its eighth year, VIRTUS is a strong advocate of ongoing employee development - and we believe that is what is needed here. As the UK accelerates the adoption of digital technologies, all employees will require continuous training and retraining in order to build the skills needed by their organisations and apply them effectively, and this is also true in infrastructure management.

For this report, we have interviewed a range of data centre managers and their directors, to ascertain what is skillset is required for the role, the benefits and challenges of being in this increasingly important job, and the requirements from businesses to better nurture the role.

We hope the findings of this report will help businesses ensure this crucial group is not overlooked in the drive to tackle their skills shortages or staffing needs.

Darren Watkins, Managing Director for VIRTUS Data Centres

2. Introduction and market context

"The industry is going to have to work harder to increase recruiting efforts and spread the word about its high-growth prospects. "In the data centre industry, we really haven't marketed out to the society at large, who we are, what we are, how important we are, what careers are available, and that those careers are here to stay."

Chris Brown, CTO, the Uptime Institute.

Whether they focus on maintaining enterprise data centres or monitoring colocation facilities, data centre managers have challenging jobs. They are responsible for the day to day operations and activities as well as continuous monitoring and management of data centre sites and equipment. Their tasks include anything from predictive maintenance and firmware updates, to addressing network issues and investigating unexpected downtime events with root cause analysis.

The growth of big data means that their jobs are also becoming incredibly complex. Global data centre IP traffic will grow 3-fold over the next 5 years[1] and IDC predicts that the collective sum of the world's data will grow from 33 zettabytes this year to a 175ZB by 2025 - a compounded annual growth rate of 61 percent.[2] Data is now the world's most valuable asset - and so it's perhaps no surprise that managing it is a crucial responsibility for any business.

Many data centre managers report high levels of job satisfaction and competitive compensation: data centre managers in the UK earn anywhere from £50,000 to £140,000 each year, depending on their experience. However, their roles are becoming more difficult due to the increasing demand, complexity and modernisation of data centre environments, and our consultations uncovered a feeling that crucial to

[1]
http://b.xfreeservice.com/redir/clickGate.php?u=8otB939m&m=12&p=3b121G4eNI&t=33&splash=0&s=&q=growth%20of%20data%20data%20centre&url=https%3A%2F%2Fwww.cisco.com%2Fc%2Fen%2Fus%2Fsolutions%2Fcollateral%2Fservice-provider%2Fglobal-cloud-index-gci%2Fwhite-paper-c11-738085.html
[2] https://www.seagate.com/gb/en/our-story/data-age-2025/

their job satisfaction is the need for their jobs to be recognised as business critical, and as strategically important to their employer.

When it comes to specific data centre management skills, data centre managers asserted that, in the past, having a solid technical background with networking or hardware skills was sufficient to be a successful candidate. The shift to cloud computing, however, has meant that data centre managers need to arm themselves with the knowledge they need to stay relevant in modern data centre environments.

Indeed, as the industry changes, our data centre managers' report suggests that a set of new skills, particularly around Artificial Intelligence (AI) and big data, are required, that may not exist in the legacy workforce. Indeed, not addressing this need for new skills could hamper the ability of some organisations to support their businesses as they continue to evolve.

Our interviewees also report a lack of workplace diversity in the industry. In particular, research from the Uptime Institute highlights a significant gender imbalance: 25 per cent of managers surveyed have no women among their design, build or operations staff, and another 54 per cent have 10 percent or fewer women on staff. Only five per cent of respondents said women represent 50 percent or more of staff.[3]

The consultations also pointed to diverse routes into the field. From quantity surveyors to sales support staff, the background of data centre managers is not necessarily in IT. This suggests that recruitment drives need to come from outside of the traditional technology fields, in order to attract more candidates.

3. Skills components

"For me, the stereotype of the IT 'geek' simply doesn't hold true in the data centre world. As the Solutions Director for VIRTUS, I work alongside some of the industry's most talented people who are responsible for everything from design, building, marketing, sales and operations. And they're from all backgrounds: we employ architects, engineers, consultants, builders, marketeers, sales staff, coders, financiers and security specialist, and it's this diversity of talent which makes the industry VIRTUS such a compelling place to work. As Solutions Director, my responsibilities include pre-sales consultancy with sales team, design and implementation works with the operational team and post-sales client management for our wealth of Enterprise customers."

David Watkins, Solutions Director at VIRTUS Data Centres.

[3] https://uptimeinstitute.com/2018-data-center-industry-survey-results

Traditional data centres are now feeling the impact of disruption from the cloud, digital transformation, edge computing, advances in colocation and hosting services. In addition, advances in the areas of power, cooling, telecommunications, AI, operations, hardware and software are transforming enterprise data centres more quickly than ever before. Our interviewees defined several important areas of capability they must have, or acquire over the next decade, in order to succeed in a complex and morphing industry.

a) Analytics capabilities

As part of widespread digital disruption, many businesses are implementing smart devices with environmental sensors. When used in conjunction with Data Centre Infrastructure Management (DCIM) software or other data centre monitoring tools, the result is an explosion of data that is too large, complex, and granular to be analysed through traditional means, such as spreadsheets.

It's therefore no surprise that analytics has become a critical component of data centre management. Every data centre uses analytics as an important component of their overall DCIM to maximise operational and energy efficiency moving forward. Data centre managers need to be able to analyse the data, derive insights from analytics, and use these insights for better data centre management.

Data centre software can make a data centre manager's job easier through out-of-the-box data centre business intelligence reports and dashboards. Data centre power monitoring is perhaps the most common use case for data centre data analysis, but nearly every data centre challenge can be addressed through data and analytics.

Data centre asset management can also improve with the application of data analytics. Tracking the age of assets can help to determine when preventative maintenance needs to take place, and knowing how many items you have by customer or application can help you bill back costs.

Analytical skills and aptitude are a crucial requirement for the data centre manager's job.

b) Cyber security

The data centre houses the enterprise applications and data, so comprehensive security is critical. Denial of service (DoS) attacks, theft of confidential information, data alteration, and data loss are some of the most common security problems afflicting data centre environments.

Security has always been an important skill for some IT professionals. What's changing now is that security is fast becoming everyone's responsibility, at least to

some degree. Thanks to the DevSecOps movement, IT roles that didn't traditionally require much expertise in security -- like development and IT operations -- increasingly do, and for our interviewees, this extends to the data centre.

Indeed, a data centre manager or operations director needs to understand compliance and security policies followed by the industry, and observe strict adherence. Some reports suggest that in-house data centre operations managers tend to take these policies lightly, but respondents to our consultation recognised the severe implications of security threats on the company's business.

"Having the right skills in place is fundamental, as are clear lines of responsibility within the business. There is no one-size-fits-all solution for organisational security. It might be right that the CISO has responsibility, but equally it could be that the engineering director or the data centre manager is best placed to do this. What is important is getting the right organisational structure in place that can empower and support teams to improve security, and to enable the business to achieve its objectives."

Operational technology consultant, at a major security company.

c) Service-Level Agreement Management (and customer service acumen)

With more resources being dispersed across enterprise data centres, colocation data centres, and private / public clouds, data centre managers need to manage a disparate range of vendors/

This is where service level agreements (SLAs) become critical. Colocation data centre providers typically have SLAs that cover availability of support, power, cooling, and network connectivity, as well as maintenance windows and any exceptions - but managing multiple SLAs from different vendors can be complex.

Our interviewees report a pressure to manage both internal and external SLAs, and that this is a learning curve. Data centre management software is proving to be a vital assistance for many - helping managers confirm that their providers are meeting their SLAs, and indeed that they are meeting SLAs for your internal or external customers.

Added to this, is a fundamental need to understand customer service and the importance of meeting customer demands. One director of operations told us "when we're looking at diversity of recruitment efforts, we look at fields like the legal profession or business consultancies. People working in these fields understand what it's like to have customers needing quick and comprehensive solutions to complex problems - and this is absolutely vital in our field, too."

4. Data centre Infrastructure Management (DCIM)

Modern data centre managers are expected to be knowledgeable about the way the industry is moving. In a mission critical role, being ahead of the curve and employing new technologies and practices could provide competitive advantage for firms that do it right.

For our respondents, consolidation in the marketplace, new data centre management challenges, and improvements to new software products have led to increased reliance on DCIM software. DCIM provides a wide range of capabilities that addresses multiple pain points and pitfalls of legacy tools. For example, while traditional DCIM tools might have handled only data centre power monitoring or asset management, new DCIM software addresses multiple data centre challenges in a single interface.

Data centre managers need to understand the possibilities of DCIM and how to implement it in their own environments. DCIM software can not only help address data centre management challenges but also to keep pace with changes in the industry and management practices implemented by your peers.

5. Ability to follow process

One of the most critical skills, which can often be overlooked, is the need to be able to define and follow process. In fact, this is a key customer requirement and fundamental customer expectation. Unless Data Center Managers are meticulous about process, they will be unable to succeed in the role.

6. Adaptability

"The main advice I can offer recruits into our world is not to fear change – but instead to embrace it. The industry needs bright new people to make its services even better, and being a 'geek' is not mandatory – far from it. Data centre providers need talent from many industries and visionary employees, in order to help them continue delivering the innovative and mission critical service that they do today,"

Data Centre Manager for a large multinational organisation.

A data centre's lifespan can easily exceed a decade, and technology changes fast in this arena - so it is crucial for a data centre manager to help adapt an infrastructure solution over time. As requirements for adaptation arise, infrastructure solution offerings must present a good measure of flexibility for design and optimisation purposes.

On a more fundamental level, data centre professionals must balance the need for security and certainty with the ability to innovate and take risks where appropriate. Gartner Inc. dubs this dichotomy 'bimodal IT': holding onto traditional data centre skills, such as troubleshooting and improving utilisation, while embracing better communication and strategic thinking. The ability to adapt and flex with business requirements was cited by our interviewees as a crucial skill for data centre managers to have.

4. The benefits of the role

Modern life relies on the functioning and availability of data centres. Data centres run every aspect of human activity; from energy, lighting, telecommunications, internet, transport, urban traffic, banks, security systems, public health and entertainment - even how our personal data is collected and stored is ultimately controlled by data centres.

The welfare and security of billions of human beings is reliant on data centres - and the supervision of data and information is therefore, of vital importance.

The responsibility of the role is what attracted many of our interviewees to the career. Data Centre Managers now have strategic responsibility in a business, and it's this recognition that keeps many of them motivated and engaged. On a more tangible level, the variety of work and opportunities to travel proved compelling, and the ability to work in a team also emerged in our consultations as a key benefit of the role.

The top reasons cited by respondents both for taking a role in data centre management and for staying in the job were:

- Strategic responsibility in the business
- Variety - many respondents told us that 'no two days are the same'
- The ability to work in small and large teams, alongside technical and sector experts
- Customer service responsibility - being able to troubleshoot and solve customer issues and maintain satisfaction
- The pace of the role - technological advancements are moving at speed, meaning that the job of data centre manager is also changing rapidly

5. A focus on training and development

When it comes to staffing, our research found that there are some innovative initiatives underway, particularly among some of the largest data centre operators, to hire outside the traditional staffing routes. It's now recognised as being important that

efforts to attract a more diverse workforce – to actively recruit not only women but also other underrepresented populations – continue to ramp up across the entire industry.

Our consultations found that a general career path for Data Centre Managers is through IT (with many coming to the job with computer science qualifications) but that businesses find it beneficial to look for a more diverse skill set.

However, while staff recruitment is clearly important, too many organisations don't prioritise employee development, to retain and develop their staff.

Indeed, while we see most organisations at least paying lip service to staff development, too many are failing employees by not having the right tools in place to achieve a true learning culture.

However, research shows that employees are hungry to learn and that opportunities for growth are a key driver for staff retention and engagement, and often the reason job applicants decide to join an organisation. Organisations have a real opportunity to foster a more engaged, loyal and productive workforce through a commitment to training and learning.

To do this, companies must listen harder to what their employees want, ensure that training meets real and relevant needs, and are more collaborative and flexible in how learning is delivered.

Our respondents called for employee development opportunities such as:

- The ability to receive ongoing and ad-hoc training
- The need to better understand the company's wider strategic goals - in order to feel fully aligned with their employer's mission
- Regular and comprehensive reviews
- Open channels for feedback and collaboration - not just with managers, but with peers - both from within and outside of the organisation

6. Conclusion

This report is just the start of examining the skills of a data centre manager. With a growing number of Internet of Things (IoT) services and products coming out to the market, our interviewees added to this the need for knowledge of cloud computing and languages like SQL and Java – for SaaS programming.

As data centres become increasingly complex, data centre managers need to evolve beyond the traditional, IT-focused skillset to encompass cross-functional skills and advancements in data centre software. Armed with these skills, teams will be able to

meet the needs of their customers while ensuring their own expertise and relevance — no matter how your data centre environment may change.

However, according to our interviewees, it's also important not to ignore the soft skills required for the role. Soft skills - a cluster of productive personality traits which include collaboration, communication abilities, language skills, personal habits, cognitive or emotional empathy, time management, teamwork and leadership traits - and are increasingly valued by businesses and by employers of data centre managers.

This report demonstrates that the role of data centre manager offers varied, interesting and evolving opportunities - and there is a need for businesses to focus on recruiting the most talented candidates for this mission critical job function. A focus on staff retention is also vital in order for businesses to navigate the skills shortage which is reported by industry and economists alike.

Why become a data centre manager?

This report looks closely at the skills required to be an effective data centre manager, and, as the world's economy becomes reliant on data, we believe that this role will become increasingly vital and in demand. Additionally, nearly every interviewee consulted as part of this process advocated the career, urging graduates or those already in work to consider the role. The opportunities afforded to a data centre manager are varied and extensive, and the career is both challenging and rewarding. If you're interested in finding out more about a career in data centres, visit www.virtusdatacentres.com

ABOUT **VIRTUS**

VIRTUS Data Centres, the UK's fastest growing data centre provider, owns, designs, builds and operates the country's most efficient and flexible data centres. VIRTUS leads the industry with award winning innovation in hyper efficient, Ultra High Density and highly interconnected facilities.

Located in and around London's metro, VIRTUS offers the best of traditional retail and wholesale colocation models, combining dedicated support and complementary ecosystems with low cost, scalable and custom solutions, in uniquely flexible and customer friendly packages. Customers also benefit from Tier III certified, ultra-secure facilities, that provide 100 percent uptime; protecting and connecting data, applications, networks and clouds within VIRTUS Data Centres and the global digital economy.

For more information please go to: **www.virtusdatacentres.com**

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