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ISSUE IV 2022

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Editor's View

By Phil Alsop Editor

The need for more diversity: Women in IT

WHAT STARTED as an idea from one of my work colleagues – to interview a handful of women working in the still somewhat male-dominated world of IT about their career experiences, the good and not so good – has quickly become a fairly substantial body of video interviews and articles, where 50+ women have shared their thoughts on a whole range of issues surrounding today's digital technology sector.

Based on a standard set of questions, I have been amazed at the variety of responses. The many different ways in which women have entered the IT sector, the varied experiences they have had once in it, the progress they have seen made when it comes to embracing diversity, the progress that still needs to be made and, crucially, the many suggestions made as to how to improve equality in the workplace, all build an amazing insight into the world of IT work as seen from a woman's perspective.

The good news seems to be that more and more organisations are realising that the more diverse the workforce, the more likely they are to be able to better understand their customers. In other words, diversity makes complete business sense.

The less good news – well, let's just say that there is still plenty of room for improvement. Although a majority of businesses are at least beginning to address the issues of diversity and equality within the workplace, the progress being made is somewhat glacial (as in pre-global warming glacial!). For example, Cranfield University's recent Female FTSE Report 2022 is critical of the slow progress of women being appointed into significant decision-making roles, such as Chair and CEO.

One interviewee's anecdote can stand for many – she told of a women's group meeting at her organisation where one male turned up by mistake, and stood around looking increasingly confused and embarrassed. The interviewee then politely explained to him that this was her world of work on an almost daily basis!

Digitalisation World's Women in IT content can be accessed in various ways, and I would urge all our readers to take some time to out to view the videos and read the articles to get a great understanding of where we are when it comes to diversity and equality and where we need to be. There are some Women in IT articles in the latest issues of SDC Channel Insights and Date Centre Solutions. Issue 10 of Digitalisation World will gather all of the articles together in a Women in IT special. The videos will be sent out as a series of dedicated video magazines between now and the end of the year. And the DW, SDC and DCS websites have all of the articles and videos gathered as out latest Hot Topic, following on from the previous focus on the hybrid workplace.

Finally, a big thank you to all those who participated in the project. The conversations I have had were always interesting, entertaining and frequently educational, as are the many contributed articles. And I hope that the combined content – both in terms of quantity and quality – will encourage many to take a slightly different perspective on their workplace in future.

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Data centres feel the crunch of escalating costs and labour race with advanced manufacturing

Data centre clients are facing project costs which are 15 percent higher than last year on average, with escalating prices for energy and key materials squeezing margins.

DATA CENTRE CONSTRUCTION is facing record-breaking inflation amid delays to materials deliveries and competition for skilled labour from large-scale advanced manufacturing projects, according to research from global professional services company Turner & Townsend.

The Data Centre Cost Index 2022 reveals how the average cost to build data centres has increased by 15 percent on average across global markets. The research analyses construction input costs – including labour and materials – across 45 key markets, alongside industry sentiment and insight from a survey of 250 data centre professionals.

Nearly all (95 percent) of experts surveyed agreed that global materials shortages have impacted construction timescales, with most citing delays of over 12 weeks.

Meanwhile 92 percent of respondents reported that they are struggling to meet construction demand due to a shortfall of experienced site teams. The global contractor resource pool is stretched as data centre developers compete with advanced manufacturing projects – particularly in Europe and in the United States – and demand for labour to construct major industrial facilities across the world.

For the first time this year Singapore became one of the top ten most expensive markets for data centre construction, with increased costs driven by changes to planning conditions which demand reduced energy consumption and improved sustainability credentials. Elsewhere markets in Europe, the Middle East and Africa (EMEA) have experienced a mixed picture. All have seen cost inflation in local markets, but in some cases the index result is affected by Foreign Exchange (FX) fluctuations with the US dollar (USD). The research presents and compares build costs in USD/Watt, therefore continued FX fluctuations should be kept in mind when utilising this data for cost comparisons.

Commenting on the research, Lisa Duignan, Head of European Data Centres at Turner & Townsend, said: "Developers are facing a perfect storm of currency fluctuations, a race for talent from other advanced technology sectors and materials delays and shortages. The sector has been adapting to this challenging environment over the past 12 months. It's becoming increasingly vital for clients to prioritise a programmatic, collaborative approach to procurement, project delivery and project controls.

"For end users, forging and building on partnerships with recognised developers with a robust supply chain is likely to be the focus during this time of economic headwinds. Contractors are competing on lower margins and so will be looking to create a shared understanding with their clients." Turner & Townsend's research shows that inability to secure materials and fabrication slots for structural steel is one of the biggest risks to many data centre project schedules. Electrical equipment such as transformers has increased in price by up to 20 percent partly due to the cost of copper and steel components.

The sector is also operating around continued logistical disruption, including port closures, scarcity in shipping containers, a shortage of drivers, and increased fuel costs. As a result, freight and haulage availability is low and prices are high. Construction labour costs are feeling the pinch in many countries due to union pressures on wages, associated with the cost of living crisis. Programme delivery is further threatened by a shortage in project delivery leadership throughout supply chains, not least senior construction managers with local language skills. Imbalances in the supply and demand of labour are also driving these staffing costs to a premium.

Despite all these challenges optimism remains high in the sector, with 85 per cent of survey respondents stating that construction has struggled to meet demand in 2022. As a result, 71 per cent of respondents saw the sector as less susceptible to recessionary pressures than other industries.

The 2022 report includes five new markets (Berlin, Columbus, Cape Town, Melbourne, Kuala Lumpur), as legislative challenges about the power demands of data centres make it more difficult to secure planning approvals and drive investor appetite outside traditional regions. With an increasingly constrained market in Frankfurt, Berlin has become a construction hotspot during 2022 with links to key network routes. A similar trend in North America has seen market saturation in New Jersey and Silicon Valley drive investment outwards to Phoenix and Columbus.

Continued market growth is expected to be led by large scale data centre end users and developers, as established companies scale their capacity to meet burgeoning demand in the system.

Keysource launches data centre 'state of the industry' report

views and insights from over 250 IT Directors in UK & Europe. This is the fifth year of the report and it showed once again that the datacentre and technology sectors continue to grow with no signs of slowing, with investment growth being driven by continued digitalisation, IT transformation and data growth.

IN ADDITION to the impact of this ongoing demand, the IT decision makers surveyed stated that they are continuing to shoulder a range of competing challenges and, as a result, over 99% believe it will be a difficult year.

Over half of the respondents see security as the biggest challenge – up slightly from previous years - with sustainability a close second at 40%.

However, the survey highlights multiple concerns with more than a third also citing pressure to adopt new technology and services, budget, access to skills and speed of change as major challenges.

In addition, 78% of respondents believe that their existing investments are preventing IT transformation – a figure similar to last year showing little or no progress in this area.

This suggests that organisations are failing to understand the money savings change could bring, as they are focused on the investment and/or don't want to admit they may have got it wrong.

This year's focus on sustainability delivered some interesting insights. Clearly the topic and its importance is well understood but there are challenges about how this is being translated into action both for the services being consumed and/or delivered.

For example, over half of the respondents admitted to not having a sustainability strategy at all, with 92% experiencing problems that are slowing or stopping their sustainability progress. In response to the question:

Where, if anywhere, do you think you can make the biggest carbon savings? – the overwhelming response was a move to using sustainable suppliers rather than looking to their own operations, usage and capacity.

This opens up possible allegations of green washing and paints a picture of an industry that is full of good intentions but lacks the tools and expertise to deliver them.

This mindset was clear once again for questions around the rising costs of power with 92% stating they were concerned.

For about half of respondents the answer is a move towards renewables and an increase in budget - less than 50% are looking at reviewing capacity requirements showing that there is a lack of focus on consumption.

Jon Healy, Operations Director at Keysource, said: "We are operating in a world with a rapidly expanding social and economic consumption which relies on processing, data and transfer to be both secure and sustainable, alongside a skills shortage and severe supply chain issues. Our respondents need broader shoulders than ever to be able to carry all this responsibility. As an industry we are used to change and challenges but these might be our greatest ones yet."

Research reveals sustainability action gap

Reports by 451 Research and Forrester indicate most of the IT and data centre industry is at the beginning stage of a sustainability journey.

SCHNEIDER ELECTRIC commissioned two independent research studies focused on sustainability in IT and data centre operations and the results reveal a disconnect between intent and action, indicating most of the industry is still at the beginning stage of its sustainability journey.

The two studies were conducted by industry leading analysts at 451 Research and Forrester. They collected data from nearly 3,000 global participants, including the largest colocation and cloud providers, and IT professionals across many segments and organisation sizes.

The 451 Research paper revealed a perception-versus-reality dilemma with many enterprise organisations believing their sustainability programs are more advanced than they are, as "the maturity evaluations of nearly half of respondents (48%) did not match a previous answer." The Forrester paper focused on colocation and found 73% of organisations ranked sustainability as their #2 business priority, but only 33% say they have created a strategic sustainability plan.

"The research clearly demonstrates that across the data centre and IT industry, there is a sustainability action gap – the intention appears to be there, but action is lacking," said Pankaj Sharma, EVP of the Secure Power Division, Schneider Electric. "Of course, IT professionals understand and have taken steps to address sustainability. But what we lack, with some exception, is comprehensive and supported sustainability action plans and measurable targets to create the change required to address the climate crisis. These two research papers have documented a sustainability action gap and that is our collective challenge to address.

Understanding the status of industry-wide sustainability initiatives

Schneider Electric commissioned the two independent research studies, which were designed to help the industry better understand the maturity of sustainability initiatives. Here is a snapshot of each paper with a sample of the results and links to the full studies: · 451 Research White Paper: Sustainability at the Edge – The Gap between Enterprise Plans and Sustainability Programs for Core and Distributed IT. The paper researched more than 1,150 medium and large enterprises worldwide representing more than 20 verticals and their sustainability efforts with distributed IT resources.

Researchers determined many enterprises believe they are further along in their sustainability journey than they actually are. For this group, the main driver of sustainability is business value and firms start with measuring energy usage then expand into other sustainability metrics and tools.

The greatest challenges in their sustainability journeys include optimising energy usage, followed by obtaining consistent data and metrics (for leaders/advanced firms) and lacking skilled staff (for starter organisations). · The leadership paper from Forrester: Reimagine Colocation Strategy with Sustainability Front of Mind.

Researchers polled 1,033 global sustainability decision-makers at colocation providers worldwide with the objective of exploring sustainability drivers in the colocation provider industry. The study also explored the major challenges for colocation players and where they are investing the most across the technology stack.

The paper found organisations lack a strong comprehensive strategy for the sustainability programs, with only 33% saying their business has created a strategic sustainability plan. This indicates that the industry is still at the beginning of a sustainability journey. The paper determined that moving forward, a key piece of sustainability success will be finding the right partner to help organisations succeed.

It also found that businesses that hired an outside sustainability consulting firm as part of their sustainability initiatives are 33% more likely to be high maturity.

Strong data centre industry growth

Uptime Institute's 2022 Global Data Center Survey findings highlight the growing, industry-wide need to achieve meaningful efficiency gains, evolve sustainability reporting practices, prevent costly outages and more.

UPTIME INSTITUTE has released its 12th Annual Global Data Center Survey. The findings show an industry that is growing, dynamic and increasingly resilient, but still working to address increasing pressure for sustainability progress and reporting, continuing staffing shortages, supply chain delays, costly outages and other complex challenges.

"The global digital infrastructure sector continues to enjoy strong growth and expansion, despite the many obstacles operators are facing today," said Andy Lawrence, executive director of research, Uptime Institute Intelligence. "We've seen the industry invest in increased resiliency and reliability, but there's still work to be done when it comes to improving efficiency, environmental sustainability, outage prevention, staffing pipelines and more."

Uptime's annual Global Data Center Survey is the largest and most comprehensive in the digital infrastructure industry. It provides detailed insights into the digital critical infrastructure landscape and a sense of its future trajectory.

Key findings from the 2022 report include:

- Many data center operators are unprepared for mounting sustainability requirements and regulations – Most respondents say they report on overall data center power use and PUE, but many still are not tracking critical environmental metrics. Although 63% of operators believe authorities in their region will require them to publicly report environmental data in the next five years, just 37% collect and report carbon emissions data (a slight increase over 33% in 2021) and only 39% currently report their water use (a 12% drop compared to 2021). New laws, standards, and requirements will force operators to address these gaps and establish more stringent sustainability tracking and reporting practices in the coming years.

PUE progress is in stasis for now and future efficiency gains must focus on IT power – The average annual power usage effectiveness (PUE) reported in 2022 was 1.55. This represents a slight improvement over the 2021 average of 1.57, which is consistent with the trend of marginal PUE gains Uptime has observed annually since 2014.

Going forward, achieving substantial data center efficiency improvements will require a new focus on IT efficiency, along with metrics to track and report progress.

More operators are investing to bolster data center resiliency – Data center owners and operators are making significant investments in the resiliency of their physical infrastructure, with about 40% of respondents reporting increased redundancy levels at their primary data centers in the past three to five years. Power and cooling systems have received similar attention, with a third of operators upgrading either or both.

Outages are becoming more expensive and are still far too frequent – The share of all outages costing operators over $1 million has reached 25%, a significant increase from 15% in 2021. In 2022, 60% of operators reported experiencing an outage (regardless of severity) in the past three years — down from 69% in 2021 and 78% in 2020.

Although the data indicates a trend toward improved outage rates, the frequency of outages is still much too high and with more than two-thirds now costing operators upwards of $100,000, the consequences are getting worse. Operators' confidence in public cloud is on the rise, despite ongoing outage risks – As the perception of improved visibility into cloud operational resiliency grows, organizations are more likely to trust the cloud for mission-critical workloads.

In 2022, just 63% of operators are not placing mission-critical workloads into a public cloud, a substantial drop from almost 75% in 2019. That trust might be misplaced, given that more than one-third of respondents report that public cloud availability zone outages (which are relativity common) would cause significant performance issues.

Data center equipment vendors optimistic despite demand pressures and lingering supply chain problems – Three-quarters of vendors project year-over-year revenue growth in 2022 despite reporting dampened revenues due to persistent COVID-induced supply chain issues.

Nearly half of respondents involved with data center construction have suffered significant delays (or other events) in their supply chains, while one-third have experienced moderate issues.

Problems attracting and retaining qualified staff are worsening – Over half (53%) of data center operators report difficulty finding qualified employees in 2022 — up from 47% in 2021 and 38% in 2018. And 42% of respondents report issues with staff being hired away (in most cases to data center competitors) – a massive increase over just 17% in 2018, which demonstrates the growing challenge of employee retention throughout the sector.

Quantifying cloud value

Cloud is quickly becoming the corporate norm, and is being used by companies to drive dramatic improvements beyond cost and scalability, including increased innovation, faster time to market and insights, and enhanced cybersecurity, according to a global Cloud Services Study recently completed by The Hackett Group, Inc..

THE HACKETT GROUP® study, which examines results from more than 1,000 organizations and looked at more than 4,000 migrated applications in 15 different categories, found that 70% of all technology infrastructure will be cloud-based within two to three years. Typical companies are seeing post-migration reduction in technology infrastructure costs of 12%.

Other significant benefits include:

- A 36% increase in developer time devoted to innovation
- A 45% reduction in time to market for new product features and functionality
- A 53% reduction in the time to achieve actionable insights from data
- A total of 44% fewer security and other critical infrastructure incidents
- And a 52% average reduction in down-time

Top performers in the study saw even more dramatic benefits, including a 37% reduction in technology infrastructure costs (more than 3x of what typical companies achieved) and an average of 15 percentage points greater improvement across nearly a dozen objectives tracked in the study.

According to The Hackett Group Principal Michael Fuller, “This study was designed to look beyond the hype and truly quantify the benefits of both moving to the cloud and maximizing the benefits of cloud infrastructure. And

the results clearly show that companies are using the cloud to deliver broad strategic value. It’s about better security, improved speed, quality, and agility. At its best, cloud migration can be the foundation that allows companies to rapidly improve their products and services.”

The Hackett Group Senior Research Director Richard Pastore added, “We also came to conclusions about the differences between typical companies and top performers.

To truly drive the maximum benefit, top performers make the cloud part of their operating DNA and treat it as a core competitive strategy. They reject the easier application ‘lift and shift’ approach to cloud migration. Instead, they assess their workloads to determine the proper migration methodology and focus on optimizing them in the cloud, which often means rearchitecting or redesigning their systems and processes to take best advantage of what the cloud can offer.”

The Hackett Group released the study as part of the launch of its new Cloud Value Assessment Services Offering, a service designed to help companies understand how to optimize the management of current applications in the cloud and future migration to the cloud.

The assessment leverages The Hackett Group’s detailed performance metrics and benchmark taxonomy and takes just four weeks, as little as a third the time of a full benchmark assessment to complete.

The Hackett Group released the study as part of the launch of its new Cloud Value Assessment Services Offering, a service designed to help companies understand how to optimize the management of current applications in the cloud and future migration to the cloud

Multiple clouds deliver data value

But data sovereignty is a concern for the majority, VMware research reveals.

BY 2024, 95% of organisations across EMEA will be looking to their data as a revenue driver, with 46% recognising it as a significant source of revenue – up from 29% today. This is according to new research announced by VMware Inc.

The research, entitled The Multi-Cloud Maturity Index, was conducted amongst almost 3,000 business and IT decision makers across EMEA, and reveals that nearly half (47%) strongly agree that using multiple clouds will enable them to maximise their data to innovate – while addressing critical issues such as national and sector data sovereignty. In fact, data sovereignty is highlighted as one of the key challenges facing organisations – with 95% admitting it's a concern.

The ambition to realise more value from data, however, comes with additional challenges. Security (35%), skills (35%), difficulty stitching different cloud environments together (31%) and siloed access to data (27%) remain key obstacles. Organisations must also improve the control they have over their operational and cloud expenses, with 76% and 74% respectively agreeing this is a concern if data is to drive genuine business value.

"The reliance on data to fuel innovation and drive competitive advantage is now the backbone of the digital business. Being cloud smart – the ability to choose the right type of cloud for the right data, including highly sensitive information that needs to remain within national borders – is becoming the de facto business model for organisations looking to drive advantage from their data," said Joe Baguley, VP and CTO VMware EMEA.

"Organisations who are fully exploiting the competitive advantages of using multiple clouds to manage data are seeing benefits across the business. To achieve success, however, they must be able to take control of where their data resides – without compromising security, compliance or sovereignty, and the choice of providers to manage it."

"Our Digital Retail Strategy 2026 is built on a 'data-centric, digital-first' approach. Data, and the cloud it runs on, are at the heart of all our operations and our value creation model. This digitisation will improve the customer experience with greater personalisation, increase operational efficiency at headquarters as well as in stores, and have a positive effect on the Group's revenue," explains customer, Damien Cazenave, CTO and

CISO Carrefour France, a leading global retailer.

There is agreement (86% of respondents) that the benefits of multi-cloud – the ability to use and manage different types of private, public, edge and sovereign clouds – outweigh the challenges. Almost half (46%) believe multi-cloud use has had a very positive impact on revenue growth, while 46% also believe it has had a very positive impact on profitability. In fact, only 4% believe multi-cloud is not critical to business success.

And this is even better news for organisations across Europe, where the data economy's impact on GDP in the European Union and UK is expected to grow to 4.2% from 2.6% by 2025, according to the European Commission.

Decentralised IT comes under scrutiny

ManageEngine has published the findings of its latest research. It found that almost all organisations globally (94%) are on the path to decentralisation of IT. In stark contrast, however, almost a third (31%) of companies in the UK have no plans to decentralise IT.

THE REPORT, IT at Work: 2022 and Beyond, draws from a global survey on the empowerment and democratization of IT. ManageEngine commissioned independent market research agency Vanson Bourne to conduct the research. Responses were received from 3,300 decision makers from across IT and line of business functions, including 300 in the UK and Ireland. It found that around the globe, IT departments are responding to the trend for personalised IT by decentralising their IT structure.

Two-thirds (64%) of organisations globally have already decentralised, with a further 30% currently attempting to do so. In the UK and Ireland, respondents said the decentralisation drive has been spurred by a desire for innovation (55%) and to acknowledge IT's role more prominently (51%). Eight out of 10 respondents (79%) claim non-IT employees in their organisation are more knowledgeable about IT than they were before 2020, which is increasing the appetite for rapid, accessible innovation.

However, concerns that decentralised IT functions will open the door to fraudsters are leading many businesses in the UK and Ireland to maintain their own IT sovereignty, and with good reason; those on the path to decentralisation cite IT security as their main concern (47%) followed by maintaining regulatory structure and reliability of ongoing support (both 41%). Other key findings are as follows:

IT Teams Face Bigger Expectations But Have Limited Influence

Eight out of 10 (82%) respondents said collaboration between IT teams and other departments has increased over the last two years. This is partly because autonomy in decision-making is increasingly common across departments, placing more technology choices into each department's hands. However, collaboration is not always harmonious. Although business decision-makers report feeling IT has an important advisory role in decision-making across departments, one in five (19%) IT leaders feel they are "not consulted at all" or "consulted inadequately" about flexible working models.

This speaks to other findings indicating that although IT leaders face higher expectations post-pandemic, innovation is being stifled by the under-representation of IT teams at a leadership level (according to 79% of respondents). Although the vast majority (89%) believe IT is more responsible for business innovation than ever before, 59% believe IT is not expected to drive innovation, but simply assist innovators. This might be an unsustainable state of affairs: IT professionals report that, in terms of the next five years, they are most motivated by a desire to guide change (22%) rather than by the prospect of promotion (19%) or the chance to gain new skills (15%).

IT Owns Security

The majority of companies claim to be exposed to risk, with 74% believing that to protect their business from cyberattacks, existing security strategies must change. Of business decision makers, 95% believe IT departments have considerable authority to prevent business decisions based on security concerns. Likewise, of these respondents, 61% believe IT approval is required for decisions relating to security, which would give IT more influence in this area than any other department.

Nearly a quarter (23%) of UK companies hold all employees accountable for cyberattacks, compared to a mere 7% worldwide. The need to protect personal data is the key motivator for this over company performance concerns, and 73% believe employees try to help protect against threats.

IT Teams Feeling the Pressure

Underpinning all these factors is that economic uncertainty is beginning to be felt by IT teams. The job market is slowing down, leading 59% of IT professionals to hold off looking for new positions. More worryingly, the majority (52%) are more nervous about losing their job than they were six months ago.

These sentiments are strongly influenced by the impacts of the pandemic. Almost half of IT professionals (45%) say they feel less loyal to their employer than they did two years ago, and six in 10 (62%) employees are not satisfied with the level of support they received during the pandemic. Unsurprisingly, flexible working models are now the most important factor in job retention (56%), followed closely by pay increases in line with inflation (55%), a need felt strongly during the cost-of-living crisis. Arun Kumar, regional director at ManageEngine, says: "Post the pandemic, it has become crucial for organisations to focus on various functions, specifically IT functions. It is imperative for IT to become more democratized and empowered. We believe the important statistics derived from this survey will shed light on the current scenario in the UK market and draw attention to the factors that command immediate action."

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Micro mobile data centre market worth $20.44 billion by 2030

The global micro mobile data center market size is anticipated to reach USD 20.44 billion by 2030, according to a new report by Grand View Research, Inc. The market is expected to expand at a CAGR of 19.3% from 2022 to 2030. The demand for micro mobile data centers is poised to grow on an account of several factors such as increasing cloud service applications in several industries and increasing emphasis on cost efficiency and low power consumption.

MICRO MOBILE DATA CENTERS are gaining popularity owing to their several benefits compared to conventional data centers. Some of the prominent benefits of micro mobile data centers are low latency, increased resilience, standardization, scalability, improved data security, faster deployment times, and reduced costs. The emergence of 5G technology and Artificial Intelligence (AI) and the adoption of these technologies by different sectors such as IT, defense, and BFSI are expected to fuel market growth in the future.

Organizations and corporations have been increasingly adopting cloud-based services and cloud computing services in recent years. The rising demand for cloud services is one of the primary factors impacting the market growth. In addition, micro mobile data centers are highly portable and energy-efficient, making them better and more efficient than regular data centers. The COVID-19 pandemic had a positive impact on market growth. This is due to the increased demand for digital platforms, cloud services, and edge computing in various industries.

Micro Mobile Data Center Market Report Highlights

- Based on type, the up to 20 RU segment is projected to attain a significant CAGR during the forecast period. This growth can be attributed

to the increasing demand for lesser rack units (RU) data centers in the defense and IT and telecom sectors. In addition, the benefits of up to 20 RU data centers such as high-range and greater capacities that can accommodate larger f acilities will further accelerate the market growth i in the future

- Based on the industry vertical, the government and defense segment dominated the market with a share of over 25.0% in 2021 and is projected to maintain its dominance over the forecast period. Micro mobile data centers are very small in size compared to big data centers and are easy to move. Thus, they find significant application in the defense sector
- North America captured the largest market share of over 40.0% in 2021 and is expected to retain its position over the forecast period. This can be attributed to the early installation of micro mobile data centers in the region and massive investments in technological advancements. Europe is one of the major markets for micro mobile data centers. Industries such as IT and telecom, healthcare, oil and gas, and defense are increasingly incorporating micro mobile data centers in their operations
- Market players are introducing innovative solutions in various regions to gain a large customer base. For instance, in June 2022, Schneider Electric introduced an all-in-one modular data center solution for European lients. The firm's 'all-in-one' data centers merge all cooling, power, and IT devices into a single, pre-configured solution, providing value for venture and IT organizations.

Virtualisation market worth $23.14 billion by 2030

The global data center virtualization market size is expected to reach USD 23.14 billion by 2030, according to a new report by Grand View Research, Inc. The market is expected to expand at a CAGR of 16.0% from 2022 to 2030. The necessity for centralized and unified management of data centers and the growing need to lower operating costs for businesses and increase business agility are major drivers of the market. It is anticipated that factors including the growing demand to reduce data center complexity, rising spending on data center technology, growing demand for improved network security, and adoption of optimization services will also contribute to the market growth.

Furthermore, COVID-19 has increased the penetration of digital transformation. Increasing adoption of digital transactions, smart devices, and IoT, rising automation scope in manufacturing industries via industry 4.0 technologies, and potential for huge data generation by the sectors such as BFSI, education, healthcare, IT & telecom, and media & entertainment will boost the growth of data centers, thereby driving the market for data center virtualization.

The global data center virtualization market size is expected to reach USD 23.14 billion by 2030, according to a new report by Grand View Research, Inc. The market is expected to expand at a CAGR of 16.0% from 2022 to 2030

Data Center Virtualization Market Report Highlights

- By component, the software segment accounted for the largest revenue share of over 70.0% in 2021 and is anticipated to maintain its dominance over the forecast period. Surged use of virtualization software owing to its benefits such as better disaster recovery solutions, reduced hardware costs, enhanced performance, increased IT agility, and quick availability of resources is contributing to the market growth
- The service segment is expected to register the highest growth rate of 16.8% during the forecast period as these services provide organizations with an understanding of the transformation roadmap
- In terms of organization size, the large enterprise segment dominated the market and captured a revenue share of over 70.0% in 2021. Early and rapid adoption of data center virtualization software and services by large enterprises to handle large volumes of data is propelling segment growth. The small and medium-sized enterprise segment is expected to exhibit the highest growth rate of 16.5% during the forecast period
- In terms of the end-use industry, the IT & telecommunication segment accounted for the largest revenue share of over 60.0% in 2021 and is anticipated to maintain its dominance over the estimated timeframe. The rapidly growing IT and telecom industry across the globe is creating more demand for virtual data centers
- North America held the largest revenue share of over 40.0% in 2021 and is expected to retain its position over the forecast period. The presence of various leading market players in the region is a major factor contributing to the market growth
- Asia Pacific is expected to grow at the highest rate of 17.3% during the forecast period owing to the growth of end-use industries and a rise in investments in cloud technologies.

Standing the test of time

LOUIS MCGARRY, SALES & MARKETING DIRECTOR, CENTIEL UK, celebrates the company's record for innovation in developing both the first transformerless and true modular UPS systems, before going on to explain how the focus on DARA has led to increased UPS resilience in the latest product design.

COMMERCIAL UPS systems have been around since the 1980s and it all started with what we now know as standalone architecture. You only have to search the internet for images of UPS systems from that time to see the sheer size and scale of them. Early versions of this technology were gigantic, and even after several years of development they were still large, requiring purpose-built spaces. It was only when an innovative team of engineers created the first transformerless UPS that we saw a dramatic reduction in size and increase in system efficiency. It was this same team of innovators that introduced the biggest change in the industry to date, with the development of true modular UPS systems.

With any new technology there are always sceptics and a natural fear of the unknown. This is a risk adverse industry so it was expected that end-users and even other UPS manufacturers would challenge the reliability of this innovative approach. However, extensive investment in research and development, and a strict set of performance standards ensured that the most robust and reliable systems were produced and accepted quickly.

Despite the challenges of bringing a brand-new product to market, purchasers started to experience the full benefits of a true modular system in terms of its superior availability (uptime), flexibility and robustness early on. It was not long before this huge leap in UPS technology took a significant share of the market. This team has now been developing true modular architecture for over three decades. Now on its fourth generation, there is a proven track record for quality and innovation.

So why am I telling you all of this? A company's heritage is important, understanding how a solution is created and the experienced team behind a product will give you the confidence that you are making the right investment. It's also for these reasons that a technology like true modular architecture can stand the test of time.

The team that developed the first transformerless UPS and the first true modular UPS are known for products that offer the highest levels of availability, and efficiency, and are the founders of Swiss-based manufacturer, Centiel. It's true, other manufacturers have followed the trend of modular by launching their own interpretation. However, the technology is not the same. Now education has become more important for clients to be able to differentiate between system architectures and to understand the true meaning of modular. Let me explain more.

Modular

Think about a traditional parallel configuration using standalone architecture, these systems are

➤ Cumulus Family

positioned horizontally to increase the power rating and the level of redundancy. If you take this concept and flip it to stack the parallel arrangement vertically, it provides a much smaller footprint. It is now fundamentally, a modular system offering the same power rating and redundancy in a single frame. This is modular in its simplest form.

True Modular

True modular UPS solutions are a further development. Technological advances in architecture have increased the levels of availability that UPS systems offer. The latest generation of true modular UPS CumulusPower designed and manufactured by Centiel now provides industry-leading availability of 9 nines (99.999999999%) achieved through Distributed Active Redundant Architecture (DARA).

DARA means that downtime is closer to zero than ever before. So, what exactly is DARA?

Distributed (D)

A distributed and decentralised architecture adds far more layers of resilience. It offers the highest level of availability because all of the components are replicated throughout the system and at module level. A completely distributed architecture means each UPS module includes rectifier, inverter, static bypass, and control logic. No single module takes control of the decisions for the whole system, instead, distributed decision making takes place to eliminate the logic's single point of failure.

Active (A)

Centiel's distributed decision-making technology is a real differentiator.. At module level, a distributed active control logic enables independent decisions to be made. This means that in the unlikely event that a fault occurs within a module, it actively removes itself from the rest of the system, however, this is not done in isolation as the module in question instantaneously communicates with the

Technological advances in architecture have increased the levels of availability that UPS systems offer. The latest generation of true modular UPS CumulusPower designed and manufactured by Centiel now provides industry-leading availability of 9 nines (99.999999999%) achieved through Distributed Active Redundant Architecture (DARA)

ecn engineer with switch gear

remaining modules to allow them to work together to share the load. This automated process ensures that the system remains live and that the critical load is protected at all times.

Redundant (R)

By using modular technology, redundancy can be achieved by simply increasing the number of UPS modules over and above the number that is required to support the load. A true modular UPS such as CumulusPower, with distrib uted architecture offers the highest level of availability because it replicates all of the components across the multiple modules, resulting in further power resilience.

Redundancy must also apply to communication between modules. CumulusPower has been designed with a Triple Mode communication bus. As its name suggests, there are three paths of communication with redundancy within the electronic circuits. In this way, the control logic allows the communication between UPS units to be maintained even if one of the parallel buses has become disconnected or short-circuited, ensuring there is no single point of failure.

Architecture (A)

A distributed and decentralised architecture ensures that any module being added to a live system can be fully isolated and tested within a running frame before it accepts any load (safe-hot-swap). Potential faults are identified before integrating any modules with the rest of the system, preventing any risk of the load being lost.

Centiel's Distributed Active Redundant Architecture (DARA) is the reason why CumulusPower is the safest and most available true modular UPS on the market.

The Future

It is impossible to make major improvements to a UPS which already has such high levels of availability and efficiency! Therefore, to make any further advancements it will involve enhancements and refinements of existing technology. For us, we will be able to gain increments of efficiency and higher power density in a smaller footprint.

Components will become smaller and faster just like other IT systems have done. Design will be around sustainability and working with the customer to address specific needs as opposed to just engineering for engineering's sake.

What we do know is that it doesn't matter what changes are afoot, our experienced team will continue to work with clients as trusted advisors, designing optimal solutions to increase availability, reduce cost of ownership and improve sustainability. Centiel's UPS solutions will also remain robust.

They have stood the test of time and will continue to do so.

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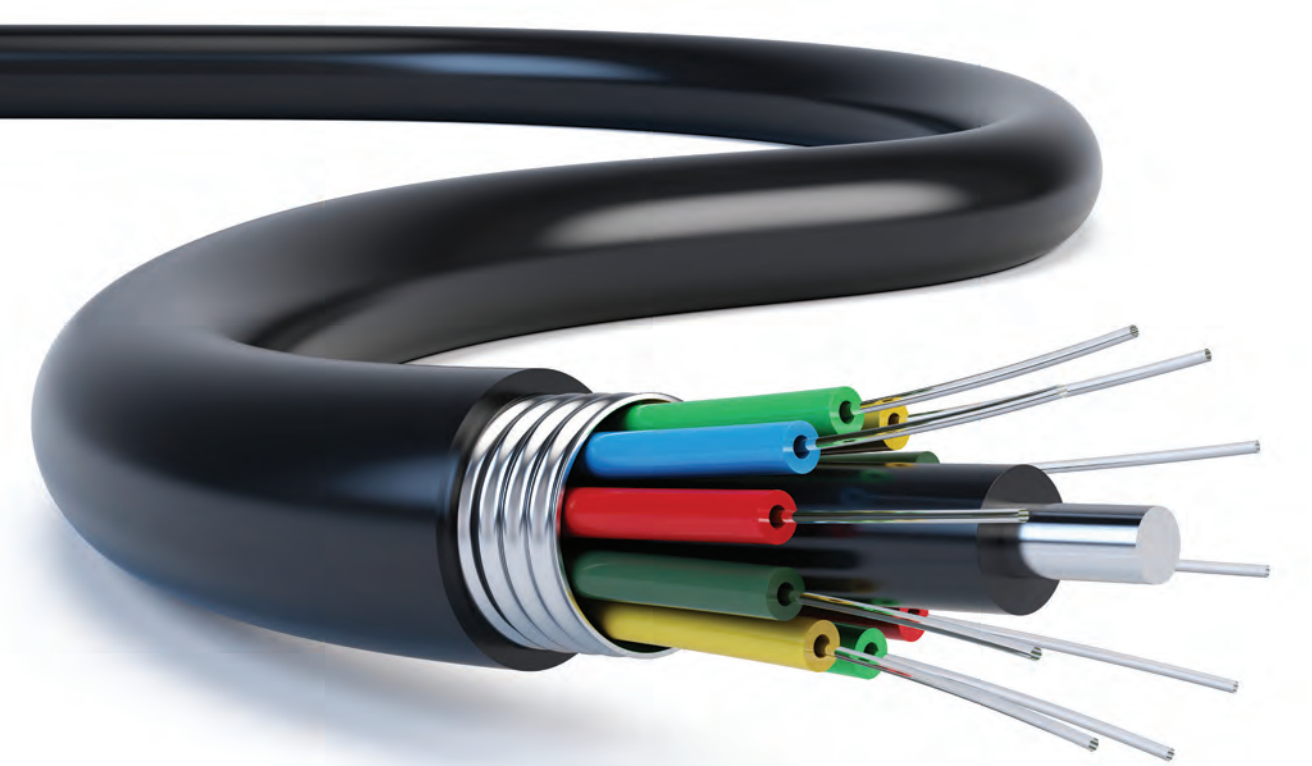

Three key considerations for creating a flexible, future-ready fibre platform for data centres

With data speed and the complexity of infrastructure on the up, forward-thinking data centres are having to evolve quickly to keep up.

BY KEN HALL, DATA CENTRE SOLUTIONS ARCHITECT AT COMMSCOPE

WE ALL KNOW data is one of the most valuable assets an organisation can have. And as it continues to generate at breakneck speed (the latest estimates suggest 2.5 quintillion bytes of data is produced every day), the demand for more storage space grows with it.

This has resulted in unprecedented growth in the global data centre market, with recent research estimating it will reach USD 288.3 billion by 2027, growing at a CAGR of 4.95%.

It's no great revelation therefore that the data centre environment, whether hyperscale, global-scale, multi-tenant, or enterprise, is in a state of constant change - and now is a time of great opportunity. It is also the case that with data centre applications becoming more resource-intensive and fluid, network managers must up their infrastructure game to meet these rapid technological advances head on.

However, some of the changes in data centre evolution - characterised by an ever-increasing change in fibre density, bandwidth, and lane speeds - can be complex to implement and have greater and further reaching consequences than others.

And it's not just the data centre that feels them. Everyone in the ecosystem — from the designers, integrators and installers to the OEM and infrastructure partners — must adapt to these fundamental changes.

So, what's causing them in the first place? For a start, we're witnessing the next great migration in speed —the octal era — where 400G applications

make the jump to 800G (and beyond). That in turn is increasing global data consumption, and demand for resource-intensive applications like big data, IOT, AI and machine learning has pushed the need for more capacity and reduced latency within the data centre.

At switch level, the use of higher capacity ASICs (Application Specific Integrated Circuits: the brains of the switch) makes this possible. Data centre managers need to provision more ports at higher data rates and higher optical lane counts. That's no small feat and requires thoughtful scaling with more flexible deployment options at a time when data centres are being forced to achieve more with fewer resources.

This task might fall at the feet of data centre network managers, but installers, integrators, system designer and OEMs are all invested in the data centre's success. The value of the physical layer infrastructure is dependent in large part on how easy it is to deploy, reconfigure, manage, and scale.

Identifying the criteria for a flexible, future-ready fibre platform

We began focusing on the next generation of fibre platform at CommScope several years ago. After our own initial research, we went straight to our customers and partners. We asked them 'Knowing what you know now about network design, migration and installation challenges, and application requirements — how would you design your next-generation fibre platform?'

The answers were illuminating - and the dominant themes matched our own research. These advanced platforms must enable easier, more efficient migration to higher speeds; ultra-low-loss optical performance, faster deployment, and more flexible design options.

By synthesising this customer input with lessons learned from over 40 years in the industry, we have identified three critical design requirements necessary for addressing the changes affecting both data centre customers and their design, installation, and integration partners. These are:

Application-based building blocks

Generally, application support is limited by the maximum number of I/O ports on the front of a switch. For a 1RU switch, for example, capacity is currently limited to 32 QSFP/QSFP-DD/OSFP ports. Making the best use of switch capacity is the key to maximising port efficiency.

The more traditional four-lane quad designs offered us a steady migration to 50G, 100G and 200G. But where we are now, at 400G and above, the 12- and 24-fibre configurations used to support quad-based applications become less efficient, leaving significant capacity stranded at the switch port. This is where octal technology comes into its own. At 400G and above, the most efficient multi-pair building block for trunk applications is eight-lane octal technology, and 16-fibre MPO breakouts.

This 16-fibre design — including matching transceivers, trunk/array cables and distribution modules — is the foundation for enabling data centres to move forward from 400G to 800G, 1.6T and beyond

By doubling the number of breakouts, we give network managers the ability to eliminate some switch layers. Not to mention that today's applications are being designed with 16-fibre cabling in mind. By supporting 400G and higher applications with 16-fibre technology, we are allowing data centres to maximise and deliver full switch capacity.

This 16-fibre design — including matching transceivers, trunk/array cables and distribution modules — is the foundation for enabling data centres to move forward from 400G to 800G, 1.6T and beyond.

Of course, data centres have got to be ready to move away from 12- and 24-fibre deployments — and not all are. They can't waste fibres or lose port counts while supporting and managing applications, so efficient application-based building blocks for 8f, 12f and 24f configurations are just as important too.

Design flexibility

The second requirement is the flexibility in design. This is important so data centre managers and their design partners can quickly redistribute fibre capacity at the patch panel and adapt their networks to support changes in resource allocation. The best way of achieving this is to build in modularity in the panel components that enable alignment between point-of-delivery (POD) and network design architectures.

Let's consider a traditional fibre platform design. Any components — including modules, cassettes,

and adapter packs — are all specific to the panel. Therefore, changing components to options with different configurations means that you need to swap out the panel as well. This requires extra time and cost to deploy both new components and new panels, which at the same time, data centre customers need to consider ordering more products and the related inventory costs.

Compare that to a design where all panel components are essentially interchangeable, and can be installed in a single, common panel. This would allow designers and installers to reconfigure and deploy fibre capacity in much less time and at a much lower cost, helping data centre customers to streamline their infrastructure inventory and all the associated costs.

Simplifying and accelerating fibre deployment and management

The last piece of the puzzle is the need to make the routine tasks involved in deploying, upgrading, and managing the fibre infrastructure easier and quicker. While panel and blade designs have helped to push along functionality and design to some extent over the years, there is plenty of room for improvement.

There's also the issue of polarity management. The fact is as fibre deployments get more complex, it's getting harder to ensure the transmit and receive paths stay aligned throughout the link. At the very worst, ensuring polarity means installers may have to flip modules or cable assemblies, and mistakes can be easily missed before deployment, which takes time to resolve.

And finally, end-face performance for the fibre connections can have a significant impact on network performance and the ability to support these applications. Ultra-low loss fibre connections, whether single mode or multimode, flat or angled connector choice can determine the architectural options for these critical networks.

What's the solution?

With data speed and the complexity of infrastructure on the up, forward-thinking data centres are having to evolve quickly to keep up. Hyperscale environments are particularly feeling this, where lane speeds are accelerating to 100G, 200G and beyond, and fibre counts across all layers of the network multiply.

We need everyone involved in this process — from network managers and designers to integration professionals and installers — to work together and help data centre operators to make the very most of their existing infrastructure investments, while also preparing for future applications. Early alignment in the process is critical.

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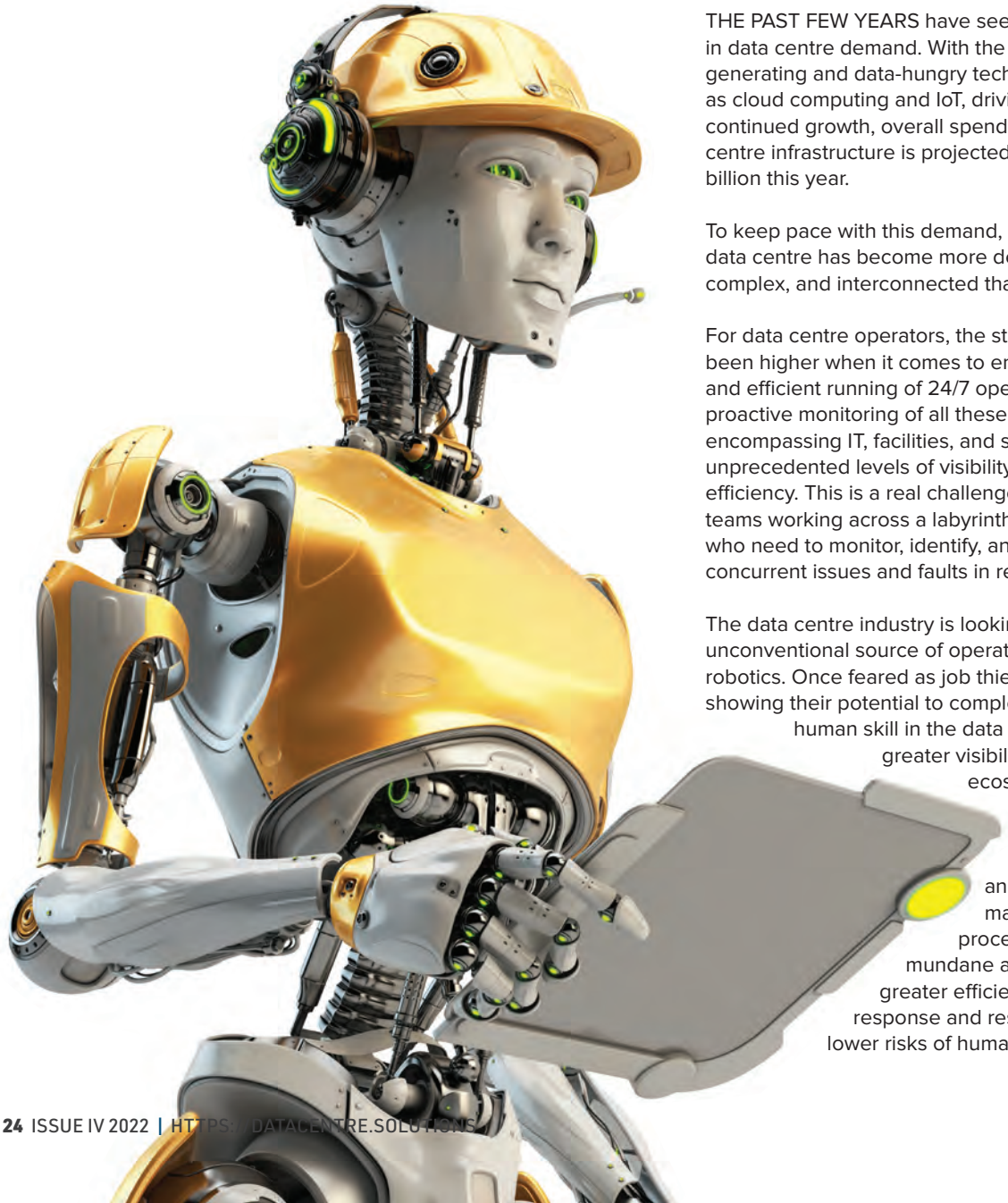
Safe in the hands of robots

How innovations in robotics can enhance data centre efficiency

BY PAUL LEWIS, SENIOR OPERATIONS DIRECTOR, TELEHOUSE



THE PAST FEW YEARS have seen a huge swell in data centre demand. With the rise of data-generating and data-hungry technologies, such as cloud computing and IoT, driving the market's continued growth, overall spending on data centre infrastructure is projected to surpass $200 billion this year.

To keep pace with this demand, today's hyperscale data centre has become more densely populated, complex, and interconnected than ever before.

For data centre operators, the stakes have never been higher when it comes to ensuring the secure and efficient running of 24/7 operations. But the proactive monitoring of all these components – encompassing IT, facilities, and security – requires unprecedented levels of visibility and operational efficiency. This is a real challenge for dispersed teams working across a labyrinthine data centre, who need to monitor, identify, and respond to concurrent issues and faults in real-time.

The data centre industry is looking towards a more unconventional source of operational support – robotics. Once feared as job thieves, robots are now showing their potential to complement and enhance human skill in the data centre by providing greater visibility across the ecosystem. In fact, the latest innovations in robotics are streamlining and transforming manual data centre processes, automating mundane activities to drive greater efficiencies, faster response and resolution times, and lower risks of human error.

Multidisciplinary intelligence

In today's sprawling data centre, the need for fast, frictionless communication between security, IT and facilities are more pronounced than ever. Without this harmonious interaction, data management systems may lack a comprehensive overview of the entire ecosystem. This could result in faults or safety hazards being left unnoticed and unaddressed until they escalate into bigger problems.

Data centre staff need a centralised reference point that gives them the visibility of potential operating issues, ensuring that they are quickly identified and responded to. While current control systems and data centre personnel do undertake regular hazard checks on facilities, robotics can support and streamline these efforts by providing a single source of truth. This federated view is essential for the smooth day-to-day running of the data centre, as it allows for timely and proactive problem-solving with minimal disruption to regular operations.

Robotics offers a multidisciplinary all-in-one solution to a raft of operational challenges, combining human expertise with automated precision and speed to achieve maximum efficiency. For example, a single robot can obtain 4k, in-depth, and 360-degree visibility across all areas of the data centre. With these capabilities, the machine can diligently isolate and resolve issues while communicating any irregularities back to teams for immediate escalation. By acting as a 'one for all' system for enhancing functionality across the ecosystem, the robot can also strengthen the security and compliance of all data centre operations.

Traditionally, a member of staff would notice a fault – such as a missing fire extinguisher – and diligently take steps to resolve the issue. But would they necessarily have spotted an unrelated hazard in an adjacent room? With robotics, operators are given extra peace of mind. A single robot can swiftly identify multiple unrelated safety hazards, flagging issues that may not be immediately obvious. By carrying out the most exhaustive manual checks in a fraction of the usual time, robots also simultaneously communicate data insights around security, facility, and environmental health across multiple departments.

Unrivalled visibility

Robotics use self-driving technology to autonomously map and navigate the data centre. Real-time sensor data then allows the robot to monitor key metrics, establish norms, and immediately escalate any anomalies for human analysis. With no risk of distraction or bias, the technology offers decision-makers a level of visibility, speed, and multi-layered intelligence that no single human or static camera could ever replicate.

AI-driven sensors and live visualisations of energy dynamics, such as heat mapping, can accurately detect anything from temperature and Wi-Fi signal strength to air quality index, smoke, and gas levels inside the data centre. The live data and reports provided then enable staff to proactively deal with any issues that may jeopardise operational efficiency and customer satisfaction.

This real-time visibility is particularly valuable at a time when the length, cost and severity of data centre outages continues to surge. A significant number of these unplanned outages are caused by factors such as weather, water, heat, or computer room air conditioning (CRAC) failure. Therefore, controlling humidity helps to protect sensitive equipment from moisture damage and system failure. Robotics that monitor temperature and humidity levels in a busy data centre yield real-time, advanced data which provides data centre staff with an extra layer of visibility. This helps decision-makers to balance workloads throughout the data centre, leading to further efficiencies in cost and energy.

Automated allies

When all these benefits are considered, media-fuelled fears of robots 'stealing' people's jobs ring increasingly hollow. Human workers 'need not fear' robotics in the data centre. By excelling at the most tedious, time-consuming and repetitive aspects of data centre work, robots free staff from robotic tasks, enabling them to channel their own attributes and skills into more strategic areas. Therefore, robotics and humans can actively enhance each other's complementary strengths, driving operational excellence to yield greater insights and innovation as demand on data centre infrastructure continues to grow.

Automation in the data centre is nothing new – but the latest innovations in robotics are unlocking a new frontier in operational efficiency. To cope with growing pressures and demands, data centres need the multidisciplinary, all-in-one capabilities of robots to streamline essential processes across the ecosystem. With enhanced visibility and 360-degree intelligence, humans and technology can combine to reach unprecedented levels of autonomy, productivity, and round-the-clock security.

Robotics offers a multidisciplinary all-in-one solution to a raft of operational challenges, combining human expertise with automated precision and speed to achieve maximum efficiency

Taking the pain away from data centre admins

What keeps a company going? For IT administrators, the answer is clear: the server room or data centre is often seen as the heart of the company. After all, this is where the entire IT infrastructure and the company network are managed.

BY FELIX BERNDT, BUSINESS DEVELOPMENT MANAGER IIOT AND DATA CENTERS AT PAESSLER AG

THIS MAKES it even more important to take security measures that protect and permanently monitor the data centre. In the event of a failure or malfunction, in the worst-case scenario, the entire operation is paralysed. Such failures can be prevented with holistic monitoring.

Many companies already monitor their IT infrastructure 24/7 with a monitoring tool. This allows them to keep a constant eye on the status of devices such as servers, switches, computers and routers. In addition, the tool can sound an alarm directly if defined threshold values are exceeded. The data centre is often doubly endangered: not only trojans, viruses and similar threats can cause great damage. Environmental influences can also have a negative impact on the infrastructure. Often this is a real shock moment for IT administrators - because, as with an undiscovered disease, they spend a long time trying to find the underlying cause of the symptoms without knowing the cause.

Damage due to environmental influences

Dangers from the network aren't the only thing that can be dangerous for the data centre. The environment also poses an underestimated danger. In some cases, even minimal changes in the air - such as temperature or humidity - are decisive in negatively affecting the reliability, performance and service life of IT components.

For example, increased humidity can create condensation inside a server and lead to short circuits or corrosion. Excessively high temperatures cause processors to throttle their speed or servers to shut down for security reasons. With a monitoring tool, sensors can be used to measure the temperature in the room, for example, and the results can then be compiled on a central dashboard.

This helps system administrators to see at a glance whether the increased temperature of a server CPU was caused by a short-term increase in computing load or whether the room temperature is responsible for it. Countermeasures can be taken at an early stage before other components are also affected. An overall picture of the possible sources of error shortens troubleshooting considerably and thus prevents greater consequential damage.

Looking the danger in the eye

The IT infrastructure and the premises are often seen as separate worlds for which several teams are responsible. For this reason, it is often difficult to get a comprehensive overview of the condition of the entire data centre. Central monitoring ensures that faults or failures are detected, localised and remedied as quickly as possible across departments.

Modern monitoring tools can help to monitor both physical and physical security regarding access control, power supply and distribution as well as air conditioning around the clock. This not only helps to detect hacker attacks; environmental sensors can also be integrated into the monitoring to record all essential ambient and environmental parameters: temperature, relative humidity, dew point, carbon monoxide as well as movement and vibration.

The various sensors immediately detect abnormalities or deviations from predefined limit values and immediately report them to the person in charge. The IT administrators are then automatically informed by e-mail, SMS or push notifications and can react immediately.

24/7 monitoring - without restriction

For the monitoring tool used to effectively monitor the data centre and contribute to failure-free business operations, some basic aspects must be considered when selecting it. In the first instance, technical support should be available, but also continuous updates - so that faults can be responded to immediately.

A rights management system is also important to define responsibilities precisely. Clear dashboards and flexible reporting also help both the IT administrators and the management level staff to see results at a glance.

Due to the increase in home offices, it also makes sense to make the solution available as an app. This enables those responsible to react from anywhere and to keep a constant eye on the data centre. With these things in place, not only can the data centre and its security be optimised at all levels, but existing resources can also be used in a more targeted manner and operating costs can be permanently reduced as a result.

First aid for the data centre

The data centre is often the pivotal point in a company - here, the IT infrastructure is collected in one place. It is therefore even more important to protect it from hacker attacks, environmental influences or unauthorised persons. In order to ensure error-free operations in the data centre, it is advisable to integrate a holistic monitoring solution.

Almost all devices and applications can be integrated into the monitoring system. Interfaces make it possible to query the respective device status as well as environmental influences, security factors or technical functions. In short: with a suitable monitoring tool, the IT administrator can monitor almost all areas of their data centre around the clock.

This enables critical points of the network to be kept in view and information for analysing resource utilisation to be collected centrally. It also enables those responsible to react to problems and error messages before it is too late.

Demand response, renewables and reputation

Data Centre power demand is set to grow, leading to increasing public awareness – it requires a response through greater grid interactivity.

BY ED ANSETT, CHAIRMAN AND FOUNDER, I3 SOLUTIONS GROUP

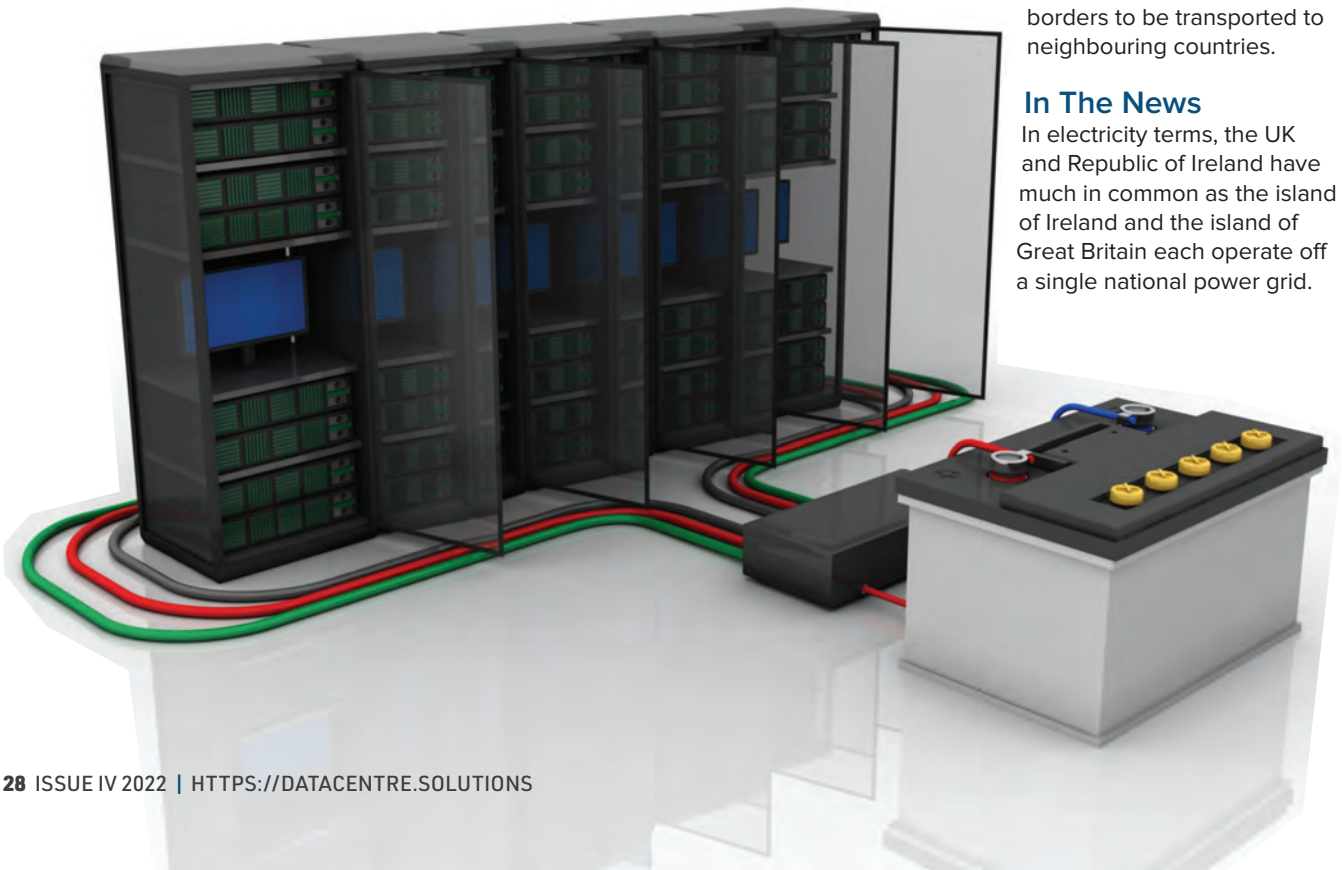
HOW CAN THE INDUSTRY start to address public concern over data centre power usage in the UK and Ireland? First, the data centre sector must speak openly about its efforts to build a sustainable industry and good power citizen reputation.
In the UK and Ireland, the reputation issue is becoming particularly acute. Because, unlike mainland Europe, each of the main islands has a limited number of grid interconnectors. Today, the UK National Grid operates electricity interconnectors with France, Netherlands, Belgium, Ireland and Norway. Additional interconnectors are planned with Germany and Denmark. The 720km North Sea Link (NSL) between the UK and Norway is also the world's longest subsea interconnector, the result of a €1.6 billion joint venture between the countries, which commenced commercial operations 1st October 2021.

Overall, interconnector capacity increased to 7.4 GW in 2021. The addition of a second link (IFA 2) made France the source of more than half the UK's imported electricity (53%), with Belgium second highest (24%) followed by the Netherlands (15%). Despite only being in operation for three months, NSL provided 5 per cent of total electricity imports. Ireland has two interconnectors with Great Britain and there is a commercial plan to connect with France.

By comparison, mainland Europe is significantly more interconnected. To boost its security of electricity supply and to integrate more renewables into energy markets, the EU has set a target to increase the number of cross-border electricity interconnections, encouraging each country to have electricity cables in place allowing at least 15% of the electricity produced within its borders to be transported to neighbouring countries.

In The News

In electricity terms, the UK and Republic of Ireland have much in common as the island of Ireland and the island of Great Britain each operate off a single national power grid.



How relationships between the grid and data centres evolve in both places and how they are perceived by a public concerned about energy security and sustainability has profound implications. In Ireland and the UK, awareness of the amount of power drawn by data centres has risen. Recent headlines include 'Eirgrid [Ireland's grid operator] pulls the plug on the data centres.'

Reports that power used by Ireland's data centres grew by one third in a single year and now accounts for 14% of the country's electricity output were not received positively. Ireland has around 70 large data centres reportedly using 900MW, with eight more scheduled for construction.

Recently, Amazon was granted permission to build two new data centres in Dublin, telling council planners that its new 115MW wind farm project in Galway would support the company's facilities in the country. Recently Microsoft announced that batteries in its Irish data centre campus would provide electrical support to local grids. The batteries will complement solar panels and wind farms near Dublin. The intention is when the grid requires more power than it can provide, the batteries inside the data centre will export stored energy to the grid. For now, with a de facto moratorium in place, it appears the pause button has been hit for new data centres in the Republic of Ireland until 2028.

Meanwhile, Data Centres and the UK Grid
In the UK, which has around 450 large data centres and nearly 300 commercial colocation sites, the question is, can the data centre sector find a way to speak positively about its energy use?

In June, The Economist reported, "A boom in data-centre construction has affected west London particularly badly. This area is only a small part of a regional grid that covers a swathe of southern England, but it has received 90% of all applications to connect data centres to that grid in the past two years. The amount of electricity these new facilities require is roughly the same as west London's entire existing capacity."

We live in an era of surging demand. Demand connections to the UK grid has risen fourfold in the last three years. The UK Government's energy strategy security document, issued in April 2022 says: "On uncertainty, whilst there are many future decisions yet to be taken, and a need for an agile approach to network infrastructure, we do know that electricity demand is highly likely to double by 2050".

In July 2022, National Grid announced plans for a major upgrade of the UK's electrical system with a £54bn investment package to boost the grid infrastructure capacity and build secure connections with new onshore and offshore wind farms and other renewable energy resources. The UK is committed to a mass conversion and adoption of renewable energy to generate 50GW by 2030. Fintan Slye, Executive Director of ESO said "It is a key step in providing certainty to offshore wind developers and mitigating potential impacts on the environment and local communities from energy infrastructure."

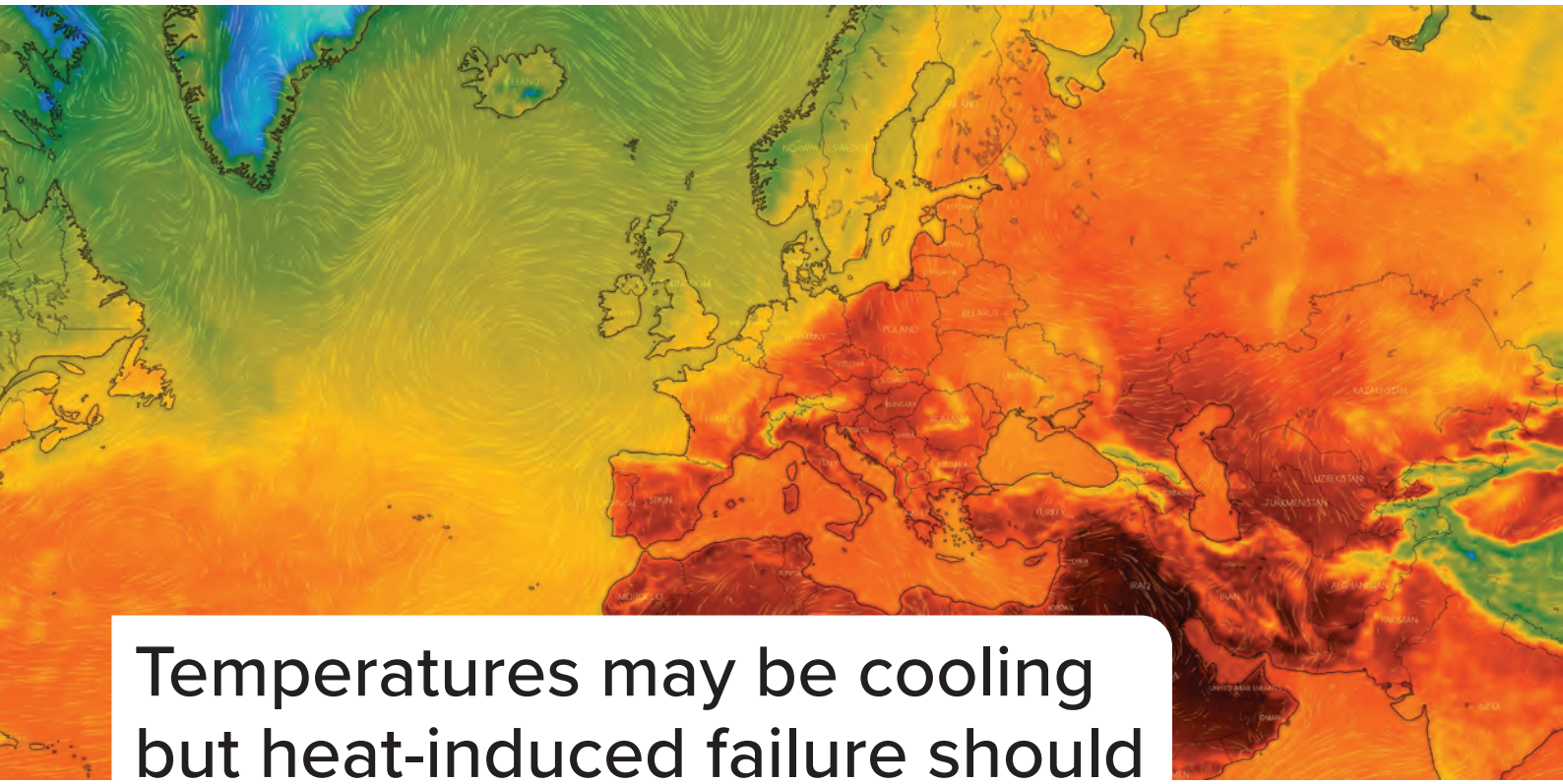
Exceeding Demand with Offshore Wind Plans
In terms of capacity, Ireland's good news is that there is a plan for 3.5GW of offshore wind power by 2030, and Grid supply to data centres in Ireland is on course to be 2000MW by 2025. The UK target is 70GW of power from offshore wind farms by 2030. Garry Connolly, founder of industry group Host In Ireland says: "In Ireland the biggest challenge is the grid. To get from the current +/-2,000MW (1.2GW built and 800MW the in the process) is going to require the grid to transition to smart. That is about physics and time. The data centre operators are becoming active on the demand response side and becoming better grid citizens. They are refreshing the older centres, so managing more data for same inputs of electrons."

How relationships between the grid and data centres evolve in both places and how they are perceived by a public concerned about energy security and sustainability has profound implications. In Ireland and the UK, awareness of the amount of power drawn by data centres has risen

Just as the grid itself changes, with more microgrids and large-scale battery energy storage systems becoming more intelligent and more agile with better management, data centres have an opportunity to become part of the solution by becoming bi-directionally grid-interactive.
The major UPS suppliers have developed grid interactive UPS systems. This approach is an excellent example of how data centres can support the grid.

Reputation Management

Adopting sustainable solutions such as participation in demand response will enable the data centre sector to become a good energy partner. During this significant grid energy transition to renewables, the industry cannot exacerbate the problem, especially when it is perfectly placed to be part of the solution.



Temperatures may be cooling but heat-induced failure should still be a hot topic

With cooling challenges in data centREs on the rise, managers need to be prepared to handle the associated risks.

BY DAVE KING, SENIOR PRODUCT MANAGER, CADENCE

THE GLOBAL HEATWAVE that hit the UK this summer, causing temperatures to soar to highs of 40°C and plunging many parts of the UK into droughts, presented challenges for every industry, not least data centers. Facility managers grappled, and in several instances failed, to keep data centers cool to avoid outages, while also facing difficulties with the limited water supplies that are a critical part of the cooling infrastructure.

The sad reality is this extreme weather, and its repercussions, are not isolated incidents. The Met Office has predicted that, in the next 50 years, top summer temperatures could be 4-7°C hotter, with a significantly higher likelihood of jumping above 40°C.

As autumn draws in, the weather may be getting colder in the short term, but we can't afford our focus on this hot issue to cool off. UK data centers, and indeed their counterparts around the world, need to be taking this brief respite to evolve and manage the ongoing challenges rising temperatures will create. Introducing new technology to facilitate this evolution will be critical to success.

This summer's hottest trend – heat-induced failure

Faced with record-breaking temperatures globally this summer, many data centers around the world experienced heat-induced failures as they were pushed beyond their limits. Several companies on both sides of the Atlantic had to take the decision to shut down their data centers to repair cooling mechanisms and avoid systems being damaged.

This resulted in countless hours of disruption while services were restored and associated "long tail" issues were overcome.

These challenges were not unique to the UK. However, it's undeniable that the country was less prepared for the swings to high temperatures that are more common elsewhere in the world, and that this resulted in significant consequences for critical infrastructure and the businesses reliant upon them. For example, hospitals were unable to access patients' medical records, necessitating the cancellation of appointments and further deepening a backlog that has been struggled with since the beginning of the pandemic.

It's clear that the results of these outages are far from inconsequential and that the cause was systems struggling to cope with extreme heat that they were not designed to handle. Retrofitting existing data center systems, and designing new facilities with this in mind, is essential to better deal with the extreme, hot weather we can expect to become commonplace over the next 50 years.

The coolest data center innovation – digital twins

Crucially, in today's climate, it's paramount that data center managers can operate cooling systems as efficiently as possible to prevent outages. Deploying a digital twin – which is a 3D virtual replica of a physical data center that can visualize a facility under any operating scenario – is an effective way to optimize cooling systems. Using this technology, managers can simulate the cooling loop and airflow from IT to the facility level to ensure it's working as effectively as possible and meeting thermal demands. Furthermore, testing these configurations virtually first mitigates the risks of changing complex cooling systems in the physical facility to prevent outages.

To take a more specific example of how digital twins can support the design of new facilities and optimize their cooling systems, let's look at Kao Data. Kao Data invested in the technology to make informed decisions around the design, implementation, and operations of an indirect evaporative cooling (IEC) system at its facilities. IEC is a greener, more efficient, and cost-effective approach where water evaporation is used in place of mechanical systems to cool the air. A digital twin was central in ensuring the optimal operational performance of this system, by predicting performance and offering recommendations for the different phases of implementation. This was in addition to highlighting operational risks – which could have resulted in outages – that may never have been discovered until after deployment.

For example, during simulations, the design team validated thermal performance under normal operating conditions. They consequently discovered that at full load occupancy, and with a prevailing south-westerly wind, humidity in the external air stream intakes would be raised, and the wet bulb temperature would exceed the appropriate limit. Armed with this information, they made design improvements ahead of construction, ensuring efficiency would remain high and operational risks would be kept to a minimum.

Computational fluid dynamics (CFD) was also employed to guarantee the design would be able to manage a failure scenario, in particular, the IT equipment located by the failed cooling unit. Had these steps not been taken, the physical data center would have inevitably struggled to operate in normal conditions, and certainly when put under stress by high temperatures.

Retrofitting existing facilities to manage the challenges created by a changing climate is even more challenging than intelligently designing cooling systems in new centers, but thankfully digital twins can play a role here, too.

Imagine, for instance, a facility looking to upgrade its existing rooftop chillers. Historically, there had been challenges with reduced cooling from the chiller plant on hot days, due to recirculation of airflow in the rooftop plant.

However, it faced additional complications because new planning regulations meant any change would also require the construction of sound reduction measures, adding an extra wall around the roof. The wall could be louvered but would still present an additional impediment to airflow. Roof space is fixed, with no possibility to change the building and other existing infrastructure. Resultantly, there would be no feasible placement options beyond the existing chiller position.

Given these constraints, the only option for mitigation of airflow issues would be the construction of various baffles and chimneys to physically segregate hot and cold air. A digital twin could be used to simulate various options and find a configuration that completely mitigates the airflow issues, but of course, there are further considerations. A solution that fully segregates the airflow may also significantly hamper regular maintenance and cause other operational issues day to day. But with the output from the digital twin, a cost-benefit analysis can be done and might show that partial mitigation would provide the best balance of risk and cost.

This is significant because it's important to recognize that existing sites will be constrained by the infrastructure already in place, and changes may fall foul of new planning regulations, further complicating matters. Compromises will need to be made. Simulating the environment to understand potential risks, what the possibilities for mitigation are, and the cost of those mitigations will help businesses make the right decisions – notably on if, when, and how they will implement any changes to handle a hotter environment. In some cases, it may be the right decision not to take any mitigating steps. However, even in those cases, having the knowledge from the simulations of the impact of extreme events will help site teams plan when they are forecast.

Prepare now to avoid pain later

With cooling challenges in data centers on the rise, managers need to be prepared to handle the associated risks. Investing in technology now to understand and plan for the impacts of extreme weather is vital to preventing future outages in future warmer months and preparing managers for the challenges that will accompany a warming planet in the long term.

Crossing the gender gap to become Telehouse's new MD

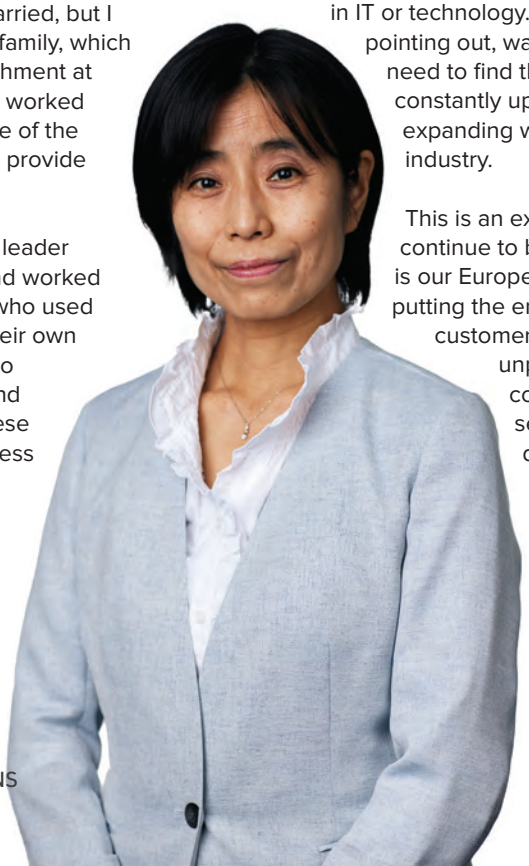
TAKAYO TAKAMURO IS THE NEW MANAGING DIRECTOR OF TELEHOUSE EUROPE, the global colocation provider that brings together more than 3,000 business partners, including carriers, mobile and content providers, enterprises and financial services companies. In her new role, she is tasked with overseeing continued growth, expanding Telehouse Europe's highly connected ecosystem.

COMING FROM JAPAN, my career started at a time when women were still expected to fulfil support functions. So, it was quite unusual for women to work in sales within the IT market. I can't say that concerned me too much – I was keen to learn.

After completing my degree in sociology from Keio University in 1995, I began my career with Telehouse's parent company, the telecoms operator KDDI Corporation, working for Teleway. I was taking care of major financial companies that had entered the Japanese market and required an international network.

I joined Telehouse in 2004 as a sales manager and worked there for three years. When I started work at Telehouse, I was already married, but I decided to live away from my family, which caused a great deal of astonishment at KDDI. Upon my return to HQ, I worked as the sales manager in charge of the Japanese trading company, to provide their international network.

I was then promoted to group leader for the wholesale business, and worked for a variety of major carriers who used KDDI's network to establish their own network in Japan. Moving up to Director of Global ICT Sales and Marketing, I supported Japanese customers' international business from the network perspective. I was leading global sales and business development for major manufacturers and finance companies, which was challenging, fascinating and a wonderful learning experience all at the same time.



And then in 2020, I was appointed Senior Assistant to the board, which gave me a great opportunity to learn something very different – how to manage the company as a board member. Last year (2021) I became Deputy Managing Director at Telehouse International and in October of this year I became Managing Director.

If I offered advice to women about a career in IT, it would be to rid themselves of any ideas that sales or technology should be men's work. It is vital to forget stereotyped ideas of this kind that just hold women back.

To get on you must be hungry and eager to learn new things even though you may not be a specialist in IT or technology. My degree, it is worth pointing out, was in sociology. Women need to find their way forward by constantly updating their knowledge and expanding what they know about the industry.

This is an exciting time for me now. I'll continue to be based in London, which is our European headquarters, and I'll be putting the emphasis on innovation and customer experience. We are seeing unprecedented demand for connectivity, scalability and security, which we aim to deliver at Telehouse. We have a long-established reputation for excellence in the connectivity and data centre market and I'm determined to continue following through on our commitment to reliability, resilience and all-round best-in-class excellence.

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A career is not a ladder, it is more like a jungle gym

Birgit Jackson, Director Integrated Racks and IT Solutions Business in EMEA at Vertiv, shares her career journey and challenges and opportunities for women in IT.

TODAY, Birgit Jackson, mother of two, is director of integrated racks and IT solutions business in EMEA at Vertiv, a global provider of critical digital infrastructure and continuity solutions. She leads the Integrated Racks and IT Solutions line of business and manages a team that is responsible for the product lifecycle management and financial performance in EMEA.

Birgit joined the company in May 2021 and brought with her more than 20 years of experience gained through a diverse career in global product management. Over the years, she has defined product lines, positioning and price structure, led on product strategies, and directed company-wide marketing and communications initiatives. But how and where did her career in technology begin?

Birgit studied physics at university and she has always been passionate about technology and numbers. When she started her career she didn't want to limit herself to R&D - she wanted to be in an office and in touch with people. This led her to embark on a career in product management; it gave Birgit the perfect combination of R&D and sales. She has worked in the technology industry all of her working life and today, Birgit is a decisive and strategic business leader with a passion for working with the ground-breaking technologies which power a smart, digital future.

The road to success

Birgit began her tech career in Munich back in 1997, when she worked for Nokia Display Products. At the time, it was the market leader in mobile phones and it was fascinating to witness how quickly society changed with this new technology in people's hands. Mobile phones were, and still are, particularly interesting because they comprise of so much technology - hardware, software and data. Being a part of defining the future of the mobile industry was one of the most exciting times in Birgit's career.

Birgit then joined Compaq Computer / Hewlett Packard, followed by Siemens, before moving to NEC Display Solutions Europe. Her role at Siemens was especially interesting. As the portfolio definition manager, she was responsible for the project management of future products which meant looking at design and technology trends

and predictions 10 years ahead. Commenting on her time at NEC, Birgit said: “I started as a product manager for desktop displays a year after my daughter was born. I knew that I was capable of doing my job and managing a family. My managers at NEC were very supportive and they gave me the flexibility and opportunity to grow in my career. I was promoted quickly and was eventually appointed head of product management for all NEC display solutions products.” Birgit continued: “I really enjoyed this role as I had the freedom to create an environment in which my team could thrive. One of my proudest moments in this role was introducing a new and successful product management team structure. It included bringing in new team members and coaching product managers to expand their skills. I gave them the tools to really understand relevant business trends and developed a new communication structure which improved collaboration with the management in Japan and other regional heads of product management.

Birgit joined Vertiv because she believes that it is another company that defines the future through technology - data is the new “oil” - and she is thrilled to be part of a fast moving business and work with a very talented team. Birgit said: “We are living in a time of accelerated digital transformation. Critical infrastructure now has utility status and I’m really excited to be part of a company at the forefront of creating and implementing the IT solutions that will power the digital world.”

Championing women in technology

Outside of Birgit’s day job, she’s passionate about inspiring women to undertake careers in technology and helping to break down the stigmas and roadblocks which stop women entering the field. She believes that one of the most pressing challenges that women in IT face is gender bias: men are often more likely to be promoted than women, even when they have comparable qualifications and experience.

Unlike male counterparts, there is a lack of relatable female role models in STEM industries. Females are often underrepresented in leadership positions in tech companies, which can make it more challenging for women to advance their careers and achieve their goals. For Birgit, it’s vital that this situation changes and that more women are able to succeed in technology industries. She said: “It’s well known that more diverse teams deliver better results, women lead innovative organisations and women in leadership positions attract more women to work in the company and industry.”

To encourage more women into STEM industries, Birgit believes it’s important to raise awareness of the career options and opportunities available in tech . This should start with education playing a key role in inspiring women to work in the field. She thinks women and men should be encouraged on to follow their talent at a young age and that being a “girl” doesn’t mean you cannot be passionate about solving mathematical problems. Sadly, it is still very often almost predefined that women should embark on careers in HR or marketing and men should be engineers. Early work experience such as internships and school-work programmes are a great way for young students to explore career opportunities.

Outside of Birgit’s day job, she’s passionate about inspiring women to undertake careers in technology and helping to break down the stigmas and roadblocks which stop women entering the field

Birgit says that one of the main enablers of her career success was management having trust in her ability, talent and commitment. She feels strongly that trust is the basis for attracting and maintaining the best talent - and not only women. Being trusted to work flexibly to manage a family and a job is key.

Sharing success

During her career, Birgit was fortunate to have always had people who supported her as well as great mentors. She said: “One of the things I really enjoy is leading teams and helping them to succeed and grow. Vertiv is a great place to learn and there are lots of opportunities to develop skills and careers. I think the best advice I can share is to build a good network of people around you and find a job that you are really passionate about. I now ensure that I make time to mentor other female talents because I want to help women to be more confident and successful in their careers.”

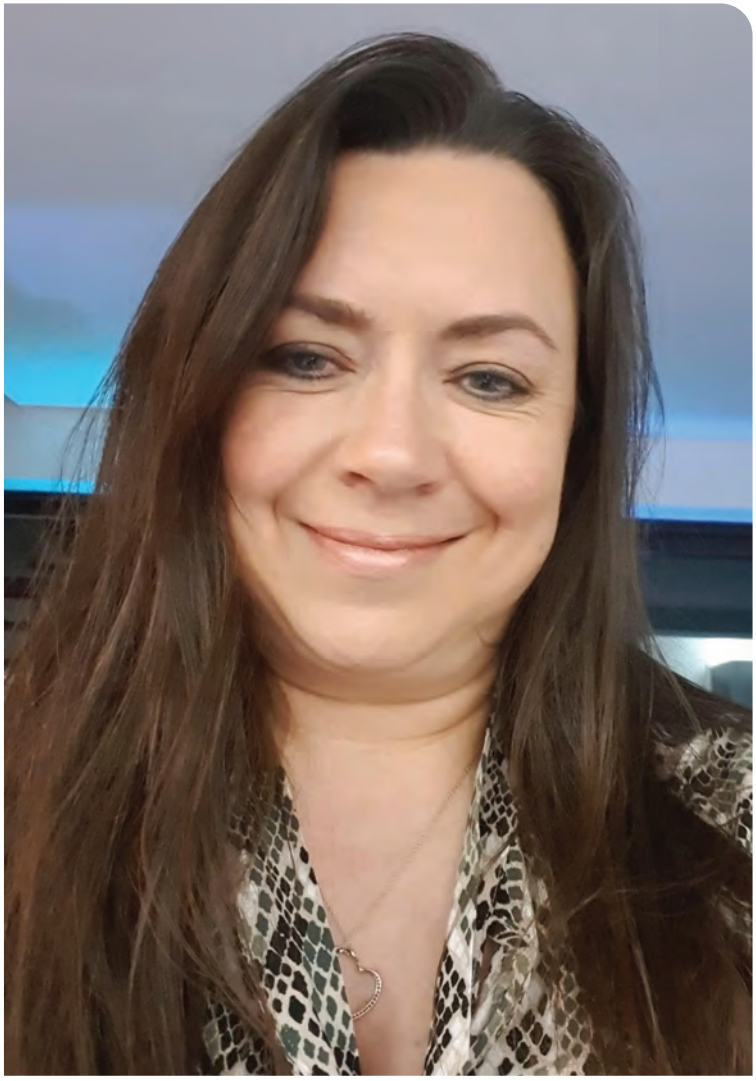
Although the world of work is different (in a good way) for women today, it’s an evolution. There are more opportunities and most companies, including Vertiv, are investing resources to design ad hoc programmes and strategies to recruit more female talent, drive diversity and enrich talent . Technology has also made the world smaller which means most businesses now put talent as a higher priority than where people are located. This helps to provide more flexibility for women to progress in their careers. There are also more female role models in leadership positions than 20 years ago.

Birgit’s final thoughts: “I highly recommend reading Sheryl Sandberg’s book “Lean In”; it is very inspiring. The most important take away for me was to accept that a career is not a ladder, it is more like a jungle gym.”

Why mentoring is critical for women in tech

Encouraging more women into technology careers to close the gender gap is now more important than ever.

BYPAMELA NAPIER, SENIOR MANAGER OF CLOUD UKI, VEEAM



DESPITE the incredible opportunities that technology offers, only 31% of the tech workforce in the UK are women, with the majority of them still earning less than their male counterparts. As women create a more balanced working environment, with typically higher levels of emotional intelligence, a critical skill for managing today's hybrid workforce, these numbers are disappointingly low. Therefore, encouraging more women into technology careers to close the gender gap is now more important than ever.

But it's no longer enough to just raise awareness, we need to take tangible steps to increase the number of women in technology positions and nurture them throughout their careers. One way to do this is by ensuring women have access to mentors.

I've worked in the technology industry for over 20 years, holding positions in channel management, system integration, end-user sales and more. When I began my career, the industry was noticeably male-dominated and at times it felt like an uphill battle to get where I wanted to be. I needed to be more than good at my job. I needed to be extra-resilient, not afraid of sharing my opinion and holding my own in a male environment. To achieve this, I worked with a series of strong mentors who empowered me to take risks and make the right decisions.

As a result, I believe that mentoring is critical for helping more women choose and progress in technology careers. This why I actively participate in Veeam's 'Mentor Lab', a programme that encourages employees to continue to train and develop at work as a mentor, mentee or both.

Gives you the confidence to take risks

Women who advance in their careers know how to constantly pivot and adapt, which involves facing their fears and taking risks. So, a mentor's role should be to give their mentees the confidence to take risks without feeling like they're failing or making a mistake. By providing sound advice, support and sharing similar experiences, an experienced mentor can empower you with confidence to make the right decisions, whatever stage of your career you're at. I've worked with several mentors who've helped me make important career decisions.

For example, in 2018, after seeing the IT market shift to the cloud, I decided to transition from vendor sales to working with cloud providers to build my knowledge and experience in this market. But, without previous experience in the cloud space, this transition felt like a big risk. My mentor at the time supported me through this change and helped me feel confident in my abilities. So much so that I managed to rise up the ranks to become a cloud tech leader.

Helps you overcome imposter syndrome

A common theme for women in tech is suffering from imposter syndrome; the belief that you aren't as capable as others think and fear you'll be exposed as a fraud. As a result, women feel like they need to work harder and be better to achieve the same goals. They do this by guiding you through your career rather than giving you all the answers and telling you what to do, helping you believe in yourself and your abilities. This will empower you o find your own way and give you the confidence to make the right decisions.

Enables you to learn how to mentor other women
Mentoring not only helps you with your own career progression, but it also enables you to learn how to mentor other women and provide them with the confidence to make decisions and ask for help and advice when needed.

While the biggest skill as a mentor is listening, sharing experiences of how you've overcome problems and held your own in a male-dominated environment will help equip your mentee with the skills to manage similar situations.

I've had a mentee for the last two years and believe that a mentor/mentee relationship should begin with a solid understanding of what the mentee wants to achieve and where they want their career to go. What keeps them motivated? What interests do they have outside of work that may be valuable to help them stand out? Also, allow them to drive the session so they can get the most out of this relationship.

An investment in the future

I believe investing in mentoring is investing in the future of women in technology. By empowering them to take more risks and make bolder decisions, more and more women will choose careers in technology and progress to leadership roles.

Furthermore, as diversity is a fundamental tenet of a successful business and women play a critical role in creating a balanced and productive working environment, we need to do everything we can to support mentoring, encourage more women into tech and reduce the gender gap – very much the thinking behind Veeam's 'Women in Green' program.

Inspiring the next female leaders

Despite significant improvements in gender representation across the technology industry, according to a recent study, women are predicted to only reach 33% representation in technology roles, up 2 percentage points from 2019. Clearly, we have some work to do.

BY CLAUDIA THURNER, CHIEF COMMERCIAL OFFICER, RIPJAR

K who has enjoyed a range of dynamic and exciting roles within the technology industry, I am keen to encourage more women into these roles. Assumptions and stereotypes may remain, but I'm passionate about breaking through those misconceptions, acting as a mentor and helping professional women make the most of their potential and the opportunities available to them, in this incredibly rewarding industry.

The STEM misconception

When speaking to young women, I often come across the misconception that working in tech is only for STEM students or those involved in coding. However, as the sector expands, roles are developing very quickly, requiring a variety of skills and professional experience. In my current role as Chief Commercial Officer, my ability to maintain client relationships and to build business cases is as important as my technical knowledge. Today's graduates may end up in roles that don't even exist now, so they should focus on gaining as much experience now as they can, rather than focusing on a future career that could look drastically different. This will allow them to seize opportunities and experiences while embracing change.

In the hiring process, companies should also place as much emphasis on soft skills in candidates as they do on field of study. This will allow teams to capitalise on the potential of candidates and will ultimately allow for more women leaders in organisations. Inclusivity in the hiring process begins with writing an inclusive job posting and thinking of creative ways to attract diverse talent. This is a proactive process for hiring teams who now appreciate the value of diversity to drive creativity and ultimately create more successful teams.

Work-life balance

Another issue which has been a barrier to success in the industry for women, has been the lack of flexibility. This has led to many women switching industry before the age of 35 which is a loss for the teams in which they could have contributed. Even though this is still an issue, the switch to hybrid working, the focus on diversity, equity and inclusion (DEI) and the shift in working culture has been a major win for women looking for work-life balance. Because tech companies, particularly start-ups, are constantly looking to shift working models to improve productivity, there has also been a significant spike in policies which allow for flexible working. Across my career, I have been lucky enough to have this flexibility to work how

Personally, having mentors early on in my career who encouraged me to take my first step up into management roles, was immensely important. The opportunity to form relationships with other women in tech could be the catalyst to inspire the next generation

and when I want, as long as I met my targets. As this attitude becomes the norm, I hope to see better representation of women in teams.

Lack of role models

The lack of female role models in the industry is also an issue when trying to encourage women to enter the space. Despite improvements in representation, 78% of students still fail to name a famous female tech leader when asked. Alongside hiring practices to encourage diversity, companies should also implement mentorship and internship schemes to help young women at the beginning of their career.

Personally, having mentors early on in my career who encouraged me to take my first step up into management roles, was immensely important. The opportunity to form relationships with other women in tech could be the catalyst to inspire the next generation and resolve any misconceptions they may have about roles available.

Looking to the future

To anyone interested in building a career in tech, I always try to be as encouraging as possible. It is an extremely dynamic field that allows individuals to learn and develop through a wide range of opportunities. The next generation of tech leaders will come from a multitude of backgrounds and have the creative vision to innovate.

I have been lucky enough to always have autonomy in my roles which has allowed me to be creative and grasp responsibility. In this field, taking risks and being ambitious can be well rewarded and allow for rapid growth. No matter your experience or field of study, the right attitude can allow for success.

Making the case for mentoring

Why providing mentorship programmes and growth opportunities to women in technology should be every organisation's priority.

BY ALIONA GECKLER, CHIEF OF STAFF AND SVP OF BUSINESS OPERATIONS AT ACRONIS

MORE AND MORE WOMEN are joining the tech industry every day. Companies, no longer comfortable with the status quo, begin to realize the great benefits of having a diverse workforce, and start to provide equal opportunities to people of all walks of life. I love hearing stories about diversity changing company culture and even improving the bottom line. It shows us the workforce is evolving and women play an essential part in this process. I recently read a Deloitte article that predicted that by the end of 2022, the tech industry will reach an all-time high of 33% female representation.

This is a pivotal and exciting time for women in tech, a historically male-dominated industry. However, there are many remaining obstacles women face in the workforce. Luckily, with the proper resources and guidance, organisations can empower women with the skillsets needed to overcome challenges and lead successful careers. One such tool is mentorship.

A mentor is someone who usually has either a similar profession or background and who can offer their wisdom and share their experience with the mentee to help conquer obstacles and make important career choices. The right mentor can even be a door opener and a long-term point of reference to confide in during the journey.

The impact of mentorship on career satisfaction is striking: 40% of women cite lack of mentorship as one of the biggest challenges in the tech industry, alongside a lack of female role models and opportunities for advancement.

As the Chief of Staff and SVP of Business Operations at Acronis, I am proud to see first-hand the role mentorship plays in inspiring and educating women in the tech industry. We have officially launched our own mentorship programme, with already 50+ mentees involved across the world.

Our mentorship programme is part of the #CyberWomen initiative which is targeted to identify, educate, inspire, and coach the next generation of female leaders. We identified 50 high-potential women, selected through our performance review process, to be mentored by 40 of our senior leaders, executives, board members and advisors. Our mentees are fortune enough to receive guidance from accomplished industry leaders like our

To make it a successful mentorship programme, the organisation must ensure employees have the time and resources to be able to connect with these potential mentors on a consistent and private basis

Chairman and former CEO of VMware Paul Maritz, Acronis Board Member and former CMO of Palo Alto Networks René Bonvanie, and former Vice-Chancellor of Germany Philipp Rösler, who is one of our Advisors, among several other senior executives.

Mentoring meetings are happening monthly, and we started with internal training on what mentoring is about, the role of mentor and mentee, and how to start. It's essential to agree on the goal of mentoring for each mentee, and we mainly focus on developing soft skills and support with career progression. I, myself, currently have two mentees at Acronis. I enjoy our sessions very much and am happy and satisfied when I can give support to my female colleagues. This support can be around understanding themselves better, planning their next career steps, achieving more in their current roles, navigating difficult situations, networking better internally and externally, or balancing professional goals and personal plans like marriage and children. Mentorship sessions also are beneficial for mentors. I am continuously learning from my mentees and using this knowledge in many aspects of my work.

There is also an evident demand for mentors—when the mentorship programme was first announced at Acronis, my inbox was immediately inundated with supportive women eager to join the programme. Leaders looking to implement mentorship opportunities for women can – and should – start by looking within their organisation for potential mentors. This is not to offset all mentor responsibilities on individual employees, but having female supervisors and executive women available to provide direction and help navigate the corporate world can go a long way. These one-on-one relationships are essential to help professionals develop the proper networking and interpersonal skills, including self-preservation, self-care, and improved confidence in the workplace.

To make it a successful mentorship programme, the organisation must ensure employees have the time and resources to be able to connect with these potential mentors on a consistent and private basis. These mentored employees can go on to become mentors themselves later on in their careers, helping strengthen the bond and sense of community in the workplace between women and those from various backgrounds. Studies have even shown that employees with mentors are promoted up to five times more often than their non-mentored peers, with mentors being promoted up to six times more than their peers.

With consistent mentoring, women from all backgrounds and walks of life can thrive in their careers and inspire a stronger, more confident future generation of women to join the technology sector which will benefit both the market and individuals in the long run. My personal experiences in this field have only inspired me to continue pushing for mentorship initiatives in Acronis and spreading the word about the benefits of professional mentoring.

Shifting the needle on gender diversity in the technology industry

The tech industry is male-dominated, and it may remain this way for a while. But we do have the power to change things.

BY HAYATH HUSSEIN, CHIEF OPERATING OFFICER AT COM LAUDE

MANY OF THE WORLD'S biggest tech firms are still facing a dearth of female talent. According to the World Economic Forum Global Gender Gap Report 2021, women make up just 14% of the workforce in cloud computing, 20% in engineering, and 32% in data and AI. Despite widely publicised efforts to redress this imbalance, Deloitte Global predicts that large global technology firms will still only reach nearly 33% overall female representation in their workforce this year – up by just over 2% when compared with 2019 levels. Moving the needle is difficult and progress has been notoriously slow.

This lack of diversity hampers the sector. In an industry driven by innovation, diversity is critical to ensure that ideas are challenged and disruptive concepts continue to come to the fore.
Young people still see the technology industry as better suited for men and many don't think women can do certain roles, like being engineers. Those archaic ways of thinking are engraved from a young age and often start in school. But a lot can be done to encourage girls to consider IT or technology as their career path when choosing their GCSEs or A-Levels. If this mindset is not rectified, the industry will suffer and miss out on thousands of talented women.

Below we explore what can be done to shift the needle and increase the number of women seeking

to pursue, enjoy and sustain an IT career.

Inclusivity starts in early education:
It takes time but it's important to focus on the next generation and ensure a level playing field for their career aspirations. That starts with encouraging girls at school to consider studying STEM subjects and pointing them towards female role models within tech. Creating opportunities for girls to engage with the industry very early in school and letting them know they can pursue technical careers is very much the first step.

Women often have this fear that they're not good enough. Giving women the opportunity to learn, fail and stand up again and move on at an early age is key to instilling confidence. By encouraging them to give it a try we can often be amazed by what young people can do if somebody believes in them.

Breaking down the barriers in recruitment:
More women are entering the technology industry, but it's still not where we want it to be and there's more that can be done. Recruitment is vital to helping more women see themselves in roles they might not have previously considered. Job descriptions may be one of the issues that turn many women away. Perhaps a frightening statistic is that most women won't apply to a job unless they meet 100% of the requirements, whereas men typically apply when they meet just 60%.

Managers have a responsibility to make tech more accessible and write inclusive job descriptions that avoid jargon and gendered language. Make them simple and avoid writing a wish list – include only what's needed for the role because women do rule themselves out more often. In addition, highlight the learning and development opportunities available to prospects to make them feel valued and invested in long term.

Getting started:
For anyone that enjoys working with people and processes, or is intrigued by new and highly disruptive markets, tech could be a worthwhile career. You don't need to be an expert; everything can be learnt. You may start at the bottom, but there is huge potential to grow and work your way up the ladder.

Women need to believe in themselves and have confidence in their abilities – this is what has allowed me to get where I am today. In the early days, there were of course challenges but crucial to success is learning from your mistakes to grow as a professional.

The business responsibility:
Businesses need to look at the structure of their teams and evaluate how many women are in leadership roles. This is critical to fostering a diverse and inclusive workforce. Having women in senior leadership positions can encourage more women into tech roles. If you don't see someone like you in a leadership position, then you might think this isn't your world. Supporting this with giving girls the opportunity to shine and helping them to learn and grow is key.

In addition, when a job becomes available, businesses must expose the role to everybody. Companies need to recognise that talent can also move within the organisation. Some companies are very rigid in structure and firms need to be open-minded to saying that someone in finance, for example, could move into operations. Paths into technology are not always linear; businesses have a responsibility to make this known to break down the barriers to entry.

The tech industry is male-dominated, and it may remain this way for a while. But we do have the power to change things. As a woman, it's taken me fifteen years to be recognised as being good at what I do. However, I was given the chance, to prove myself and I delivered. It's now up to all of us to give women and girls a chance and encourage them by providing a platform for them to shine.

More women are entering the technology industry, but it's still not where we want it to be and there's more that can be done. Recruitment is vital to helping more women see themselves in roles they might not have previously considered. Job descriptions may be one of the issues that turn many women away

5G and ‘net-zero’, the journey ahead to sustainable business

New technologies such as 5G offer new opportunities for operators to shed their legacy networks and ways of working, replacing them with more efficient, cost effective and greener 5G network infrastructure.

BY MARC SERRA, CHIEF MARKETING OFFICER AND CORPORATE DEVELOPMENT OFFICER, INFOVISTA

CONSUMER PRESSURE regarding sustainability in the telco sector has been focused, until relatively recently, on handsets rather than networks. A similar pressure has been on host providers such as AWS and Goggle. Things are changing though. Consumers (and investors) are finally beginning to look more closely at the green credentials of network operators, their infrastructure, and operations.

MNOs (Mobile Network Operators) are not blind to this shift in focus. According to the GSMA’s 2021 Mobile Industry Impact Report on Sustainability, at the end of 2020, 69% of operators (by connections) had disclosed their climate impact, and 31% of operators had set carbon reduction targets of achieving net-zero by 2050 or earlier.

These ambitious sustainability targets are balanced against ongoing ambitious targets for growth and focus on the bottom line, which for most MNOs includes the imminent and widespread deployment of 5G networks. However, according to technology analyst ABI Research, 5G could increase operators’ power consumption by as much as 61 times between 2020 to 2030, with more complex networks, more powerful network elements, and more traffic all contributing to this surge in demand.

With soaring energy costs, bringing power consumption into ever sharper focus, operators are faced with an indisputable business need to address how they design, optimize and power these new 5G networks – so much so in fact, that operators are now publicly cautioning that increased energy costs could cause 5G investment to be delayed.
But what practical and tangible steps can they take now to ensure 5G deployments are made with a view to sustainability and green credentials?

1. Buy renewable energy

An attractive and obvious short-cut on the route to sustainability for many MNOs is pledging to buy renewable energy. Indeed, a growing number of MNOs and other large power-hungry organizations are already looking at renewables. For instance, Vodafone is targeting net-zero across all of its operations by 2030, and has committed to purchasing 100% of its electricity from fully renewable sources.

Power consumption for Vodafone and other operators leading the renewable charge, such as Verizon and AT&T, is going up as a result of 5G but, with this move, their overall carbon footprints will be stepping in the opposite direction. This transition will further the cause of renewable energy providers - helping them to build scale and lower the cost of renewables for all.

Buying 'green' energy is a great first step, but is only one piece of the puzzle. There is still a lot of uncertainty surrounding the reliability, scalability and long-term cost of renewable energy, and operators cannot afford to put all of their eggs in one basket.

2. Focus on the plan

"Fail to plan, plan to fail," or so the saying goes. Network planning is more important today than ever. MNOs will spend $1.1 trillion on CAPEX between 2020 and 2025, with more than three quarters of it 5G-related according to the GSMA.

The complexity and CAPEX cost of 5G roll-out makes accuracy even more important than ever. Where and when are the 5G services required most? What new infrastructure will be required, and what can be overlaid with 5G?

Recent research by Mobile Experts calculated that an improvement in RAN planning accuracy can increase an operator's capacity by as much as 24%, without any increase in the number of radios or antennas. This not only enables operators to defer capacity investments (which in itself could save a nationwide US mobile operator $2 billion over a 10-year period), but it means they can get more out of the 5G infrastructure they already have.

The new business models and revenue streams that are opened up by 5G mean network planning can no longer siloed from the business. New ways of working, where tech and business teams work together, off the same data, to make smarter decisions not only makes for smarter CAPEX decision-making and optimized return of investment by ensuring the right infrastructure is deployed in the right place. It also means they can also save on the carbon footprint of unnecessary macro and small cells when delivering a 5G experience that will still deliver a compelling customer experience. Smarter planning and optimized networks are both good business and eco-sense.

3. Embrace AI

According to a GSMAi-Nokia survey, 78% of communication service providers see AI as very or extremely effective at delivering energy-efficiency improvements. Indeed, it's already being cited in operators' annual reports as a key tool in their armory for optimizing their energy use.

Data-powered efficient energy management will play an important role in 5G network operations. Management is applied to the entire network, including energy transmission from the supplier, the base station sites themselves e.g. cooling, heating and lighting, the power supplies for network elements and mobile data transmission. According to Nokia, AI-based energy management automation can reduce energy costs and carbon footprint by 30% with no negative impact on performance or end customer experience.

AI also enables operators to streamline and optimize outdated processes. Take drive-testing, that unglamorous but nevertheless critical routine of physically driving around the network and testing that the experience being promised is the one being delivered. Big network vendors like Nokia are now using AI-driven technology to predict where to drive and what tests to perform, removing trial and error and saving unnecessary driving and pollution. It also significantly impacts the time to market and efficiency of their network deployments, accelerating 5G roll-outs and helping operators reduce their time to revenue. Once again, the drive towards net-zero and an improved ROI go hand-in-hand.

4. Sail towards the sunset!

The pace of roll-out of 5G networks is accelerating, and with it comes the ability to sunset older, more inefficient technologies. According to the latest information collected by the GSA about the switch-off of 2G and 3G around the world, more than 135 operators have already either completed, planned or are in progress with 2G and 3G technology transitions in 68 countries and territories.

With this comes a further sustainability dividend. Not only are operators spared from having to power multiple networks across multiple iterations of technology, but they can sunset networks which are, by today's modern standards, power hungry. In many cases 3G networks can be as much as 70% less energy efficient than 4G equivalents, meaning there are significant financial and environmental savings to be made in their removal.

Sustainability is a business imperative

What's clear is that sustainability has very real business drivers – customers demand it, investors expect it, and the costs of failing to build a net-zero business make it a business imperative.

New technologies such as 5G offer new opportunities for operators to shed their legacy networks and ways of working, replacing them with more efficient, cost effective and greener 5G network infrastructure.

The ROI is significant – more efficient energy consumption means lower power bills; more accurate planning translates into CAPEX and OPEX savings and happier customers with lower churn; and modern ways of working, with AI-driven processes, mean not just better decision-making, but being able to optimize the whole value chain and share the net-zero benefits more widely.

the shift to 5G: Adapting to achieve network success

A highly secured, reliable network is no longer a nice to have for enterprises of any size. Prioritising the rapid deployment of products and platforms in an agile manner must be the focus for all businesses, and that's something traditional network infrastructure can no longer keep up with in today's fast-moving market.

BY DARREN PARKES, KYNDRYL

WITH OPERATIONAL COSTS on the up, along with a greater application pace, increasing data volumes and growing user requirements, more and more industries are looking to private wireless networks as an alternative option, to help them keep up with demand.

In fact, a recent report from global technology intelligence firm ABI Research showed that the overall market for private networks within enterprise industry segments, will reach $109 billion by 2030.

What is a private network?

As it sounds, it is a network built on spectrum frequencies reserved exclusively for a customer environment. That spectrum is different from the frequencies controlled by commercial mobile network operators and going alone gives companies the control they need to adapt their network for their individual uses.

While enterprise private wireless networks have traditionally used wi-fi technology, which has its limitations, recent regulatory changes have opened access to new spectrum frequencies, meaning private LTE and 5G is a possibility. This opens up much larger windows of opportunity.

Cellular technology, by design, is better at supporting IoT and artificial intelligence in strategic

indoor and outdoor operations. It can be deployed in standalone or hybrid models and incorporate technologies like multi-access edge computing to support low-latency applications.

Regaining control

Reliability isn't the only benefit. Private networks also allow businesses increased control thanks to an independence from traditional service providers — and there are a number of ways that this plays out. Private networks provide businesses with total control over managing network throughput and bandwidth, determining what gets to connect to the network and how. Managers can even set the usage policies around what a device can access once it's on the network and tap into optimised spectrum bands to access broad coverage across indoor and outdoor environments.

While wi-fi can have black spots in big spaces with high ceilings or outside, private 5G networks can virtually guarantee blanket coverage across the whole site without any dropouts, from only a handful of base station antennas.

Staying secure

Blanket coverage is vital for companies who rely on connectivity to keep their business running, both safely and effectively. Whether it's ensuring a seamless performance for things like driverless vehicles in factories or warehouses, or the high bandwidth, low latency connectivity that's needed for augmented reality and video analytics — private networks can help avoid unnecessary downtime that can have both cost implications for companies and impact the wellbeing of staff.

Private networks also allow companies to apply more advanced security measures, including SIM-based authentication, strong air interface ciphering, and security at equipment, user, data and network levels. This means you can allocate different security roles to devices, depending on the provided wireless identity, which makes it really easy to manage.

Not only this, but the total cost of ownership (TCO) compared to traditional Wi-Fi is considerably lower, giving companies the ability to prioritise operational costs after the initial outlay.

Approaching the edge

We've only just scratched the surface of the benefits that the wider adoption of private 5G networks will bring. As the technology transitions from niche to more general use, it unlocks the use of edge computing as a third landing zone for data, beyond on-prem or cloud — revolutionising how businesses think data can or should be worked with.

Edge is not new, but the increasing uptake of private 5G will propel its usage to new levels of adoption, in industries we haven't yet seen it widely used. For example, in retail, edge could reduce the amount of data needing to be backhauled and processed, giving breathing space in the infrastructure for new, richer applications, or pared away to reduce costs. Financial institutions, meanwhile, will see a transformative effect on security postures thanks to edge, by reducing the need to move highly-sensitive data out of the systems which produced it.

While some of the benefits can be predicted, it is important to remember that the emergence of edge as the third landing zone is a significant new territory to explore, in which, all of the possibilities are not yet known. Still, the adoption of private networks will be a key enabler for this enhancement, and as businesses consider taking a step forward in their networking potential, they should also think proactively about the impact of edge and how they stand to benefit from it.

A complex process

While all the benefits of a private wireless network might sound hugely appealing to companies on paper, the nitty gritty of the deployment details can cause discouragement. To ensure the process goes smoothly, businesses need to understand the spectrum they are going to use and match it to the technology they're going to deploy.

Once the spectrum has been acquired — which often comes with its own challenges —networks must be deployed to fit the specific use cases for that working environment. Every environment is unique, and there needs to be considerations for connecting to local area networks, wide area networks, and the public cloud so data can be transferred or analysed.

Whilst implementation might not be the most straightforward process, once the network is up and running, it can be nothing short of transformational – leaving a business wide open to the new opportunities that improved stability and greater agility will bring.

Embracing the amalgam can unlock your advanced wireless journey

Despite the transformational benefits of private networks, the reality is, it's not a one-size-fits-all approach. Just as demonstrated above, there are going to be challenges associated with any connectivity solution – Wi-Fi isn't obsolete yet.

For some customers, Wi-Fi networks are still the answer and will be their solution of choice for years to come. In fact, in future, we're expecting to see huge developments in advanced wireless technologies such as Wi-Fi 6, and even customers adopting a hybrid 5G/wireless technology approach to connectivity. It really comes down to the unique needs and priorities of each customer. What is important is staying open to interweaving technologies and the consideration of embracing a hybrid approach to the wireless journey, to truly deliver on customer ambitions.

Unleashing 5G core: overcoming the barriers of decryption and data visibility

The rollout of next generation network connectivity is always a source of excitement for businesses and users alike, introducing us to heighted capabilities and conveniences. 3G technology brought us new levels of connectivity when on the move, then 4G arrived to greatly improve our connection speeds. Now we have 5G, and 6G is already being discussed.

BY ROB POCOCK, TECHNICAL DIRECTOR, RED HELIX

5G IS SET to provide even more opportunities for users through enhanced mobile broadband offerings, the reality of massive Machine Type Communications (mMTC) and ultra-reliable low latency communications. This offers a breadth of new possibilities from industrial automation to self-driving vehicles and connecting a network of IoT devices with ease.

However, for businesses and users to reap the true benefits of 5G, operators and those delivering the service have some fundamental challenges to overcome. 5G rollouts are already behind where they need to be, due to delays caused by the pandemic, skills shortages, and a lack of resources, such as silicon chips, causing extended delivery times – not to mention the phasing out of Huawei. These delays are now being exacerbated by the fact that control plane data in the 5G core requires higher levels of encryption due to new security risks brought about by the growth in use cases for 5G.

Legislation requires that data be encrypted on the control plane using the latest version of transport layer security _ TLS1.3. However, this is harder to decrypt, meaning operators have to either sacrifice visibility or commit to testing using unencrypted data – with many holding back on introducing this strong new encryption standard. On top of this, capacity remains largely untested, as the expansion and

adaptation of new devices that could use 5G hasn't existed before. This means there is no model to follow, leaving operators in the dark when it comes to knowing how robust and reliable their network really is. Instead of offering customers untold opportunities to scale through 5G and beyond, they could leave them with ineffective solutions and highly vulnerable to cyberattack.

The impact of 5G delays

5G is set to revolutionise the way we connect. Not only is it faster, with speeds projected to be upwards of 100 times quicker than that of 4G, but it also offers low latency and high bandwidths, allowing applications and communications running on 5G networks to share data in near real-time – holding huge potential for the Internet of Things (IoT) and automation, and acting as a driving force for the Fourth Industrial Revolution.

Yet, with such prominent implications, delays to the implementation of 5G hold severe consequences. In a report from the Centre for Policy Studies (CPS) it was found that a potential £34.1bn of additional economic output could be created if the government delivers its 5G target of covering the majority of the population by 2027. But the key to achieving this is speed, with networks built faster leading to higher regional gains, and there are concerns around whether the UK will be able to meet these deadlines.

If these targets aren't met, not only do we face the potential of missing out on this huge economic boost, but we also risk dampening the UK's position as a world leader in connectivity. A large part of those concerns came from delays caused by the COVID-19 pandemic, which of course had huge ramifications for numerous industries across the board and was responsible for a great deal of disruption.

On top of this, while trying to make their recovery, network operators are now being faced with new challenges posed by legislation around the security of data exchanged across the network. With various mission-critical use cases, security for 5G needs to be tighter, leading to a global mandate for the 5G core to use the newest and highest level of control plane encryption and privacy, TLS 1.3.

What TLS 1.3 means for network operators TLS 1.3 and PFS (perfect forward secrecy) is a major improvement on its predecessor, TLS 1.2, offering increased performance and security. It brings about faster handshakes between client and server, improved latency times, and removes several security vulnerabilities found in the previous version. The issue for network operators, however, is that TLS 1.3 also poses several new decryption challenges.

Due to its high-speed, low-latency infrastructure, inline passive devices can no longer be used to efficiently decrypt network traffic visibility at the control plane. Additionally, with the higher levels of encryption and PFS, passive inspection monitoring is no longer a viable option for TLS 1.3. This has meant that network operators are left with limited options, to either down-rev the TLS 1.3 standard protocol to allow for network visibility but expose the network to security risks, or to implement TLS 1.3 encryption but sacrifice the ability to inspect and monitor traffic. Alternatively, they can implement complex measures into the service mesh, but this brings its own complications and security issues.

To be able to keep up with demand and achieve the targets set by the UK government, network operators need a more robust solution that will enable acceptance of modern TLS 1.3 encryption, yet still grants the carrier visibility over their network for security, inspection, and monitoring purposes.

Breaking down the decryption barrier: introducing SKI

In order to bypass the additional challenges to 5G rollout brought on by the TLS 1.3 standard protocol, network operators need a pure-play decryption solution that will show complete details of traffic without security risks. In its 2019 workshop on enterprise visibility, the Center for Cybersecurity Policy and Law set a baseline criteria for the acceptability of solutions for visibility challenges.

In keeping with these criteria, any proposed solution to the challenges associated with TLS 1.3 must be scalable, relatively easy to implement/deploy, usable in real time and post-packet capture, effective for both security and troubleshooting purposes, and widely available and supported in mainstream commercial products and services.

Such a solution exists in Session Key Intercept (SKI). It builds on the previous concept of Keylogging, the basic idea of getting and using keys to decrypt sessions and makes it a viable solution for scaled and secure mission-critical use. SKI works by extracting the individual TLS session encryption keys developed during the handshake and using these to bulk decrypt the communication – discarding them after use. Once these keys become accessible, then bulk, fast, and low CPU power decryption is achievable.

The solution plugs into existing tools already in use and works in any environment where TLS encryption is used, providing a plug-and-play style solution to network operators which allows them to bypass the complexities of trying to decrypt traffic using a native service mesh technology.

By implementing SKI, network operators can break down the barriers of TLS 1.3 decryption and keep full visibility over their networks, which will allow them to accelerate the roll out of 5G without sacrificing security or the ability to inspect and monitor traffic.

The future of private 5G networks in the corporate world

With economic dependence on the fourth industrial revolution mounting, globally, there has never been such high demand for connectivity. But what role will 5G play, and where is there still work to be done if the technology is to reap the benefits businesses truly need?

BY TIM MERCER, CEO OF DISRUPTIVE TECH FIRM VAPOUR, EXPLORES.

WE LIVE AND WORK in a world hungry for collaboration, agility, and connectedness. Society – especially within the Generation Z demographic – vocally pushes back against obstacles that restrict our productivity, flexibility, and security. And with the pace of change seemingly showing no sign of slowing, the expectations we place on our data, devices, and apps, are greater than they've ever been.

It's therefore no surprise that 5G is such a hot topic. Telcos are promising the public that big changes will come with ongoing 5G advancements, and there are already signs that this is true. Smart cities are no longer a pipe dream, for example, with the technology powering everything from streetlights to air quality monitoring. And augmented reality and IoT innovations are thriving because of 5G's ultra-low latency, with use cases springing up in agriculture, utilities, motoring, healthcare, and manufacturing – to name just a few.

People have faster access to the applications they want to use, on a network's edge, and open RAN (Radio Access Network) functionality means device connectivity is unparalleled. As the Ofcom website conveys – more data, more devices, instant response.

This next-generation wireless technology certainly has the potential to transform how we live, work, and play. But 5G is not yet foolproof, and perceiving the tech as a quick fix in the world of corporate networks, would be naïve.

Carrier upgrades

As it stands, some carriers don't yet have the capacity required to carry all the 5G traffic.

Significant back-end network upgrades have been required – mammoth projects which some operators have completed, yet others haven't.

Consequently, earlier this year, Ofcom hit the headlines when it announced a consultation into plans to relax spectrum band criteria in a bid to accelerate the 5G roll out and uptake.
With only a limited amount of spectrum available, the proposal centred around allowing Vodafone and O2 to reuse 4G frequencies for 5G. Now, admittedly Ofcom has a job to do, to help the UK become a world-leader in 5G provision, and with the demand for 5G services evident, permitting the use of existing infrastructure and spectrum sharing does make sense. But the news was understandably met with some controversy, not least because EE and Three paid significantly more for their 5G spectrum than Vodafone and O2, during the 2021 auction. How Ofcom's stance on this pans out longer term, is yet to be determined, but it seems that agility and adaptability surrounding spectrum usage is required, if the benefits of 5G are to be truly maximised.

Security concerns

As with many technological advancements in recent years, innovation and accelerated tech adoption does bring about heightened security risks.
Take the hybrid working step-change, for example. Millions of people have proven that they can work effectively irrespective of their location, resulting in benefits to organisations and society alike. But what many business leaders – and in some instances their technical teams – still fail to realise, is that this shift has opened up phenomenal security concerns. Others have acknowledged the flaws, but have not yet implemented resolutions, as typically the security focus lies at a network's edge, as opposed to it being in-built, by design, at the network's core. This is of course a topic all of its own, but the point to be made is that even the most progressive, technologically-driven change can still cause adverse security challenges. Back to 5G, and we must therefore remember how complex network traffic – not to mention network threats – can be. As a result, security considerations in this respect, also need to be made at the core, not just the edge.

The role of private 5G networks

Organisations are rightfully hungry for 5G – especially in rural locations and/or on temporary sites such as those in the construction industry, where flexibility and speed to deployment is critical. But while 5G sims present an attractive connectivity option – whether as a primary or back-up service – companies would be foolish to throw all their data over a public 5G network, both for security and traffic visibility reasons. The technology still needs to be run in the right way, if it is to function as a resilient business solution.

It might be used as a failover, for instance, if a leased line service was to go down. But you can't just put a 5G sim in and expect it to work. What happens to traffic visibility? And who will manage, control, look after and monitor the technology, if it sits outside of the corporate estate?

As with many technological advancements in recent years, innovation and accelerated tech adoption does bring about heightened security risks

5G connectivity in the corporate world needs to be rolled out as a considered part of a private network strategy, especially if it will be relied upon by 'mission-critical' applications.

An IT director buying multiple sims and routing them via VPN into a network is one option, but this isn't ideal as the service isn't managed. Think about what happens if leased line connectivity goes off – a business wouldn't go straight to the carrier as they'd get no help. It should be no different with 5G.

The dream is to partner with a private network specialist that can themselves interconnect directly into a 5G provider – ideally one with multiple carrier relationships so that usage is flexible depending on coverage performance in any given area. That interconnect brings the mobile network into an SD-WAN infrastructure, which then provides the same traffic visibility – in terms of data usage, application management and threat analysis – as traditional network connectivity. It also gives the SIM a static IP address. Put a proactive application monitoring solution at the heart of it all – even better.

This way, whether connectivity is delivered via the ground or air, the network's resilience, intelligence, and SLAs, remain the same.

The future is bright

The worry is that 5G sims might currently feel like an easy 'plug and go' option, just like domestic broadband routers did many years ago. But this was a residential product that organisations tried to hijack for the corporate world, before learning they weren't built for this reason, and would therefore fall over. We can't let history repeat itself.

The future of 5G is very bright, and with time it will form a critical and scalable 'co-pilot' when it comes to driving traffic, automation, and innovation that risks being stifled by existing network limitations. However, for businesses to achieve the speed, flexibility, and security performance they really need – indoors and outdoors – there's still work to be done.

The DCA Workforce Capability and Development SIG

BY STEVE HONE DCA CEO

AS THE TRADE ASSOCIATION to the Data Centre sector The DCA understands that it is imperative that key issues affecting the sector have a point of focus. The DCA SIG's (Special Interest Groups) / Working Groups regularly come together over shared interests to discuss issues, resolve problems and make recommendations.

Outcomes result in best practice guides, collaboration between group members, participation in research projects, this includes clarification and guidance for decision and policy makers. Members find these groups are a great way to ensure their opinions and views are considered in a positive and cooperative environment.

The DCA currently facilitates nine Special Interest or Working Groups. DCA members (non-members are allowed at the discretion of the Chair) can join any of the groups and contribute, find out more here: https://dca-global.org/groups

The DCA Workforce Capability & Development SIG is co-chaired by Steve Bowes-Phipps PTS Consulting / DCA Advisory Board and supported by Adelle Desouza Higher Hire / DCA Advisory Board.

About the SIG

As reliance on digital services continues to grow our industry needs to become far more effective at promoting Data Centres as a career destination.

It is simply not just engineers at the coal face which are needed but a talent pool across the full supply chain; if we are to stand any chance of having the resources needed to match future demand in our sector.

The DCA's Workforce Capability & Development Special Interest Group was formed to provide a collaborative forum for the exchange of ideas and strategies on how the data centre sector can broaden its appeal and attract the skill set it needs.

It you would like to contribute by becoming a part of this Group please get in contact.

To request to join this group please contact the DCA - mss@dca-global.org

What role does talent play when it comes to building a sustainable data centre industry?

ADELLE DESOUZA – DCA ADVISORY BOARD MEMBER AND HIREHIGHER

ATTENDING The DCA's Datacentre Transformation Conference was a breath of fresh air (excuse the environmental pun). Not only was it 'in-person' but the desire for the industry to evolve was palpable amongst the delegation. Industry professionals gathered with like-minded academics and local students to discuss, debate and deliberate on what change the UK data centre industry must undergo to future proof itself.

Sustainability was on everyone's minds and this was reflected within the programme. From open discussions on the measures organisations could adopt to debating whether the government needed to step in, I am convinced it was an event that will produce change.

One area that piqued my interest was the understanding and agreement that talent had a role to play. With 85% of delegates stating that their organisation would be the perfect environment to welcome young talent - is young talent the answer to our prayers? The introduction of diversity of thought, from those with fresh ideas and a different outlook when it comes to sustainability, a generation starkly aware of our environmental commitment to the planet.

Now if the answer is yes, with less than half of the companies present offering opportunities for those in their early careers, questions quickly turned to barriers and more importantly how to overcome them.

What is preventing young people from joining the data centre industry?

One in three cite awareness as the main barrier to young people joining our industry. So the question becomes who's role is it to promote the industry. With calls for subject matter to feature within the national curriculum.

The department of education regularly engages with industry professionals and research academics to ensure a modern and relevant programme of study is available, but how often can we expect this to happen? If we are being honest with ourselves, our industry changes so much in a 5-year period.

Having said that highlighting the impact our industry has on the modern world in a classroom setting does create instant awareness, so much so that without it students who joined us just last month, only found out due to a guest lecturer on campus.

With almost every secondary school in the UK engaging with the gatsby benchmarks in line with their OFSTED assessments, could this be the way to start the revolution when it comes to careers education. If so, we must standardise our story to deliver an on-brand message to the absorbent yet inquisitive minds of the next generation.
In defining our story and what it is we want to be known for as a workplace for the future generations, we do have to look inward and ask are we realistic in our expectations? Ranging from career progression and development right through to remuneration and compensation packages.

Today's generation are facing a cost of living crisis like no others in recent times, yet more and more companies are offsetting low starting salaries for the promise of training and career progression. May I remind you of Maslow's basic hierarchy of needs, career progression promises do not pay this month's rent, and even if they did, often they do not materialise. The other factors discussed at the annual event organised by The DCA, gave weight to the role of mentoring, coaching and the prevalence of unconscious biases, of which the former gained 22% of the audience's recognition as a barrier to entry.

We need to create a sustainable recruitment and retention strategy across our industry and in doing so we will produce an industry brand reputation that is like no other. We have a USP, the daily lives of every young person in the UK today relies on the existence of our industry. Without data centres, there is no social media, no online banking, no remote learning and no streaming services. In preparing our brand for the audience we wish to attract we must act now.

Einstein famously said that the definition of insanity was doing the same thing over and over again expecting different results. Now is the time to stop just talking about the demographic disparity our industry possesses but rather to act, otherwise things will not change. The talent is out there, leaving school or graduating from university every 12 months.

So, ladies and gentlemen this is a call to arms, for all of those who are members of the Trade Association to let The DCA know if you offer early careers opportunities. You are ahead of the curve, and we want to celebrate and promote that. We have taken your feedback on board, and we will be making moves to connect with the educational institutions and sharing your vacancies to the next generation, awareness is just the beginning. Be part of the change.

Threats To The Industry – Skills Shortage Continues

BY JAMES HART, CEO AT BCS (BUSINESS CRITICAL SOLUTIONS)

AS THE total amount of data created, captured and consumed in the world is forecast to continue to increase exponentially, few would argue against the importance of the need for a secure, flexible and efficient data centre infrastructure platform to house it.

However, once again, a potential threat to the delivery of sufficient new stock is a lack of sufficiently qualified professionals available to the industry, particularly in the fields of design and build. This has been likely amplified by the effects of international lockdown on the movement of a skilled labour force to areas of demand.

In this year's BCS Summer report, which contains the views of over 3,000 senior level data centre professionals across Europe, we have sought to understand who is in short supply and what the likely impact is on the sector moving forward.

All our respondent groups are in agreement

Across all of our respondent groups there remains real concern over a skills shortage in the data centre industry. Over 90% of respondents believe that the coming year will see a decline in supply of staff, around the same amount (93%) reporting this in Winter 2020, arguably at the height of the COVID-19 crisis across Europe. To further exacerbate the problem, some 70% believe that this will be accompanied by a rise in demand for such staff. For the second survey in a row there is near universal agreement amongst our developer respondents, that the coming 12-month period will see a fall in supply of staff whilst the demand for those skill sets rises; the highest degree of assent amongst all our respondent's groups.

In addition, Design, Engineering and Construction (DEC) respondents share an almost identical response profile – a universal belief that the next year will be characterised by a fall in supply of staff whilst the demand for those skill sets rises. This reflects a hardening of attitude on this issue contrasted with the 72% reporting this just six months ago.

In contrast, colocation providers have

maintained the same level of concern since our last survey, with nearly 90% predicting increasing demand levels for skilled workers against a falling supply in the next 12 months. Integrators and carriers also expressed a similar degree of concern compared with six months ago. Where they differ is in the degree of concern with 19% of carriers couching their agreement in the strongest possible terms.

Corporate respondents also registered a higher degree of concern over a potential skills gap, albeit more muted than our supplier sections. Amongst end-users, 62% believe that rising supply of skilled staff would be met with falling demand - up from the 40% who shared this view six months ago.

So, who is in short supply?

Over the last six months, we have noted an increase in the number of respondents concerned about potential problems arising from shortages specifically amongst design professionals; from 74% to over 84%.

Within this we have seen a more pronounced rise in the number of respondents expressing their belief in the strongest terms – up from 25% to 37%. It should be noted that this level of concern is the highest we have recorded in the last six years, a period where we have seen a slow rise in the overall trend in concern amongst stakeholders in the European data centre industry.

At the build stage, the problem appears to be just as acute, with this survey registering an increase in those that both agreed and agreed strongly. Indeed, nearly 80% of the segmented supply specialists expressed their concerns that a shortage of sufficiently skilled build contractors existed, an increase on the 69% who suggested the same in the second half of 2020. According to our respondents the difficulties in sourcing operational staff are slightly less pronounced than at the design and build stages. Around three-quarters expressed their agreement when asked about the shortages of sufficiently skilled operations staff, an increase on the 69% reporting it in the previous survey.

The strength of agreement does vary amongst the groupings, albeit not as pronounced as in other categories. Perhaps not surprisingly our DEC respondents expressed their concern over skills shortages in the most robust terms, with almost universal agreement that shortages exist at both the design (98%) and build (92%) stages.

Amongst our service providers the strength of belief in design and build skill shortages is slightly less pronounced, nevertheless, over 90% of these respondents agreed that shortages are problematic.

For end-user respondents, a belief in shortages of skilled operational staff pose the biggest problem – 72% compared with just 22% for design professionals and 17% for build professionals. Many end-users adopt neutral position on these categories, perhaps not surprising given the increasing popularity of outsourcing solutions meaning many of these are not exposed to the early stages of data centre delivery and as such have limited direct experience of the problems associated with it.

The problem is widespread

In terms of job shortage concerns, there appears to be widespread agreement that these are spread across a variety of specific job roles. Indeed, most respondents identified multiple roles as areas of concern. In the construction sector almost two-thirds of respondents stated that they had experienced shortages of quantity surveyors, site managers and site engineers within the past year.

Within the operational sphere, around 70% of respondents stated that they have had direct experience of shortages amongst operations and network engineers/technicians over the last 12 months, with a slightly lower proportion – around two-thirds - seeing a shortage of infrastructure specialists over that period. Also worthy of note, Mechanical & Electrical project managers were also highlighted as an area of concern around the availability of skilled workforce – just over 60% cited shortages amongst this skill set as problematic.

What is the impact of these shortages?

The skills shortage debate is set within the context of the potential impact for the delivery of stock to the end user. Evidence from this survey suggests that these shortages have already had real consequences and directly impacted on respondents. When questioned about what impacts they had experienced because of these shortages in the past year, most respondents cited multiple factors.

The most cited impact is that these skills shortages have placed a greater workload on existing staff, nearly nine-out-of- ten cited this as the case, an uplift from the eight-out-of-ten recorded six months ago.

The shortage of staff has also inevitably led to increasing operating/labour costs recorded by 86%, a rise from the 70% who cited the same factor in

Winter 2020. Such shortages also can be seen as a contributory factor in the increasingly popularity of the use of outsourcing options, with around 60% citing it as such.

Encouragingly, it appears that fewer respondents are finding it difficult to resource existing work this year than was the case in 2020, with just over 40% stating that they had experienced difficulties in meeting deadlines or client objectives, down from 51% six months ago and some 70% who cited it as factor at the beginning of the pandemic 12 months ago.

However, the more extreme consequence of skills shortages is lost orders, with a quarter of respondents still believing that this happened, although this is a fall on the one-third identified six months ago. In addition, around a third stated that shortages had led to delays to developing new products/innovations, marginally down on the 39% recording this in our last survey, whilst the proportion that noted they had ceased offering certain products or services has fallen positively to 10% from 14%.

In conclusion, there is no doubt that the skills shortage is continuing to have a negative effect on the industry – and in my experience has been for over a decade. The question is how long it is sustainable and will the industry respond and find a solution. I hope so.

Reskilling the Data Centre Workforce

BY PETER HANNAFORD, SENIOR PARTNER, PORTMAN PARTNERS

THE DIGITAL WORLD is expanding rapidly, requiring various technology-related skills in the DC sector. Can we use a reskilling/training strategy to fill the gap?

The Global COVID-19 pandemic has increased worldwide internet traffic to record levels. As a result, in every region of the world, data center capacity is being dramatically expanded in a buildout of extraordinary proportions. In the recently published, "The people challenge: Global data center staffing forecast 2021-2025," Uptime Institute reported that as data centre capacity expands, the availability and potential lack of specialist staff will be an increasing concern for all types of data centers, from mega-growth hyperscalers to small, private enterprise facilities. As a result, we need greater investment, more training, and more creative approaches to employment.

However, they also noted that "although data center recruitment needs are expected to rise steadily to 2025, the growth in demand does not need to represent a crisis. Individual employers can take steps to address the issue, and the sector can act together to raise the profile of opportunities and improve recruitment and training."

So, in the immortal words of Lance Corporal Jones in the British sitcom Dad's Army, "Don't Panic!" Instead, we need a plan.

According to the report, data center staff requirements are predicted to grow globally from about 2.0 million full-time employee equivalents in 2019 to nearly 2.3 million in 2025. This Uptime Institute estimate covers more than 230 specialist job roles for different types and sizes of data centers, from design through operations and across all regions, primarily in the Asia-Pacific, followed by North America, Europe, the Middle East, and Africa. While this estimate of absolute growth equates to around 3% per annum, it doesn't consider the number of older, experienced employees retiring during this timescale.

The relative "newness" of the industry, given that data centres as we know them didn't really exist before the mid-1990s, means that traditional paths haven't existed as they have for other professions. Additionally, the nature of the business means that a large number of jobs in the sector demand mobility, and we really have no idea what impact AI and Machine Learning will have on certain roles, especially those in design, engineering, operations, and maintenance, so hiring people with specific skills and experience could be shortsighted.

The CV only tells you what a candidate has done, not what they are capable of doing. More critical are characteristics such as intellect, personality, and motivation. Therefore taking talent from other industries and reskilling and training them should result in more well-rounded employees who are more adaptable and able to change in a constantly moving market.

Data centres are mission-critical facilities, meaning that the applications, networks, and services they support should never fail. A datacentre with "5-nines'' availability was always considered the gold standard. That's 99.999% uptime, Or expressed another way, 001% downtime. That's five minutes each year, but no company should aim for that. "Always-on" should be the mantra. A recent Facebook outage is estimated to have cost the company $100m, and at least 80% of failures are due to human error, either in operation, design, or construction. But data centres aren't the only sector that can't tolerate failures.

Failures in the pharmaceutical or wafer fabrication process can be very costly, and failures in space exploration, aircraft navigation and operation, and nuclear industries can be fatal. Employees in these sectors are desirable candidates for recruiters in the data centre industry, and nuclear submariners are in very high demand.

Another item on the "must-have" list for recruiters is academic qualifications, as is the requirement for 'diverse' candidates, but this can present difficulties. For example, some companies are trying to attain a 50/50 gender balance, but if you're seeking qualified engineers, you have a problem in the UK, where just 11% of the UK engineering workforce are women, one of the lowest percentages in Europe.

Meanwhile, Latvia, Bulgaria, and Cyprus lead with nearly 30%, potentially influencing where European talent is employed, especially for international operators. But because diversity should not simply be a matter of ticking boxes, what's really required is a diversity of thinking – "cognitive" diversity. This type of diversity includes people with different problem-solving styles and can offer unique perspectives because they think differently. Often their viewpoints are informed by their gender, their different experiences, cultural backgrounds, and gender identities they bring to the workplace.

a hospital with an urgent requirement for a brain surgeon wouldn't hire a newer med school graduate who'd never operated before. Likewise, pilots, surgeons, and nuclear submarine captains need time and years of training before being let loose

Of course, there are some jobs where specific experience is necessary. For example, a hospital with an urgent requirement for a brain surgeon wouldn't hire a newer med school graduate who'd never operated before. Likewise, pilots, surgeons, and nuclear submarine captains need time and years of training before being let loose. Therefore, getting the right people on board first is of paramount importance – people with the right intellect, behaviours, and values who, with the appropriate reskilling and training, can fill the ever-widening gap in the industry today.

About Peter Hannaford:
Peter's career accomplishments span decades and was recognized when in 2018 he received the Datacloud Congress Lifetime Achievement Award for "outstanding achievement spanning one's entire career." Peter began his pioneering work in Nigeria in the 1970's implementing that country's first on-line banking system, and went on to develop foreign exchange systems for international banks in the 1980s.

In the 1990s, Peter started one of Europe's first datacenter construction firms and founded the company that developed the first water-cooled rack for high-density servers. The company was sold to APC in 2003 leading to APC's development of In-Row Cooling and Containment, which dominated the datacenter market in the 2000's.

In 2010 Peter founded Datacenter People, the first global recruitment firm dedicated to the datacenter sector, and, in 2018 he founded Portman Partners where he currently works. Peter's considerable personal network and reputation helps firms in the digital infrastructure space find leadership talent around the world. He was recognized again in 2019 when he was included in the Power 200 list of personalities around the world who "are leading the datacenter and cloud and sectors through charting new innovations or technological breakthroughs, investment or business acumen or exceptional entrepreneurial skill sets."

About Portman Partners:
Founded in 2018 by industry veteran and Data Center People founder Peter Hannaford, UK-based Portman Partners is a strategic advisory consultancy and the leading executive search firm working exclusively in the digital infrastructure sector. Portman works with clients to identify and place the senior-level talent needed to execute value-driven strategies in the new, accelerating digital economy covering EMEA, APAC, and North America.

For further information, visit **www.portmanpartners.com**

Ways to improve cognitive diversity within organisations

BY TERRI SIMPKIN, PORTMAN PARTNERS ASSOCIATE, ASSOCIATE PROFESSOR AND MBA DIRECTOR AT THE UNIVERSITY OF TASMANIA

INNOVATION, be it technical, system, or product, is fundamentally reliant on diversity, but diversity is not simply 'box-ticking' surface-level diversity.

Instead, it's strategically driven cognitive diversity. Cognitive diversity goes beyond the common understanding of diversity, which often drives over-indexing on recruitment of under-represented groups (e.g., getting more women in data centres). Cognitive diversity refers to the underpinning notion of diversity of thinking – different perspectives and information processing styles; how people think and make sense of their context, seeing alternatives because they view the world through a different lens.

While cognitive diversity can be related to differences in gender, social background, or age, contrary to popular belief, it's not automatically generated from or calculated by these factors.

So, for example, a product or technical team could be comprised of people from different genders and nationalities, but if they've had a similar upbringing and think in similar ways, the team may not deliver better or more creative outcomes than a team that looks, on the surface, more homogenous, but whose members come from different socio-economic backgrounds, cultures or industrial sectors, and who process information differently.

Cognitive diversity is more nuanced and complex to achieve, but research indicates it can improve outcomes where teams and individuals are charged with delivering innovative responses to new or emerging complex challenges in ambiguous circumstances. Cognitive diversity is the secret sauce that, while challenging to identify, adds that special, irreplicable zing of creativity and inspiration to a workplace.

So, if hiring more women and people from international backgrounds will not necessarily deliver cognitive diversity, what will?

First, it's important to note that the drive to populate the digital infrastructure sector with a less homogenous workforce is vitally essential for a raft of reasons. Access to talent, developing a more broadly based pool of potential employees, and generating a more inclusive culture to retain a heterogeneous workforce are all imperative to a robust, vibrant, and thriving industry. And, without a workforce population that includes different genders, cultures, socio-economic backgrounds, neurodiversity, and vocational backgrounds, cognitive diversity is less likely to be achieved. Second, while it's not easily identified from the outside, there are ways to improve cognitive diversity within organisations. It's well-documented that people often surround themselves with people who reflect their own image, which is not limited to characteristics like gender, age, or cultural background. Nor is it confined to the recruitment process.

Often people are drawn to team members who think along similar lines,

express similar views, and communicate in a similar manner. Thus, teams often find themselves unwittingly becoming more and more homogenous in their thinking, behaviours, and ways of working. Consequently, the capacity for innovation, which thrives on differences of opinion, creative disruption, and positive conflict, is diminished.

So, to diminish strongly homogenous cultures (often found in data centres, for example), organisations can recruit for differences of thinking, drawing on people from outside the usual pool of candidates. Doing so not only expands the landscape from which talented individuals can be found but offers the opportunity to invite in people who see the world and the challenges within it differently.

Moreover, as the digital infrastructure sector continues to experience labour and talent shortages as well as skills wastage, looking outside the sector for transferable capabilities brought by people from non-traditional backgrounds is one of the smartest ways to generate the capacity for innovation.

That's not the end of the story, however. It's one thing to recruit for cognitive diversity; it's another to keep those people in the business. So often, people are brought into an organisation with all the best intentions to develop a more diverse workforce, but the culture, systems, and ways of working work against the value that difference brings. Instead, people feel pressured to fit in, not make waves, work to type, and replicate the 'way we do things around here.' This implicit lack of support for diversity (in all forms, not just cognitive diversity) negates the value of alternative ideas and increases turnover risk – people leave and look elsewhere for a role where their capacities will be valued.

While different tests can offer an indication of how people think and how they might resist, tolerate or expedite change, and how creative or innovative they might be, fundamentally, leveraging the value of cognitive diversity comes down to culture and leadership. Encouraging an environment that feels safe goes beyond simple notions of diversity to true belonging and manages differences of ideas, ways of working, and a multiplicity of views is key to innovation. Leadership has been tilting toward authenticity (i.e., being human and allowing oneself to be vulnerable and authentic) for some time now. This change is welcome, but more importantly, to support creativity, diversity of thought, and innovation, leaders must create a culture of belonging and maintain systems that flex to accommodate differences and modes of operation that build trust. Most crucially, leaders must encourage their teams to bring their authentic selves and divergent ideas to work.

About Terri Simpkin

Terri Simpkin, a Portman Partners Associate and Associate Professor and MBA Director at the University of Tasmania, was named one of the 50 most influential women in the data economy. In 2020, she received the IMasons 100 Awards for her work in the digital infrastructure sector, and was awarded the Global Women in Telco and Tech's Brynn Fowler Agent of Change for her commitment to advancing diversity, equity and inclusion initiatives.

ONLINE ROUNDTABLE

Connecting Leaders & Experts in the Data Centre Field

- Based around a hot topic for your company, this 60-minute recorded, moderated zoom roundtable would be a platform for debate and discussion
- Moderated by the editor Phil Alsop, this could also include 3 speakers
- Questions would be prepared and shared in advance
- There would be an opportunity to view and edit out any unflattering bloopers

This event would be publicised for 4 weeks through all our mediums including:

- A banner on the Digitalisation World homepage for 8 weeks
- 4x weekly dedicated HTMLs
- 4x news pieces which would also appear on the weekly newsletters
- Promoted through our social media platforms for 8 weeks (pre and post event)
- Available as an on-demand asset through all mediums
- All registered attendees' details would be made available to you

Cost: £4995

DCS DATACENTRE SOLUTIONS

DEVELOPING DIGITAL INFRASTRUCTURE IN A HYBRID WORLD

Contact: Jackie Cannon
jackie.cannon@angelbc.com

ANGEL EVENTS

Should the power we seek come from within?

Onsite Power Generation, is it the end of the road for diesel generators -and if so what should be your plan (B) Be?

BY JASON KOFFLER, FOUNDER & MANAGING DIRECTOR, CRITICAL POWER SUPPLIES

DIESEL GENERATORS have played a key role in data centres up to now but is their cost now prohibitive not only in terms of fuel but also emissions? Can the power from within show the way forward?Certainly, peak demand can be offset by the new types of energy solutions coming on line.

When we start to think about powering from within, we have several choices, whether it's peak shaving with onsite energy storage, combined energy storage or energy optimisation.

Our new energy solutions should be thought of as before the meter solutions and after the meter solutions. in terms of everyday data centres we are really looking at solutions behind the meter. Applications could be focused on peak Shaving and Self-consumption optimisation. The questions we need to be looking at, are we looking for minor changes to our power use or step changes in how we use power on site? Therefore, how we integrate power creation and storage into our onsite applications.
If we were to start to factor in the government's EPC ratings for 2027 and 2030 and then look at how fines may be charged for sites, energy storage is a great answer for making our building more energy efficient and improving existing EPC RATINGS.

From 1 April 2027, the minimum required rating would rise to 'C', so landlords must have improved the building by then or have registered a valid exemption. If the building possessed a 'C' rating as of April 2025, the landlord would be compliant with the regulations.

In the second compliance window, from 2028 to 2030, a landlord would have to present a valid EPC by 1 April 2028 and from 1 April 2030, the minimum rating would rise to 'B'. If the building possessed a 'B' rating as of April 2028, the landlord would comply.

It's worthwhile considering that

Peak shaving:
Charge your batteries whenever electricity rates are low or with renewable energy and discharge to avoid paying peak prices during the most expensive times of the day.

Bristol airport is currently investigating how they can provide Electric car owners with free airport parking in return for the right to charge and discharge their car during its stay in the airport car park.

Self-consumption:
Reduce your energy bill through self-consumption. Combined with renewable energy sources this also significantly reduces your carbon footprint.

Concluding points
How to release the power instead of consuming it.

- Power monitoring and measurement.
- Identifying underutilised or idle servers.
- Deploy environmental sensors to your racks.
- Implement remote power control.
- Optimise airflow management in server cabinets.
- Remote working and the shift to the cloud.
- Release the power on-site with onsite energy creation and storage.

So, whether its Peak Shaving or Self Consumption you have the power.
www.criticalpowersupplies.co.uk

Battery technology: The backbone of modern data centres

Data is central to our modern lives, whether that is in business or personally. As a result, the reliance we put on the data centres that contain this data is increasing rapidly.

BY THOMAS VERGHESE, TECHNICAL MANAGER AT ENERSYS

AS WE BECOME more concerned about energy usage, it is important to note that data centres use around 1-1.5% of global energy[1] – and this figure will inevitably rise even though efficiency improvements mean that energy consumption is rising at a slower rate than data generation. However, managing electricity consumption is a key issue for data centre operators, to meet international guidelines and comply with their social responsibility.

Changes in Data Centres

In the face of this growth, it comes as no surprise that the structure of data centres is changing, and this is equally applicable to the Uninterruptible Power Supplies (UPS) that they rely on to address power outages. Until recently, UPS batteries were sized to give typically 10 to 15 minutes of autonomy thereby allowing enough time for generators to be brought online, or an orderly shut-down performed. However, as modern generators can be remotely or automatically operated this time has reduced to less than 5 minutes in many cases, therefore requiring less battery capacity.

Another trend that seeks to reduce energy consumption is running data centres at elevated ambient temperatures, which reduces the need for air conditioning. To achieve this, all equipment (including the servers and UPS batteries) must be capable of being reliable in these conditions.

Battery Technology

Battery technology has progressed significantly in recent years, although lead-acid remains a popular technology in data centre UPS systems. In the early days, traditional flooded lead-acid batteries were used. While effective, their operation meant over time maintenance with the topping up with water was required and due to the rate of gas emissions, high ventilation requirements were needed.

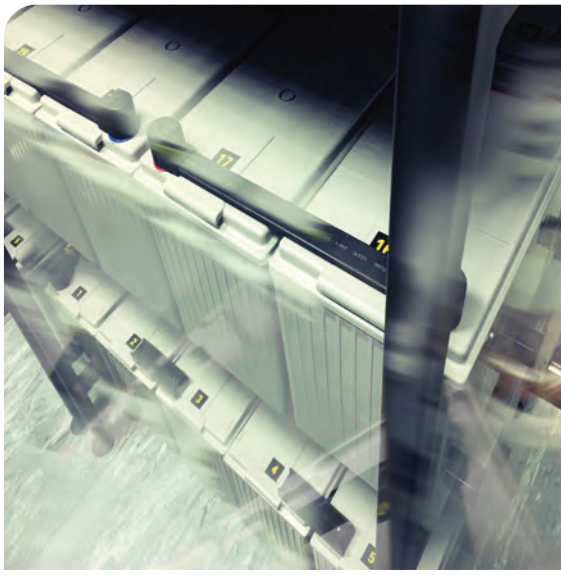
The next generation was valve-regulated lead-acid (VRLA) that immobilized the electrolyte in a gel or absorbent glass mat (AGM). This approach significantly reduced the water loss resulting in no topping up being required and a significant reduction in the ventilation requirements, thereby improving operating costs. In fact, AGM-based VRLA batteries have become very common in data centres in recent years.

AGM VRLA technology has further advanced with the advent of Thin Plate Pure Lead (TPPL) technology, which adds several significant benefits. Here, thinner grids of very high purity are utilized to form the plates, resulting in a greater contact area between the plate and the active material/electrolyte.

Benefits of TPPL Technology

As the plates in TPPL batteries are thinner, more can be stacked in the same volume. This not only boosts power density; it also ensures that TPPL batteries are faster to charge and can deal with larger current peaks.

The higher density reduces the space occupied by batteries by around 20%,



freeing up additional space for servers, thereby increasing revenue for the data centre operators.

Batteries are a significant part of data centre expenditure and all batteries have a finite life expectancy.

TPPL-based batteries have been demonstrated to have a lifespan of 8-10 years which represents a 25% increase over VRLA-type batteries. Furthermore, TPPL batteries are suited to the higher temperatures found in data centres that have reduced their air conditioning capacity to reduce energy usage. However, there is some degradation of service life due to the elevated temperatures so data centre operators should consider the best trade-off between reduced energy costs and more frequent battery replacement.

Another feature of TPPL technology is its low self-discharge characteristics that mean they can be stored for longer than traditional lead acid battery types.

Typically, a TPPL battery can be stored at 20?C for up to 2 years without needing a refresh charge.

As they exhibit high charge acceptance when compared to other lead-acid technologies (AGM, VRLA or flooded), TPPL batteries can be recharged quickly, and they are ready to respond again within a very short period. This means they can deal with situations where multiple outages could occur.

Summary

The pace of change in data centres continues to increase, fuelled by the increasing amounts of data our society is generating as well as the thirst for ever more frequent access to this data. The recent pandemic will have exacerbated this situation due to increased remote working.

Coupling this with greater instability in mains power, due to a variety of factors including increased demand and it is more important than ever before that data centre operators have access to reliable, high-performance battery technologies to support their UPS. TPPL batteries represent the latest generation of lead-acid batteries that have been used in backup applications for decades and this exciting new technology delivers many benefits that help data centre operators meet their demanding challenges.

For more information about data centre UPS batteries, please visit enersys.com

[1] Digitalization and Energy Report, International Energy Agency, November 2018.

Hillstone and the DCA

With a long history of load bank Design, Rental and UK Manufacture, Hillstone have been uniquely placed within the data centre testing industry for the past 14 years.

BY PAUL SMETHURST, MD HILLSTONE LOADBANKS

OUR ORIGINS go back over 30 years with load banks for testing batteries in the North Sea oil & gas and UK power station battery systems. These founding engineering principals have led the evolution of our data centre commissioning across the world.

From the initial rack load bank designs for BT and original heatload IST testing for Telecity in London and the BBC at Media City in Manchester, our product development and investment helped pioneered data centre commissioning, testing and UTI certifications.

Having been a member of The DCA - Data Centre Alliance since 2015, the opportunity to be part of the special interest group for a best practice guide on data centre commissioning, was a natural fit from our load bank perspective.

The responsibility of the contributors representing this Trade Association, are focused to ensure the audience benefits from the best practice guide of how to utilise design and build data points that can become part of and enhance existing metrics used in the running data centre operations. (The IEEE reference 10 relative metrics just on energy).

This has formulated the guide to consider the wider perspective from the 'design and build' process and the journey across to the operational requirements on the client side.

A key area of the guide is to include and explain the benefits of utilising 'ongoing calibration check points' for the benefit of tracking the day-to-day requirements of auditing, compliance reporting and environmental demands on today's data centres.

From the initial stage of design and build the guides focus is commissioning and is explained from the commonly used and adopted principals of 'The 5 stages of data centre commissioning from ASHRAE'. These are broken down under the sections of:

1 – Factory Acceptance Testing
2 - Component Verification
3 - Component Installation,
4 – Site Acceptance Testing
5 - Integrated System Testing

Within each of these sections the guide highlights the benefits of robust commissioning and how to utilise the obtained data from vendors and where the commissioning process needs to be benchmarked for value of datum points that will be used with ongoing calibration during the operation of the data centre.

The Data centre Alliance Special Interest Group Best Practice Guide on data centre commissioning will benefit all stakeholders when making decisions relating to operating a variable IT digital load.

https://www.hillstone.co.uk

Talent won't just come knocking – Launch of the rising star programme

When it comes to the talent shortage, the data centre industry needs to transition from talking to acting. However, there is something preventing the industry from doing so and I can't seem to put my finger on it.

BY ADELLE DESOUZA – DCA ADVISORY BOARD AND FOUNDER HIREHIGHER

We like being a well-kept secret?
I QUESTION whether we actually like being a 'well-kept secret' at an exclusive 'invite only' party or is it the fact that the 'old boys network' helps to keep our jobs safe? The cost of living is real, and we must help those who seek to get on the ladder.

I've read that in mature data centre markets, such as North America and Western Europe, much of the existing workforce is aging and many professionals expect to retire around the same time, leaving data centres with a shortfall on both headcount and experience. Our small pool of talent keeps salaries high for those of us who made the right choice all those years ago.

Maybe it's the role of the HR teams?
Does it just come down to the people and talent team – is it their remit? What will happen when you need to recruit in your own team? Many employers are simply not drafting a job description with realistic expectations, whether it's multiple years of experience required for entry-level roles, or at times arbitrary inclusions i.e., 'Degree preferred'.

We must amend our expectations when it comes to recruitment. A recent Uptime Institute report on the global data centre market, stated: 'The most successful employers in the sector take multiple steps to attract and retain top talent, including revisiting advertised job requirements, implementing training and mentoring programmes and ensuring adequate diversity efforts. I am not saying that these two suggestions are the reasons why we have failed to make progress in this space, I am merely highlighting what it could be.

Final thoughts – maybe it's just very difficult to know what to do when the problem is so widespread and multi-layered. Much like disillusioned voters wondering what difference their vote will make, it is easy to see how industry players could feel the same. Having one scheme in one company doesn't address our issue and while plausible for some to have schemes with teams and coordinators, this is not the case for all. With these issues in mind, I'd like to introduce you all to **The Rising Star Programme (RSP),** created by HireHigher and supported by The DCA. This initiative is dedicated to addressing the skills problems faced by the industry - attraction, acquisition and retention of talent. The programmes initiatives acknowledge the feedback from not only data centre professionals, but millennials and Gen-Z both from within and outside of the industry.

The Rising Star Programme recognises that change is on the horizon. The responsibility for attracting skills does not lie with one organisation, the programme requires pledged support from organisations across the industry who want to drive change and who accept action must be taken.

Find out more about **The Rising Star Programme here**

The design & build process of data centres

Currently, achieving a buildable Stage 5 design for a data centre is a convoluted process .

BY LAWRENCE HOOKER - OPERATIONS MANAGER SECTOR LEAD FOR MISSION CRITICAL, MICHAEL J LONSDALE

THIS IS DICTATED more by a demand to shift perceived contractual Risk than it is to conduct the most efficient and cost-effective development of the initial client brief. Consequently, the benefits of true collaboration utilising BIM modelling are compromised or even removed all together. The client appoints a team of consultants, engineer and architects to produce a Stage 2 then Stage 3 design. But they want to retain that team to oversee the later design development by the contracting team.

So, they then either send the Stage 3 design out to the marketplace to obtain bids from contractors or they proceed to pay their design team to develop the project to Stage 4 and then go out to the marketplace. The bidding and bid-review process will involve the raising

and resolution of various Queries and RFIs that are often relevant to the overall tender costs.

Once awarded, with either a greater or lesser quantity of outstanding queries to be resolved, the Contractor then appoints his design team who have to re-validate and repeat a fair amount of what the client's designers have already done, to satisfy their own corporate QA procedures and their Insurers in producing their own Stage 4 then Stage 5 designs. That takes time and incurs additional design fees solely to allow the contractor's designers to own the design liability.

Because the design process involves the selection of a number of criteria that have a range of acceptable values, the comparison of original design loads and duties with those resulting from the contractor's design validation is often difficult. Workshops are often required to compare base design criteria to understand the root cause of any differences.

There is still, even at this advanced stage, the risk that some fundamental question or an accumulation of lesser issues will delay the completion of the contractor's design and require resolution by referral to the original client design team. As such, both programme and costs are still not fully confirmed.

Another issue created by this protracted process is that the client's designers, wanting to incorporate a measure of flexibility for the client's requirements and because they are not expert in the detailed installation techniques, are not able to hone certain aspects of the design to minimise costs such as pipe and duct sizing.

Likewise, the design progresses to a fairly advanced stage using major equipment whose actual cost has not been benchmarked in the current market.

There seems to be a general opinion that the process described above is the best way of retaining access to a competitive contractor marketplace and thereby keeping costs down... However, in reality, this creates several significant risks.

Commercial:

- Additional design fees are incurred.
- The base client design is optimised for early-stage flexibility, not lowest build cost.
- Suppliers and manufacturers are not confirmed until the contractor's design is substantially complete.
- In the fast-changing market of current times, PQS consultants budget and costplan advice is often out of date by the time the Stage 4 design is sufficiently advanced to allow the procurement of major equipment and therefore both the contractor and client are at risk of having inadequate allowances.

Timeline:

- Additional time is required to address the contractor design team queries and to allow the contractor's designers to repeat certain elements of the design process.
- Completion of the contractor's design will affect procurement and manufacturing of equipment.
- Later completion of the contractor's design means a later date for the full confirmation of builders work openings, fire-stopping requirements, support steelwork, leave-down walls, craneage etc.

Technical:

- Late proposals by the contractor to utilise alternative manufacturers or to 'streamline' distribution systems, even if done to identify Value Engineering at the client's request, risks introducing errors in performance and material compliance.
- Acoustic modelling and CFD modelling have to be validated on the contractor's design and are therefore available later, when the resolution of any issues identified has the least amount of time available.
- The very fact that the client's design team's output is primarily to allow contractor pricing and not intended to be used to build to, introduces the risk that a level of detailed design is not undertaken until the contractor's design is underway.

In the current market, engaging contractors at the earliest opportunity significantly reduces most of the above risks and if anything, also secures firmer and more favourable pricing at a much earlier date.
https://www.michaellonsdale.com/

The NDCA project

We have some really serious challenges in the Data Centre sector, on one hand we have the growth of digital services, everything is going online, and not to forget that only half the world has access to the internet, and on the other energy security problems, and the net zero goals.

BY JOHN BOOTH, MD, NDCA

WE HAVE AN AGING WORKFORCE and as we do not have a recognised career path within the sector, in fact almost every event I've been to about this topic, has resulted in a simple fact, that most of the people "fell into" the industry. Most of them came from other sectors be they IT, HVAC or ex-military personnel.

Luckily, the UTI has recently published a career map and our goal now is to attract graduates to start in the industry, but there is still quite a major problem.

Other sectors have formal training facilities, which provide theoretical and PRACTICAL training, and all people working in that industry have to be formally accredited, think electrician, plumbers, gas fitters etc, they have to be "card carrying" to do their job, in our sector we do not do that, and we should.

The NDCA's (National Data Centre Academy's) sole role is to create a world-class purpose-built data centre training facility which will offer space where traditional classroom training can be delivered as well as providing practical DC space where that theory can really be put to the test. The facility can be utilised by not only existing training companies but also DC providers and suppliers.

The potential for this practical training facility is endless, for example it will also be used as a semi-permanent exhibition space or showroom, enabling vendors to showcase their own equipment, as an innovation, research incubator hub

or as an internal staff training resource to gain practical hands-on or VR experience without the fear of causing any damage.

With the stakes so high, most businesses simply can't afford to let staff on to the shop floor without both adequate training and practical hands-on experience, so it's no surprise that interest in this facility is so high. Let's face it you would not trust your life to a pilot who had only read an instruction manual to fly a 747 without practical experience; the NDCA offers the data centre sector with the equivalent flight simulator which airlines and the Air Traffic Control Authority trust to make sure their own staff are fit for purpose. As a visitors' centre, school pupils have the opportunity to experience what a data centre is all about and discover the mission critical role it plays in their increasingly digital world. What better way to capture the imagination of the next generation of data centre experts than to give them a peek inside what could very likely be their future career.

There is no limit to what can be achieved and by working together as we have all the tools at our fingertips to shape the data centre workforce of the future. The NDCA has recently submitted a funding request (Nov 22) to the West Midlands Combined Authority – Innovation Accelerator with its partners, DCA, Digital Birmingham, Birmingham City University and Connectium Ltd and if successful we will be opening in Q2/3 2023.

Please visit the linked in page, NDCA website or contact info@nationaldatacentre.academy for more information.

Managing energy market volatility

Highly volatile energy markets justifiably dominate the headlines and should be an area of great concern and focus for data centres.

BY BOBBY COLLINSON,MD, NOVEUS ENERGY

WHILE THE UK government's business energy support will shield some against volatile prices there is still much uncertainty beyond April 2023 when the scheme ends.

In response, Noveus Energy's Managing Director, Bobby Collinson, will be discussing how to manage market volatility utilising a dynamic approach at The DCA's latest 10x10 event in London. While here you can get a quick overview of what Bobby means by taking a dynamic approach – one that brings together risk management and energy purchasing, and proactively incorporates renewables into your strategy.

Dynamic risk management and purchasing

In my experience, data centres are looking for a clearly defined strategy and approach that delivers a competitive price and cost certainty that meets their tenants' requirements. This can be achieved with a dynamic risk management and energy purchasing strategy, which data centres are well placed to implement, and in my opinion, should be adopted as best practice.

With the current energy market fluctuations, at Noveus Energy we monitor markets daily, advising our customers when to buy and sell, including how to deal with all too often price spikes and when to switch buying tactics to take advantage of market volatility.

Described above is what we call a dynamic approach – one that delivers a lower commodity cost by maximising the benefit of market volatility and limiting the risk of buying on the wrong day when prices are artificially high.

It requires an in-depth understanding of the market, daily analysis, and ongoing adjustments to deliver a lower price than the average market, with decisions constantly reviewed.

In normal market conditions and with a dynamic approach, you can save up to 10% on energy procurement. However, you could achieve considerably more savings in the current highly volatile environment, but you must be fleet of foot – daily, weekly – as the market is changing rapidly all the time.

Renewables integral to your strategy

Across the energy market I witness many consultants adopting a static approach for their clients, where the risk and purchasing strategy is set at the beginning of a contract and is rarely – if ever – reviewed or adjusted throughout. With this approach, renewables are often viewed as a separate issue and unaligned to the energy risk management strategy. However, it is my view that renewables should be an integral part of the risk management strategy and power purchasing agreements (PPAs) and onsite renewables must be considered as a mechanism to hedge market risks and create a more balanced energy strategy for your business.

There are many PPA options available to you, including virtual, hybrid, corporate/sleeved, time-of-use and private wire arrangements, as well as the option to have renewable energy sources directly onsite – and with current market prices these offer good value at the present time.

Now is also a time when data centre tenants will be insisting on renewable power, and when reducing emissions and achieving net-zero targets are central challenges. But be aware that the renewables market is extremely fast moving, and both the cost and availability will come under pressure in the next 12-24 months.

If you would like to informally discuss any of the above, please get in touch with Bobby Collinson at Noveus Energy.