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Modern enterprise IT - from the edge to the core to the cloud

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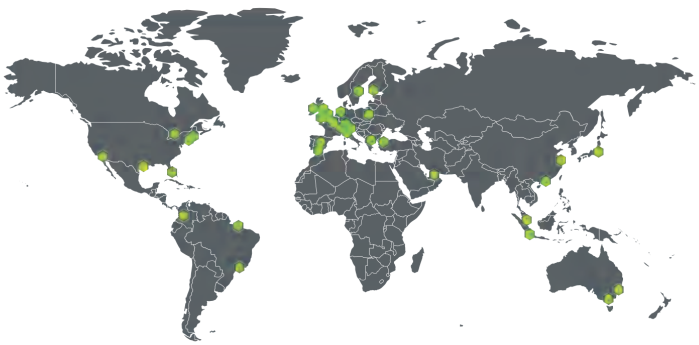

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Editor's View

By Phil Alsop

Hybrid is here to stay

WHATEVER works best for your organisation is the way forward, regardless of the political posturing.

Just as the hybrid IT model seems to be generally accepted as the way forward – a mixture of on-prem infrastructure alongside cloud and managed services and, maybe, you own data centre working alongside colo resources; so, hybrid is the way forward when it comes to the workplace. Nothing original or startling with such a conclusion but, as the should/shouldn't employees return to the office full time argument is hijacked by the extreme views that seem to enjoy sowing disagreement on so many subjects, let's examine the facts!

Before the pandemic hit, many many organisations were already restructuring to allow for more flexible working practices. The IT industry itself has for many years practised hot-desking, and, where it has led, others have followed. Additionally, if an employee had to put together an important report, presentation, document for a tight deadline, they would often work from home, where they could guarantee undisturbed, productive time.

We have had the BYOD revolution, where employees bring their own technology into the office and expect to be allowed to use it. Travelling employees are expected to be productive whilst on the train, or waiting for a flight at the airport.

Enter the pandemic, and the physical workplace was, for many, closed down. Homeworking became the norm. For those with plenty of space (and no children or animals to distract!!) a refreshing change – at least for a while. For those stuck in a small flat with three others, sharing a dodgy wi-fi connection and perching on the end of a bed, not so great.

Fast forward to the present, and the pandemic-induced work practices are now, apparently, up for grabs. Almost certainly, there are no hard or fast answers. So, when you hear companies say that office-based working is much better than homeworking, full stop; or the reverse view

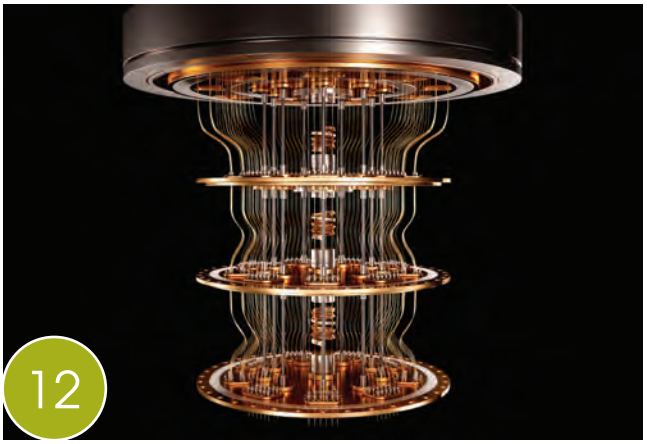
– why would anyone ever want to go back to the office? – then it would seem that one of the valuable lessons of the pandemic has not been learnt. A flexible, hybrid model has to make sense for the future. A model which takes account of the needs of both the business and of the employees.

Likely, this will involve an overall strategy which embraces the hybrid model, which is then implemented by discussing with each employee (yes, each and everyone) what is non-negotiable and what can be flexible. And for those companies serious about sustainability, there's the environmental angle to be considered as well.

Despite my earlier advice about there being no hard or fast answers, I would suggest that all organisations do face a somewhat binary choice. Do they wish to turn the clock back to a time before the pandemic (or maybe even further back, to a time before IT?!), or embrace the disruptive, hybrid, but exciting future? A future where, just as they choose the best possible location for any particular application to run – on-prem, colo, cloud etc. – so they should be choosing the best possible location from which their employees can work.

Contents

ISSUE V 2021



The data centre trade association

DCA News

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IT teams play a key role when it comes to going green

80% BELIEVE that sustainability is important to the business agenda. Research from Paessler AG, the IT monitoring specialist, highlights attitudes towards sustainability in IT departments across the globe and reveals the important part that IT can play in the move to go green.
Energy efficiency, sustainability and environmental concerns are high on the agenda for IT teams. In fact, eight in 10 (80%) of respondents agree that sustainability is either very or quite important to their overall business agenda.

Out of those surveyed, the top three countries that ranked the highest when it comes to sustainability being very important to their business agenda are:

- France (40%)
- Canada (39%)
- The UK and USA ranked joint third (37%)

IT teams working in manufacturing are the most aware of how important sustainability is to their business (71%) in comparison to other industries. Those working in finance and financial services (55%), government and education (41%) ranked second and joint third in the research.

When asked about where IT can have the biggest impact when it comes to making businesses more environmentally friendly, the top three responses by IT teams around the world are:

- Only using the necessary hardware (45%)
- Using smart building technology (i.e. IoT devices and sensors) to reduce energy usage (39%)
- Moving to the cloud and using renewable energy providers (39%) ranked joint third

Over a third (37%) of IT teams said that they have already started to make changes when asked about whether they had begun to implement new sustainable IT strategies into the business. While it is encouraging to see some companies making an effort to tackle climate change, over a quarter (27%) admit that it isn't a priority at the moment. This may be explained by the fact that company resources might be dedicated to recovering from the economic downturn following the pandemic.

Amid increasing digitalisation Paessler continues to look for ways to improve opportunities for its customers to use data monitoring to optimise the efficiency of their business. It is currently working on a prototype to help organisations across various industries, including IoT and IIOT scenarios to do just that.

Working from home is worth preserving

ONLY 16% of employees want to return to an office full time, demonstrating that the Everywhere Workplace is here to stay. Ivanti has published the results of a consumer survey, which revealed that the Everywhere Workplace is here to stay.

Nearly two-thirds (66%) of respondents said they would rather work remotely than be promoted, and almost half (49%) said they would take a pay cut in exchange to be able to work from anywhere. Further validating the desire for remote work, only 16% of respondents claimed that they want to return to an office full time in the future.

The report found that less commute stress (42%), saving money (48%), and a better work/life balance (45%) have been the top benefits of working remotely. On the other hand, the biggest concerns have been less physical activity throughout the day (40%), lack of interaction with colleagues (44%) and screen fatigue (33%). Despite these concerns, more than half of respondents (55%) claimed that their morale was positively impacted while working outside of the office.

According to the survey, 39% of respondents would prefer to work from home if given the choice after the pandemic, while 41% would prefer a combination of the home and office. While offering this flexibility can be a great recruiting tool for organisations, it's critical to ensure that the proper security protocols, training, and technology are implemented to protect against cyberattacks. Organisations also need to modernize their help desks to ensure that remote workers receive immediate and personalised resolutions for IT issues.

The survey found that 23.38% of respondents have contacted IT support once a week and 25.27% have contacted IT support one to three times a month while working remotely. The main tech issues that have plagued remote workers include the inability to access corporate resources (20.78%), Wi-Fi issues (21.98%), and password resets (28.77%).

"Just over a year ago, the pandemic reshaped the way that millions of people around the world work, whether or not their employers were prepared," said Chris Goettl, senior director of product management at Ivanti. "It's clear that many employees have found ways to thrive in their remote environments and would prefer to have the freedom to work from anywhere moving forward. As we enter the next phase of work, in which there will be both remote and hybrid employees, it will be imperative that organisations implement a zero-trust security strategy to better protect their digital assets and ensure that employees can access the data they need to stay productive, regardless of where they are working from."

Survey underscores business benefits of modernising applications

RACKSPACE TECHNOLOGY has published the results of a global survey revealing that, in addition to allowing products and services to stand out, modernizing technology and applications to improve customer experiences drives real-world, bottom-line benefits.

According to the survey, *How Applications Impact Customer Experience*, organizations that adopt an "experience-led" focus enjoy 1.6x higher brand awareness, 1.5x more employee satisfaction and nearly double their rates of customer retention, repeat purchases, average order values and customer lifetime value. The research underscores the impact that modernizing applications to provide better CX can have on competitiveness and growth.

The global survey included 1400+ respondents in IT and non-IT business units, from companies with $300M annual earnings revenue and above, including both decision makers and application users. The results overwhelmingly confirm that CX is a main strategic priority (48%), ahead of IT security, compliance (45%) and IT strategy (41%), and that technology is the key to driving CX.

Over half (55%) of survey respondents credit applications with enhancing customer experiences. Moreover, almost all organizations surveyed understand the importance of customer experiences, with 94% reporting that some form of user experience initiative is underway within their organization. Only a small percentage (6%) report having no customer experiences strategies or initiatives in place.

"The results of our survey are further evidence that modernizing applications through a user lens is not just a 'nice to have' from a customer satisfaction perspective, but also delivers a wealth of tangible, quantifiable benefits to organizations," said Jeff DeVerter, CTO, Rackspace Technology. "Applications are a foundation of customer experiences, and it is encouraging to see an increased focused on and rising enthusiasm for customer experiences improvements."

Applications and Customer Experience

Applications play a key role in customer experiences, providing mobile accessibility, simplifying application submission, processing customer data, and delivering immersive experiences. Over half (55%) of survey respondents credit applications with enhancing customer experiences. Additional areas of significant benefit include providing more availability to services (48%), security (45%), engagement with products and services (41%), and process improvement (39%).

A large majority (88%) of respondents believe that non-technical C-suite executives recognize the bottom-line benefits of applications, and 90% report that senior management has a better understanding of the benefits of applications in their business than they did just five years ago.

As expected, CIOs (55%) and CTOs (53%) are ranked as the most aware of technology benefits. However, CEOs rank close to CIOs and CTOs at 49%, with a noticeable drop off across the rest of the C-suite.

With this high level of awareness among the C-suite, technology is taking the driver's seat in corporate strategy in many ways. Six out of ten (63%) respondents are using technology to drive automation efficiencies and over half (51%) are using it to drive IoT and cloud native initiatives.

While both categories have an indirect impact on customer experiences, technology initiatives focused on real-time data analysis (44%) and customer engagement (30%) have a more direct impact on building and refining customer interactions.

Barriers to Application Technology Adoption

Although the survey results point to a heightened focus on the use of applications to enhance customer experiences, organizations still face a number of barriers to application technology adoption, including:

- Fear of negatively impacting existing customer experiences (28%)
- Legacy IT systems (26%)
- Limited budget (24%)
- Lack of staff with the appropriate skill sets (22%)
- Lack of expertise to lead transformation activities (18%)
- Cultural resistance to change (16%)
- Lack of buy-in to digital transformation strategy (16%)
- Lack of support from leadership (13%)

Risk from AI 'irresponsibility'

RESEARCH examines how global organizations are deploying AI and progress on ensuring AI is used ethically, transparently, securely and in their customers' best interests.

FICO, a global analytics software firm, has released its State of Responsible AI from market intelligence firm Corinium which found that despite the increased demand and use of AI tools, almost two-thirds (65%) of respondents' companies can't explain how specific AI model decisions or predictions are made. The study found that the lack of awareness of how AI is being used and whether it's being used responsibly is concerning as 39% of board members and 33% of executive teams have an incomplete understanding of AI ethics.

Conducted by Corinium and sponsored by FICO, the report – State of Responsible AI - surveyed 100 C-level analytic and data executives and conducted in-depth interviews with industry thought leaders from MIT, AI Truth, The Alan Turing Institute, World Economic Forum, and FinRegLab to understand how organizations are deploying AI capabilities and whether they are ensuring AI is used ethically, transparently, securely and in their customers' best interests.

While compliance staff (80%) and IT and data analytics team (70%) have the highest awareness of AI ethics and responsible AI within organizations, understanding across organizations remains patchy. As a result, there are significant challenges to build support to establish practices as the majority of respondents (73%) have struggled to get executive support for prioritizing AI ethics and responsible AI practices.

"Over the past 15 months, more and more businesses have been investing in AI tools, but have not elevated the importance of AI governance and responsible AI to the boardroom level," said Scott Zoldi, Chief Analytics Officer at FICO. "Organizations are increasingly leveraging AI to automate key processes that - in some cases - are making life-altering decisions for their customers and stakeholders. Senior leadership and boards must understand and enforce auditable, immutable AI model governance and product model monitoring to ensure that the decisions are accountable, fair, transparent, and responsible."

The study found that almost half (49%) of the respondents report an increase in resources allocated to AI projects over the past 12 months, followed by team productivity (46%) and predictive power of AI models (41%). Whereas, only 39% have prioritized increased resources to AI governance during model development and 28% have prioritized ongoing AI model monitoring and maintenance. Despite the embrace of AI, what is driving the lack of awareness? The study showed that there is no consensus among executives about what a company's responsibilities should be when it comes to AI.

The majority of respondents (55%) agree that AI systems for data ingestion must meet basic ethical standards and that systems used for back-office operations must also be explainable. But this may partly reflect the challenges of getting staff to use new technologies, as much as wider ethical considerations. More troublesome is that almost half (43%) of respondents say they have no responsibilities beyond meeting regulatory compliance to ethically manage AI systems whose decisions may indirectly affect people's livelihoods – i.e. audience segmentation models, facial recognition models, recommendation systems.

What can businesses do to help turn the tide? Combating AI model bias is an essential first step, but many enterprises haven't fully operationalized this effectively as 80% of AI-focused executives are struggling to establish processes that ensure responsible AI use.

Currently, only a fifth of respondents (20%) actively monitor their models in production for fairness and ethics, while less than a quarter (22%) say their organization has an AI ethics board to consider questions on AI ethics and fairness. One in three (33%) have a model validation team to assess newly developed models and only 38% say

they have data bias mitigation steps built into model development processes.

However, evaluating the fairness of model outcomes is the most popular safeguard in the business community today, with 59% of respondents saying they do this to detect model bias. Additionally, 55% say they isolate and assess latent model features for bias and half (50%) say they have a codified mathematical definition for data bias and actively check for bias in unstructured data sources.

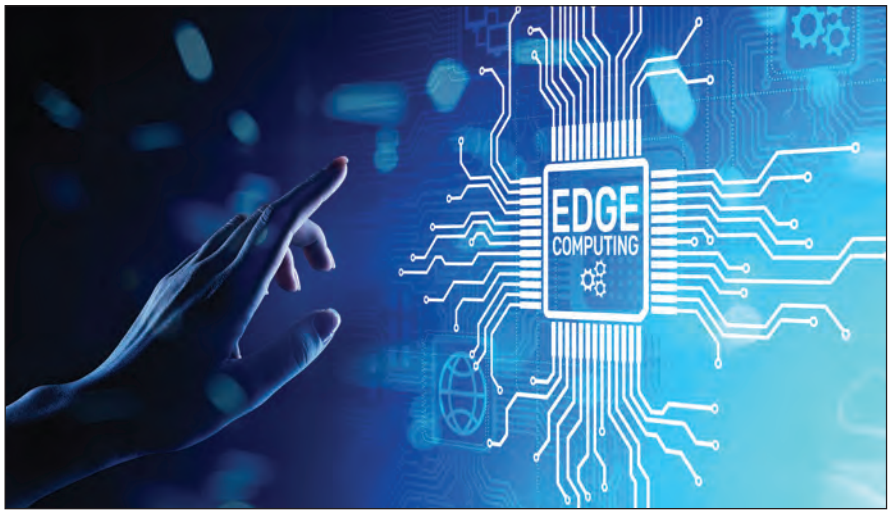
Businesses recognize that things need to change, as the overwhelming majority (90%) agree that inefficient processes for model monitoring represent a barrier to AI adoption. Thankfully, almost two-thirds (63%) respondents believe that AI ethics and responsible AI will become a core element of their organization's strategy within two years.

Educating key stakeholder groups about the risks associated with AI as well as the importance of complying with AI regulation are two critical steps to addressing companies blindspots around responsible AI. Additionally, the report highlights several best practices that will help organizations plot a path to responsible AI, including:

- Establishing practices that protect the business against reputational threats from irresponsible AI use
- Balancing the need to be responsible with the need to bring new innovations to market quickly
- Securing executive support for prioritizing AI ethics and responsible AI practices
- Futureproofing company policies in anticipation of stricter regulations around AI
- Securing the necessary resources to ensure AI systems are developed and managed responsibly

Edge computing drives innovation

BUSINESSES are turning to the edge to help accelerate growth and drive business transformation.



Intel's new report, "The Edge Outlook," identifies edge computing as a critical factor that businesses must harness to both successfully navigate and understand data both now and into the future. Intel is currently working with customers across numerous industries to extract real business value by a move to the edge. The edge makes it possible for every single object to store information and for that information to be extracted and used in real time.

Technology use has grown exponentially during the pandemic, generating new, unprecedented volumes of critical business data. This data will be central to the digital transformation of many businesses, but many organizations are facing very real data processing challenges. For example, it's impractical to send the sheer volume of data now being created back to the cloud for processing due to latency issues. This is where edge computing can play a critical role in driving efficiencies and underpinning the future growth of business.

The rate at which the world is changing is exacerbated by the global pandemic, climate crisis and rising sociopolitical tensions. Alongside this, our reliance on data is soaring — trillions of minutes are processed on video platforms per month. Businesses need this data readily available to drive real-time innovation. This data explosion has sparked urgency amongst businesses looking to maximize their use of technologies such as artificial intelligence (AI), edge computing and 5G communications. Business leaders are waking up to the infrastructure demands of these technologies and the role edge computing can play in driving competitive advantage via accelerated digital transformation.

The paper provides insight into the now, new and next of edge computing across key industries. In short, the edge is where businesses can turn ambitious plans into reality. Businesses are realizing that the edge is integral to unlocking future innovations — 76% say that identifying "the ideal location" for data process is a challenge.

This report offers guidance to IT leaders on how to use edge computing to drive operational efficiencies, create new products and open new revenue streams using real-world success stories. Alongside practical advice from digital pioneer and AI scientist Inma Martinez, the report reveals why businesses can no longer afford to ignore the edge. "Data has always been a cornerstone of civilisation, even going back to the Bronze Age. The edge makes possible a world where all of a sudden, every single object has the potentiality for information – information that can be extracted and used in real-time."

With the edge set to transform every aspect of life and business, businesses must embrace collaboration and leverage ecosystems that allow them to capitalize on all its opportunities. Edge computing is already bringing digital services to the next frontier, working in synergy with critical technologies like AI and 5G.

Among Intel customers alone, there are now over 24,000 edge deployments generating real business value, helping companies grow and innovate in this new era of distributed intelligence.

Pega study reveals poor service can bring customers to the brink of tears

BUSINESSES RISK losing customers due to inconsistencies in the efficiency and quality of service across channels, according to new research by Pegasystems.

The global study, conducted by research firm Savanta, recently surveyed 12,700 business leaders, agents, and customers to understand how the pandemic is impacting the current and future states of customer service. Businesses are making progress by adding more digital service channels to keep up with customer demands; however, this progress often comes at the expense of service quality by creating more inconsistencies and increasing customer frustration.

For many businesses, the pandemic created extraordinary challenges that exacerbated longstanding customer frustrations, such as having to repeat the same information to multiple agents and being passed to different departments to resolve a single issue. Bad service can be so irritating that nearly 27% of consumers surveyed felt it had ruined their day and even caused one in 10 to cry or nearly cry. But their most consequential reaction is often expressed through their wallets: 77% of customers said they would take their business elsewhere if they received poor service. The pressure is on executives to address these service issues before they do any further damage to their businesses, many of which are still in pandemic recovery mode.

In some ways, businesses are already responding. Compared to a similar study in 2019, the number of businesses providing some form of omnichannel service today has increased from 55% to 68% But even as organizations invest in or explore new technologies to enhance service, most (80%) still admit the quality of service varies across the channels they support.

The survey identified three areas that will be a priority as organizations continue to strive for optimal customer service:

- **Service needs to offer final resolution on all channels**
  The main issue with service today is the lack of consistency; 67% of customers think businesses need to improve service quality on non-traditional channels, such as web, mobile app, and chatbot/ intelligent virtual assistant. This lack of consistency results in customers repeating information across channels (the top frustration amongst surveyed customers and agents) and resorting to less desirable channels, such as the phone, to achieve final resolution – half of customers cited a phone call as the only way to solve an issue. If they've tried and failed with other channels, by the time they resort to the phone, they are often frustrated, angry, or both. Organizations need to equip all service channels to be equally effective, saving customers and agents time and improving the experience for customers and employees.
- **Self-service is gaining in popularity, but mainstream approaches fall short**
  The desire for self-service is stronger than ever – 45% of customers surveyed are more likely to use self-service today than before the pandemic. And while 82% of consumers are willing to use self-service, almost half (46%) still don't expect it to work. With 75% of customers wanting businesses to improve self-service and 56% visiting a business' website before calling, there is a massive opportunity for business leaders to improve self-service capabilities. And as customer bases grow to include younger, digital-native generations, organizations must meet new service preferences and expectations to maintain loyalty and draw new customers in.
- **AI and automation are crucial to achieving high levels of service**
  Once life begins to return to normal, customers will still expect the same – if not better – levels of service, which require the right infrastructure and tools. Eighty five percent of businesses expect to invest in AI technology in the next few years, while 57% will increase investments in self-service and automated customer service technology within the next two years. Additionally, 53% of business leaders plan to use technology to proactively monitor customer data to predict problems before they arise, and almost two-thirds of customers agree companies should provide this service. These investments will help enhance both agent-assisted and non-agent-assisted channels for faster resolution – even before a problem arises.

The impact of the pandemic has long-lasting implications for customer service, both today and in the future. As businesses adjust, having the right solutions in place will help provide the level of service customers have come to expect.

Business leaders disagree over tech priorities

CYBER SECURITY, Digital Transformation, AI and Cloud Computing all score similarly in terms of priority for IT leaders. GDS Group, the global events, research and technology services company, has published the results of the second of a two-part research study into the top IT trends concerning business leaders today.

The Business Technology Barometer report (Part 2) looks at how technology priorities have shifted in the four months since part 1 was conducted in December 2020, while also identifying the divergence of priorities across roles within the business, and leaders' preferences for the many different ways they can keep themselves up-to-date with developments in their industry.

The report anonymously polled over 200 GDS customers – all senior leaders (VP/Directors and above) from major global brands. In total, 74% were from large organisations (2,500+employees) and 71% were at Director-level or higher. The research was independently conducted and analysed by Boost Evaluation Limited.

Digital transformation and AI/automation are the most important topics for business leaders

Digital transformation and AI/automation are the hottest topics for business leaders today, scoring 7.7 and 7.6 out of 10 respectively. AI/automation has seen the biggest shift in the four months between the two studies, having ranked 5th out of 6 in December 2020 but jumping to second place in April 2021. By contrast, IT security, which was the most important topic in Part 1 with a score of 9.0 out of 10, has dropped to 4th place with a score of 6.3/10.

Leaders are struggling to agree on priorities

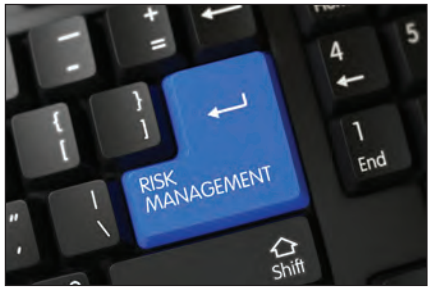
When evaluating the results against specific job roles, there are some interesting differences. IT leaders have no clear preference in terms of hot topics; while 'Cyber Security and Resilience' received the highest average score for importance (7.8), it was followed closely with 'Digital Transformation' (7.7), 'Artificial Intelligence' (7.6) and 'Cloud Computing' (7.5) all earning very similar scores, suggesting IT leaders are struggling to prioritise against a backdrop of numerous enticing and disruptive trends. Board members (as with the previous report) don't share the same views as IT in terms of technological priorities, and seem to be most closely aligned to finance in terms of what is and isn't important. Big Data and Augmented Analytics is the top priority for the CEO/board (7.9), as it was with Finance (9.0). Digital transformation is the only area where all job roles are in broad agreement, with all roles giving it a priority score of 7.3 or above.

How are leaders keeping themselves educated and up-to-speed?

GDS also asked respondents to score out of ten how convenient and effective they found various types of learning (supplier exhibitions, virtual roundtables, written content, digital content etc.) in order to determine which methods of learning are considered to be most convenient and effective.

The most effective mode of learning (face-to-face training) was acknowledged as being the least convenient. After a prolonged period where remote learning has been the one and only option, the time spent travelling to a conference or seminar has clearly been put into the spotlight. Supplier exhibitions were the only mode which were considered both inconvenient and ineffective, suggesting a preference for virtual events – in all forms – for some time to come.

The various digital modes of learning are mostly clustered together in the high convenience and medium effectiveness zone, while digital versions of face-to-face learning received a disappointingly low score for effectiveness.

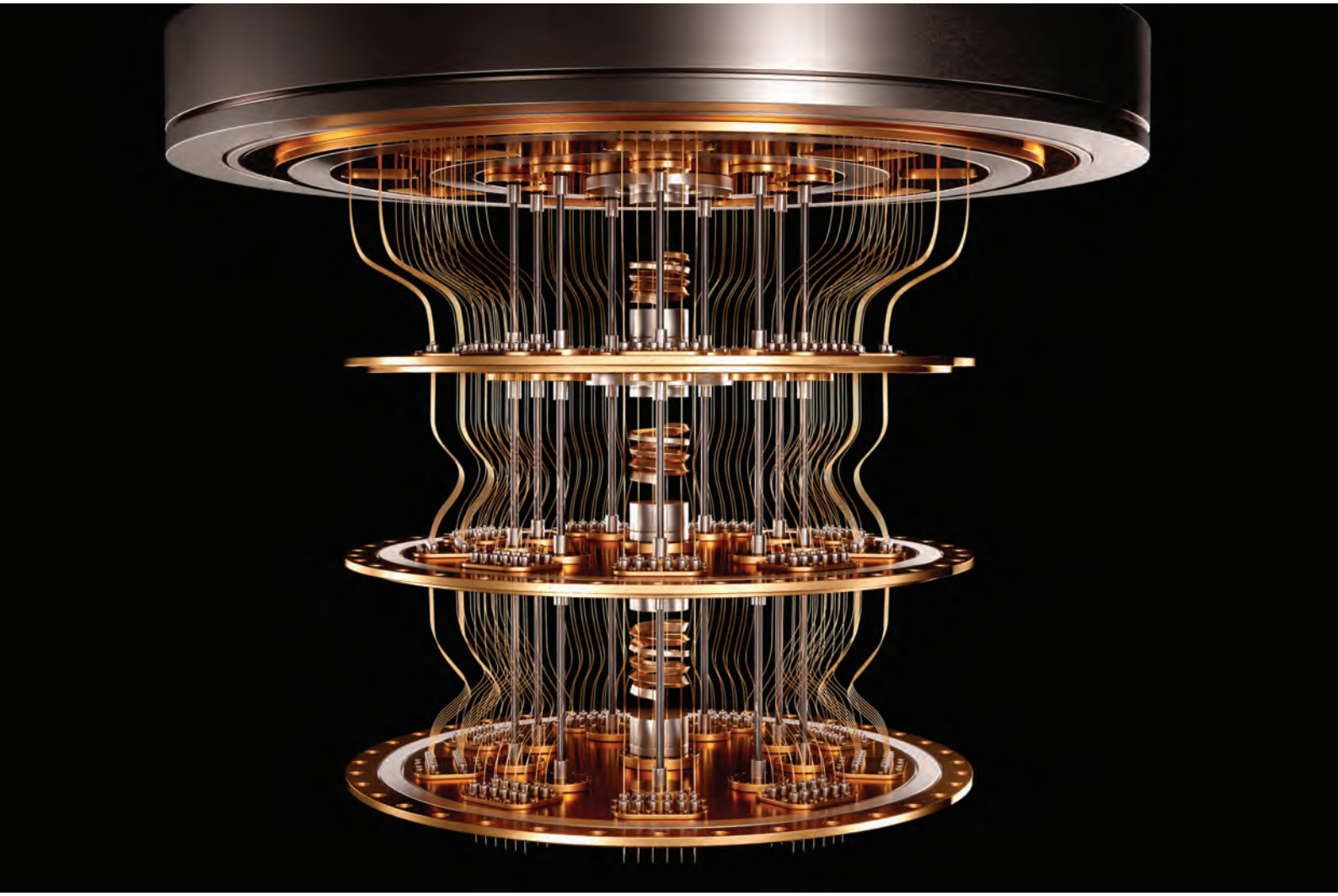


An embarrassment of riches for IT leaders?

Spencer Green, founder and chairman of GDS comments on the report's findings, "Who would want to be an IT leader right now? With so many enticing and disruptive trends to consider, IT leaders are clearly struggling to choose where their priorities should lie. While digital transformation is the top trend for business leaders more generally, IT leaders have security, digital transformation, AI and cloud all competing for their attention.

"Or to look at it another way, is this an embarrassment of riches for IT leaders? Technology is transforming the world at a pace never seen before, with IT leaders at the forefront. It is only natural, therefore, for IT leaders to be interested in so many different topics, because each one is so important and potentially transformative to the future of their organisations. H

owever, with disagreement among the different leadership roles over which technologies should be prioritised, IT leaders have their work cut out for them. Business leaders need clarity of vision and an understanding of the opportunities available to them so they can make informed investment decisions. As the technology evangelists and experts within their organisation, IT leaders have a responsibility to educate themselves on all of these topics so that they can better educate their non-technical peers on the opportunities available to them so they can make the right decisions to transform the business."



Quantum computing attracts increased investment

Investments in quantum computing are expected to increase in the next 24 months, according to new survey results from International Data Corporation (IDC).

THE NUMBER OF ORGANIZATIONS allocating more than 17% of their annual IT budgets for this technology are expected to rise from 7% in 2021 to an estimated 19% in 2023. These investments will be driven by organizations seeking to achieve a competitive advantage by using quantum computing technology to improve and accelerate business processes with enhanced AI capabilities, better security, and optimized algorithms.

Recent IDC survey findings indicate that, at the start of 2021, one fifth of companies interested in quantum computing technology reported current usage and two thirds expect to be experimenting with this technology in the next 18-24 months. This growth is due to global enterprises investing in cloud-based platforms that provide access to quantum computing hardware and software, hiring quantum specialists, training quantum developers, and collaborating with quantum vendors to develop new business solutions. Complex technology, skillset limitations, lack of available resources, and cost deter some organizations from investing in quantum computing technology.

To ease these concerns, quantum computing vendors, select cloud-service providers, and independent software vendors are offering quantum cloud-based solutions that allow organizations to experiment with this technology. Combined, quantum computing infrastructure as a service (QCIaaS), platform as a service (QCPaaS), and software as a service (QCSaaS) offerings provide organizations access to the quantum computing technology, applications, technical support, and other resources needed to begin the quantum journey. Technical and business consultancy services are also gaining popularity.

These services help clients determine the value of adopting quantum computing technology, develop and test quantum algorithms, and become more resilient in a post-quantum era.

"Quantum computing is the future industry and infrastructure disruptor for organizations looking to use large amounts of data, artificial intelligence, and machine learning to accelerate real-time business intelligence and innovate product development. Many organizations – from many industries – are already experimenting with its potential today to gain a competitive advantage tomorrow," said Heather West, senior research analyst, Infrastructure Systems, Platforms, and Technology at IDC. "Organizations interested in quantum computing should not be deterred from investing in this technology as it is likely to become an industry disruptor."

"Even though quantum computing is still in a nascent stage, the interest as well as the number of European companies engaging with quantum projects is constantly growing. The most innovative companies across industries have understood that the identification and development of quantum business use cases should start right away," said Stefano Perini, senior research analyst, European Quantum Computing Launchpad co-lead at IDC. "This push is hence progressively contributing to the development of an actual European quantum computing market which is growing year on year."

European IoT spending to exceed $200 billion

International Data Corporation's (IDC) Worldwide Semiannual Internet of Things Spending Guide estimates that spending on the Internet of Things (IoT) will reach $202 billion in 2021 in Europe and will continue to experience double-digit growth through 2025. Despite the global impact of the COVID-19 pandemic, the IoT market still experienced growth, though at a slower rate than in previous years. IDC expects this growth to continue in 2021 in various sectors as operations, projects, and employees start to return to normal.

In 2021, the largest portion of spending is expected to remain within the hardware (modules and sensors) category, followed by the services category, as an important area of spending for enterprises, driven by the need to evaluate, design, and deploy the physical devices and to support ongoing operation of the devices (the "things"). The software category, especially application software for IoT used to organize and access a range of structured and unstructured information, will be the fastest-growing technology in the next few years.

COVID-19 and the uncertainty that has come with it will continue to have an effect over the next few years in some industries, creating a mixed industry performance tied to the role of IoT use cases in the transition to the next normal

The consumer sector will be the largest industry for European IoT spending in 2021. This will be driven by home automation solutions that enhance the living experience and streamline everyday interactions to create a connected home environment in which consumers can remotely monitor and control, through apps or websites, their home systems and home preferences/consumption. The second largest industry, manufacturing, was one of the most impacted industries in 2020 but it has leveraged IoT solutions to remotely track, monitor, and maintain industrial manufacturing devices that are part of the production value chain by assessing equipment conditions and remotely diagnosing equipment failures before they happen by analyzing the live stream of data produced by the machine.

With social distancing and remote working, remote health monitoring solutions that use IoT technology to improve the quality of life and care through accurate and focused medical home monitoring will make healthcare the fastest-growing industry in the next couple of years.

"Even with COVID-19 changing the investment plans of many European enterprises, the IoT market

continues to be attractive for many industries such as healthcare and retail, where IoT can support evolving multichannel retail strategies to provide a seamless consumer experience through any shopping channel," said Alexandra Rotaru, research analyst at IDC Customer Insights & Analysis.

"However, other verticals such as construction and personal and consumer services will see less demand and will develop more slowly in the coming years, focusing on supporting other business priorities in the post-crisis recovery process."

Worldwide software-defined infrastructure software revenues surpass $12 billion

According to the International Data Corporation (IDC) Worldwide Semiannual Software-Defined Infrastructure Tracker, the worldwide software-defined infrastructure (SDI) software market reached $12.17 billion during calendar year 2020, an increase of 5% over the previous year. While this growth was lower than historical trends, the market grew faster than other core technologies during the difficult, pandemic-stricken year.

The three technology pillars that make up the SDI market are: software-defined compute software (53% of market value), software-defined storage controller software (36% of market value), and software-defined networking software (11% of market value).

"Software-defined infrastructure solutions have long been popular for companies looking to eliminate cost, complexity, and risk within their data centers," said Eric Sheppard, research vice president with IDC's Infrastructure Platforms and Technologies Group. "And while this technology has been available for many years, recent technology advancements are driving new features and capabilities that align today's software-defined infrastructure solutions with contemporary datacenter challenges better than any other time in the past.

Indeed, software-defined infrastructure is rapidly becoming the platform of choice for datacenter modernization and transformation undertakings all around the world."

"Software-defined compute technology has grown to be the standard in the datacenter with server virtualization. However, the market continues to evolve, and recent modernization initiatives have shifted the growth in the market to cloud system software and in particular, containers," said Gary Chen, research director, Software-Defined Compute.

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The Future of Cloud Management:
Managed vs Unmanaged Cloud

In this article, we'll take a look at the growing trend toward digital transformation, how it's been accelerated in the past eighteen months or so, and how businesses can walk the tightrope of cloud adoption.

BY JON LUCAS, CO-DIRECTOR OF HYVE MANAGED HOSTING

IF 'digital transformation' was a buzz term before the pandemic, it's now gone stratospheric. It's something that's been high on the agenda in boardrooms around the globe for at least the past decade, but the pandemic and its fallout has led to something of a digital boom as businesses flocked to the cloud in their droves in order to stay operational during lockdowns and other restrictions. Office-based businesses in particular were faced with a 'sink or swim' dilemma that saw them cram more than a decade's worth of digital change into the space of weeks, according to McKinsey.

First, let's take a look at why COVID-19 accelerated cloud adoption, and why moving to the cloud is so much more than a temporary fix.

The acceleration of cloud adoption

Technology thrives during periods of disruption. While the true scale and fallout of the pandemic is yet to be reckoned, there are some small silver linings

that came with the displacement and upending of businesses. Necessity is the mother of invention, and in order to stay operational and keep their customers and clients well looked after, businesses had to rapidly establish remote working policies and cloud strategies. According to Gartner, there was a global surge in cloud adoption across a diverse range of industries in 2020, and spending on cloud services is likely to grow by more than 18% in 2021.

Why? Because businesses have learned that a presence in the cloud offers a level of resilience that they can simply no longer afford to pass up. There are no shortage of reports online from businesses that talk about how their cloud computing capabilities mitigated pandemic-driven disruption, allowing them to carry on relatively unscathed while other, less digitally mature businesses, floundered. Perhaps that's why nearly a third of business leaders increased their spend on cloud technology during the pandemic - they want a slice of that resilience, and they've learned the hard way that they very much need it.

In this way, the pandemic has been a catalyst that might actually service businesses well in the long run. But as business leaders well know, rushing headlong into a new technology as a solution to a very immediate problem rarely comes without challenges. In the case of cloud, those challenges seem to boil down to how much a business thinks it can take on, and whether it opts for managed or unmanaged cloud to carry itself forward. Any business that approaches cloud transformation will undoubtedly come across this choice at some point in the early stages of its journey - so let's weigh it up.

What is an 'unmanaged' cloud solution?

An unmanaged cloud solution, as the name suggests, refers to cloud migration with a 'do-it-yourself' mentality. The core services will be provided to a business, but after that, they're largely on their own. It's a little bit like renting a property, where the landlord will give you access to a home and fix anything that falls under their jurisdiction, but you're largely responsible for its upkeep. In this instance, the cloud provider is the 'landlord', renting infrastructure to a business, but the business itself is entirely responsible for running it and all the tools and applications it hosts. Such 'landlords' - to strain the analogy - include AWS or Azure.

One of the most appealing things about unmanaged cloud solutions is that they can be very cost-effective for businesses with the in-house expertise to use them effectively. Many of them have a pay-as-you-go pricing model that can make unmanaged an attractive proposition for businesses with lots of in-house talent that want to scale quickly without wasting resources. However, therein lies the rub. In order to take advantage of unmanaged cloud solutions, a business needs an expert in-house team, otherwise it'll find itself out of its depth very quickly.

For this reason alone, businesses that were looking for rapid cloud transformation in response to the COVID-19 pandemic would have done well to steer clear of an unmanaged solution, as they're unlikely to have had the expertise on hand to properly implement it. Even if a business had unlimited HR resources, finding the talent it would need to run a cloud migration process on its own in such little time would have been a near-impossible feat. In fact, demand for candidates with cloud expertise shot up to its highest-ever level during the early stages of the pandemic, and salaries skyrocketed as a result.

What is a 'managed' cloud solution?

With a managed cloud solution, the hosting provider does more than rent out space and infrastructure - it effectively works as an extension of an organisation's own IT department. If an unmanaged cloud solution was comparable to a landlord/tenant relationship, then

"Where cloud migration was a nice-to-have, it's now become essential for the vast majority of businesses if they want to stay resilient, secure and optimised in a rapidly changing digital environment. Managed hosting offers an off-the-shelf solution to what is usually an extremely difficult puzzle for businesses to solve. Do they need a high-powered compute workload? Perhaps they ought to focus on I/O? Managed solutions like ours help businesses to answer these questions before giving them a blueprint to the cloud, and we stay with them at every step of the way."

a managed cloud solution would be more like living in an all-inclusive hotel where the majority of your needs are taken care of. A managed cloud provider will ensure that you have access to expertise whenever your business needs it, whether that's a team of expert engineers to implement a tailor-made cloud solution, or a dedicated consultant to lead discovery and map out solutions from the very beginning.

Managed cloud solutions have been more popular during the pandemic because they represent more of an 'all-in-one' solution that businesses can tap into quickly. Cloud design, configuration, storage and networking will all be taken care of on a business' behalf, leaving them to get on with day-to-day operations.

Managed cloud solutions usually come with a fixed pricing model, so it doesn't have quite the same potential for shaving costs and limiting resources that an unmanaged service would, but for most businesses the predictability of the cost structure more than makes up for it.

Managed solutions, such as the one offered by Hyve, should feel like a natural extension of a business' team. It should help with all stages of the cloud migration process, including designing and planning the cloud infrastructure, mapping out the migration process, as well as ongoing security monitoring and management.

More than 90% of organisations already have at least one foot in the cloud, and since the pandemic, more than 60% of all cloud-based workloads are running on a managed cloud service. It's yet more evidence that managed cloud service adoption is going mainstream, and for all the right reasons.

Managed cloud solutions have been more popular during the pandemic because they represent more of an 'all-in-one' solution that businesses can tap into quickly. Cloud design, configuration, storage and networking will all be taken care of on a business' behalf, leaving them to get on with day-to-day operations

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Five ways digital services can engage remote workers

Achieving employee retention by providing the best digital experience

BY IDO DUBOVI, VP PRODUCT CONTROLUP

PREVIOUSLY companies won employee loyalty with trendy architecture, healthy food choices in the dining hall, and leisure areas stocked with pool tables and video games. However, today it's possible that employees will spend weeks or months without stepping into the office.

Instead, companies are building a corporate culture based on a series of digital interactions. New digital apps and services are designed to onboard, train, and provide essential services to their employees. Many companies are reporting that they will continue to have employees work from home even if they are fully vaccinated, for their convenience and to keep costs down. Some of these personalized digital services will continue even if employees return to the office. Here are five examples of digital services that support remote workers.

1. Employee Surveys

During the current crisis, several companies sent out digital surveys to build employee trust and to discover creative ways to meet the unknown challenges. The employees' responses revealed requirements for new services, requests for new communications channels and suggestions for ways to integrate remote work teams. For example, Southwest airlines implemented an employee engagement app to receive employee input following the outbreak of the pandemic. In addition, many companies have started a practice of using digital surveys to receive feedback on new online services.

2. Online Classrooms

Most likely corporate training will not return to in-person classrooms even if the pandemic resides and business returns to usual. Digital training is faster and cheaper, but it also has several other advantages. It can accessed using mobile devices, be designed to be more engaging, scale quickly to accommodate a large number of students, be highly personalized, and measure individual learning outcomes in a way that isn't possible with classroom training. To prevent a sense of isolation while employees are studying alone, a larger video group session can include discussion boards and smaller more intimate break out rooms where students can learn in smaller groups.

3. Digital Onboarding

Today virtual tours of facilities take the place of

walking down corridors and meeting co-workers face to face. Where previously new employees were paraded through different departments, now they need to receive the most basic items by ordering online including parking passes, computers, e-mail addresses and security badges. Following the outbreak of the pandemic, many companies have upgraded to slick professional produced onboarding videos, and content which is specific to certain professional positions. Some companies also make a point of providing ways for employees to meet with management. At Marriott, for example, new employees are invited to webinars to interact with executives. Some companies invite new employees to virtual meetings with other team members for informal information sharing.

4. Benefits Portals

One of human resources' most time-consuming responsibilities is benefits enrollment for new hires and existing employees. An online portal can streamline the process by enabling employees to access their own data and develop strategies based on their priorities, such as planning for college tuition costs or retirement. In addition, providing benefit information online is also more secure than relying on email communications. With cyberattacks on the rise, after the pandemic outbreak, employers can't afford to be using unsecure means to send employees' personal health information. Benefit portals are designed to be compliant with the latest personal privacy regulations and are regularly monitored for data protection.

5. Beefing up the infrastructure to the home

To support the hybrid approach, where employees work at home and in the office, organizations will need to invest in a more reliable remote infrastructure that supports advanced services such as augmented reality and virtual reality. Edge computing will come to the home and augment the compute capacity of the devices. Work-from-anywhere is the new mantra and employee will need to have the computing power necessary to provide a digital experience as close as possible as the real thing to ensure a high level of productivity.

Even if employees return to the office, a new realm of online digital services may live on. The ability of new companies to attract and keep the most qualified workforce will no longer be limited to their facilities, but will also be defined by how successfully they can provide a positive online experience. However, in many cases, the stress on computer networks can threaten the performance of these services. The ability to monitor and optimize the employee digital experience will be considered an important aspect of the services employees receive.

Today, the quality of the employee experience is largely determined by system availability, and how long it takes to logon to a work area, load a web page, or save an electronic form. Having the ability to provide a positive employee digital experience with the right tools can be just as important as the services themselves.

An online portal can streamline the process by enabling employees to access their own data and develop strategies based on their priorities, such as planning for college tuition costs or retirement. In addition, providing benefit information online is also more secure than relying on email communications

AI-fuelled digital experiences are the future of great customer experiences

Delivering great online experiences have become a top priority for companies over the last decade. Yet, few take meaningful action to achieve them.

BY MARK ARMSTRONG, SENIOR DIRECTOR AT GENESYS

AS A RESULT of the events of the past year, the world is moving towards digital. Forrester predicts that digital customer interactions will increase by 40% in 2021. Meanwhile, IDC is predicting that this year alone, 65% of businesses will have shifted to digital-first through automated operations and contactless experiences for customer service.

Due to the pandemic many companies had to rethink and accelerate artificial intelligence (AI)-powered strategies as a reaction to ballooning interaction volumes with consumers. Many started by automating certain types of queries using bots to relieve pressure from their workforce. Now that the panic phase is over, businesses are increasingly looking into AI's predictive and continual learning capabilities to facilitate more tailored experiences.

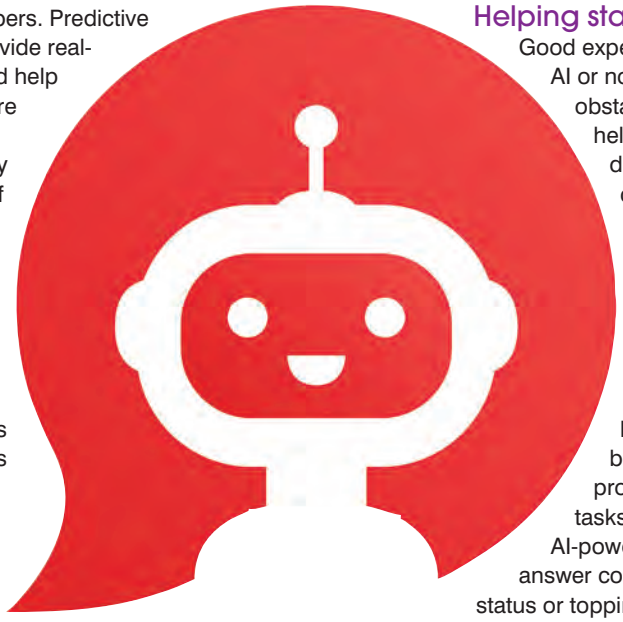
From surfacing up relevant knowledge to assist workers to matching employee and customers for the best outcomes, many are seeing that it can deliver

real business value in customer retention and sales situations. And this is only scratching the surface of the potential of the technology.

Moving from reactive to proactive experiences
The application of AI is complementary to the work staff undertakes and only serves to make their lives easier. The popular belief has been that AI will eliminate jobs in the long-term, when the reality is that nearly 60% of workers say they do not feel the technology threatens their jobs. In fact, 64% of UK employees say that AI makes them more effective. Customers will still need the balance of automated responses and those highly personal touches from real people dependent on the need and situation in hand.

AI has real potential to transform the way businesses interact with customers. By harnessing the technology to predict the best possible time to engage with consumers, organisations can foster deep and

meaningful relationships with shoppers. Predictive capabilities allow businesses to provide real-time engagement to consumers and help them with any potential issues before the customer knows they have a problem or intervene in their journey in order to maximise the potential of a certain outcome too.



When applying AI to the customer experience industry, that has traditionally been reactive in nature, businesses can engage with customers in a new and meaningful way. With AI-driven tools too, it's also possible for businesses to predict and act versus simply respond. This can help companies transform their customer service operations from a cost centre to a profit centre, whilst delivering smarter services, and facilitate better overall decision-making, and remain highly competitive.

Better use of data leads to better insights

Making use of various customer data points will be the new gold rush for businesses. However, brands must gain consumer trust and create environments where people feel comfortable sharing their data. Findings from a recent Genesys research report concluded hesitancy still exists about how much or little information to give organisations, as 7 in 10 consumers try to control to some extent how their data is collected.

To succeed in winning consumer trust and harnessing the power data now offers, organisations need to use the right combination of information to inform and improve experiences. This involves using insights from the entire customer journey (marketing, sales, service), and across every channel. Crucially it also means tying information together across systems – from contact centers to CRM to marketing automation. Only then can brands hope to create a holistic view of the customer and use AI effectively to continually inform and improve performance based on the breadth of insights available.

AI can also be used to improve the fluidity of shopping experience, so that it's connected across every touchpoint, fully contextual and predictive in nature too. Businesses can use data to trigger AI capabilities that help them serve customers with better context and predict the optimum desired outcome based on behavior, history and intent.

There's also the potential to combine native and third-party enterprise data to gain predictive insights, inform attributions and feed outcomes in a way that ultimately augments and continually improves customer experience use cases.

Helping staff go above and beyond

Good experiences, whether powered by AI or not, begins with employees. Any obstacle that prevents them from helping a customer, such as siloed data, complex website structures or complicated routing, directly affects the overall experience delivered. What's more, it can lead to frustrated, unengaged staff who are unwilling or unable to provide the best possible service.

AI capabilities can lend a helping hand across nearly every facet of a business now, simplifying complex processes and removing repetitive tasks from to do lists. For example, AI-powered chatbots and voicebots can answer common questions such as order status or topping up mobile phones.

In the event that a bot can't solve the query, it's transferred to the appropriate employee, with full contextual information in real-time to enable better support on calls. In addition to this, AI technologies have the capability to act as a personal assistant to contact centre staff.

Here AI can 'listen' in on calls and offer the latest knowledge articles relevant to the issue. The technology has matured to the point that it can identify customer sentiment and determine potential upsell opportunities or follow-up actions.

AI also allows businesses to identify employees' strengths and areas for improvement, allowing the right tools and hands-on support to be deployed to make them more comfortable, capable, and able to succeed. In turn, this can help facilitate a more engaged and dedicated culture, enhancing brand loyalty, increased staff retention and tenure.

The future is already here

Delivering a seamless customer experience is far from simple. Organisations must use a variety of communication channels, continue multiple intermittent customer conversations over several days or weeks, and deliver results under increasing pressure from both leadership and customers. We have reached a tipping point where the potential for innovations that use AI has only just begun.

To make the most of this opportunity, businesses must look to underpin their digital experiences with AI, while orchestrating data from third party systems to create fluid, personalised experiences that stand them in the best possible position to truly differentiate themselves from the competition. The future is already here, and companies must ensure they have the capabilities, strategy and skills in place needed to make the most of AI aspirations.

Time to level the DEX playing field

The COVID-19 pandemic has changed life in many ways but how we work has been one of the most seismic shifts in history.

BY NICOLE ALVINO, FOUNDER AND CHIEF STRATEGY OFFICER, SOCIALCHORUS

WORKING LIFE will never be linear again. No longer will the bulk of the world's workforce shuttle repeatedly between where they live and where they do their job. Traditional employment patterns are changing so that hybrid working becomes commonplace, not a curiosity.

According to McKinsey, up to four times as many employees could work from home in the future compared to pre-pandemic levels[1].

Meanwhile, research by Forbes magazine found 80% of businesses believe their workforce will spend at least a quarter of their time doing their job remotely[2]. Hybrid working is here to stay.

An unequal experience

One of the unexpected effects of the COVID-19 upheaval wrought is that the inequality between the wired and unwired worker has been thrown into the spotlight.

As those who were always connected and in the office were suddenly thrust into working remotely, many employers were forced to face the fact that those who have always been deskless have been getting a raw deal when it comes to the Digital Employee Experience (DEX). In fact, a 2020 survey by Forbes[3] found just that 56% of deskless workers in the US felt connected and engaged with their employers. Furthermore, 84% of deskless workers said they don't

get enough direct communication from management, and only 10% felt strongly connected to their companies.

The impact of this is far reaching. Employee engagement is a key indicator of internal performance and productivity, and a disengaged workforce has a direct impact on the bottom line.

The painful truth is that many deskless employees, including frontline workers, have been putting up with a substandard level of DEX for years – often isolating them from the rest of the business. Things cannot continue in this way – employers are now realising that they need to ensure that every employee, whether working at home, remotely, on the frontline, or a combination of all those methods, enjoys the same DEX experience.

No more marginalisation

All employees deserve to be fully connected with - and valued by - their organisation. Having had a taste of what can be achieved, deskless workers are no longer willing to put up with being marginalised. And nor should they. Now more than ever it is time to tackle the inequity between the experiences of desk-based and deskless workers.

It is imperative that employers take action now to apply DEX principles and platforms across the entire workforce – if they haven't already.
That means:

- Looking at long term digital transformation plans and ensuring they are fit for purpose
- Taking steps to establish what employees want from their working lives and be prepared to meet those needs.

As with any significant industrial events - those that lead the way will prosper. The ability to offer an equally slick and fulfilling experience to all employees, no matter whether they are based in the office or at home, or deskless and on the frontline, will be critical to attracting and retaining talent beyond the pandemic. Those that are unable - or unwilling - to provide this will face justifiable criticism and will subsequently be left behind.

Seizing hybrid working opportunities

With the evolution in employee engagement and experience will surely come more responsibility and scrutiny from the C-suite - and that means DEX becoming even more of a boardroom priority. According to the latest report from IDC, the key is making the right investments in DEX. Its COVID-19 survey revealed 47% of organisations that had longer-term digital transformation strategies in place before the pandemic are now showing strong signs of business growth.

Human Resources and Internal Communications teams (HR/ICs) are also beginning to recognise that

their DEX strategies must be built around the switch to hybrid working and that they are willing to invest time and budget in proven DEX technology.

They are more determined than ever to include deskless, frontline and remote workers alongside office-based employees in their strategies for success. Doing so will also tackle inequity between the experiences of desk-based and deskless workers at a time when all employees deserve to be fully connected with - and valued by - their organisation.

Time for a reset

Change is never easy, and the challenges all of us have faced in the last 12 months have pushed everyone to the brink. The fatigue is widespread. However, it's important not to ignore the positives that have come as a result of this challenge.

The pandemic has highlighted the need for a reset in many areas of life, and internal business communications is one of them. Qualities such as empathy, transparent communications and leading a diverse workforce no matter where they are based – have been brought to the fore and paved the way for a redrawing of the lines of engagement.

Those leaders that ensure these qualities are maintained, valued, and driven from the top down will be the ones that help to unite entire organisations as we continue to collectively recover.

Further reading

[1] https://www.mckinsey.com/featured-insights/future-of-work/whats-next-for-remote-work-an-analysis-of-2000-tasks-800-jobs-and-nine-countries
[2] https://www.forbes.com/sites/forbescommunicationscouncil/2020/11/11/the-future-of-work-the-hybrid-workforce/?sh=77aa9f4a362a
[3] https://www.forbes.com/sites/forbestechcouncil/2020/04/21/dont-ignore-the-deskless-workforce/?sh=1e5623eb15fe

Alarm bells are ringing...

Digital experience investment in the UK

Even before COVID-19, digital transformation was making an assured assault on the agenda of every enterprise boardroom.

BY DAVID OGIDI, HEAD OF THE UK, CONTENTSTACK

THE RECEIVED WISDOM has been that the pandemic has led to an aggressive acceleration of digital projects, collapsing years of progress into months. However, there are signs that this runaway success could be about hit tricky ground. 98 per cent of UK companies have digital transformation initiatives underway, but only 27 per cent of companies think the technology they currently have will be able to support this transformation over the next 18 months. One in ten companies already believe that their current tools are an outright obstacle to these goals.

The immediate questions that these figures suggest are a) how do we stop the wheels from coming off of these projects without sacrificing the necessary speed and progress made so far and b)where did this risk begin, because digital transformation was always supposed to be about being better AND faster.

Who started it?

Unequivocally, digital transformation is being led by people in technology roles, with nearly half of all programmes being led by Chief Technology/ Information Officers. A fifth of companies had an executive role dedicated specifically to digital or transformation.

These roles were most likely to be found in manufacturing and financial services – both sectors that are currently experiencing immense pressure for rapid change, which may be why they are more likely to have a specific C-level transformation role.
While technology roles may be in the driver's seat, transformation is by no means a technology-only process. As companies digitally mature, the role of the leader grows from technology orchestration to aligning that technology to the goals of each department and the overall vision of the company.
But this leads us to consider the opinions of technology leaders when it comes to what causes technology to be inadequate, why technology goes unused, and what the priorities are in new technology investments. Communicating with business and marketing stakeholders about different needs and priorities is key to successful initiatives, but it will often be the technology leadership that defines digital transformation, for good or ill.

This difference can be seen in the fact that business and marketing leaders expect an average of 32 per cent of current investment to be inadequate over the next 18 months, with 30 per cent of each group expecting more than 40 per cent of investment to be obsolete in the same time period. In contrast, technology leaders expect the average to stay steady at 24 per cent.

The difference in opinion could be attributed to the idea that technology leaders have a better overview of the current toolkit. As they are usually the ones leading transformation they may have purchased tools to match future ambitions and have yet to implement them fully. In other words, they know what is in the armoury, they know the toolkit is already mature and they expect the ambitions to mature over the next 18 months.

On the other hand, the difference could indicate that business and marketing leaders are hearing more about the capability performance from the user's perspective. The back-end of a solution might be smooth and theoretically it should be able to do what you want, but if users find it frustrating it won't be seen as adequate technology.

A third explanation could simply be a difference of ambition over the next 18 months. For example, business and marketing leaders are more interested in opening new revenue streams with digital than technology leaders, while the technology cohort is more focused on optimising and streamlining current processes than their counterparts.

How bad are things?

Regardless of shifts in perspective, there is a sobering status quo: that 81 per cent of companies use 60 per

cent or less of their current technology capability. On average, companies are only using half of their digital experience investment. This means not only do current technologies lack the capabilities to meet ambitions, but the capabilities these tools do offer are largely going to waste, right now.

Business, technology, and marketing leaders all experienced the pile-up of unused features, reporting an average use of 45 per cent, 49 per cent, and 52 per cent, respectively, of their current digital experience investment.
This has a direct financial impact. On average, companies spend 24 per cent of their digital experience budget on unexploited capabilities and nearly a quarter estimate that over 30 per cent of their budget is unused. With global spending in digital experience technology expected to reach $2.3 (£1.7) Trillion by 2023, that's equivalent to £408 Billion left on the table.

So what happened?

There is a consistent culprit behind this immediate and future frustration. Half of all business and marketing leaders, and a third of technology leaders, said that implementation costs cause investment to not be fully exploited.

Businesses need not get hung upon semantics here. Technology executives may be more focused on implementation barriers on the back-end, while their marketing and business cohorts also include usability into their definition. A solution can be integrated well into the technology stack but not very well implemented in the business model – but as soon as there is an integration issue, it slams the brakes on digital transformation effectiveness. This needs to be addressed as a matter of urgency. As investments in new technologies are expected in the near future, selecting tools with the best chance to be fully used – for which, you can read, best integrated – businesses must tackle the current barriers across departments.

Why this happened?

Identifying the root cause of digital transformation failure was always going to come down to one of two possibilities – either the new business model is wrong or the technology is not up to the job.
It is the latter.

Legacy technology that refuses to integrate without massive investment and delay, is the culprit behind many of the digital transformation barriers that enterprise companies are facing. Positioned as all-in-one software suites, vendors justified the complicated implementation process with the idea that once you had the solution in place you were set. They would provide all the features and capabilities needed for digital experience. In the early stages of digital experience this model worked fine but, as digital needs expand and more tools are added to the technology stack, companies are finding those legacy platforms are even more complicated to adapt than they were to implement. With custom workarounds needed for every change, the cost to innovate becomes too high. And the speed of change leaves these companies standing.

So what do we do about it?

The need for a more evolvable solution ecosystem is why more enterprises are turning to a modular architecture and why modern software vendors are designing solutions around MACH principles (microservices, API-first, Cloud-Native SaaS, headless).

Legacy digital experience tools are expected, rapidly, to become increasingly obsolete. Enterprises feeling the pain of inflexible legacy software can design a more modular architecture with MACH tools. Designed to evolve, modern MACH tools support a composable enterprise in which every component is pluggable, scalable, replaceable, and can be continuously improved to meet evolving business requirements - easing integration pains and ensuring businesses are never again locked into obsolete technology.

This change is already underway. New research, conducted by DJS Research and commissioned by the MACH Alliance, found that 81 per cent of businesses expressed the strong intention to increase MACH elements in their front-office architecture in the next 12-months. 63 per cent of respondents said customer experience is the main driver of their transition to a modern MACH infrastructure, while 57 per cent noted the ability to innovate faster – both hallmarks of the original reason to undertake digital transformationi. Unless otherwise attributed, figures taken from The State of Digital Experience Investment in the United Kingdom – download the full report here.
i See MACH Alliance Research Report

Use 'Fusion Teams' to accelerate your digital transformation success

Ecommerce expert **ALEXANDER GRAF, CO-FOUNDER & CO-CEO** of marketplace experts **SPRYKER,** and author of *The E-Commerce Book,* explains the advantages in a very new way of business and IT collaboration.

TRADITIONALLY, IT worked on specific projects, engaged with stakeholders in the business periodically – and often in rather formulaic ways – and followed rigidly-defined processes and methodologies, and in many companies there was a bottleneck of a strict weekly or monthly approved release.

But today, the demands of digitisation mean that IT needs to work in more flexible ways. We need to collaborate across organisational boundaries, adapt as priorities change and learn new processes and tools as required. How can this circle be squared? In essence, IT reams need to start operating as 'fusion teams' – a new concept that's emerging as critical to success in digital transformation, as Gartner predicts. And given the world will spend, according to analyst firm IDC $6.8 trillion on such projects in the next two years, it's worth trying to take advantage of this highly promising new concept.

Of course, cross-functional team working is not new – it's been delivering results for years. But there's a big difference between cross-functional teams and fusion teams; the former tend to focus on creating new ideas for products or services by bringing together people from the sales, marketing and product department, and they don't typically take responsibility for actually deploying a software project.

In contrast, the core concept of the fusion team is that the team can independently develop something with a direct interface to the customer, creating a new, valuable customer experience. In some ways, the concept of fusion teams mirrors the concept of macro and micro services; every service has its own team,

where everything used to be planned over a period of a year or two, management tends to view mitigating risk as their main challenge. Managers expect to be offered different options, e.g. option A, option B, and option C, graded by risk (i.e. option A, the most aggressive approach, would lead to bigger potential payback, but with lots of risks)

so if you want to change search engine behavior on your website by adding suggested search terms or pictures, a fusion team consisting of a developer, a data person and the product manager would then develop and deploy the project. This way, a fusion team can develop an enhanced website search function and get it live quickly, so that customers using the website benefit in a matter of days or weeks, rather than months or years.

The best way of finding out which option is best is simply to try them out

Note that to build high-functioning fusion teams, the IT organisation must allow teams to work independently on the tech stack. Ideally, the tech stack should allow fusion teams to deploy features directly onto the website, in the mobile app, the search engine, or the email engine—speeding up IT solution delivery markedly.

I don't think many of us will object to that. It is quite possible that fusion will lead to the death of the traditional, more centralised approach, which contains multiple middle management layers and all too often leads to a situation where change is very difficult. As is well known, if gathering requirements takes 12 months, by the time code starts to be actually cut the information will be out of date, and technology and customer requirements will have moved on.

In addition, where everything used to be planned over a period of a year or two, management tends to view mitigating risk as their main challenge. Managers expect to be offered different options, e.g. option A, option B, and option C, graded by risk (i.e. option A, the most aggressive approach, would lead to bigger potential payback, but with lots of risks).

This approach was possible when data for each option was so consistent and stable that managers were able to plan over a long period of time. But in a digital economy as we now live in, it is not possible to build such an option set—business requirements are changing all the time. Instead of presenting management with three options, now there may be six or more to consider. The best way of finding out which option is best is simply to try them out.

After all, businesses just don't know which feature will be most appealing to customers. The optimum approach is to create different features, products and services and test them in the marketplace, and the ones that resonate well and bring business value are the ones to focus on. Even better, the fusion teams approach has a much-enhanced ability to test and learn, in order to drive up productivity and business results.

Everything changes – especially IT

Entering the fusion team era means everything changes, from how you purchase IT to how you manage it. The focus must therefore be on creating an infrastructure where a team can deploy features, in the search engine, or the product management system, for example, without going through the bottleneck of the central IT process. Plus, older programming languages have no place (surprising as it may sound, Java is not well equipped for this environment, for instance). Technology to support fusion teams must also be able to connect with multiple interfaces that often come with their own programming language or programming concept. In addition, software architects who understand the interdependencies between different services and the back end also play a vital role.

But the biggest, and most welcome change is that IT can no longer be viewed simply as a cost centre. IT has to deliver business value creation. That's because it's the organisations with the truest business-IT collaboration that will be in the best position to respond faster to unexpected challenges and be the winners in digital transformation.

If the past year has taught us anything, it's that we live in an unpredictable world, and that we need to respond in a rapid and dynamic a way in order to stay relevant. Fusion will help you be ready for the next new challenge; it's well worth finding out about it.

COVID-19 and the future of work:
Two things you need to know

Hybrid models are here to stay and the employee experience has never mattered more.

BY TIM MINAHAN,
EVP OF BUSINESS STRATEGY AND CMO AT CITRIX.

THERE'S FINALLY LIGHT at the end of the long, dark tunnel we've all been navigating for the last year. And as we begin to look forward and plan for the future, we need to come to terms with the fact that work will never be the same. The global pandemic has permanently changed the way both organisations and their employees view how and where work will get done. And things are not going back to the way they were.

If there's anything this crisis has taught us, it's that work can be done from anywhere. And it will. When asked how they would prefer to work post-pandemic, 52 percent of more than 7,000 respondents to a recent survey conducted by Citrix and OnePoll said they want a hybrid model where they can choose to work remotely or from the office each day, while 16 percent indicated they have no interest in returning to the office and would prefer a permanently remote role.

There's No Going Back…

Employers are taking note. "Work from anywhere is not a pandemic play," said Jose Guereque, Executive Vice President of Infrastructure and Chief Information Officer, Teleperformance. "We will keep the hybrid scheme forever as our permanent model."
And others will follow suit. Why? Because remote work works.

Throughout the pandemic, both companies and their employees have seen the benefits that more flexible work models can bring in terms of productivity, engagement and well-being. According to Citrix research, 77 percent of employees work the same or more hours at home, and 69 percent say they are more productive in doing so.

And employers have been impressed with the resiliency and innovation they're demonstrating. "COVID-19 has enabled us to see how easily our financial advisors and accountants could adapt to new work styles very quickly," said Andrew Griggs, Senior Partner, Kreston Reeves. "Creative employees have implemented new ways of solving traditional problems that will help us fine-tune and accelerate some strategic initiatives to better serve our clients as we go forward."

…But Things Need to Change Going Forward

To sustain such benefits, how work gets done will need to change too. The blocking and tackling companies needed to do to get their teams working remote is complete. They've given their workforce the tools to connect to the resources they need to get work done – wherever it needs to get done.

But all the great productivity they saw at the beginning of the pandemic is waning because the tools they've put in place, while designed to make employees more effective while working from home are increasingly distracting them from their core work, causing mass fatigue and adding to their frustration.

They may be working longer hours, but employees are accomplishing less because they've been given too many tools that constantly interrupt them, cause them to switch context across different apps and interfaces, and don't foster efficient ways to engage, collaborate and execute work.

According to the Citrix-OnePoll survey,

- 41 percent of employees face distractions in their home environment (children, pets, etc.)
- 28 percent lack appropriate technologies and applications to get work done
- 36 percent feel isolated and out of touch with colleagues

Experience Matters

"The need to provide a simplified work experience for employees has never been more critical," said Mark Bowker, senior analyst for Enterprise Strategy Group. "To keep employees engaged and productive in today's hybrid work environment, companies need to not only provide secure and reliable access to the resources they need to do their jobs, but tools that enable them to work more efficiently and effectively across work channels, devices and locations."

This can't be done by cobbling together individual chat and collaboration technologies that force employees into yet another way of working instead of working the way they work. What's needed is a platform that does three things:

- **Unifies work –** Whether at home, on plane or in an office, employees have consistent and reliable access to all the resources they need to be productive across any work channel, device or location
- **Secures work –** Contextual access and app security, ensure applications and information remain secure – no matter where work happens.
- **Simplifies work –** Intelligence capabilities like machine learning, virtual assistants and simplified workflows personalise, guide, and automate the work experience so employees can work free from noise and perform at their best.

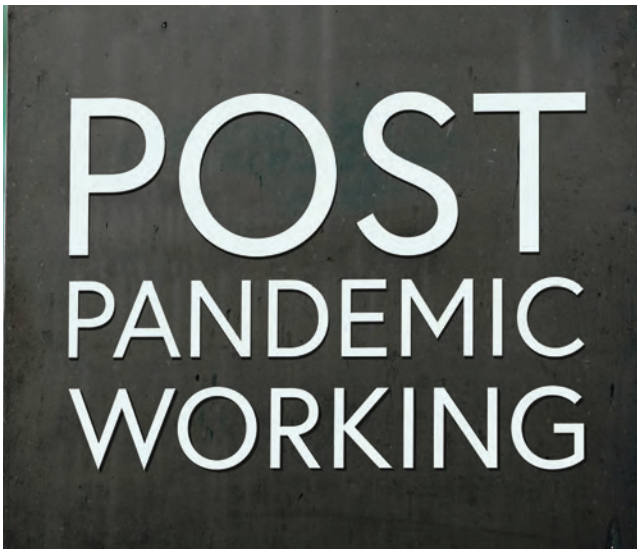
In essence, businesses need to put an experience layer between people and technology that removes the distractions from employees' days and allows them to work the way they want.

Working their Way

Today, most IT organisations adapt work to the way systems function. In the future, they will need to adapt systems to the way employees work if they want to keep them happy and productive. As many companies have learned through the pandemic, digital workspaces are an effective way to do this, as they provide a platform that enables employees to:

- Efficiently engage with the apps they need to get work done without having to navigate them and execute work across multiple systems
- Collaborate without being forced into another way of working and IT organisations to:
- Personalise the work experience by building workflow extensions that surface key insights and tasks from key systems of record and automatically deliver them to employees so they can focus on the work that matters most and execute quickly.
- Drive more efficient work and better business utcomes through collaborative work management tools that enable individuals and teams to, among other things, share goals and align on direction, interact in high-quality ways and focus on work that matters and enjoy it.

So much about the future remains unclear. But one thing is certain: hybrid work is here to stay. And to emerge from the pandemic in a stronger, better position, companies must find a way to simplify work and give employees the space they need to succeed.



Future of hybrid working and its impact on workspace governance

With hope on the horizon and a COVID-19 vaccination schedule in place, businesses are looking ahead and establishing plans to return employees to the office.

BY SEB MATTHEWS, CHIEF STRATEGY OFFICER OF PROVISIONPOINT

HOWEVER, many people have become accustomed to this new lifestyle, where they can work from home and to a flexible schedule. Employees generally appreciate a company that allows them to work from home, and research reveals that this could also boost productivity for the employer. In fact, 75% of workers claim to be more productive at home due to reduced distractions and two-thirds of employers report increased productivity for remote workers compared to in-office workers. Many businesses are now scrabbling to ensure the right measures and tools are in place to meet the longer term shifts in employee preferences.

Looking back to the beginning of the pandemic, organisations were reluctant to pivot to the remote work paradigm, or were unable to convince leadership of its benefits. One year later, flexible working has proven to be anything but detrimental to business. In fact, there has been ample evidence that remote working is not only feasible but there is a high demand for it.

Introducing hybrid working

As organisations navigate best practices for returning to the workplace, the focus has shifted to a hybrid working model that combines working on-site with remote options. In the UK, employers expect the proportion of its employees working from home to double, from 18% pre-pandemic to 37% post-pandemic. Most workers would prefer a balance where they are in the office for some days of the week and at home for the remainder, with 92% of people expecting to be able to work from home at least once a week after the pandemic subsides.

Despite the challenges throughout the pandemic, employees and organisations have experienced a number of benefits from working at home. These include a better work-life balance, saved time

and costs from commuting and higher levels of productivity. For companies, remote working can result in reduced office costs, increased staff retention, environmental benefits and access to a wider talent pool making this model is a win-win for both employers and employees alike.

Businesses now need to consider what 'hybrid working' means for them, as well as establish what measures need to be put in place to meet employees' changing needs and how this working model will work effectively in the long term. For many, the introduction of hybrid working will require a cultural shift, with new working policies that provide employees with the desired flexibility on when or where they work. This also involves moving to outcome-based working, which requires a change in focus for business leaders. The focus should be on results and productivity, not hours and presenteeism.

One of the most important considerations is ensuring that the company is investing in hybrid working the right way. This looks beyond the company environment, and more at creating a collaborative, technology-enabled workspace that transcends office walls. Tools like Microsoft Teams, SharePoint, Groups, Planner, and Yammer have exploded during the pandemic, with Microsoft adding 95 million users worldwide in 2020. It's now time for companies to reflect on the past year and ensure that it's prepared for the future of hybrid working - which is where workspace governance comes into play.

Establishing workspace governance

Collaboration software, channel-based chat, cloud storage and shared calendars are amongst the tools used when working remotely. As businesses move towards adopting a hybrid working model, they need to consider how best to manage these applications and ensure that employees can use the platforms, features and functionalities to the best of their abilities. Taking Microsoft 365 as an example, many organisations enabled self-service creation of Teams and Groups during the pandemic to promote collaboration. However, they quickly realised that users created huge amounts of workspaces with limited guidance that has in turn, increased uncontrolled IT sprawl.

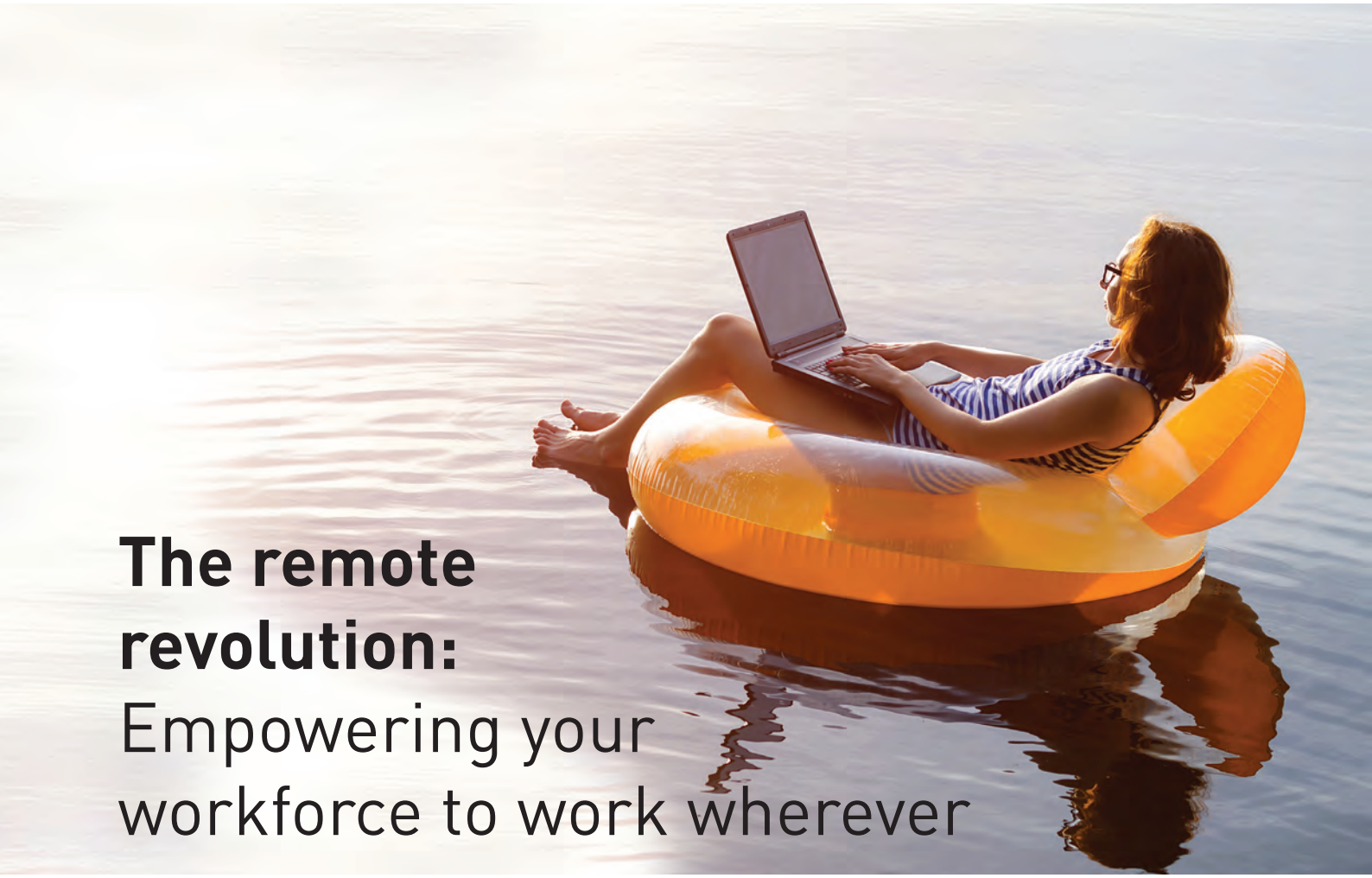
Workspace governance can take away this pain, by helping to bring order to workspaces, ensuring that they are created in the correct way, managed appropriately and then archived or deleted when no longer needed. This is vital when deploying hybrid working models, as greater reliance will be placed on compliance and usability when employees are working from home or in the office environment. Proper governance also ensures that roles, permissions, user capabilities and third-party connections are set up in a controlled and secure way for employees, bringing improved security and peace of mind for IT managers.

In addition, workspace governance can help employees simplify workspaces and bolster their digital experience at work. It allows businesses to improve adoption by offering a self-service function that makes it easier for employees to rapidly request new functions or objects to enhance their productivity, collaboration and efficiency. Not only this, but employees feel empowered to take responsibility for their own workspaces, while the business remains confident that they are set up with everything they need to make the most of hybrid working environments.

Future of hybrid working

Even before the events of last year, many organisations were beginning to introduce flexible working for their employees. The COVID-19 pandemic has simply accelerated this adoption at an exponential rate, with most businesses being forced to deploy home working out of necessity rather than choice. However, it is clear that remote working has been a successful experiment. Now, the introduction of hybrid working is imminent, with 98% of respondents in a recent survey stating that they would choose to work remotely, at least part-time for the rest of their careers. With that in mind, businesses need to ensure that they deploy a policy to support and introduce hybrid working, as well as respond to the organisational implications, such as technology and IT tools.

Workspaces will play a critical role in the future of hybrid working, as employees will need to be able to work seamlessly between home and the office, and collaborate with both colleagues and external parties. Getting up to speed with workspace governance means organisations can build compliant digital capabilities that will support employees in the long term, with advanced security and usability measures.



The remote revolution: Empowering your workforce to work wherever

The technology is there to not only support remote workers, but to help them excel. Time is ticking, however, for the companies refusing to accept and establish a better style of working, now and tomorrow.

BY CALLUM ADAMSON, CEO AND CO-FOUNDER, DISTRIBUTED

SINCE THE 1980s, Silicon Valley has been at the epicentre of innovation and driving change –through technology and its ripple effect on culture. Companies originating there set the pace; the rest just try to keep up. But since the pandemic shook up the way we work, these businesses at the pinnacle of modern progress are stumped when it comes to remote working. In fact, none of them appear to be backing the same horse. Despite the likes of Twitter setting their stool out early in the pandemic, stating no-one would have to return to the office if they didn't wish to, Google sent shockwaves recently when it announced it was "inviting" employees back into the office, with WFH only an option for a maximum of two week stints. Even more traditional sectors, such as banking, are more amenable to remote working, with HSBC and JP Morgan stating that thousands of their employees would be based permanently from home.

The answer, cried the future-gazers, was hybrid working. Here, employees would be based in a blended workstyle, in a mixture of working both from the office and from home. Frustratingly, this is in fact just an example of offering reheated office perks, as opposed to a revolution.

In our opinion, being truly flexible goes beyond offering hybrid working as a cure-all. For me, the only viable, long-term solution is a remote-first approach to work.

Holding on to tired practices

As we went into the first UK lockdown last March, we heard a lot of concern about productivity levels as laptops were packed up and taken home for the foreseeable future. But, since then, workers have proven to their bosses that they are both capable

and willing to work efficiently and effectively from home – with 58% reportedly feeling more productive since working remotely. So why are companies like Google in such a rush to get everyone back into the office once more? IBM even announced its proposed system of remote working in March 2021, which leaves 80% of their workforce working at least three days a week in the office. This was, apparently, based on a fear that it will affect employees' career trajectory as remote workers would not be able to manage people effectively or help build company culture. Ironically, this reveals attitudes which could instead cause even more damage to workers' career progression. It risks reverting back to old stereotypes of not trusting employees and not giving them credit to work effectively and efficiently – like adults – without being micromanaged.

Furthermore, it reduces the pool of talent employers have access to. Forcing employees to work from one centralised location limits the workforce to those from the periphery – so businesses are not able to hire talent from the rest of the UK, let alone across the world. It also indirectly hinders the diversity of your workforce, by enforcing bygone and unnecessary restrictions on who can work for you, i.e. only those who can commit to the office 24/7, without any other pulls on their time, family or otherwise.

Accepting the role of remote working

Supporters for a hybrid-style of working have dominated the conversation for the past few months. Many businesses are calling this their new approach, extolling its virtues of the best of both worlds. But it has only been theoretical up until now. What's more, each business' definition of hybrid working differs from one to the other.

Whatever the definition, in practice, it creates more problems than it solves. Managing part-remote workforces and helping them to build a successful culture in a hybrid environment creates a disadvantaged party in those that are remote.

It's an unnecessary burden for employers and employees alike. That's why remote-first is the best solution. The pandemic shone a light on the best ways of working and encouraged leaders to reflect. Work that was once "only" ever meant to be done in the office is now fine to do remotely and is considered the norm for many. The success of the transition to remote working encouraged the likes of Spotify to put their hats in the "work wherever" ring early on.

The flexibility and better work-life balance offered by remote working does not only come from the ability to work wherever is most comfortable, without needing to commute. The money saved from overheads or rent could even go towards new, improved and more meaningful employee perks that offer a replacement for the in-person interaction in a better way: a summer beach break or ski trip for example.

Benefitting from long-term flexibility

Choosing this way of working also avoids a split, or even tiered system, between those in the office, and those not, when it comes to using resources, networking and collaborating. It is not about putting everyone at a disadvantage. Businesses simply need to work to make remote working a better approach for everyone.

Key to building a remote-first working model is trusting and empowering your employees to meet up for in-person collaboration when necessary, rather than forcing it with permanent office space. The ability to do this only comes from thinking through a remote-first lens as those that adopt a hybrid approach would consider the office a natural meeting spot. Taking a remote-first approach also means businesses can make budget available for flexible collaboration space to meet the needs of the employees at any time and wherever they are. When done well, the benefits of remote working are substantial, according to WEF. They include higher job satisfaction thanks to the greater flexibility, greater trust between employers and employees to effectively do their job, teamed with the greater ease of doing so, through growing adaptability using digital tools that enable remote work.

By embracing remote systems, companies are setting themselves up for future success. Build the processes that allow for staff to really use remote work to their advantage and enrich all areas of their lives. For example, once "where" employees are working has been addressed, the next logical step is "when" best suits them. While it's important to promote a good work/life balance, more flexibility around when employees open up their laptops gives businesses additional opportunities to employ a broader, more diverse workforce.

Next steps

A silver lining to the pandemic was the light it shone on how we had been working, including its lack of long-term stability and sustainability. As a result, business leaders have been handed the opportunity to revolutionise their employees' ways of working, offering them the freedom to move away from the decades old 9 to 5 routine and settle into working and living anywhere. All that's left for them to do is take it. The calls for flexibility were present prior to the pandemic, but were easily muffled out. Now, the entire workforce is demanding change and long-term flexibility, and control of their working practice. If businesses want to walk the walk when it comes to offering forward-focused approach to work, they need to pave the way for employees to determine their own career paths.

Fortunately, the technology is there to not only support remote workers, but to help them excel. Time is ticking, however, for the companies refusing to accept and establish a better style of working, now and tomorrow.

The hybrid working model: A phase or the future?

With the prospect of restrictions easing on the horizon, the focus turns to what type of working environment employees expect to return to from the comfort of their own home.

BY JAKE WERNER, PEOPLE ANALYTICS LEAD, NORTH AMERICA, SPLASHBI

THE LAST TWELVE MONTHS have proven that hybrid working is doable by almost every industry and thanks to Covid-19, the acceleration of the working from home model was implemented across the board. The nature of business itself has been fast tracked and now employees are at the forefront of data-driven decision making.

Company culture is more valuable than ever and with this being a contributing factor to employee retention strategies, Jake Werner, People Analytics Lead, North America of SplashBI discusses how a seamless return to work can be achieved for both business and employee.

Trusting your talent

Trust is the key ingredient in most relationships and it applies to your work relationships just as much. Helping employees mitigate unnecessary stresses is crucial and this can be encouraged via people analytics. Normalising common issues such as childcare struggles, getting to grips with new technology advancements and shifting the work life balance, contributes to unlocking happier, healthier and more productive employees. Given the circumstances faced throughout 2020, effective senior leadership will provide businesses with a competitive advantage and greater insights to drive profitability and efficiency.

The scramble of the first lockdown meant that employees were told to adapt quickly to work from home, meaning that day to day employee interaction and culture slowly faded away. How can businesses attract and maintain talent whilst retaining company culture? Twelves months on and hundreds of zoom quizzes later, it suggests that maintaining and building a company culture ensures employees feel a sense of belonging and value, which is key whether the business chooses to have a central office or home office.

Culture is not about perks and benefits; reimagining your culture for a virtual environment is about returning to the foundations of your company and building infrastructure to support connection to each other through the lens of your mission, vision and core values. Building rituals that allow team members to truly get to know each other, and work with intention to ensure the team is engaging with and getting the intended result from these rituals. Promoting a positive work-life balance and recognising that your employees have a life outside of work is important,

and will often make your staff feel more motivated, engaged and loyal to the company if their personal commitments and situations are recognised. Senior management departments should be analysing the input and outputs of their staff rather than tracking them in a micro managing style. Business should be utilising talent management – if your employees are outputting what you expect, does it really matter if they drop something at the post office or take the dog for a quick walk around the block in work hours? Creating and adopting an environment where employees feel valued and trusted is key to building a high performance culture.

Office vs. Online

Business as usual isn't an option and as the pandemic forced organisations to reevaluate their legacy processes, it became clear that HR processes were at the forefront of change and the question of how businesses can continue to run at an efficient, fun and most importantly flexible rate is asked.

Due to Covid-19, the increase in the hybrid model of working has accelerated and businesses are encouraged to step back and re-think their values, culture and what this means for both employee and business. Of course, the workplace banter and watercooler conversations cannot be replicated while working from home, but employers can offer incentives to stay connected with teams and create that community spirit at home. Keeping employees stimulated is essential and the lean on HR teams within the organisation during Covid-19 was extremely taxing. Pre-Covid-19, businesses optimised their processes with one goal in mind: efficiency. Building a more responsive workforce and organisation opens the door for resilience instead of being efficient. As the market dips up and down at the moment, checking in with employees and upskilling them in terms of communication, teamwork and empathy may allow organisations to respond quicker in times of need while also trusting that your workforce are getting the job done.

Conclusion

It's no secret that Covid-19 has drastically changed the landscape of business outlook and employee retention strategies. With this in mind, it is important to be transparent with employees about why the new normal way of working will be standard as we move out of the pandemic. It is important to strike the balance between work and life as both businesses and staff need to be in sync in order to come out on top, together. If businesses can learn to continue to empower their staff with incentives such as flexible working and the ability to share and drive ideas to keep motivated, then the return to work will be seamless - and worry free.

NDR and NPMD: Their role in managing the "New Norm"

The shift in workforce locations and related network infrastructure changes – cloud, hybrid, remote, WFH – is forcing companies to forever change the way they manage and secure that user base.

BY STEVE BROADHEAD, BROADBAND-TESTING

2020 was the year of the "new norm". This pandemic-led, revised state of play involved a huge shift to working from home (WFH) with a dissolution of centralised office working and a very different user management scenario as a result. The user base was no longer largely in one or more self-contained areas, but spread across broad areas, each with different variations on a theme at the endpoint; Internet connection type and speed, working hours, requirements, knowledge base… This, in turn, resulted in increased security risks, performance management issues, support issues; after all, the end game was to maintain the existing user experience (from being central-office based) as much as possible.

2021 is no different. And nor will 2022 be. This "new norm" really is – by and large – here to stay. Far better to be backing a service provider than a commercial real estate investor right now! Businesses are already embracing the very different, but often more efficient, cost fabric associated with deploying and supporting a WFH workforce and waving goodbye to expensive office space. But that fundamental change in the physical shape of IT and the underlying network infrastructure creates its own potential problems. Let's face it, even in a traditional head office-based infrastructure, or a classic hub and spoke, HQ and branch office topology, few businesses really knew exactly what was running across those connections, whether applications or other forms of data. Visibility is everything. How can you secure an element of the network if you can't see it? How can you optimise a data stream that isn't on your management radar? Simple answer – you can't. Do you actually need to? Absolutely. In its recent market guide for Network Performance Monitoring and Diagnostics (NPMD), Gartner noted that data monitoring and analysis is becoming increasingly difficult because of these infrastructure changes, with cloud-native architectures replacing the classic designs and thereby rendering simple NetOps and SecOps monitoring collaborations meaning "job done" as being a thing of the past. The hardly anticipated mega shift to WFH strategies over the past year has simply complicated matters even further. One specific point Gartner made was the need to "Increase alignment between network operations and security operations, by coordinating NPMD

procurement decisions with security analytics solutions, including network traffic analytics tools."

Additionally, the guide talked about the goals of NetOps and SecOps being more tightly aligned, given that they both rely on capturing and manipulating network traffic data. Therefore, combining resources in a single entity means relying on job-specific tools, notably NDR (Network Detection and Response) solutions. The advice was to future-proof network monitoring by investing in network performance monitoring and diagnostics tools that provide the required level of visibility in hybrid environments, including edge network and cloud network monitoring. Substantiating this thought, Gartner states that "by 2024, 50% of network operations teams will be required to re-architect their network monitoring stack, due to the impact of hybrid networking."

Whatever the changes over the decades in IT, network infrastructures and the ever-increasing security threat, preserving or improving the user experience has rightly remained paramount. Simply that it is now more challenging than ever, as is finding and using the right tools for the job. In the current networking landscape, two of those key tools identified for managing, securing and optimizing the network and end-user service delivery are NDR and NPMD. Starting with the former, NDR is used to detect and prevent malicious network activity, investigate and perform forensics to determine root cause, and then respond and mitigate. It does this by initially providing greater visibility into what is actually happening on the network, using ML (Machine Learning) and AI (artificial Intelligence) software technology to identify unusual behavioural patterns for example which, in turn, enable security teams to identify and block any suspicious network activity, thereby minimising the impact.

Moving onto NPMD, these products are generally considered to be tools that take in and manipulate a number of different data sources – for example, network-device-generated health metrics and events; flow-based data sources and application-level traffic. Note, not all NPMD tools support all of these areas – some are still simple, raw packet-based data capture products which simply are not up to the task of resolving contemporary network issues. Fundamental to a modern-day solution is the ability to provide insight into the quality of the end-user experience, based on network-derived performance data.

What has changed out of all recognition in recent years is what is considered to be that "network". Before it was simply a collection of LAN or WAN based network devices, servers and endpoints. Now the focus has to be on the same single view of the "network" but this will be across on-premise, Data Centre, SDN, cloud and hybrid environments. And, as more of the workforce continues to operate long-term from the home or other remote locations, so this expansion of the network continues. This means the need to remotely manage and optimise user experience for performance, security, application availability and reduce the MTTR (Mean Time To Repair) problems becomes paramount. Remote users tend to be nervous and distrusting of technology – thereby providing a guaranteed level of support and service delivery can help enormously with their productivity. Providing that level of service delivery is also essential in a multi-tenant environment, such as where a Service Provider is delivering a range of services to many different customers from a single management point. Being able to customise that offering, while still operating from a single management point is essential, both for quality-of-service delivery on the one hand and economies of scale for the Service Provider on the other. Switching back to NDR, one of the primary issues created by this expanding WFH network is that, from a security perspective, the attack surface has therefore expanded too.

This coupled with the endless rise of increasingly complex and sophisticated threats, that are capable of bypassing existing perimeter and endpoint protection, means that the mindset has to change from "protected" to being proactive towards potential threats with a detect and respond mentality. This is why NDR tools, as highlighted by the aforementioned Gartner guide, have become a fundamental component of a company's defensive armoury. It is all about allowing SecOps to detect risks in their infancy – ones that bypass traditional cyber security approaches - and respond accordingly, even where traffic is encrypted. Part of this new view of the network is the ability to detect potential issues with previously ignored east-west traffic within the network; a network, remember that now spans from BYOD and IoT devices to cloud connectivity. In so doing, a company can equally protect against malware and non-malware threats, including insider attacks, credential abuse, lateral movement, and data theft.

In conclusion, the shift in workforce locations and related network infrastructure changes – cloud, hybrid, remote, WFH – is forcing companies to forever change the way they manage and secure that user base. Gartner has identified that, in order to succeed in this absolute requirement, NetOps and SecOps teams need to work closely together, rather than in isolation, or simply on a casual interaction basis, and this means bringing specific tools to the fore. NDR and NPMD have been cited as the perfect solution to this potential crisis point in networking and IT change. It is important, however, to understand that – as in any other aspect of IT – NDR and NPMD solutions are not all equal in terms of their capabilities and fit; in some ways – for example, flow versus packet-based – they can even be radically different. Aspects such as being able to intelligently monitor network behaviour patterns and allow proactive countering of potential threats, while still being quick and simple to deploy and manage, are important considerations to factor into the decision-making process.

Retail innovation:

Enabling the store of the future

How can brands leverage mobile and digital technology in-store to deliver new retail experiences?

BY PAUL LYNCH, AREA VICE PRESIDENT & MANAGING DIRECTOR, LIVEAREA EMEA

WHEN WE THINK of retail innovation and new retail technology trends, a lot of recent talk has been about how brands should focus on digital channels over physical retail investments. How can brands replicate physical experiences online? What are the latest digital channels or social media trends? How are brands delivering personalised experiences?

These are important considerations, and we can't ignore the rise in digital adoption. However, what we don't consider is the opposite. What can brick-and-mortar retail take from the digital space? How can digital shopping tools be leveraged to improve the in-store experience?

If we accept that physical and digital worlds are no longer separate entities, but ones that can inform and improve one another, the possibilities are incredibly exciting.

Mobile

We now consider mobile as a convenient device that we use to research, engage, and transact on-the-go. However, mobile also plays a central role in physical retail innovation, the key tool for connecting online and offline worlds.

Functionalities available on our mobile devices will elevate the in-store experience. The camera can be used to interact with QR codes and bring AR or VR applications to life. For example, scanning a range of QR codes for different products to compose an outfit which you can try on in-store without having to find your size or wait for a fitting room cubicle.

But retail innovation doesn't always have to re-invent the wheel, it's about connecting our everyday digital experiences and making them relevant in the store environment to elevate the experience. The potential is enormous, just consider everything we use our phones for.

You could play your favourite Spotify playlist in the part of the store you're shopping in, or sync your calendar to arrange a click and collect window or a private shopping experience. Try on new

lipstick or nail varnish colours via a Snapchat filter. Use location sensors to point you in the direction of a special offer you might've walked past but missed. Talk to Siri-style chatbots for customer service.

24/7 Access

Convenience is a key part of the digital experience, being able to research and buy products from the comfort of our home, office, commute, anywhere, at any time. Ecommerce is not dictated by store opening hours. However, that doesn't mean stores have to be completely dormant out of hours. Stores could, for example, have interactive window displays or QR codes for window shoppers to interact with out of hours, or use Bluetooth to ping passers-by with coupons to entice them to return to stores for a special offer. Lockers outside stores could be used to fulfil click-and-collect orders out of hours.

Fulfilment Options

Talking of fulfilment, in-store technology could be used to elevate this experience, too. Imagine being able to walk around a shopping mall, going from store to store viewing and trying items, without the need to carry bulky shopping bags from the previous stores you've visited. Instead, with a combination of Scan & Go technology and ship-from-store fulfilment, you could view, try, and buy the items, seamlessly pay, and choose to have them shipped straight home, just as you would online. Likewise, if they didn't have a shirt in your size, a seamless experience would be ordering the right size, have it fulfilled by another store or warehouse and delivered the next day.

Checkout

When we think about checkout and payment as part of a digital journey, we talk about an optimised experience where every detail is designed to be as quick and friction-free as possible. That isn't the case in stores, where we have to queue, before scanning and paying for items, whilst additional actions like coupons, credit card machines, loyalty cards and receipts add additional friction at the till. So, how do we take the notion of digital's 'one-click' payment into stores?

Scan & Go technology is one way, where customers can use their mobiles to scan the barcodes on products they want and use mobile payments on their own devices to shop, pay and checkout at their own pace, bringing the convenience of an online experience into physical stores. This experience could incorporate popular payment methods such as Klarna or PayPal. Similarly, store associates can use mobile POS technology to help customers checkout anywhere in-store, without the need to queue.

Gamification

The notion of gamification is becoming more prevalent digitally. Consider the likes of Strava and Peloton where communities are encouraged to earn coupons and rewards through activity. Brands are also adopting this concept in-store – Burberry's social retail concept offers exclusive content and gaming-like experiences in-store. Alibaba introduced a Pokémon Go-like game called "Catch the Cat," drawing shoppers to brick-and-mortar stores where they could earn discount coupons.

What technology is needed?

Brands and retailers that are leading the way with digital innovations are leveraging microservices architecture – 'headless commerce' – to do so. Headless commerce allows fast and limitless front-end innovation, leveraging smart APIs to connect with back-end management platforms such as customer data, payments, inventory, and fulfilment systems.

Whilst retailers generally understand headless as an online execution, the same architecture enables in-store innovation, too. This lean microservices architecture, via APIs, allows brands to deliver innovative experiences for any customer-facing points of sale – in-store devices, mobile, smart speakers, TVs – all at the same time. This is done through a lean microservices architecture, via APIs.

When we think about checkout and payment as part of a digital journey, we talk about an optimised experience where every detail is designed to be as quick and friction-free as possible

How essential retail can be guaranteed with satellite connectivity

Over the past year, the Covid-19 pandemic has highlighted the importance of connectivity when it comes to retail and providing access to essential goods and services. For rural and remote areas, providing guaranteed connectivity can be a challenge as terrestrial networks do not always extend that far and expanding them is not a cost-effective solution.

BY JOSE LUIS BARRIOS NARVAEZ, TELECOMMUNICATIONS ENGINEER AT SPEEDCAST

FOR RETAILERS in isolated locations, it is difficult to work effectively without a connection line that is both affordable and efficient. Without it, this has a huge impact on the surrounding community. By utilising satellite technology, connectivity can be provided to hundreds of stores that are the backbone of its local communities, at a time when access to basic food and medicine supplies was needed the most.

Rural connectivity

Although broadband and 4G services are improving in many areas around the world, over 40 percent of the global population do not have access to the internet, according to Statista. If we look at buying food, health and home essentials, many of us take for granted the simplicity and ease of walking or driving to a local supermarket or store, selecting items from a wide-stocked shelf, and paying for what we need, no questions asked. Many of us order deliveries online, so we do not even need to step foot in a physical store. For people living in rural or remote areas, the process is not quite so effortless. Imagine living in a small, rural community in Columbia, far away from high-quality roads or travel networks. Urban areas in Columbia make up just three percent of the nation, due to the rugged geography which includes the Andes Mountains, part of the Amazon rainforest and scattered islands. If there is only one or two shops that provide the essential food and medicine items needed to survive, it is critical that those stores have reliable connectivity to run the business efficiently.

In isolated areas, reliable terrestrial networks are few and far between. However, extending them is rarely a cost-effective option, so other solutions must be implemented. Satellite is one option that is opening the door to new opportunities that can really make a difference.

A mini-supermarket chain in South America were focused on expansion when Covid-19 reached Columbia, however this was fast-tracked to keep up with the demand for basic food and health supplies. The chain's growth was being supported by a leader telecommunications provider, but this provider was unable to rely on the connectivity provided by terrestrial networks. Instead, it turned to a communication service provider to utilise satellite.

With the help of VSAT technology, the provider was able to broaden its service areas in the most remote regions, ensuring more than 60 stores were able to function efficiently to ensure essential services were available for the surrounding community, at a time of crisis.

The chain's growth was being supported by a leader telecommunications provider, but this provider was unable to rely on the connectivity provided by terrestrial networks. Instead, it turned to a communication service provider to utilise satellite

Modern retail

Advancements in technology are transforming industries as we know it, from telecoms and healthcare, to mining and travel. Retail is no exception, with technology making it easier than ever to buy what we need. Earlier this year, Amazon expanded its cashier-less 'Go model' into the first, Amazon-branded grocery store in Seattle. Combining the product availability and low prices of a standard supermarket, with added convenience and quick shopping times, it is a retail model that is sure to become more common in the future. Many of us take for granted the benefits we enjoy due to the digitalisation of retail, but the Covid-19 pandemic did put things into perspective.

When offices, shopping centres and schools closed, people were able to stay at home as the internet enabled life to continue as normally as possible. If the pandemic happened 30 or 40 years ago, it is hard to imagine how different life would have changed overnight once lockdowns begun. Essential supermarkets and stores were able to stay open at the start of the pandemic, but access to these was not easy for residents living in remote or rural areas without connectivity, miles away from the nearest town or city. Instead, they relied on their local stores to provide the essential goods they needed, and those local stores relied on guaranteed connectivity.

The rise in satellite

A few decades ago, satellite technology was often the last option when it came to providing connectivity. Bandwidth was incredibly high-priced, while ground equipment was bulky, power-hungry, and expensive. However, sharp declines in equipment and transmission pricing has reduced the overall costs and has made satellite a cost-effective option. Now, satellite can be used to serve communities all over the world, where remote or challenging geography make it expensive to install terrestrial circuits. For hard-to-reach places, the development of VSAT technology has led it to become a cost-effective solution for those that need an independent communications network and the option to connect multiple remote sites, such as multiple supermarkets across South America. By utilising VSAT technology, connectivity to shops that offer essential services for the surrounding communities can be provided. Retail can resume as normal with the support of point-of-sale systems, inventory applications, ATMs and internet access. VSAT has proven itself to be an extremely reliable platform for these services, able to withstand significant environmental damage from storms or other extreme weather. In addition to voice and internet services for retail shops, it can also ensure reliable connectivity for petrol stations, another necessity for modern-day life. When we compare the costs of VSAT versus the extension of terrestrial networks, there is no competition. VSAT offers a fast, inexpensive installation, a high quality of service and the unique ability to share a pool of transmission capacity flexibly, among multiple remote sites.

The power of connectivity

Urban areas in the world are covered by a mobile-broadband network, but gaps in connectivity and internet access are still prominent in rural areas, as highlighted by the International Telecommunication Union's Measuring Digital Development report. A slower infrastructure roll-out, a lack of digital skills and affordability are all barriers that must be overcome to ensuring people all over the world have the access that enhances their quality of life.

Yet retailers cannot take responsibility for the communications network they need alone, nor do they have the knowledge, resources or time, especially when against economic recovery. Instead, communication service providers can overhaul retail operations by ensuring reliable connectivity is provided to customers. With satellite, rural stores can continue to run their businesses and provide essential items and services, no matter how remote or challenging their location. In times of a crisis, such as a pandemic, this access is also critical so that people can support essential businesses weather a difficult economic storm.

Three reasons retailers need to put their heads in the cloud

ALEX MACPHERSON, DIRECTOR OF SOLUTION CONSULTANCY AND ACCOUNT MANAGEMENT, MANHATTAN ASSOCIATES,
provides three reasons for implementing cloud-based systems

IF THE PANDEMIC-INDUCED disruption to retail in 2020 taught retailers anything, it's that the need to be flexible is crucial not only to business continuity, but to business survival. The uncertainty caused by repeated lockdowns, social distancing and working from home - not to mention Brexit – has had an enormous effect on society as a whole, but the closure of non-essential shops and the rise of ecommerce has had just as big an impact on retail as an industry too.

Clearly there is a need for retailers to be agile, pragmatic and fleet-of-foot, and yet many retailers are still using rigid legacy systems that are already outdated at the point of installation and often lack the resilience needed to operate within the industry today.

Against a backdrop of disruption, Alex MacPherson, Director of Solution Consultancy and Account Management, Manhattan Associates, discusses three reasons retailers should be looking to adopt cloud technology right now, as they begin rebuilding for what comes next.

Encourage innovation

Implementing a cloud-based system promotes business innovation and improves efficiency. Why? Well, with legacy on-premise solutions, organisations are stuck facing numerous time-consuming upgrades in order to get to the newest version of the technology. The only innovation coming into the business will be when the system gets upgraded and even then, companies will have to wait until the next upgrade - which could be years - in order to introduce the newest developments, meaning that companies miss out on improvements which benefit the entire organisation.

At this point, any chance of innovation is lost, leaving retailers behind the pace and a crowd of fed-up customers in their wake. Working in the cloud and with microservices specifically, however, enables retail organisations to continuously innovate, without the roadblocks of constant hardware upgrades, so that new ideas, systems and processes can be implemented rapidly to stay ahead of the curve. By freeing up internal IT capacity – which let's face it, comes at a premium in most organisations – working in the cloud means that more time can be spent on performing value-add services. Consequently, innovation will flourish, rather than just focusing attention on business-as-usual activities and maintaining vital systems.

Respond quickly to changes and demand

If 2020 taught us anything, it's that the rate of change is even more rapid than we may have ever thought. Being able to adapt and respond to changes in an instant is now no longer a 'nice to have' competitive advantage, it's essential. Organisations that choose to move to the cloud will

have the capacity and ability to respond to changing consumer demand and behaviour, rather than becoming stagnant and settled.

When shops shut their doors for the first time in March 2020, the retailers that were able to respond to these changes by adapting their Click and Collect networks, offering curbside pickup, turning their stores into mini distribution centres and collaborating with other local businesses were able to do so because their systems were flexible enough to handle the rapid changes.

Additionally, having the ability to quickly react to trends or seasonality changes; such as fashion retailers who could immediately offer loungewear on a larger scale, instead of office wear, when people were working from home, meant that less stock was being left to face large-scale discounts when stores were able to reopen. From Order Management Systems, to Warehouse Management Systems, retailers with a cloud-based approach were able to add new processes in a matter of hours, meeting customer demand - and customer expectations as a result.

Supporting business continuity

For many, the pandemic saw a halt to normal business practice and the realisation that a high-level of agility was needed in order to respond to industry developments at a supply chain level. Having a system that maintained business continuity was essential at a time when retailers frantically working like mad behind the scenes to maintain 'normal' levels of customer service.

Being able to upgrade seamlessly, without having to worry about every upgrade cycle or new IT deployment required enables this level of continuity and agility. At a time when so many other challenges and changes are being faced on a near-daily basis, being able to rely on this level of business continuity is something every retailer can take advantage of.

Conclusion

The drastic changes in the retail industry of the last twelve months have demonstrated how vitally important it is to have a level of flexibility, agility and pragmatism in order to adapt, evolve and survive. In our daily lives we don't care or even think about what version of an app we use on our smartphones and this consumerization has certainly filtered into enterprise thinking over the last few years too.

In an increasingly digital-first world that is constantly advancing, innovation and business continuity are two of the key pillars for all industries - not just retail - and the best way to achieve these goals is to turn to the cloud.

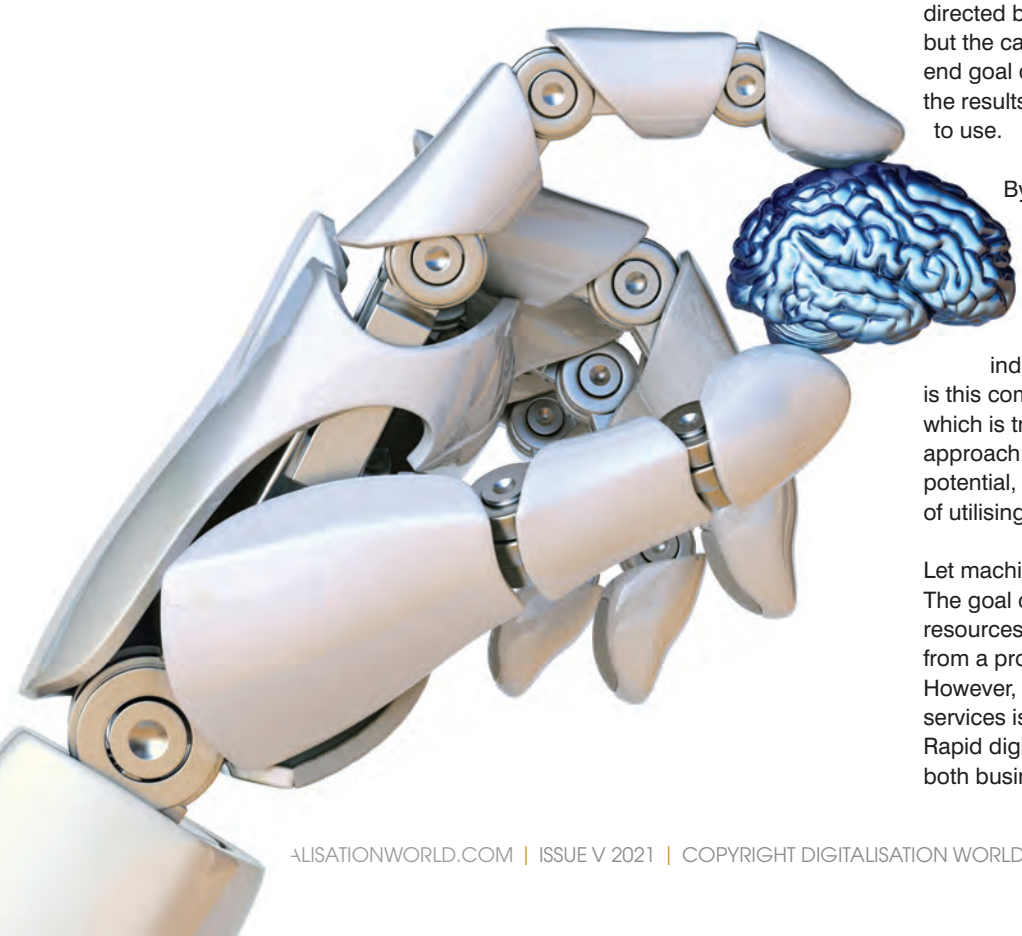
Practising what you preach:

Data centricity and democratisation

Artificial intelligence (AI) and human intelligence have always been inherently intertwined. AI was born from studies into the inner workings of the human brain.

BY IAN JEFFS, GENERAL MANAGER, INFRASTRUCTURE SOLUTIONS GROUP, LENOVO UK AND IRELAND

ALTHOUGH it previously sought to explain how the brain works, AI is now tasked with augmenting and enhancing human capabilities. Tasks that require repetitive, mundane input, or those that pull from almost incomprehensively vast data sets, are exactly the kind AI was introduced to solve. Embracing AI for such tasks stops employees wasting the energy and resources necessary to imitate a computer and instead lets them tackle problems that need a touch of humanity, such as empathy-based skills like creative design or critical thinking.



There is a false dichotomy that there is a human versus machine battle at play. The reality of the relationship is much more symbiotic, AI acts as a means to further facilitate human intelligence rather than replace it. The best analogy for this is to think of the way that we use a calculator. The device is directed by the user to solve specific problems, but the calculation of these problems is not the end goal of the process – it takes a human to interpret the results of the calculation and put the information to use.

By augmenting human intelligence in this manner, tasks that were once considered too time consuming and labour intensive can be stripped back. This results in minimal human input, producing results at a level of intricacy well beyond what an individual or team could hope to accomplish. It is this combination of human and artificial intelligence which is truly formidable. The applications of this approach are almost endless, but to truly unlock their potential, organisations must remove the complexity of utilising AI and accessing data driven insights.

Let machines be machines and people be people

The goal of any business is to assign and manage resources that provide a desired outcome, whether from a product or through a service for its customers. However, the global landscape for these products and services is far more complicated than ever before. Rapid digital transformation has raised the bar for both business and consumer expectation, creating

an environment where speed, accuracy, reliability and 24/7 availability are no longer best-in-class features; they're expected as standard. Thus, highlighting the need for digital automation to keep up in this demanding business environment.

It's important to contextualise the application of AI for different industries, as there are boundless combinations of industries and implementations. Electronics, for example, use Robotic Process Automation (RPA) in the manufacturing process of electrical devices. T Computer Vision (CV) is also used in the QA process and in fraud detection, identifying nascent issues long before they become problematic.

In these examples, the requirements as dictated by the market are beyond human capabilities. This doesn't mean that humans are excluded from the process, it's for the human to understand the context around the problem and design the wider system that meets the intended outcome. The user of these tools simply shifts from the 'doer' to the problem-solver, using their analytical and reasoning skills to improve the quality of their output.

Keep things simple

With the myth that machines are here to replace us firmly dispelled, why is there still an air of ambivalence or mistrust around AI? It is the same reason that some companies are all in on digital transformation while some tepidly chase the competition applying short term fixes. That reason is the complexity of the problem.

To get the most out of AI, regardless of your industry or the relevant implementation, the simple truth is that the technology must be usable. Not just by those with greater technical maturity or advanced data science skills, but by literally anyone in your organisation. The UI of the dashboards must be understandable. The machine learning software must be usable, the data management systems must be accessible by a variety of people with different levels of technical ability and different preferences of visualising the information. The great irony of this being that keeping things simple is a very complicated matter.

As the technology around AI improves, more frameworks, models and platforms will be widely available. Allowing teams to identify, test and adopt solutions based on their needs means there's no need to start from scratch when you can leverage the work of open source. The advancements in AI technology are also just as important. AI management applications are becoming more advanced, with much improved UIs allowing for a greater degree of intuitiveness and a lower barrier for entry. Excitingly, AI increasingly intersects with other advanced technology such as Augmented Reality (AR) broadening the appeal of AI applications to those in conventionally non-technical roles.

AI is for the Data-Centred

Organisations should embrace data centricity and democratisation, which puts data into the hands of their workforce. By letting employees use the data at hand, companies create a feedback loop of incremental improvement, enhancing the data analytics skills of their employees by improving the data collection procedures. Understanding this, we know the main priority of any successful AI implementation is to frame the problem being addressed in such a way that the actions or processes which are sought to be improved come into focus.

The success of this approach depends on whether AI is accessible to all business functions not just IT. Democratising this technology is central to integrating it into companywide workflows. This is an essential step to getting the most out of the technology and getting the return on investment of implementing AI in the first place.

This isn't to say that ROI should be the sole lens that we use to measure the success of AI integrations.

The softer benefits such as using data as a reflexive asset for ongoing improvement and the streamlining of companywide workflows can produce invaluable benefits in the longer term. The real value, though, is putting your people in control. Give them the tools, the ability, and the license to work in collaboration, not competition, with AI. Only then can artificial and human intelligence coexist in harmony, leading to enhanced business output and a smarter future.

Cloud independence:
Freedom to choose and do

Being able to maintain freedom of choice so you get the Cloud solutions you need, when you need them, regardless of where they come from is critical.

BY SIMON LOFTHOUSE, CMO, FLEXIION MSP

'NO ONE EVER got fired for buying IBM,' was a term commonly used to describe the decision to rely on a big supplier to solve all your IT challenges – size and scale equalled peace of mind. And although this exact term is, perhaps, now less relevant, the approach of relying on the 'big' supplier for that peace of mind seems to have continued in the Cloud market, which is dominated by a small number of global, big-brand hyper-scalers.

It's true, big companies like to deal with other big companies. If your organisation is large enough, then you'll probably have the necessary resources and influence to ensure your big-brand Cloud hyper-scaler responds quickly to your every need. But if your business is smaller with less customer 'clout' then getting the Cloud support you need could be more of a challenge.

The one-size-fits-all model that Cloud hyper-scalers promote is clearly very attractive; a one-stop-shop for all your Cloud requirements. But one size rarely fits all, and should you ever require something a bit different or your Cloud requirements are more fluid due, say, to changing business circumstances or evolving customer requirements, then the responsive, flexible support you require from your Cloud hyper-scaler may not be so forthcoming. Possibly, for some businesses, this is when the one-stop-shop model becomes more of a hinderance than a business enabler?

Cloud independence, does it matter?

Rapid, and sometimes, unpredictable change in the business world today is now a reality. As a result, freedom of choice and action are essential for business decision makers, now like never before. Hidden constraints and barriers conspire against the agility and responsiveness that allow successful navigation through the challenges and on towards achieving objectives and ambitions.
Cloud delivery is now unarguably mission critical to most businesses, whether they are pure technology ventures or tech enabled organisations. Cloud is now a fundamental part of business and the way things work, or don't. So Cloud independence and freedom to choose must be important?

While Cloud is a range of technology services, their central, supporting role means that they rapidly cause issues for the business if things don't go to plan. Cloud decisions are not simply technology choices because of their capacity to entangle business operations and actions far outside the domain of technology.

There are three business reasons why independence in the Cloud matters for decision makers:

1. **Costs and terms can become unacceptable as needs and usage develop**
   Change may come from the business and usage patterns shift, leading to significantly different costs to those expected. The end of free credits and other incentives may present the business with significant new costs. A provider may change the costs and terms of service, or even withdraw or change a service that's become critically important to you.

2. **Being locked-in denies freedom of choice and action**
   From a technical perspective, the ability to easily spin up new services from a Cloud hyper-scale is very attractive, but from a business point of view, the complexity this can add to moving away from a supplier is far less attractive. Technology quirks, differential pricing and other techniques can create hurdles and barriers that constrain free decision making and agile action.

3. **No one brand or provider is best at everything**
   Most big branded hyper-scalers offer a full range of services, but none excels at everything. As needs become more complex and diverse, a more pragmatic approach brings out superior performance and cost dynamics by bringing

together the best services from whatever provider is best in each case.

Freedom of choice and action, agility and flexibility are all key to business decision makers as they navigate this bumpy world of opportunity and change. Cloud is a big part of this and independence is crucial for the business. Cloud strategy and choices go beyond the technical specifications to include the needs of the business and the dynamics of change.

What are the pressures driving the need for Cloud independence?

So our use of Cloud has matured and become more sophisticated. Fewer and fewer organisations have simple Cloud infrastructure requirements these days, and the rising tides of application technologies and deployment intricacies are pushing the demands on Cloud further and further.

As hosted Cloud infrastructure grows in importance, and businesses rely on it to respond to evolving customer requirements and market conditions, build competitive advantage, grow and succeed, the richness and functionality needed calls for ever greater performance. At the same time as technology pressures and deployment are increasing, international complexities are growing from localised variations in data regulation and the demand for performance wherever the deployment.

These pressures are driving the direction of Cloud and are fuelling more and more niche services as lively innovation responds to the opportunities. All sorts of new, niche services are emerging in payments, specialist data processing and visualisation, artificial intelligence engines and data sets, storage silos, and compute power. The range of possibilities grows as different teams address different parts of the tech stack and see larger and richer use cases in servicing segments of the performance requirement.

All this presents organisations with a dilemma as they work out where they should be heading and how. Their applications and infrastructure usage need more and more effort and expertise, and so does the business of identifying, building and managing the Cloud services and infrastructure they need to deliver their business models and customer propositions.

This is why freedom of choice and flexibility is so important if the demands of building and running Cloud infrastructure aren't to strangle the work and creativity needed to use it in the business.

This is where the new category of independent Cloud support partner can contribute real value. Their skills lie in helping Cloud-using, tech-enabled organisations to identify the right mix of Cloud services needed to meet the objectives of the business, and then integrating those as a single infrastructure, delivering and managing it so that the teams in the business can concentrate on the business. Independence is central to the value and purpose of Cloud integrators so that the customer's business objectives are the true driver of the solution, and not some personal brand preference or particular commercial terms, as is the case with resellers. The truly independent Cloud support partner opens the full range of Cloud possibilities, enabling choices to be made on suitability and best fit, not the products the reseller has decided to represent, and free from any predetermined technology approaches, brand preferences or sales targets.

While the independent Cloud support partner brings the infrastructure to life and maintains it, the customer's internal team has the freedom to concentrate on the business and how that infrastructure is used to best effect. The independent Cloud integrator makes the difference, allowing the internal team to raise its game, using the best possible infrastructure, wherever it comes from.

So in an unpredictable business world, full of challenge and opportunity, Cloud will be increasingly relied upon to provide the flexibility required to rapidly introduce change, be it the delivery of new products or services or the operational enhancement of existing ones. Either way, being able to maintain freedom of choice so you get the Cloud solutions you need, when you need them, regardless of where they come from is critical.

Why price doesn't equal **cost in the cloud**

Choosing the right service cloud provider for your organisation is sometimes a confusing task. But doing the right due diligence upfront will help reach IT budget goals in the long term.

BY JUSTIN AUGAT, VP OF MARKETING AT ILAND

SAVING MONEY in IT has always been an important consideration, but due to COVID-19 many corporate strategies and budgets have been pushed off course. For example, relative to pre-COVID levels, the likelihood of undertaking cost reduction initiatives has increased globally by 74%, 66% of companies are now expected to pursue cost reduction strategies over the next 12 months and it is predicted we will see a 38% increase in these cost reduction strategies in the next 12 months, compared to pre-COVID times.

Due to the need for greater flexibility caused by COVID-19 and the need to secure these cost reductions, many organisations are now looking to the cloud. Cloud spending rose by 37% to £20 billion during the first quarter of 2020 and, according to Gartner, we saw a 19% growth in cloud spending in 2020 even when IT spending overall was down by 8%. It goes without saying that there are many benefits to moving to the cloud, one of them being cost reductions, with others including agility, flexibility, scale, working from home capabilities and the transfer of budget allocations from CapEx to OpEx.

Organisations need to look at how to do the right due diligence upfront when choosing cloud services as

it will help achieve their IT budget goals in the long term. In many cases, price doesn't always equal cost and organisations need to look at the different services and costs available before they deploy to the cloud, as different approaches to cloud technology and pricing could save them money in the long term.

Are we overspending on cloud?

In many cases, issues at the time of cloud adoption can prove costly to an organisation over the long term. For most, the top cloud initiative for 2020 was optimising the existing use of cloud through cost-saving. That is because organisations can often make mistakes during the adoption and due diligence process which can lead to them overspending on cloud services by 20-50% indefinitely.

In many instances, using a hyperscale cloud provider runs the risk of an organisation paying for more than they consume in the cloud, as organisations can often end up paying more for CPU and RAM, but their company will only use a fraction of what has been allocated to them. Many cloud environments are configured more often than not to meet the application vendors' specifications, which means that organisations end up in a situation where the resources they are paying for are simply not consumed. So, when organisations are paying for consumption they can still allocate and configure to what they actually consume but still meet the vendors' specification. This mistake with pricing models is why many organisations end up overspending by 20-50% indefinitely on their cloud services.

Additionally, in terms of storage models in the cloud, many hyperscale cloud providers will have additional transactional costs, meaning an organisation's overall cost will be higher and can fluctuate significantly.

Traditionally, hyperscale cloud providers are the most widely adopted. But the reality is that just because they are popular doesn't necessarily mean they are the most cost-effective for many organisations. Hence, organisations should only be paying for what they are consuming in their cloud environments and picking the right consumption, pricing and storage models from their cloud provider as it can make a significant difference.

The hidden costs of the cloud

When migrating to the cloud many organisations will ask 'what is the price of cloud?'. When making a cloud purchase or migrating, many organisations look at it in terms of how much compute and storage they need. However, even with compute and storage, the process is not as straightforward as you may think. With many providers, there will be additional components that organisations need to factor in before making a purchase, such as backup, monitoring, security (firewalls, antivirus etc.) and support. When organisations are looking at the initial pricing of cloud services the additional components may not be factored into the equation, or organisations may assume they are included in the service. But frequently these components are sold separately at an additional cost by hyperscale cloud providers and the fully scoped service may end up costing more. When choosing your cloud service provider, organisations need to make sure all the additional components are included in the overall cost as the lowest initial price doesn't always mean the lowest costs long term.

How to save on cost in the cloud

To avoid these costly mistakes, organisations need to adopt the below framework which can effectively reduce the total costs of IT and prove it before deploying to the cloud.

Understand your driver for change to the cloud

Evaluating your drivers to deploy to the cloud is important when looking to reduce costs as it can temper expectations of what is possible in terms of cost reduction. Organisations need to consider what their driver for change is, but to make sure to preserve what their applications and their business require also.

The lowest price doesn't always equal the lowest cost

When considering different cloud service providers organisations may be tempted to pick the cheapest one. However, it is important to consider that this low price maybe because the cloud service provider will only cover the basic needs of the organisation and there will be many additional costs on top of this.

Measure twice, cut once - calculate costs before you deploy

Cloud can be easy to deploy, but it can be very costly along the way due to mistakes made. Therefore, organisations need to measure the cost performance before they deploy to the cloud.

Cloud infrastructure matters

With all the different cloud provider offerings, there will be technologies that will be superior to others for an organisation's specific business needs - from compliance requirements to service and support levels. Therefore, organisations must evaluate which provider will give them the best offering and cloud infrastructure for them.

Choosing the right service cloud provider for your organisation is sometimes a confusing task. But doing the right due diligence upfront will help reach IT budget goals in the long term. Organisations need to take into consideration what the right consumption, pricing and storage models are for them, establish if there are hidden costs for additional components like security and support, and adopt the framework outline to secure the best price for cloud services not only initially, but in the long term.

What is Cloud Native?

Telecom network operators were rattled when cloud computing first arrived on their doorstep.

BY LIRON GOLAN, DIRECTOR OF PORTFOLIO MARKETING AT NOKIA

IN AN ALREADY competitive industry, the thought of more players entering the fray set alarm bells ringing. Telecoms couldn't compete with cloud providers' low-cost services, which could be switched on quickly and scaled flexibly.

The cloud business model appealed not only to end users, but to Telcos themselves. 'Cloudification' and virtualization technologies, such as NFV (Network Function Virtualization) and SDN (Software-Defined Networking), were ushered in with much fanfare. They promised to transform the economics of telecoms and make operators more agile in creating new services.

One term that is increasingly misunderstood by non-experts is "cloud-native". More specifically, "cloud native" is used to refer to technologies that are applied in developing applications built with services packaged in containers, deployed as microservices, and managed on elastic infrastructure through agile DevOps processes and continuous delivery workflows.

In telecoms, we should understand "Cloud-Native," by basing it on what we have learned from studying the Webscale providers (Google, Amazon, Netflix, etc.), applying it to telecoms.

- Small, stateless microservices, running in containers, because compared to large things, small things are faster to get deployed and upgraded. And small things use fewer cloud resources, because you deploy just what is needed, instead of the entire network function.
- Cloud DevOps for automation and fast time to market. When you deploy an upgrade, use canary deployment to test it with a smaller group before extending it out to everyone.
- Open architecture & APIs so you can continually onboard innovation. For example, 5G's core uses a service-based architecture, with well-defined APIs for network functions to offer services or call on each other. This, along with the cloud-native service mesh, enables rapid manipulation of your 5G core, whether for integrating new network functions, or rapidly scaling or deploying per-enterprise slices.
- Cloud agnostic, so you can deploy anywhere. Because the infrastructure is abstracted, you can eliminate the hardware dependencies.

What are cloud microservices and containers?

Containers isolate an application and its dependencies into a self-contained unit that can run anywhere. In this environment, hardware and operating systems are virtualized, which means the same operating system is shared with other hosted applications.

In a traditional IT environment, operations teams manage the allocation of infrastructure resources to applications manually. In a cloud-native environment, applications are deployed on infrastructure that abstracts the underlying compute, storage and networking primitives.

What is cloud open architecture & APIs?

Webscale providers (Google, Amazon, Netflix, etc.) initially deployed without a service mesh, but they found their large cloud systems too difficult to manage, because messages were not observable or controllable. So, they implemented a service mesh (open-source examples include Istio, Linkerd) to move where the messaging takes place — out of microservice and into an adjacent sidecar.

What is a service mesh?

The service mesh is how many microservices share information with each other. When you have a lot of messages — which happens when moving from big monolithic applications to many microservices — a service mesh becomes critical. It abstracts the messaging between the microservices in a dedicated service mesh architecture that is instantiated alongside those microservices.

Microservices offer and call on services from one another, as producers and consumers of information. The messages might flow one-to-one or one-to-many. The microservices ask for or receive the information they need, such as a slicing function asking for an enterprise's policy definitions, for example.

As a result, the service mesh enables the cloud-native architecture's modularity and programmability, so that 'on-demand' the network or service can quickly be scaled or updated. You can bring new ideas to market much faster and respond more quickly to your customers' demands. By using APIs and the service mesh to abstract the microservice network's complexity, you enable the speedy creation of new services by yourself or partners.

What is cloud orchestration?

Cloud automation is incredibly important. 5G services will continually need updated capabilities. DevOps helps you automate delivery, installation & testing. At its core, DevOps for cloud is the automation of agile methodology.

DevOps automation is becoming cloud-centric. Most public and private cloud computing providers support cloud DevOps systemically on their platform, including continuous integration and continuous development tools.

Telecoms providers are beginning to recognise the need for purpose-built pipelines to address this – to reduce time to value, improving its efficiency with all necessary assets automatically delivered (including software images, Helm charts, Test cases, etc) while the DevOps platform controls installation, test execution, and results reporting.

Cloud agnostic

Solutions provided by telecoms providers must be cloud-native by design - built to work in any hybrid cloud and to accommodate and honour customers' choices. Providing customers with a cost-efficient and rapid way to run workloads, regardless of where they are in their cloud journey, is essential to modern operations.

Allowing developers to focus on their app's business logic, by reusing common, shared micro-services helps the service provider, because cloud resources are more efficiently used. The future of Telecoms lies in offering solutions that avoid lock-in on cloud platforms and empower customers with the ability to migrate workloads swiftly, across the entire cloud value chain including Platform, Containers and Infrastructure as a service.

While great technology is a start, CSPs need more than that to deliver sustainable business value – they need to balance technology and people. By embedding the right business processes and workflows within their day-to-day operations, they'll be able to flawlessly execute their cloud strategy and achieve their business objectives while providing network IT teams with tools that boost efficiency from day one.

How to keep costs down when using the cloud

The cloud is a model that has cost-efficiencies designed into it. With the proper attention to these details, increased margins and new digital value can be created.

BY GEOFF CLARK, GENERAL MANAGER, EMEA, AEROSPIKE

CLOUD BUDGETS are increasing. According to the latest forecast from Gartner this year worldwide end-user spending on public cloud services is forecast to grow 23.1% to total $332.3 billion, up from $270 billion in 2020, Software as a service (SaaS) remains the largest market segment. Growth is expected to reach $122.6 billion in 2021 as the demand for composable applications requires a different type of SaaS experience. Technologies such as containerisation, virtualization and edge computing are becoming much more mainstream which is driving additional cloud spending.

The pandemic has also served as a multiplier for organisations interested in adopting a cloud approach and it's set to continue. By 2022, SaaS is forecasted to increase by a further 18.5% to $145.4 billion with a total market spend of almost $400 billion. Here are some useful management strategies to help enterprise organisations reduce costs when deciding to adopt a public cloud, private cloud, hybrid cloud or multi-cloud approach:

1. Public cloud:

Enterprises should consider how they design for a

specific cloud with an awareness of how workloads match the provider's cost structure. This is something organisations often fail to address, particularly when considering a longer term view.

They have to establish whether the dominant factor will be storage, networking, or compute. They also need to understand how their workloads fit with the cloud provider's instance types. Do their workloads scale up on larger hardware instances, or do they best fit with smaller instances that must be scaled out? In that case, network bandwidth may become a factor. It's possible to develop new applications to cost-optimise their performance and scalability requirements.

It becomes even more complex when moving legacy systems to the cloud or when preserving a portion of the systems or code already in place. Enterprises must evaluate the application's architecture and delve into the cloud provider's architecture and model the costs. This may lead them to rework parts of a legacy architecture or select a cloud vendor that best fits their workloads. They can't assume pricing for a given workload will be the same for all cloud vendors.

For instance, it is important to understand how applications may experience increased demand and workload due to changing consumer behaviours and trends. This is particularly relevant as more and more applications are being developed using technologies such as AI, IoT and ML. By nature they have a significant demand on network and data storage and often take advantage of 5G. In addition, applications such as these are typically real-time in nature and therefore the demand on the cloud will increase by orders of magnitude in many cases.

Expenditure in public cloud spend is strong, as enterprises continuously migrate to the cloud as part of their digital transformation strategies. However, it is wise to consider if a public cloud will deliver at the scale and volume which is required for more demanding uses.

2. Private cloud

With a private cloud strategy, organisations need to follow the public cloud's model of automation, management and attention to building the right infrastructure for their workloads. They can manage workloads that don't require a significant level of elasticity better in a private cloud.

Attention to the units of composition is key. Should they have small converged components or allow for larger instances? Should they have storage as part of the instances or as a separate service? There isn't one answer. Different applications and infrastructure components will require different architectures, and that will dictate the instance types, storage, and networking to be used. Getting this wrong can impact utilisation rates and costs which can spiral out of control and lead to unexpected billing. When planning their architecture enterprises should build with an understanding of current workloads but also consider future requirements. For example where they project their architecture to be in the next two to five years – and in some cases beyond. They'll need to design cost-efficiency into the architecture upfront and should expect to manage many trade-offs. Attention to this kind of detail can provide significant cost benefits. Digital business offerings have real infrastructure costs and companies with cost advantages can translate that into profit margin.

It becomes even more complex when moving legacy systems to the cloud or when preserving a portion of the systems or code already in place. Enterprises must evaluate the application's architecture and delve into the cloud provider's architecture and model the costs

3. Hybrid cloud

Enterprises can have the best of both worlds. Workloads that are well understood and stable in terms of scale can be best optimised on their own hardware. The cloud is flexible and agile, but it is not free. The task is to optimise across the opportunities presented for cost savings by both the public and private clouds. Enterprises need to consider the additional ingress and egress costs imposed by the public cloud provider on shared data between the private and public components. They'll have to reduce that traffic, which will lead to compromise on where they put different workloads, as these costs can be large.

This kind of addition outlay may surprise many organisations and unsurprisingly they fail to take it into account in their designs. For companies with existing systems core to their operations, this is a problem that needs to be solved. Organisations that have substantial elasticity in their infrastructure demands can realise increased savings from a hybrid cloud design that leverages the public cloud. And they'll avoid missing out on seasonal opportunities as they design with elasticity in mind.

4. Multiple clouds

When using multiple clouds, enterprises should match their workloads to the best architectures and pricing models. They have to understand the requirements of their workloads and have confidence that they've

designed them for efficiency. Then they must investigate and have a complete understanding of each vendor's pricing model. As they look at different offerings within the vendors' product lines, they'll often see that many vendors have subtle differences in how pricing works. It is also very important to understand the networking between the cloud providers and ensure they offer the required performance.

Understanding the breakpoints for operating at scale is also important. Will they meet the quotas to gain the pricing they've modelled? And what happens if they don't? More organisations are starting to investigate arbitrage and matching workloads to cloud vendors' pricing models. But they need to be careful to ensure they're not missing volume-pricing advantages, which might negate these savings.

Enterprises have new support for operating in a multi-cloud environment. For example, the Cloud Native Computing Foundation (CNCF) is a group of cloud vendors, software vendors and end-users who are collaborating to deliver a standards-based stack for orchestration and management of workloads in the public and private clouds. Intiatives like this provide the tools necessary to operate better while creating a virtual cloud infrastructure that hedges its bets on pricing, availability and the trajectory of innovation. As enterprises migrate to the cloud, they'll need strategies to help keep cloud costs under control.

The cloud is a model that has cost-efficiencies designed into it. With the proper attention to these details, increased margins and new digital value can be created.

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DCA Data Centre Sustainability SIG

An Introduction from DCA CEO Steve Hone

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 can join any of the groups and contribute find out more here: https://dca-global.org/groups

The DCA Sustainability SIG is chaired by Astrid Wynne, Sustainability Lead at Techbuyer

The purpose of the Sustainability Special Interest Group is to develop best practice in the UK data centre industry with respect to materials usage, energy efficiency, skills development and workforce retention in an operational data centre environment.

The group aims to achieve this through:

- Optimising energy efficiency at use phase
- Expert insight into IT hardware and the effect on energy draw
- Insight into the role of IT load with respect to this, including:
  a. the effect of full utilisation on efficiency as measured by compute power over energy.
  b. the ability of software to dematerialise hardware.
  c. minimising data transfer and storage, potentially leading to a sector Code of Conduct
- An understanding of the importance of Scope 3 emissions (also known as embodied energy) in the hardware, facility and building.
- Circular solutions for the IT hardware and other infrastructure
- Circular solutions for heat, power and IT load
- Use of renewable energy in the sector.
- New technologies that can aid this.
- Existing and upcoming standards relating to this.
- Education of workforce with respect to sustainability insight and practice

The group work very closely with the Energy Efficiency SIG to provide DCA members with an entire overview of data centre energy efficiency and sustainability.

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

Sustainability SIG Overview

By Chair Astrid Wynne

THE DATA CENTRE remains the beating heart of our digital world. Businesses and society rely on these facilities to keep connected, informed and entertained. However it is important that we all recognise that these services come at a price not just on the pocket but also to the environment.

With every GB of data processed, transferred or video streamed just that little bit more energy is consumed, and even more technology is needed to service it, and this is something every one of us needs to recognise and own. The COVID-19 pandemic especially has given business the impetus to consider their buying choices and habits. It seems now more than ever people are willing to participate in sustainable practices or work towards improving sustainability. For the past 7 years the DCA has included Sustainability as part of the DCA Energy Efficiency Special Interest Group remit. Despite both subjects being intrinsically linked they have now both become such big issues in their own right that the decision was made to separate them out into two dedicated working groups, with John Booth remaining Chair of the Energy Efficiency Group and Astrid Wynne becoming Chair of the newly formed Sustainability Group.

John Booth, chair of the Energy Efficiency and Sustainability explained, "The conversation is changing because the world is changing. Climate change, energy and resource scarcity are now further up the agenda than ever before, and governments around the world are slowly but surely beginning to address these problems. Data Centres are complex, "systems of systems" involving ICT equipment, servers, storage and networking, resilient power supplies, cooling as well as the actual buildings themselves. We must look at raw material extraction, processing, manufacture, transport, in use and disposal for all elements within the system and if necessary redesign all of this to be more sustainable."

Why and why now?

Co-founder of the DCA Steve Hone said,

"Continuing to simply consume more and more data without taking into account the impact we are having on our environment is irresponsible and unsustainable. We all have a moral duty to try to leave this world in a better condition than we found it."

He added, "The UK Government's commitment to a sustainable future includes a pledge that the UK is to be carbon neutral by 2050. The headline is wonderful, but it is a near impossible target to reach unless everyone is pulling in the same direction. A commitment such as this demands a "cradle to grave" approach, which needs to address not only energy production and consumption but also the technology needed to deliver these services."

Group member Dr Jon Summers, from the RI.SE Institute in Sweden says that this needs to include everything from the "chip to the cloud" alongside a serious look at the consumption and storage habits of consumers. With so many of us recycling household plastics and cardboard, we need to do the same as an industry with our historical data and the hardware it sits on. Not all ones and zeros need to be saved in triplicate or stored forever. Older technology can still be repurposed to extend its life.

What is in it for data centre managers?

In a sector beset with all kinds of critical issues, sustainability has in the past seemed like a lower priority for data centre managers. However, there is a lot of evidence that performance on people and planet plays to the bottom line too, particularly in a sector that is responsible for high energy use.

Writing as a guest blogger for Schneider, IDC Research Director Jennifer Cooke said, "Organizations are setting aggressive goals to reduce their carbon footprint and impact on the earth by 2025 and 2030 and beyond. Colocation providers that understand the critical role IT and data center resources have in this journey are making investments today to prepare for their customers' needs in five years."

According to the IDC, 55% of organizations believe that a colocation provider has a better ability than they do for monitoring environmental conditions and power consumption in white spaces. In other words, they are buying into the cloud as a solution to their data transfer and storage energy optimisation. 43% said energy efficiency and green initiatives was a top driver in their choice of colocation provider.

There are benefits for those hoping to attract investment too. In 2019, the Harvard Business Review interviewed 70 senior executives at 43 global institutional investing firms, including the world's three biggest asset managers (BlackRock, Vanguard, and State Street), giant asset owners, and the government pension funds of Japan, Sweden, and the Netherlands. It found that environmental, social and governance issues were almost universally top of mind for these executives.

Finally, in a sector for which attracting and retaining skilled personnel is a focus, demonstrating best practice in sustainability is a real asset. A global survey conducted by LinkedIn in 2016 revealed that 74% of candidates want a job where they feel like their work matters.

What does the Sustainabilty SIG hope to achieve?

With the UK leaving the European Union, there is a need for domestic legislation with respect to Zero Carbon, Circular Economy. The DCA hopes to help with this process by collecting expert insight from across the value chain as well as from academics and researchers in the field.

The scope of the SIG is wider than just energy efficiency. It also spans circular economic approaches to infrastructure refresh, mitigation of scope 3 emissions in the building, how smaller data centres can achieve renewable power supply, facilities and IT hardware, relevant standards and suggested regulation, education of the wider sector with respect to this. Ultimately this will lead to best practice guides for the sector which can then be shared with the UK government.

The circular life of data centre hardware: Future predictions

SEVERAL DCA PARTNERS are now working within the concepts of the 'Circular Economy' – here at the DCA we thought we'd find out a little more about this and have been reading more about this subject.

The definition of the circular economy made us realise that the it's a very simple concept – a little bit like the 'Circle of Life' in the Lion king. Every manufactured product on its demise returns to its creator to be re-purposed and contribute to the next version of the product.
A circular economy follows the principles of 3R: reduce, reuse and recycle.

- Resource use is minimized – Reduced.
- Reuse of products and parts is maximized – Reuse.
- Raw materials are reused – Recycled

During our investigations we read an interesting case study that we would like to share with you. Written by Deborah Andrews, Associate Professor of Design and Beth Whitehead Associate Sustainability Engineer, Operational Intelligence Ltd; here are the first few paragraphs, a link to the entire case study can be found at the end.

The case study provides predictions for Data Centres in ten years' time, key areas covered include:

- Post-use infrastructure
- Current and future growth in Connectivity and the Data Centre Industry
- The Data Centre Industry in 2030
- Future Scenario One: No Change
- Future Scenario Two – Change towards the Circular Economy
- The Role and Importance of Design in Future Scenarios 1 and 2
- Conclusion

Data Centres in 2030: Comparative case studies that illustrate the potential of Design for the Circular Economy as an enabler of Sustainability

By Deborah Andrews, Associate Professor of Design and Beth Whitehead Associate Sustainability Engineer, Operational Intelligence Ltd

Introduction

During the 1980s the British engineer and computer scientist Sir Tim Berners-Lee developed a digital information and communication language and network, which subsequently evolved to become the World Wide Web in 1989. Since then the user group has expanded from 'geeks', researchers and academics and over 4.2 billion people and 55% of the global population are now 'connected'.

While 'devices' (desk and laptop computers and mobile phones) serve as human-digital data interfaces, the hidden but critical enabler of connectivity is data centres (DCs). These facilities may be cupboard-sized or, like the largest in the world, equivalent in area to 93 football pitches, but all house digital data processing, networking and storage (ICT) equipment. Such is the popularity of the internet that since its launch the number of DCs around the world has grown to 8.6 million (Infiniti Research, 2015) with a total floor space of 180 million m2; 10 million m2 of which is in Europe with 70% concentrated in North West Europe (NWE). The main concern of the DC industry is 100% uninterrupted operation for customers and consequently, focus within the sector has been technical and product development, manufacture and operation with limited consideration of treatment at end-of-life. This paper considers two potential scenarios and their impacts for the data centre industry (DCI) in 2030; the scenarios are speculative and are based on past and present trends in and experience working with this unique sector.

Current and future growth in Connectivity and the Data Centre Industry

Such is the popularity and success of the internet that in Europe and the USA 85% and 95% of the population are connected respectively and more and more businesses, education and other service providers are becoming increasingly reliant on connectivity; in Africa and Asia even though the percentage of connected individuals is lower (36% and 49% respectively) population groups are much larger and consequently many more people are connected due to cheaper mobile devices (Miniwatts Marketing Group, 2018). Patterns of internet use vary according to user age, location and affordability: in developed countries such as the UK typically adults spend 4.75 hours per day online (IPA, 2018). In addition, data consumption has increased exponentially and concurrently with the number of work and leisure services on offer: for example, in 2016 the demand for data centre storage capacity increased by 1 Petabyte every day (Brewer et al, 2016). Growth will continue in order to process the increasing volume of data that will be generated by expansion of services via the Internet of Things (IoT), and commerce, healthcare, education, leisure services alongside population and economic growth in countries such as China and India.

It is apparent that there are differences in

connectivity according to geographical location but there are even more extreme examples: in Iceland 98% of people are connected while in Somalia and Eritrea

connectivity is limited to 2% and 1% respectively. There is also a disparity among demographic groups and women, the rural poor and residents of remote islands 'are substantially excluded from education, business, and other opportunities that the internet can provide'. Sadly, since 2007 growth in many developing countries has slowed due to a number of factors including: limited and/or no 3G, 4G and wi-fi infrastructure, and the cost of network access, smart phones and computers (A4AI, 2018). As a result, the connectivity gap between different social and national groups is growing.

Reliance on and demand for data centres will increase as more people, smart products and services are connected. In NWE alone capacity will increase 15%+ per year (300%) by 2025 and a global increase of 500% is predicted by 2030. DC operational energy consumption will rise concurrently to facilitate this growth and even though DCs are becoming more energy efficient it is predicted that by 2025, 20% of global energy will be consumed by the sector (Andrae, 2017).

Environmental and social impacts

At present the largest environmental impact from DCs derives from operational energy; this is being addressed by improved operational efficiency and the use of renewables.

However, in view of the above growth the embodied impact of DCs must not be ignored. During overall DC building life (60 years) 15% of embodied environmental impact derives from the building and facilities while 85% derives from IT equipment (Whitehead etc al, 2015). Impact is high because equipment is regularly refreshed (servers every 1-5 years, batteries every 10 years and M&E equipment every 20 years).

Although specific sectoral data has not been published, the DCI is a significant contributor to the global total of 11.8 Mt/year of Waste Electrical & Electronic Equipment (WEEE), which is one of the fastest growing waste streams across Europe and the world.

DC equipment is typically composed of 'common' metals (steel, copper, aluminium, brass and zinc), polymers (ABS, HDPE, PUR, PVC, GPPS, PBT, EVA) and 10 critical raw materials (CRM) - Sb, Be, Cr, Co, Li, Mg, Pd, Si, Dy, Nd, Pr, Tb. They are vital for economic growth but risk to supply is high and is affected by: their abundance/scarcity in the earth's crust; their geological and geographical location (which influences technical ease of extraction and political circumstances); current recycling rates; and potential substitution by more readily available materials. DC equipment is comprised of 99%+ 'common' metals and polymers and 0.2% CRMs; however, their importance cannot be underestimated because electronics cannot work without them.

Gold, tin, tantalum and tungsten are similarly essential to electronic products; they are identified as Conflict Minerals because they are produced in central Africa and specifically the Democratic Republic of Congo where their (unethical) mining and sale funds armed conflict and political instability.

The extraction processes of many of these and other materials also involves hazardous substances (e.g. arsenic, mercury, sulphides) and because a lot of their mining is unregulated and/or illegal the associated negative environmental and social impacts are high.

Read the full case study here: https://www.cedaci.org/publications

Gold, tin, tantalum and tungsten are similarly essential to electronic products; they are identified as Conflict Minerals because they are produced in central Africa and specifically the Democratic Republic of Congo where their (unethical) mining and sale funds armed conflict and political instability

Extending the product lifecycle: The first step towards circular IT

By Steve Mellings, CEO and founder of ADISA

THE WARNING from Cisco that chip shortages will impact supply throughout 2021 is a further reminder that our ability to feed the never-ending demand for new electronics is not sustainable. With the environmental impact of business now a boardroom topic renewed focus is placed on our use and consume approach to technology both in the domestic and work environment.

ADISA runs a certification scheme for companies who recover redundant equipment from businesses and after over 500 audits worldwide we perhaps have a unique appreciation of how businesses view end of life infrastructure. In our experience the way in which businesses manage asset retirement varies dramatically with many simply viewing it as a waste stream with the infrastructure being handled with almost wilful distain. Others view it as an afterthought with little appreciation of it as a genuine business process and for some it is a seen purely as a data security risk.

Why is this important you might ask?

Like all processes the starting point can shape the direction which it runs. Asset retirement and in turn, asset recovery, are 2 critical business processes which can help extend the product lifecycle and, further down the processing line, present viable technology back to the procurement teams to create a genuine alternative to buying new.

For businesses when disposing of redundant equipment, the first thought should be to the data on that equipment. A failure to fully understand how storage media can be securely overwritten leads many organisations to adopt the risk avoidance process of destruction. To destroy perfectly serviceable devices is a very credible way of protecting data but it also has a huge negative impact on component recovery and product reuse.

If we also add recent law changes regarding Persistent Organic Pollutants (PoPs) and how a failure to processing redundant equipment properly can lead to an enforced position of incineration, then perhaps we can see that the decisions made at the very beginning of the retirement and recovery process are critical if we are extending the product lifecycle.

Professional IT Asset Disposal / Disposition (ITAD) companies are well versed in managing data sanitisation and are (hopefully) well briefed on how to manage the risk of PoPs in the process and so the selection of the correct partner to help businesses manage their end-of-life assets is the first crucial part of extending the product lifecycle.

The next step is the realisation that this is a service industry providing data protection and compliance services with the by-product being potential revenue from material recycling and product resale. This is again critical when we are looking at extending the product lifecycle because the cost of recovery and processing should be borne by the company releasing those assets in return for a data protection compliant service.

Cost recovery

Once the cost of recovery is covered, the asset is on a bench at a cost zero point to the processor. This enables that processor to then invest more time and cost into that device to test it properly, repair it and upgrade it to make more appealing to the next users. If the asset is already carrying a negative cost to the processor, then their ability to extend the lifecycle is blighted by the diminishing margins associated with the preparation for reuse. Where these margins are tight, a range of negative actions can occur as the processor will either recycle the device without considering repair, sell a minimally tested product into trade OR sell a device to a user which has had a cheap process applied thus providing the next user with a poor experience.

So, the first stage in extending the product life cycle is how to retire those products in the first instance.

The next stage is for the industry to up their game and to invest in understanding technology better than merely seeing it as something to broker to the highest bidder. There are some fantastic refurbishers in the UK who can take devices back to “as new” and to present them to procurement teams as genuine viable devices. They are not the norm however, and it is this part where the sector needs to improve otherwise, we will not overcome the final challenge – PERCEPTION.

Despite us being used to buying second-hand houses and second-hand cars, to suggest to procurement teams that they should adopt a buy refurbished strategy is something for many they couldn’t even consider. And the simple reason for that is that for many second hand is second rate due to negative experiences when purchasing second hand equipment. That, however, is changing.

Within the past 12 months as new devices have become scarcer, refurbished equipment has become the only option for many despite reticence to embrace it wilfully. This demand has led many refurbishers to now deal directly with business buyers and as a result they have been forced to up their game.

From a small handful of excellent refurbishers in the UK there is now the beginning of a professional channel being created. With new standards and collaboration happening in 2021, the refurbishment channel is coming out of the shadows and with the help of those companies releasing assets, is presenting itself as viable environmentally friendly alternative to new.

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