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VIEWPOINT

By Phil Alsop, Editor

DEI- time to make a difference

OF ALL THE NEWS items in this issue of the magazine, I think the story under the headline ‘Do men in tech recognise gender inequality yet?’ is the most interesting. Asked if they agreed that men and women are treated equally within their own organisation, the men surveyed overwhelmingly (80%) said ‘Yes’.

Responding to this finding, the Chairman and CEO of the company which carried out the survey, James Lloyd-Townshend observes: “I have to say, the results are startling. I’d love to know what percentage of the men who feel there’s no gender inequality in their organization have reached that conclusion through actual conversations with the women in their workplace. It’s common for those who don’t experience inequality to ignore or deny its prevalence. What we need is more engagement, observation, listening – and ultimately allyship, from men in tech.”

Over the past couple of years, DW has conducted quite a series of video interviews with women working in the IT industry and I think it’s safe to say that, without exception, they all find that, in various ways, equality has yet to become the norm – although they pretty much all agree that the workplace has improved significantly when it comes to DEI as a whole.

The disjoint between what men think and what women actually feel and experience explains why there’s still a way to go when it comes to workplace equality. And this matters for a number of reasons.

Firstly, in the 21st century, it is simply unacceptable to have different groups of people treated differently within the workplace.



Secondly, at a time of a growing skills crisis within the IT industry, it makes no business sense whatsoever to discourage (however unconsciously) half the potential workforce from joining and/or developing a career within a tech organisation.

Thirdly, if an organisation’s workforce is not truly representative of its customer base (assuming the company wants to sell to as wide an audience as possible), then there’s every chance that the products and services it develops will not appeal to significant groups of potential customers.

As with sustainability, it may well be that, as the younger generation brings its more enlightened attitudes (to most things) into and up the workplace hierarchy, the DEI situation will naturally improve over time. But it would be great to think that some of the mature ‘leopards’ working in the industry can be persuaded to change their spots in the mean-time, even if only because of the extra commercial advantage it will bring to the organisation.





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Enterprises losing more than \$1m a week through inefficient technology use

Investment in digital adoption technology rises 63% year-over-year, as employees spend 44 working days a year compensating for technology issues.

WALKME has released its flagship report, The State of Digital Adoption 2024 (SoDA 2024). The report shows that, while digital adoption is a rising priority for enterprises, a lack of best practice is still costing many organizations dearly.

The research, based on a survey of more than 4,000 executive and employee respondents, found that an inability to correctly and fully utilize technology costs enterprises on average \$1.14M a week in lost productivity, with employees wasting 44 working days a year. However, enterprises realize the challenge, with 70% of organizations listing digital adoption as a strategic priority and with investment in digital adoption up 63% year-over-year, according to the study.

Prioritizing digital adoption has shown proven results for enterprises. 6% of respondent organizations have fully embraced all recommended digital adoption best practices, saving on average \$4.9M a month in reduced costs.

With happier employees and higher ROI, they're leading the way in the

journey towards HyperProductivity. This success explains why 69% of enterprises say those that don't embrace digital adoption will be in an unsustainable position by 2028.

The cost of doing nothing is clear — with 46% of medium enterprises' digital investment missing ROI due to lack of uptake, amounting to \$13M wasted spend. Many enterprises still lack control over their IT estate, underestimating the number of applications they use by ten to one.

"SoDA 2024 is our most extensive report yet, highlighting the critical juncture at which we stand with global IT spend anticipated to reach \$5 trillion and a 13% growth in software spend. This makes optimizing technology investments more crucial than ever," said Ofir Bloch, vice president of strategic positioning at WalkMe.

"Digital adoption is now indispensable, especially as artificial intelligence becomes pervasive, affecting every aspect of our business workflows. With 93% of enterprise leaders stressing the need to enhance productivity to stay competitive, fully leveraging digital adoption strategies is essential for addressing emerging challenges."

Highlights from the research:

Employees spend as many as 353 hours, or 44 working days, a year compensating for technology issues such as troubleshooting software problems, waiting for support, or

struggling with inadequate instructions. Enterprise leaders believe their organization uses 21 applications, but on average, large organizations use 211 applications while smaller companies use 69.

68% of organizations have a team of employees responsible for digital adoption across all departments — compared to 48% in 2021.

Organizations that have embraced all digital adoption best practices save on average \$4.9M a month compared to those that only follow some. In addition, these enterprises see:

- 14% less spend on digital transformation projects that fail to meet ROI.
- 18% higher ROI from digital transformation projects.
- 30% higher application utilization.
- 21.5 working days a year of employees' time saved through improved user experiences.

"As more organizations realize the need for effective change management and decide to fully embrace digital adoption, they will begin to experience HyperProductivity. In this aspirational state, everyone can use any application with ease, and companies will have automated as many processes as possible and integrated technologies into one cohesive, streamlined workflow," continued Bloch.

"By scaling and replicating digital adoption successes organization-wide, enterprises can give employees the tools, technology, and support they need to operate exponentially faster and more effectively than before. This will be crucial in navigating productivity challenges in an uncertain economic climate and ensuring organizations realize the full ROI of their projects."



Navigating IT budgets amid AI-boom: Experts eye automation tech

In an era of increased tech spending, especially in AI, experts emphasize the critical role of strategic investments in automation to streamline operations and make better decisions.

DUE TO INCREASING interest in AI-enhanced software solutions, along with ambitions to transform core IT practices via automation, tech spending is on a steep rise — it's projected to grow 6.8% from last year. This prompts companies to face a critical decision: where to allocate their budgets for maximum return on investment (ROI).

According to experts, Robotics Process Automation (RPA) and smart app creation suites represent promising options to gain an edge in business efficiency and innovation going forward. Strategic investments amid the AI boom The surging tech spending, expected to reach \$5 trillion in 2024, is a direct response to the digital transformation happening across numerous industries. According to Giedrius Gustas, Data and Power Platform Offering Lead at Reiz Tech, automation technologies like RPA, and AI-enhanced app generation suites show promise as investment opportunities for companies.

“RPA streamlines business processes by automating routine tasks that are typically time-consuming and error-prone, enhancing productivity and accuracy. Other notable automation tech includes smart suites that can help you program your own apps. This allows organizations to develop custom solutions, tailoring them to their specific needs. It makes app development really simple and gives companies ample opportunities to innovate,” explains Gustas.

Amid the tech wave, businesses are advised to consider investing in areas that directly apply to their needs, rather than spending on generalized AI solutions. “Investing in new technology is a requirement to maintain competitiveness, but in today's AI gold rush, it is important that these investments are strategically placed



with regard to a company's pain points,” the expert notes.

“Overall, digital transformation, AI, and cybersecurity are some of the main directions where companies should focus their budgets,” advises Gustas. In his view, it's beside the point to keep pace with the rapid advancements in these fields — companies should rather leverage the technologies to fix chokeholds and enhance their strengths.

RPA represent favorable opportunities for efficiency

RPA can offer practical benefits by automating routine tasks such as invoice processing, customer service, employee onboarding, data migration, and inventory management, enabling businesses to direct their workforce to more pertinent tasks that require human expertise.

“RPA solutions can operate around the clock, significantly reducing the potential mishaps associated with manual processes, as well as minimizing the needed manpower — it enables to effectively downsize from 20 to 5 people. Overall, embracing AI will help cust business costs, while also increasing the quality of work — when

done right, it's a win-win situation,” Giedrius Gustas highlights.

Navigating the challenges of automation

However, Giedrius Gustas cautions against the potential hurdles of automation, such as internal resistance due to fears of losing jobs, and integration complexities, as merging the new solutions with older systems can bring up unforeseen challenges. The expert recommends a phased approach, starting with simple, step-by-step processes.

Adhering to a plan for gradual expansion ensures ease during the familiarization with automation — “picking a few essential RPA tools and initiating the process gradually will help to mitigate the most pronounced challenges,” Gustas advises.

The expert also warns against overinvestments in areas like in-house IT geared to build highly customized solutions, as these may not yield a worthwhile ROI. “The rapid evolution of technology has opened up lots of affordable and quickly scalable external solutions, rendering investments like in-house IT as outdated. Typically, it is slow, costly, and too scattered to make a compounding difference,” he asserts.

Do men in tech recognise gender inequality yet?

Latest survey reveals men still slow to acknowledge sexism and misogyny in tech industry.

AS A SUBJECT with its own Wikipedia page, sexism in tech has seen serious discussion in niche tech publications and mainstream outlets alike over the last decade. Gender inequality is first and foremost a moral concern. But in the context of the tech industry, it's also a logistical concern as more than 50% of women in tech are likely to quit the industry before the age of 35.

Being able to retain women tech professionals is a concern for the immediate and long-term future of the industry – particularly in the context of a widening skills gap.

To gain further insight into ongoing disparities in tech, Nigel Frank International, a Tenth Revolution Group company, has gauged the attitudes of men currently working in the cloud space.

Survey Results

When thinking about your organization, do you agree that men and women are treated equally?

Agree 80%

Disagree 6%

Neither 14%

Responding to these stark percentages, Nigel Frank International Chairman and CEO James Lloyd-Townshend said: "Our survey encompassed more than a thousand men currently working as tech professionals and I have to say, the results are startling. I'd love to know what percentage of the men who feel there's no gender inequality in their organization have reached that conclusion through actual conversations with the women in their workplace."

"It's common for those who don't experience inequality to ignore or deny its prevalence. What we need is more engagement, observation, listening – and ultimately allyship, from men in tech."

Tips for men to support the women in their workplace

#1: Feedback

There's no substitute for listening to the experiences of your colleagues. Men in tech should be working to create

environments in which women are empowered to be honest about their workplace experiences and where their suggestions will be taken seriously.

#2: Harness existing resources

There's a wealth of incredible resources available for men interested in understanding and working to break down gender inequality in the workplace. From reading lists to podcasts, finding a medium that works for you and pursuing your own ongoing learning has never been more accessible.

#3: Vouch for your colleagues

In tech, as in most businesses, recommendations are invaluable and can make a huge difference to someone's career trajectory. Although men might instinctively vouch for the men in their teams, ensuring that you keep the same energy for your women colleagues is vital – especially when it comes to leadership roles, whether that's heading a project or a promotion track.

Legacy infrastructure creating nightmare for 63% of IT leaders

ALMOST two-thirds (63%) of IT leaders say their organisation's legacy infrastructure is causing them a huge sustainability nightmare according to new research from Daisy Corporate Services (Daisy). At a time when sustainability is under the microscope, the survey of 250 senior IT decision makers reveals that legacy hardware currently contributes to more than a third (37%) of organisations' overall power consumption.

Almost nine in ten IT leaders (86%) say that sustainability and energy efficiency is important to their operations, with 84% stating that their organisation has IT efficiency targets in place. However, only half (51%) of those surveyed are "very confident" they can meet these targets.

"Sustainability is a vital component of any modern business, and IT departments have a growing role in helping the wider organisation achieve green targets.

But legacy technology is a cause for concern amongst IT teams, with ageing equipment still contributing to a significantly to power consumption," comments Andy Bevan, Head of Propositions and Strategy Consulting at Daisy.

In addition to creating sustainability challenges, legacy technology also remains a significant cost centre. IT leaders admit that almost a third (29%) of their budgets are still being used to support, maintain, and manage

inefficient legacy hardware. At the same time, many IT leaders are being asked to reevaluate their IT spending. More than two-thirds (69%) of survey respondents describe the pressure to reduce IT capital expenditure as "significant."

As a result, IT leaders are weighing up approaches optimise costs. Of those surveyed, 86% believe moving to a consumption-based IT infrastructure model will benefit their organisations, with increased flexibility driving lower costs.

In addition, 82% of IT decision makers think the use of AIOps (Artificial Intelligence for Operations) will enhance their operations in the future.

Rapid tech expansion creates 'chaos'

86% of organisations have significantly grown their tech landscape but 76% say it's more challenging.

SOFTWARE AG has identified a common challenge caused by the rapid expansion of technology in today's businesses. A new study reveals that 89% of organisations have rapidly expanded their technology in the past few years and three quarters (76%) say it's brought with it increased 'chaos' that they have to manage.

This situation makes governance efforts more complex, organisations less agile and can harm core activities including service delivery and productivity.

Dr Stefan Sigg, Chief Product Officer at Software AG, commented: "The complexity that organisations face in today's world of disruption, risk and rapid technology change is greater than ever. It's difficult to get a grip on all of this and be a successful organisation. We see our customers overcoming these challenges by finding the right tools to manage this technology related disorder. What those tools are depends on how the challenges manifest – but there is an answer out there. And for those that find it, they can become more competitive, more efficient, and more resilient."

The three types of chaos identified as part of this research are:

Operational Chaos – where a maze of different processes and systems slow down, duplicate or disrupt day-to-day operations. Overcoming these operational barriers allows organisations to be more competitive, better controlled and more agile. Operational resilience is the prize for organisations that can manage operational chaos.

Chaos of Connectivity – where the expansion of systems is done without a plan to properly connect them together. Overcoming this lack of connectivity allows organisations to become more productive, agile, and better governed.



IT Chaos – where the multiplication of different systems is not done in a coordinated way and technology sprawls uncontrolled and unmanaged. Over-coming this IT threat enables organizations to control costs, plan future development and increase operational resilience.

Dr Stefan Sigg continued: "Finding the right tools to manage the portfolio is key. But we should not be just talking about "managing". These technology investments are being made as part of a transformation agenda. Organisations are aiming to differentiate themselves, be innovative and grow. Technology is a critical enabler for most of those plans. Greater transparency and control over the technology landscape will better align the tech and business agendas and set these companies up for success.

Key data points:

Impact of expansion:

- 69% of organisations have a higher number of disparate applications/ systems compared to 2 years ago. 71% say that number will be higher in two years' time
- 70% of companies have accrued more Technical Debt in the last year

- Managing legacy and new systems together is increasingly complex for 44%

Agility issues:

- 80% say that the size of technology infrastructure makes it harder to be agile and/or productive
- The same number (80%) feel complex tech makes them slow to launch new products/services, improve experiences for customers and employees and increase revenue/profitability

Governance issues:

- 65% feel that tech complexity makes governance issues worse
- 46% say difficulty moving data out of legacy systems slows down decision making
- 81% say that a major pain point is not having a clear view/management of all systems

Operational issues:

- 45% say duplicate process that cause internal conflict slows down action
- IT and LoB are in conflict about deploying new apps in 80% of organisations
- 82% of organisations say Shadow IT is a problem.

Report reveals open source challenges

Global survey of open source users finds challenges around security policies and end-of-life software persist and cost reduction was a leading driver.

PERFORCE SOFTWARE has unveiled the results of their annual open source survey — the 2024 State of Open Source Report. This year, OpenLogic by Perforce collaborated with the Eclipse Foundation in addition to the Open Source Initiative (OSI) to conduct the survey and produce the report.

The 2024 State of Open Source Report sheds light on the factors driving open source software (OSS) adoption, the most in-demand open source technologies, and the difficulties that teams using OSS most frequently encounter. As in previous years, adhering to security and compliance policies, and keeping up to date with patches and releases, stood out as persistent support challenges: 79% of respondents said maintaining security policies and compliance is challenging (44% described it as “very challenging”); and staying current with updates and patches is also considered challenging for 70% of organizations, regardless of size.

“One of the goals of this report is to assist organizations with open source strategy and governance, including IT security policy-making,” said Javier Perez, Chief Open Source Evangelist at Perforce Software. “An interesting finding this year is that open source security tools are underutilized, probably due to lack of awareness, so we hope the report helps drive greater adoption of these technologies.”

The 2024 State of Open Source Report also covers support and planning for end-of-life (EOL) or soon-to-be EOL software. The report shows that 22% of organizations are still using CentOS, the last supported version of which will reach end-of-life on June 30, 2024. AngularJS, which became end-of-life at the end of 2021, is still being used by more than 20% of large enterprises, which is the same percentage as in 2022.



What's more, 29% of organizations who are using AngularJS responded “I don't know” when asked what they would do in the event of newly disclosed vulnerabilities. This aligns with the report's finding that maintaining EOL versions is a significant issue for many organizations, possibly due to lack of skills and/or experience of personnel. The report reveals that the top reason organizations are choosing OSS is to reduce costs. This marks a shift from previous years, where open source being freely available ranked behind reasons like having access to the latest technologies and improving development velocity.

“2023 has been called the ‘Year of Efficiency’ as many businesses took steps to operate more leanly. Switching to community open source software offered organizations a path to cut costs without sacrificing innovation,” said Rod Cope, Chief Technology Officer of Perforce Software.

According to the report, 95% of organizations increased or maintained their use of open source software in 2023, and 33% said their usage increased significantly. The most significant growth was reported among respondents in Latin America, Asia, Africa, and the Middle East.

“It's exciting to see open source software being more broadly embraced and adopted on a worldwide basis,” said Thabang Mashologu, VP, Marketing & Community Programs at the Eclipse Foundation. “The insights from this year's State of Open Source Report are consistent with the growth we are seeing within our own communities, both in terms of project contributions and new members. We expect this positive trend to continue as more organizations recognize the technology and business advantages that come through active open source participation.”

More empathy from leaders - a good thing

Report finds increased empathy from leadership would not only boost employee satisfaction, but productivity as well.

DAYFORCE has released results from its 14th Annual Pulse of Talent report. Findings show that increased empathy from leadership is a cost-effective, and often overlooked, productivity lever within an organization.

Almost half of respondents (48%) agreed that their organization empathizes with employees. Among those who disagreed, 90% said having leaders show more empathy would make a positive difference in their work life, including improving their job satisfaction (52%), improving their job performance (39%), increasing their productivity (37%), improving mental health/levels of burnout (48%), and making them more loyal (41%).

Additionally, more than 8 in 10 (81%) workers surveyed said their employer made organizational changes in the last year.

While change and innovation are central to today's workforce experience, organizations can mitigate some of the

challenges created by transformation to benefit both employee and employer. The report, which surveyed 8,751 employees at companies with at least 100 employees from around the globe, found that:

- **Stress is high:** 70% of respondents say more aggressive performance goals/targets have increased stress levels. When employees didn't reach performance goals, 43% said it caused them to lose motivation.
- **Burnout and flight risk remain big concerns:** More than 8 in 10 (81%) respondents said they experienced burnout in the previous 12 months, nearly the same level for three years running. Flight risk (69%) was essentially flat from last year despite growing uncertainty in the job market.
- **Trust is lacking:** Only half (56%) of respondents say they trust their employers, and only 55% say their employers trust their employees.
- **Understanding and action are needed:** 91% of respondents said employers can take actions to help increase their productivity, including

creating better work-life balance (37%), hiring more people on their team (32%), skills development (29%), and more flexible work schedules (29%).

"Our research shows employers are caught in a balancing act between a need for increased efficiencies to stay competitive in the market while safeguarding employee wellbeing and trust, which has been in flux since the pandemic," said Katie Meyers, VP Global Talent Management and Development, Dayforce. "The good news is that tools and initiatives are readily available to help both sides of this equation meet the challenges of an ever-changing workplace and a boundless workforce."

The survey found 85% of respondents approved of upgrading workplace technology, with 69% saying new tech investments have increased their productivity in the past year and 39% reporting they have decreased their stress.

Companies prioritise convenience and speed over security

SYSDIG has revealed findings from its "2024 Cloud-Native Security and Usage Report." Looking at real-world data, the seventh annual report details the dangerous practice of putting convenience before preventive security in pursuit of faster application development. This report comes on the heels of significant infrastructure breaches across well-known organizations and the recently updated Securities and Exchange Commission (SEC) cybersecurity and disclosure rules.

Derived from an analysis of millions of containers and thousands of cloud accounts, users, and roles, the "2024 Cloud-Native Security and Usage Report" explores how companies of all sizes and industries across the globe

are using and securing cloud and containerized environments. Meet the researchers behind the report.

Report Highlights

69% of enterprises have yet to embed AI into their cloud environments: While 31% of companies have integrated AI frameworks and packages, only 15% of these integrations are used for generative AI tools such as large language models (LLMs). Considering the risk acceptance described in this year's report, organizations are ignoring security best practices, yet they are cautious when it comes to implementing AI into their enterprise environments.

91% of runtime scans fail: In shift-left security, organizations scan early and

often during the development phase, recognizing failed builds, correcting the code, and then redeploying. The goal is to catch issues before delivery, and before they become exploitable conditions for attackers. However, with 91% of runtime scans failing, teams appear to be relying more on threat detection than prevention.

Only 2% of granted permissions are being used: Identity management – for both humans and machines – has become the most overlooked cloud attack risk and opportunity for companies to improve their security posture, especially in light of well-known 2023 attacks that took advantage of overly permissive identities.

Emerging technology fuels cyberattacks

Research shows IT leaders believe cyberattacks are more sophisticated than ever before.

KEEPER SECURITY has released its key findings from its latest survey about what's on the cybersecurity horizon. The survey of more than 800 IT security leaders around the globe finds that the vast majority (95%) believe cyberattacks are more sophisticated than they have ever been. AI-powered attacks emerge as the most serious and phishing attacks are widely considered to be increasing the fastest.

Entering into 2024, the cybersecurity landscape showcases a compelling mix of factors with novel AI threats casting a looming shadow. The dynamic environment underscores the necessity for proactive cybersecurity strategies that can adeptly counter both existing and emerging threats.

Respondents ranked the most serious attack vectors as follows:

- AI-Powered Attacks
- Deepfake Technology
- Supply Chain Attacks



- Cloud Jacking
 - Internet of Things (IoT) Attacks
- According to global IT leaders, the attack vectors increasing the fastest are:
- Phishing
 - Malware
 - Ransomware
 - Password Attacks
 - Denial of Service (DoS)

“As emerging technologies, such as AI, fuel the next wave of cyber threats, a great paradox lies in our ability to implement the very innovations that, if not controlled properly, will radically increase cyber risk,” said Darren

Guccione, CEO and Co-founder, Keeper Security. “With the cybersecurity tools at our disposal today, we possess the arsenal to mitigate emerging threats - thereby converting this challenge into an opportunity for resilience and fortification of our digital defences.”

As technology continues to advance, evolving threats demand constant adaptation, which must remain a top priority for IT leaders. A password manager can mitigate risks by enforcing strong password practices, while privileged access management safeguards an organisation's vital assets by controlling and monitoring high-level access, collectively fortifying defences and minimising potential damage in the event of a cyber attack.

Integrating these solutions creates a layered security approach that restricts unauthorised access and enhances overall cybersecurity resilience.

Organisations only using a third of their data and content sources effectively

NEW RESEARCH from Hygraph, the next-generation headless Content Management System (CMS) with content federation, has found 84% of organisations believe their existing CMS is preventing them from unlocking full value from their data and content. Consequently, they think only a third (35%) of their current data and content sources are being used effectively.

Hygraph's 'Future of Content' report uncovers the CMS challenges businesses face in delivering digital experiences for users. The report details the findings of a global survey of 400 professionals in product and engineering roles across the U.S., UK, and Germany.

The majority (92%) of organisations say their content and data sources are

currently siloed, with 38% describing it as “very siloed”. This means the work required to integrate all these sources is both time-consuming and expensive.

More than three-quarters (77%) say they need to build and manage custom software to link various content and sources with their existing CMS. Almost nine-in-ten (88%) respondents say building custom software is an innovation bottleneck.

“Many existing content management systems are struggling to deliver the modern, seamless, digital experiences that users and customers demand,” comments Michael Lukaszczyk, Co-Founder and CEO at Hygraph. “Without a future-proof CMS, organisations risk amassing significant technical debt maintaining a patchwork of integrations.

This will slow down digital innovation at a time when it should be accelerating,”

CMS challenges are restricting revenue opportunities

According to the respondents surveyed, the top five challenges they face with existing CMS' are:

- Changes can only be made by a small number of people with the right skills (46%)
- It is difficult to add new types of data and content to their products and services (40%)
- Integrating their CMS with other systems (36%)
- It only works with a limited number of content types (34%)

They cannot expose multiple data sources and make real-time updates without creating copies (28%)



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Gartner unveils top eight cybersecurity predictions

Gartner has revealed its top eight cybersecurity predictions for 2024 and beyond. Among the top predictions, generative AI (GenAI) adoption will collapse the cybersecurity skills gap and reduce employee-driven cybersecurity incidents; two-thirds of global 100 organizations will extend directors and officers insurance to cybersecurity leaders due to personal legal exposure; and battling malinformation will cost enterprises more than \$500 billion.

SPEAKING at the recent Gartner Security & Risk Management Summit in Sydney, Deepti Gopal, Director Analyst at Gartner, said, “As we start moving beyond what’s possible with GenAI, solid opportunities are emerging to help solve a number of perennial issues plaguing cybersecurity, particularly the skills shortage and unsecure human behavior. The scope of the top predictions this year is clearly not on technology, as the human

element continues to gain far more attention. Any CISO looking to build an effective and sustainable cybersecurity program must make this a priority.”

Gartner recommends that cybersecurity leaders build the following strategic planning assumptions into their security strategies for the next two years.

By 2028, the adoption of GenAI will collapse the skills gap, removing the need for specialized education from 50% of entry-level cybersecurity positions.

GenAI augments will change how organizations hire and teach cybersecurity workers looking for the right aptitude, as much as the right education. Mainstream platforms already offer conversational augments, but will evolve. Gartner recommends cybersecurity teams focus on internal use cases that support users as they work; coordinate with HR partners; and identify adjacent talent for more critical cybersecurity roles.

By 2026, enterprises combining GenAI with an integrated platforms-based architecture in security behavior and culture programs (SBCP) will experience 40% fewer employee-driven cybersecurity incidents.

Organizations are increasingly focused on personalized engagement as an essential component of an effective SBCP. GenAI has the potential to generate hyperpersonalized content and training materials that take into context an employee's unique attributes. According to Gartner, this will increase the likelihood of employees adopting more secure behaviors in their day-to-day work, resulting in fewer cybersecurity incidents. "Organizations that haven't yet embraced GenAI capabilities should evaluate their current external security awareness partner to understand how it is leveraging GenAI as part of its solution roadmap," said Gopal.

Through 2026, 75% of organizations will exclude unmanaged, legacy, and cyber-physical systems from their zero trust strategies.

Under a zero trust strategy, users and endpoints receive only the access needed to do their jobs and are continuously monitored based on evolving threats. In production or mission-critical environments, these concepts do not universally translate for unmanaged devices, legacy applications and cyber-physical systems (CPS) engineered to perform specific tasks in unique safety and reliability-centric environments. By 2027, two-thirds of global 100 organizations will extend directors and officers (D&O) insurance to cybersecurity leaders due to personal legal exposure.

New laws and regulations — such as the SEC's cybersecurity disclosure and reporting rules — expose cybersecurity leaders to personal liability. The roles and responsibilities of the CISO need to be updated for associated reporting and disclosures. Gartner recommends organizations explore the benefits of covering the role with D&O insurance, as well as other insurance and compensation, to mitigate personal liability, professional risk and legal expenses.

By 2028, enterprise spend on battling malinformation will surpass \$500 billion, cannibalizing 50% of marketing and cybersecurity budgets.

The combination of AI, analytics, behavioral science, social media, Internet of Things and other technologies enable bad actors to create and spread highly effective, mass-customized malinformation (or misinformation). Gartner recommends CISOs define the responsibilities for governing, devising and executing enterprise-wide anti-malinformation programs, and invest in tools and techniques that combat the issue using chaos engineering to test resilience.

Through 2026, 40% of identity and access management (IAM) leaders will take over the primary responsibility for detecting and responding to IAM-related breaches.

IAM leaders often struggle to articulate security and business value to drive accurate investment and are not involved in security resourcing and budgeting discussions. As IAM leaders continue to grow in importance, they will evolve in different directions, each with increased responsibility, visibility and influence. Gartner recommends CISOs break traditional IT and security silos by giving stakeholders visibility into the role IAM plays by aligning the IAM program and security initiatives. By 2027, 70% of organizations will combine data loss prevention and insider risk management disciplines with IAM context to identify suspicious behavior more effectively.

Increased interest in consolidated controls has prompted vendors to develop capabilities that represent an overlap between user behavior focused controls and data loss prevention. This introduces a more comprehensive set of capabilities for security teams to create a single policy for dual use in data security and insider risk mitigation. Gartner recommends organizations identify data risk and identity risk, and use them in tandem as the primary directive for strategic data security.

By 2027, 30% of cybersecurity functions will redesign application security to be consumed directly by non-cyber experts and owned by application owners.

The volume, variety and context of applications that business technologists and distributed delivery teams create means potential for exposures well beyond what dedicated application security teams can handle.

"To bridge the gap, cybersecurity functions must build minimum effective expertise in these teams, using a combination of technology and training to generate only as much competence as is required to make cyber risk informed decisions autonomously," said Gopal.

Edge Computing investments to reach \$232 billion

Worldwide spending on edge computing is expected to be \$232 billion in 2024, an increase of 15.4% over 2023.

ACCORDING to a new forecast from the International Data Corporation (IDC) Worldwide Edge Spending Guide, combined enterprise and service provider spending across hardware, software, professional services, and provisioned services for edge solutions will sustain strong growth through 2027 when spending will reach nearly \$350 billion.

IDC defines edge as the information and communications technology (ICT) related actions that are performed outside of the centralized datacenter, where edge is the intermediary between the connected endpoints and the core IT environment. Characteristically, edge is distributed, software defined, and flexible. The value of edge is the movement of computing resources to the physical location where data is created, transacted or stored, thereby increasing enablement of business processes, decisions, and intelligence outside of the core IT environment.

“Edge computing will play a pivotal role in the deployment of AI applications,” said Dave McCarthy, research vice president, Cloud and Edge Services at IDC. «To meet scalability and performance requirements, organizations will need to adopt the distributed approach to architecture that edge computing provides. OEMs, ISVs, and service providers are taking advantage of this market opportunity by extending feature sets to enable AI in edge locations.”

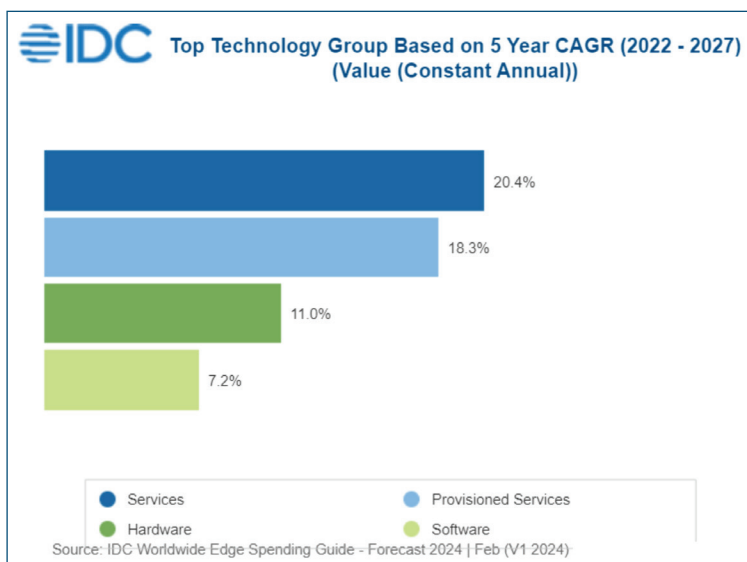
Across 19 enterprise industries, IDC segments edge ICT spending for more than 500 named enterprise use cases in six domains. In the service provider industry, investments for edge services delivery is built on infrastructure spending for multi-access edge computing (MEC), content delivery networks, and virtual network functions. Combined, these three use cases will account for nearly 22% of all edge spending this year.

For enterprise adopters, including the public sector, examples of edge named use cases with large investments and rapid growth through 2027 include augmented maintenance (augmented reality), production asset management, AI-augmented supply and logistics, augmented diagnosis and treatment systems, supply chain resilience, in-home remote patient monitoring, and in-store contextualized marketing.

Examples of emerging edge use cases that are forecast to have the fastest spending growth over the 2022-2027 period include autonomous mining operations, site design and management (construction), pipeline inspection (utilities), augmented training (multiple industries), and expert shopping advisors & product recommendations (retail).

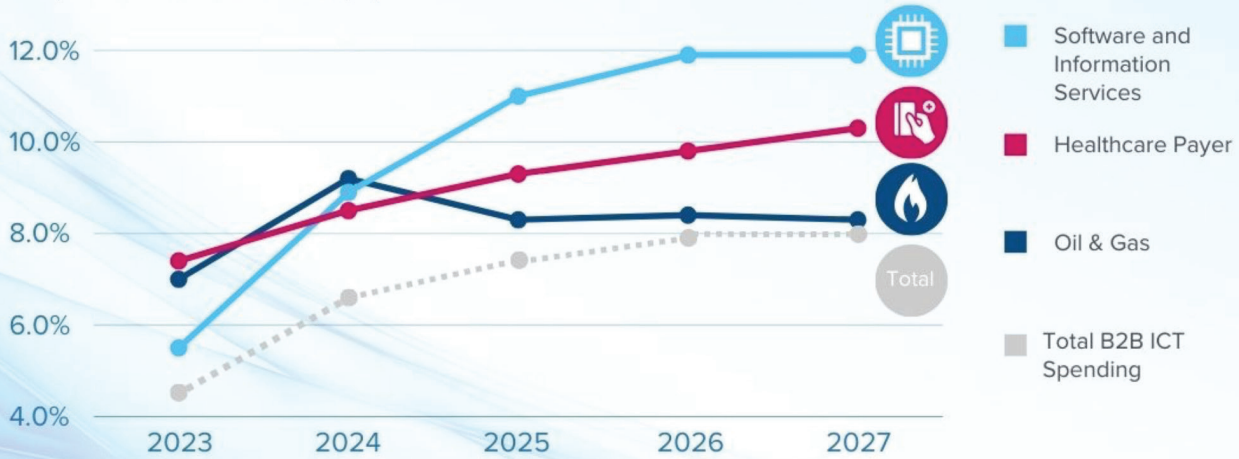
“Enterprise investments have continued to shift the past 24 months toward infrastructure expansion and greenfield deployments. Companies are acting on plans to build more robust local computing infrastructure capabilities. And through it all, customer-facing new services and products and enabling new business processes are top enterprise drivers,” said Marcus Torchia, research vice president, Data & Analytics at IDC. «Over the next two years, the share of planned investments moderately favor MEC offerings. Yet in the balance, enterprises are looking to rationalize total service provider outlays. This sets up a dynamic market of capex and opex based edge offerings competing for investment dollars through 2027.”

Across enterprise end user industries, the sheer size of discrete and process manufacturing will account for the largest portion of investments in edge solutions this year, followed by the retail and professional services industries. IDC expects all 19 enterprise industries profiled in the spending guide will see five-year compound annual growth rates



Top 3 European Industries with the Fastest-Growing ICT Spending in 2024

(Year On Year Growth Rates, %)



Source: IDC Worldwide ICT Spending Guide: Enterprise and SMB by Industry | February (V1 2024)

IDC Spending Guide

(CAGRs) in the low-to-mid teens over the forecast period. The service provider segment will see the greatest CAGR of 19.1%.

The largest investment share will continue to be led by hardware, at close to 40% of total spending, to build out edge capabilities especially driven by service provider infrastructure. Hardware spending will be driven by investments in edge gateways, servers, and network equipment. Over the forecast period, adoption of provisioned services by enterprises will surge, surpassing hardware share by 2026 for the first time. Within provisioned services, connectivity and IaaS will represent the greatest share and fastest growth categories, respectively. On-premise software will be a critical component of edge infrastructure but remain the smallest category in terms of overall spending.

From a geographic perspective, the North America will be the edge spending leader throughout the forecast period capturing more than 40% of the worldwide total share, followed by Western Europe and China, respectively. China and Middle East & Africa will experience the fastest spending growth over the five-year forecast with CAGRs of 16.2% and 15.3%, respectively.

Software and information services drive European ICT spending

According to the Worldwide ICT Spending Guide Enterprise and SMB by Industry published by International Data Corporation (IDC), information and communication technology (ICT) spending in Europe will total \$1.1 trillion in 2024 and will reach more than \$1.3 trillion by 2027, recording a five-year (2022-2027) compound annual growth rate (CAGR) of 5.3%. Software and business services remain the main drivers of spending, fueled by the need

for remote collaboration, security tools, and the accelerating adoption of artificial intelligence.

European industries will continue to face challenges in 2024, but with the easing macroeconomic pressure, ICT spending is poised to gain momentum. ICT market value will record the fastest growth in Sweden, Finland, and Norway this year, where a strong base of software companies is driving digital innovation. In contrast, the overall ICT market is expected to struggle in Romania, where high inflation has resulted in a significant drop in the market value of devices, leading to a slight decline in total ICT spending.

“Although inflation and energy prices have been falling, geopolitical tensions and the economic slowdown will fuel uncertainty for European businesses well into 2024. However, ICT investments remain safe, and spending will grow across all industries,” says Zsolt Simon, senior research analyst at IDC Europe. “The software and information services industry will be particularly interesting to watch, as developments in generative AI will boost spending in the years ahead.”

In the commercial segment, the oil & gas, software and information services, and healthcare payer industries will post combined year on year spending growth of 9% in 2024, exceeding total B2B ICT spending growth of 6.6%. The energy sector will present one of the highest growth rates of ICT spending this year, as the diversification of energy sources and compliance with environmental and sustainability-related regulations will require upgrades in digital capabilities.

Software and information services organizations will continue to invest heavily in cloud solutions



and AI tools. The adoption of generative artificial intelligence (GenAI) through a wide range of areas, including chatbots, language processing and coding, will support investments in software solutions such as customer relationship management (CRM) applications and collaborative applications. While the healthcare payer industry remains the smallest in terms of total value, it will record strong ICT spending growth through 2027, building on the technology developments in health insurance systems to provide safer, more flexible, and more reliable service to clients.

The rise of DeepTech

In newly published research, the IDC Emerging Technologies team investigates the potential of DeepTech in Europe. IDC defines DeepTech as “a class of emerging technologies, built upon scientific and engineering innovation, whose primary focus is to address social challenges.”

In an era marked by rapid technological advancements, the emergence of DeepTech is poised to reshape industries and contribute significantly to the attainment of the United Nations Sustainable Development Goals (SDGs). DeepTech ventures beyond conventional profitability, aiming to address complex global issues in areas such as healthcare, sustainability, transportation, and more. These technologies are ready to make a profound social impact by aligning with the UN SDGs and pushing the boundaries of current technological developments.

According to IDC, DeepTech encompasses a diverse range of emerging technologies, including Advanced Intelligence (AI, human-machine interfaces, and swarm intelligence), Next Generation Computing (quantum computing, and neuromorphic computing), and Human Augmentation (robotics, and

XR technologies and devices). These technologies, though still in their early stages, hold immense promise for revolutionizing industries and improving the quality of life globally.

Despite the challenges associated with their development and adoption, DeepTech solutions have garnered interest across various industries. From utilities to professional services, organizations are recognizing the transformative potential of these technologies in areas such as autonomous and electric vehicles, advanced battery technologies, next-generation agriculture, and carbon capture technologies.

European institutions, including the Commission and the European Investment Bank, alongside the United Nations, have emerged as key proponents of DeepTech initiatives. Through programs such as Horizon 2020 and DeepTech4Good, these entities demonstrate their commitment to supporting the development and deployment of DeepTech solutions. In order to unlock the full potential of DeepTech, a robust ecosystem of investors, policymakers, and corporate organizations is essential. Initiatives such as the European Innovation Council Fund and various national funds play a crucial role in providing financial support to DeepTech startups, ensuring their growth and success.

“DeepTech represents a paradigm shift in technological innovation, emphasizing the importance of addressing societal challenges alongside commercial interests. By leveraging advanced scientific discoveries, these technologies have the potential to drive meaningful change and create new opportunities for economic growth,” said Lapo Fioretti, Senior Research Analyst, Emerging Technologies and Macroeconomics, at IDC.

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Time to give the data centre industry an ESG-inspired makeover?

The impending skills shortage in the data centre sector, and the IT industry more generally, is well documented. How to address this issue is rather less well understood. **MARK YEELES, VICE PRESIDENT, SECURE POWER, SCHNEIDER ELECTRIC UK & IRELAND**, offers some thoughts as to why the problem continues to loom large, as well as detailing some of the actions required to address the situation – both by individual organisations and collectively.

SCHNEIDER hosted a panel discussion at the recent DCW event, where the focus was very much on how to attract early talent into the data centre sector. We brought together like-minded people from the industry, some senior stakeholders, to talk about how do we address this topic. It's an important topic for us at Schneider, and one where we'll be announcing the skills partnerships we are building in the near future.

However, at DCW, in addition to the panel session, we also asked some of our key clients to bring along one of their early talents, so we could talk to them and understand what's missing from the industry's approach to recruitment. We engaged with individuals from both companies and universities and they told us what was wrong about the way the industry targets potential employees. Apparently, our language is appalling! It seems that the way many of us put together job specifications is too often sub-standard – it's not the language people want to see or that they particularly understand. For example, a few years ago, you might see a job spec for a data analyst. Now, we advertise for a data scientist. Such an apparently simple language change for the 'new' generation is super important. Words matter.

Having a sense of purpose also really matters for this group. And that's all about how we explain our industry to them – why it matters, its sustainability credentials and the like. In one of our breakout workgroup sessions this message came across loud and clear. We need to improve the way in which we explain our industry to those who might be wanting to join it.

While no one knows the exact impact that Generative AI will make over the next few years, it's unlikely to make much impact on the 75,000 or so vacancies predicted to exist in the industry in the next three years, as the older generation heads into retirement.

Such a skills gap translates into jobs not being done. Clients expect projects to be completed in a

reasonable timeframe but, without the necessary labour, this simply will not happen.

Apprenticeships

In order to solve this problem, we have to redress 25 years of under-investment in apprentices and that's a big thing for us at Schneider. We've taken on 65 apprentices this year - five years ago, we were only taking on eight to 10.

While there is always a debate to be had as to the relative merits of a university education as opposed to the apprenticeship route, the feedback from our DCW discussions seems to be leaning towards the idea that apprentices become useful to an organisation at a younger age than graduates – it's as if they are three years ahead of the game because they have had all that experience of the world of work as they have been learning on the job.

Furthermore, more and more potential students seem to be less and less keen to take on the three years of debt that a university education almost inevitably requires. Especially when set against three years of working and being paid in a company. However, in the UK at least, the biggest obstacle to the expansion of the apprentice programme is around public relations – how to change the somewhat negative rhetoric around apprentices, especially when compared to a university education.

Sustainability, schools and social media

If a change in mindset is required to attract fresh talent into the data centre sector (and more of this later), then that's also true to what is, perhaps, and even greater challenge for the industry right now – sustainability. Put simply, sustainability is not going to be promoted and sold by luddites. It's going to be sold by really smart people who have a real passion for changing the way so many of us see the world. I share this passion for change and I feel like I am an enabler. As part of Schneider Electric, I have the opportunity to help bring new talent into the industry. Our DCW event convinced me that I can be an agent for change to create, if you like, a vortex

- but, we need people coming through to follow on from my generation. And here we come back to the attraction challenge.

As I discussed with many stakeholders at our event, we need to get into schools. No one would dispute this point. But we've known this for several years now. So, what is actually going to move the dial on this – to turn the talk into meaningful actions and outcomes? Well, rather than go the school route, or certainly in addition to this approach, what about social media? I believe that, done properly, it can do a lot more for our industry than simply targeting schools. We have the opportunity to reach them at pace and at scale.

A final point to emerge from our DCW focus was the discussion around STEM subjects. One of the participants shared some research she had done on industry internships. It turns out that, of 165 internships offered over a recent summer, only one was for a non-STEM role. My point is that, yes, we do need to ensure that we have the right quantity and quality of technical personnel to support the data centre industry into the future, but there are also some great opportunities for individuals with HR, marketing and other non-technical qualifications and skills to join us.

Both as individual organisations and collectively as an industry, we have the opportunity (and a somewhat urgent responsibility) to promote data centres to our future workforce in a much more positive and creative light. During the pandemic, the IT industry became known as the fourth utility, and we should be doing much more to

illustrate, and be proud of, how well the world works thanks to digital infrastructure.

And that means losing our (almost literal) concrete bunker mentality. Of course, individual data centres have to keep many secrets, but the industry as a whole should be opening up much more, losing its mystery. Few people are likely to join an industry they've either never heard of or don't understand.

Why not open up one or more data centre innovation/education centre in the UK?

The objective being to provide easier access to and more transparency around what we're doing and how we're doing it. A data centre visitor experience centre if you will. Other industry sectors and individual companies working within them already do this kind of promotional activity, so why not us?

I'd like to think that, with the right degree of inspiration and collaboration, the data centre industry could transform itself in the same way that it is enabling so many organisations on their own digital transformation journeys. ESG is a great place to start.





Does multi-cloud hype match reality?

Five reasons to buy in.

**BY CHARLES CUSTER, SENIOR TECHNOLOGY RESEARCHER,
COCKROACH LABS**

FROM THE BOARDROOM to the break room and every industry survey in between it seems multi-cloud is the direction of travel - but does the hype match the promise?

There's certainly a lot of obstacles to overcome for any organisation embarking on a multi-cloud strategy. Service providers offer what we call "squint-only" compatibility between each other; overcoming that at an architecture, platform and management level demands a huge commitment and a certain level of technical maturity.

Get it wrong and you're looking at the kinds of costs and operational complexity that can easily diminish the potential returns of multi cloud.

Our latest state of multi-cloud 2024 report examines best practices for success in building multi-cloud and looks at organisations' key reasons for adoption. We spoke to 300 experts in technical leadership roles in the US and Europe and interviewed our own engineering team building multi-cloud environments for customers on AWS, GCP and Azure to get a clear understanding of how - and why - people are moving to multi-cloud.

What did we discover? These are the top five reasons - along with the nuances and considerations - for you to consider:

Regulatory compliance

This was the number-one reason for companies taking the multi-cloud route. Rules on data residency are nothing new - they have long been a fact of life for doing business at a sector, national and/or international level for many. Multi-cloud, however, has become part of the response to new policies and regulations: the Bank of England's Statement of Principle on Operational Resilience and the EU's DORA which takes effect in January 2025, were both driven by governments' concerns over maintaining the finance function in the event of cloud-service outages.

The risk is that, with so many banks relying on the same providers an outage in one supplier could take down a whole company or an entire sector. Failover to their existing service provider's different region simply isn't sufficient and might not be possible under data residency rules. Multi-cloud has therefore become an important way to achieve service resilience by diversifying suppliers.

Avoid vendor lock-in

Vendor lock-in has traditionally gone hand-in-glove with enterprise IT, leaving customers feeling powerless in the face of roadmap and pricing changes. Multi-cloud lets you diversify suppliers to avoid becoming tied into a single provider's technology roadmap at the expense of your own IT plans. Also, it can mean potentially regaining leverage during contract negotiations. Our interviews with experts, however, found a degree of scepticism about the value of multi-cloud as a negotiation tool.

A scenario where it can be potentially effective is in a market where one provider dominates and competitors are trying to expand, by offering low prices to tempt the incumbent's customers. Cloud providers, though, will be aware that the task of cloud migration is difficult and costly for customers; many who operate multi-cloud continue to concentrate their workloads on a primary supplier. Either way, multi-cloud is about reserving the right to migrate and the option to run workloads with different suppliers. How far you follow through is down to you.

Serve customer requirements

If you are an infrastructure provider or deliver software-as-a-service to other businesses, multi-cloud offers a great way to run workloads in a way that suits your customers. Some customers, for example, could be all-in on AWS, meaning their workloads must run on it. Others will consider Amazon a competitor so won't place workloads or data on AWS because it means funding a rival. In a business-to-business setting, multi-cloud means providing your infrastructure or services on AWS, GCP or Azure in addition to private clouds to meet those business or operational requirements customers might have.

Attract talent, empower your team

The IT skills shortage is a decades' old story that's been accentuated by digitalisation, yet in one industry survey, 74 percent of organisations said the

multi-cloud model actually allowed them to attract and retain staff. That might sound counterintuitive given so many are chasing exactly the same people - those skilled in the tools and technologies to build clouds. Our experts, however, corroborated this data saying building multi-cloud applications actually helped them land the best engineering talent. Consultant McKinsey elaborates on the potential reasons for this.

It suggests a big part of multi-cloud's appeal is that it gives developers, engineers, operations teams and architects the opportunity to work with cutting-edge technologies, using tools they prefer and gives them free rein to experiment. Multi-cloud can therefore create a rewarding, working environment and enhance the prospects for professional development.

Operational cost savings

This is seen as one of cloud's biggest wins but how does this work in practice? Operating across multiple clouds means you can potentially chase the best pricing in near real-time, spinning-up servers on the cloud that is most affordable or offers the best deal in a specific region at a given time. Putting aside the technology and process needed to make this work, the deal breaker will invariably be the cost of moving data between service providers - it's an expensive business. So this kind of initiative can be effective in scenarios such as ephemeral spot-instance game servers that rely on a tiny amount of persistent data such as player performance statistics but would be less suited to workloads that require lots of persistent data like a line-of-business application.

Conclusion

The pace of multi-cloud adoption is likely to accelerate during the next few years. Those who identify clear justifications and who leverage the right tools and approaches in the process can avoid introducing unnecessary cost and complexity. In so doing they stand to realise the benefits they envisaged - making multi-cloud right for them.

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Exploding the myths of “Cloud Bursting”

How to burst into the cloud with success.

BY CHRISTOPH DIETZEL, GLOBAL HEAD OF PRODUCTS & RESEARCH, DE-CIX



DOES YOUR ORGANIZATION need flexible resource scaling for peak loads without exploding its budget? Perhaps your organization already has excellent on-prem infrastructure, so moving everything onto the cloud doesn't quite make sense. Cloud Bursting may be the solution you and your team have been waiting for. Careful network capacity planning is needed for the dynamic scaling of IT resources from on-prem servers to the public cloud for temporary peaks. Cloud Bursting achieves this, but for more organizations to buy into Cloud Bursting, myths such as high latency, a lack of interoperability, and crippling cloud egress costs need busting.

While operating only in the cloud offers seamless and seemingly infinite scalability, maintaining critical data and workloads on-premises or in a private cloud remains the preferred option for many companies regarding security and compliance. High investment costs and long amortization periods for on-premises hardware and infrastructure have resulted in hybrid set-ups where non-critical data and workloads are farmed off to the cloud to free up internal capacity for critical tasks.

However, such piecemeal hybrid scenarios do not offer a solution for when more capacity is suddenly needed on-premises or in the private cloud. A surge in demand on the company website due to a marketing campaign, for example, or doing big data analytics with internally stored data, will either be throttled by a lack of internal capacity, or it will need to burst its banks.

The answer is Cloud Bursting – the dynamic scaling (or “bursting”) of IT resources from on-premises to the cloud for temporary peaks in data traffic or compute needs.

What is Cloud Bursting?

Cloud Bursting differentiates itself from standard hybrid scenarios in several essential ways. First, it will only function effectively with careful planning of network capacities. Second, it entails several challenges that need to be overcome relating to

latency, interoperability, and cloud egress costs. These challenges, taken at face value, turn many businesses off the idea of Cloud Bursting. However, the idea that these challenges are insurmountable or somehow outweigh the myriad benefits of Cloud Bursting is mythical.

Properly implemented as an on-demand practice, Cloud Bursting will pay dividends through significant cost reductions because you only need to pay for the additional resources that your organization uses at peak times. Alternative approaches are to invest in on-premises infrastructure dimensioned for the largest peaks a company might experience (a costly undertaking) or have all resources already in the cloud and scale the cloud when necessary, something that not all companies are willing to do.

Cloud Bursting can be set up to take place both manually and automatically, depending on the use case. Take an e-commerce platform or web shop example: the burst could be implemented manually before marketing campaigns are expected to increase network demand. It can also be automated so that as soon as a certain threshold is exceeded, it triggers the bursting application to move the workload into the cloud. As soon as traffic normalizes, the additional resources in the cloud can be decommissioned manually or using automation, and workloads can return to their standard on-premises or private cloud environment. Now, to address some of the myths around Cloud Bursting.

Cloud Bursting Myth No. 1: “You can't connect to the cloud with low enough latency”

Unfortunately, the question of how companies connect to their chosen clouds is often neglected in formulating a cloud strategy. Still, for Cloud Bursting, it is an essential infrastructure planning and design component.

Because Cloud Bursting demands low latency and high bandwidth connectivity, the path companies tend to take to the cloud – over the public internet – is appallingly insufficient. The best way to ensure

low latency connectivity to the cloud is to connect the company infrastructure directly – and with sufficiently dimensioned network capacity – to the clouds in question using the private connectivity solution that each cloud service provider offers.

This can be implemented via a connectivity solution provider. Still, if more than one cloud is being used, an interconnection platform or Cloud Exchange will likely be more efficient. The result? Dedicated cloud connectivity with guaranteed capacity, ensuring the security of the data being transferred.

Cloud Bursting Myth No. 2: “Cloud egress fees make cloud bursting costly.”

Migrating data to the cloud is relatively straightforward. However, taking data back out of the cloud when you retrieve the results or decommission the cloud can lead to a painful hike in cloud egress fees. This is also the case for bursting any outbound-heavy applications that send more data to customers than they receive, especially if the data needs to traverse the public Internet.

For such scenarios, the cloud provider’s private connectivity solution again comes into play. This is because the pricing for cloud egress is much lower over the direct connectivity services than the public Internet. So much so that if more than 25Mbit/s of traffic is exchanged, the private connectivity service virtually pays for itself.

Cloud Bursting Myth No. 3: “There’s no interoperability between private and public clouds”

Direct connectivity, while valuable, is only part of the solution to making Cloud Bursting a success. The uncomfortable truth is that clouds were not designed to interact with each other – and regardless of whether we’re talking about a private cloud or other on-premises infrastructure, they cannot easily interoperate with public clouds. Some cloud service providers offer private clouds with built-in interoperability to their public cloud. However, taking this option leaves the company locked in with that provider.

Another option is to add a layer of translation between the different infrastructures in the form of a cloud router. This can be a separate device installed at the interface between the company

infrastructure and the private connectivity service, or it can be a software-based cloud routing service, as offered by some Cloud Exchanges. This ensures interoperability on a network level, allowing a seamless transition between the on-prem and public cloud infrastructure, a prerequisite for successful Cloud Bursting.

Cloud bursting allows for the dynamic expansion of IT resources from on-site servers to the public cloud during high traffic or computational demands. However, successful implementation requires debunking myths about latency, interoperability, and cloud egress costs. Organizations pay only for extra resources used during peaks, and concerns like high latency can be addressed with private connectivity solutions from cloud providers, which also reduces egress costs. A cloud router ensures seamless integration between private and public clouds and on-premises infrastructure.

Cloud bursting offers flexibility in resource scaling, ensuring cost-effective management of sudden demand surges, software testing, data analysis, and machine learning training, all while maintaining security and compliance standards. In this way, adequately dimensioned solutions for direct and private connectivity are crucial to maximizing the benefits of Cloud Bursting.



Why the cloud isn't magic

Since the cloud, at its core, is simply hardware in an off-site location, it is important that companies work with straight-talking hosting partners that offer transparency on the details that matter to their operations and finances.

BY TIM WHITELEY, CO-FOUNDER OF INEVIDESK



BEYOND THE BROWSER INTERFACE and the surface service experience, at its core the cloud is hardware. An array of cables, servers, switches and firewalls - the really important (ugly technical) reality that nobody wants or cares to think or talk about. It is not magic. Over the past 10 years, we have seen a rush to adopt cloud software. This has been fuelled by a perception of the cloud as an unlimited computational resource, with unlimited storage, access and scalability, where you pay less money for ever-increasing efficiency.

But, generally speaking, the hardware underpinning cloud services is provided by tech giants, since they have the almost limitless resources to buy up large amounts of hardware and run extensive data centres across the globe. Not only does this mean that a huge amount of the world's digital resources are placed in the hands of a few giant tech vendors,

but companies have less ownership over the technical core of their business, often leading to a degradation of in-house skillsets and understanding. So, let's take a step back and take a more critical view.

The cloud doesn't necessarily offer good value for money

Running cloud services on a large scale requires a significant amount of hardware, meaning tech giants are required to invest a lot of money in building infrastructure. These large vendors charge based on usage, which allows them to advertise services in apparently low-priced increments, with potentially unlimited scalability, making cloud services appear, at first glance, to be far cheaper than they are in practice. Companies don't immediately see how much they could end up spending in the long term, with realisation only dawning once the monthly bills start coming in.

Big vendors often use old and overprovisioned hardware

All of this hardware is expensive, which means vendors will keep using older hardware to try and squeeze as much value as possible out of each unit (especially as it may well be sitting there unused for much of its life).

Additionally, to maintain the illusion of unlimited resources and extract maximum value, hardware is likely to be overprovisioned. This, combined with the fact that older hardware may be populating these large data centres, means lower levels of performance.

High cost doesn't necessarily translate to high performance

You may think that despite all these issues, at least the big vendors are more likely to maintain uptime due to their seemingly limitless resources and points of presence. But the reality is that services run by





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The panel discussions and keynotes are supported by extensive networking time for delegates to meet with potential business partners.

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Amazon and Microsoft go down pretty regularly, taking out huge swathes of global services when they do so.

And that downtime can be extensive. Why? Because bigger infrastructure gets increasingly complex which in turn makes identifying the root cause of problems much more difficult. Everything is fine until it's not. And when it's not fine, it's really not fine.

What companies should be looking for in cloud vendors

Despite some of these lesser-known issues with the big cloud providers, it is important to remember that hosted services can still work wonders if used correctly!

Indeed, I am not suggesting that companies

should go back to on-prem infrastructure – as it generally no longer fits the bill for our increasingly hybrid working world – but rather that companies should take the time to understand the services they are considering as underpinning their businesses.

Querying vendors about their platform, costs, and benefits and then modelling this in a realistic way based on the way you need to work is a vital step in finding a service that works for you and your budget. Anyone looking to move their infrastructure off-

premises needs to take the time to ask themselves the following questions:

1. Is the hardware used to run the service going to give you the best level of performance for your investment?
2. Does this service give your business a good level of resiliency?
3. How much is it going to cost and is it better value for money than other solutions?

Since it will likely cost more than on-premises solutions, is the additional cost going to provide you with a better ROI? This could take the form of more efficient operations, continuity in business terms or even converting to a smaller office environment.

The importance of transparency

Since the cloud, at its core, is simply hardware in an off-site location, it is important that companies work with straight-talking hosting partners that offer transparency on the details that matter to their operations and finances.

If you cannot get clarity and a firm idea of performance and cost, don't just assume the best or that because it is the cloud, it is what you need. Remember, it's not magic. Don't be afraid to look behind the curtain.

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Managing the migration madness

The case for multicloud.

BY MICHAEL CANTOR, CIO, PARK PLACE TECHNOLOGIES



IT'S IMPOSSIBLE to escape the data-hungry technologies shaking up the way we do business. While AI and ML have been on the agenda for years, the rise of GenAI and other compute-intensive technologies means that, for businesses, the data chickens have really come to roost in 2023. For many, this means needing to embark on a migration journey aimed to create a robust infrastructure that is ready to manage next generation technologies while remaining compliant in an increasingly complex regulatory environment.

Given the need for scalable capacity, cloud is a central piece of this puzzle, but this leaves businesses with the question of what will best set them up for success: hybrid, public, or multi? However, figures show that many businesses have already made up their minds. According to a recent report, 87% of businesses already have some form of multi-cloud strategy in place. This indicates that, while hybrid and all-in on a single cloud supplier are still popular, many businesses are exploring the benefits of a multi-cloud future.

The problem is that this is no easy task, and those who set off on a multi-cloud journey will face several hurdles, from 'sticky' cloud vendors to compliance complexities.

So, is it worth it? We look at the benefits of multi-cloud adoption and how businesses can overcome the migration hurdles.

The case for multi-cloud According to 451 Research, cost saving opportunities are at the centre of 40% of organisations' multi-cloud journeys, but the benefits of multi-cloud can be much broader than a

money-saving exercise. By leveraging the strengths of different cloud providers, organisations can experience benefits such as improved flexibility, enhanced redundancy, reduced vendor lock-in, and better performance optimisation.

Each hyperscaler provides enhanced experience in different areas, including machine learning, scalability, and digitalisation. Multi-cloud gives businesses the freedom to mix and match the best-in-industry options for their workloads. By choosing a combination that works to support business objectives, organisations can make the most of their investments.

By taking the time to choose vendors that match the business needs, as well as considering how clouds will all interlock with each other, businesses can make the most of their infrastructure and lessen the challenges normally associated with migration. This includes considering the lack of standardisation between vendors meaning metrics, restrictions and availability will not always be the same.

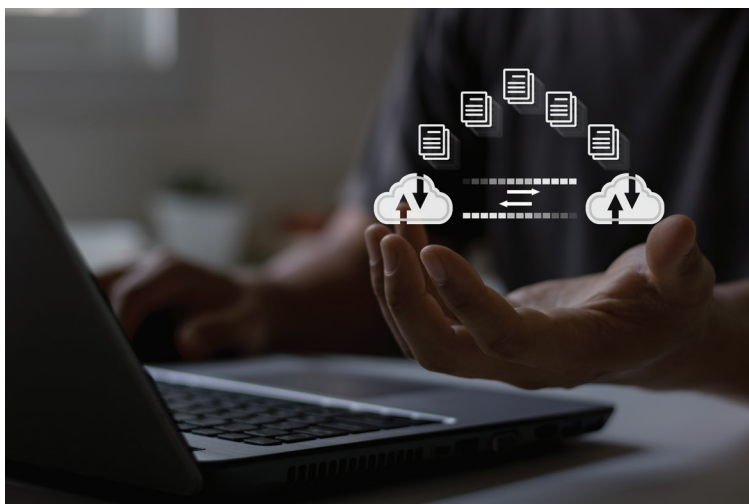
Breaking the chains of vendor-lock in

While there are many benefits of going all-in with a single cloud vendor, those who look to migrate may experience some resistance when trying to move to a different vendor. Leading you to the 'sticky' experience of exiting contracts and shifting workloads. Vendor lock-in has been a concern for businesses for some time, and a multi-cloud approach gives businesses a greater degree of flexibility.

Before they begin the process, businesses would be wise to consider whether the move to multi-cloud is right for them. Beyond economic pressure, a move to multi-cloud must be underpinned by wider business priorities.

If it's the right time, right place, for the business to change its infrastructure, then bringing in the right partners can be a migration game changer. The process of migration is challenging, but there are steps businesses can take to ease the pain. By collaborating with specialist independent partners familiar with the large cloud providers and their 'stickier' points, businesses can strengthen their position when negotiating out.

These partners can also provide insights into how to get the most from each hyperscaler, including options for using more open and generic services, versus keeping specific applications confined to one provider.



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How to help ensure Infrastructure as Code (IaC) success in the data centre

Infrastructure as Code (IaC) continues to grow and has significant potential benefits for data centre owners and managers, but there can be a big gap between the theory and successful deployment. Based on experience both in-house as a DevOps engineer in some of the world's largest companies (and now in my vendor-side role), I have witnessed first-hand what does (or does not) work.

BY DAVID SANDILANDS, PUPPET BY PERFORCE

TO HELP ORGANISATIONS shorten the route to IaC success, I would like to share some of those best practices, as well as some pitfalls to avoid. But first, it helps to clarify what IaC is: using technology to control software, hardware, network components, data storage, and operating systems. Via machine-readable definition files, IaC manages and provisions data centre resources instead of physical hardware.

The consequential advantages can be powerful. IT is deployed faster, and it becomes easier for end users to access what they require, thus reducing the number of requests to IT operations teams. Costs decrease due to less dependency on physical hardware, plus it is easier to update and patch IT systems, even remote sites. Security and compliance can be drastically improved, ensuring the IT infrastructure is continuously in a 'desired' state. However, successful IaC is as much about people and processes as it is about applying technology.



The best IaC projects work with current teams and embed themselves in their processes. Involve all stakeholders — existing teams, consultants, vendors, and other relevant in-house teams in all IaC explorations and plans right from the start. Invite everyone to meetings and regular stand-ups. This will be the best method to discover a scope and focus with everyone's buy-in.

Focus and scope

Also, it is best to avoid the temptation to chase big goals quickly to see an impressive ROI. Decision makers and other colleagues might be pressuring the IT team to see a result to justify the budget commitment. However, computer configuration is complex, so starting small with some of the more achievable wins that still demonstrate ROI makes sense. At the same time, show the future vision but emphasise that it must be an incremental journey. Once the scope and focus have been agreed upon,

it is important to set the minimal acceptance criteria (an equivalent to a minimal-viable-product) for code to be delivered to production and, therefore, which tests it must first pass. In addition, be wary of scope creep, such as expanding on the use cases for IaC: as implementation shows its benefits, other teams may want to add extra use cases. While it is important to keep an open mind, it is also essential to stay focused on the end goal or vision.

Of course, introducing IaC into a greenfield site is easier than a brownfield or heritage one, especially if it has a lot of existing configuration drift (when ongoing, often small changes or misalignments to policies grow over time). Furthermore, many organisations are a result of mergers and acquisitions, so there could be multiple configuration standards with which to deal.

One pattern of IaC adoption is to incrementally build automation levels in heritage services to create confidence, for instance, by installing software agents on all nodes within the existing infrastructure. This will provide better visibility of the current state, making it easier to manage roll-out progressively and provide valuable data for the configuration management (CMDB) system.

Next, look at orchestration, and there are probably common scripts and tasks across the heritage IT estate that various teams perform manually or semi-automatically. Using an orchestrator, these scripts and tasks can be wrapped appropriately to give greater access control and management, plus the option to be triggered on events. In this way, there is no need to deconstruct working scripts into a new language and can reduce the toil and risk of using scripts.

Look at baseline configuration and find something non-negotiable to commence with, such as versions of application agents that are critical to upgrade and manage to prevent vulnerabilities from occurring. This leads to then implementing of the tools required for automated audit reporting and compliance remediation.

To cloud or not to cloud

Implementing IaC often coincides with a move to the cloud, and it can potentially deliver significant benefits, such as greater flexibility, reduced costs (though sometimes not the case in reality), access to cloud-specific technologies, and reduced burden on IT operations. For instance, the ease of using availability zones for compilers to minimise the risk of data centre failures is a complex feature to implement in private data centres.

However, once the legacy private data centre environment has been examined before IaC implementation, it is vital to consider how this could be different in the cloud. There are two common mistakes I have seen in cloud adoption, the first of which is a wholesale copy of all infrastructure, processes and components — in their working stage

in the private data centre — to the public cloud without first understanding what is a suitable fit. Consequently, this can lead to unexpected bills because the infrastructure is inflexible, without considering that the public cloud is based on a rental model. Also, many solutions that work well in a private data centre are better implemented as cloud-native solutions in the public cloud.

The second problem is the opposite: leaving everything behind, which may be because teams are frustrated with inefficient internal processes and delivery times. However, that means losing the hard-won lessons learned in private data centres, including best audit, configuration, and testing practices. Hence, teams must start from scratch, with issues inevitably found in this new fractured environment. Cost is also a significant determining factor when choosing cloud, but also whether an organisation is looking for the benefits of cloud-native features, such as the flexibility of availability sets and load balancers, which can allow easy horizontal scaling of infrastructure. The public cloud might also be used to jump-start a new, more cloud-native way of working, so having separate cloud and private infrastructure is more logical.

Agile and platform engineering

I am also an advocate of Agile and a platform engineering approach to enhance IaC's success. Good Agile sprint practices include having epics, which are then broken down into a small number of focused objectives. Each task should be possible to complete in a regular time-boxed sprint cycle (commonly two weeks). Once the sprint finishes, these new features can be demonstrated to stakeholders. Retrospectives at the end of sprints help ensure that what is being worked on is still effective and that issues are being resolved. This also helps prevent developers from working in isolation.

Platform engineering is another hot industry topic, and — once IaC has been implemented — it makes a major contribution to ongoing IaC success, making it easier for users to access what they need while preventing IT operations teams from being overloaded by requests. Platform engineering means having a platform team responsible for the management of tooling, workflows, and a self-service platform for end users. This platform should be treated as a product and its users as customers, ensuring their needs are met and that the platform continues to evolve to meet those needs.

IaC has much to offer, but while there are some impressive success stories, there are also some problematic or even failed IaC projects. So, understanding the fundamentals — what the aim is, what the current IT environment is, what to take or leave behind, choice of cloud, and how it will be managed once deployed — must all be considered before starting a new IaC transformation. And, above all, involve everyone: successful IaC is a team effort.



IaC security - how to get your developers and security teams together

Infrastructure as Code (IaC) describes how organisations manage their cloud resources in repeatable and predictable ways. As companies use more cloud computing services, managing deployments requires more automation and repeatability. To deal with this, developers and DevOps teams deploy the same methods for cloud that they use in the software development lifecycle.

BY PAUL BAIRD, CHIEF TECHNICAL SECURITY OFFICER EMEA, QUALYS

IaC TURNS the process of commissioning, scripting and deploying cloud resources into code, so the process can be repeated the same way each and every time. This makes it easier to check for potential issues with your installation images, and to share the process with others. However, if you rely on IaC to manage your infrastructure, then you have to be sure that the set-up is secure.

IaC security should enable you to proactively detect and address potential threats in your cloud infrastructure by providing early detection and visibility into misconfigurations and non-standard deployments. It should also flag any changes in your environment over time where installations have

'drifted' out of compliance with your initial images, and point to any problems around accounts and privileges as well.

The strong point for IaC is that it allows you to carry out full version control on your cloud infrastructure deployments. However, it is also responsible for how you deploy all your infrastructure over time.

Consequently, any issue in your template will be replicated multiple times, from development into deployment and production. For security teams, assessing how you use IaC throughout your software development pipeline makes it easier to fix problems before they scale up.



For developers, using IaC helps them be more efficient in their roles, but being given responsibility for security fixes can make the process harder. To improve collaboration, security teams can provide any list of security issues with details on which faults should be prioritised. This integrates developer and security operations in practice and reduces risk.

Making security practical for developers

Alongside priority information, you will have to integrate your security processes with the tools that your developers interact with every day and where those IaC images are used.

This can include multiple different tools across the software development lifecycle (SDLC), from the repositories used to host code such as GitHub, GitLab, and BitBucket, through to the Continuous Integration / Continuous Delivery (CI/CD) tools like Bamboo, Jenkins, and Azure DevOps that are used to push workloads from one stage of the SDLC to the next.

Developers will also want to integrate any security tooling into the code editors that they use on a daily basis like Visual Studio Code. This approach allows developers and DevOps to check their IaC images for potential misconfigurations during the development process without leaving the environment that they work in, and it means that security is not another process that developers have to remember to apply.

This integration should take place using APIs, providing your DevOps team with real-time assessments of potential cloud misconfigurations so that you can prioritize remediations before deploying into production.

Alongside this integration, you will also have to help developers implement security fixes into IaC as part of their overall work. Providing guidance on software flaws or misconfigurations can help developers fix problems, but you can also offer more details on which ones are the most time-sensitive or need to be addressed soonest. This will help your developers balance requests for new functionality against the security fixes or other changes that are needed.

Implementing security across all your software environments

IaC security should allow you to set up and enforce security policies across your whole software development lifecycle and into production. To provide comprehensive coverage, this should include your runtime environments too.

IaC lets you evaluate what you need within your implementations and then automate those deployments. However, when you deploy those images, you may find that you need something more within those deployed instances to meet your needs. For example, you may want to install the

“ The strong point for IaC is that it allows you to carry out full version control on your cloud infrastructure deployments. However, it is also responsible for how you deploy all your infrastructure over time. Consequently, any issue in your template will be replicated multiple times, from development into deployment and production. For security teams, assessing how you use IaC throughout your software development pipeline makes it easier to fix problems before they scale up ”

latest version of the software you run as you set up the container from a software repository - this avoids the problem of adding and managing updates to your IaC templates all the time. However, that can open up potential security issues.

Runtime security helps to minimise the risk of security gaps and vulnerabilities being introduced into the infrastructure due to misconfigurations or changes made after deployment. Rather than relying on static scans, you can see any drift between your approved images and the current state of your deployed infrastructure. While making single changes to IaC images might seem like it would be an additional responsibility for developers, it can actually save a lot of time and potential problems in the long run.

IaC makes it easier to build IT infrastructure in repeatable, automated ways. However, using IaC also requires a security point of view. Without an effective security process, issues in your IaC deployments can scale up and spread potential vulnerabilities more widely. Help your developers and security teams to collaborate on these problems, and you can remove potential threats much faster and more efficiently.





As businesses move mobile, so do the threats

The mobile device has risen quickly. There are now five billion unique mobile internet users globally and for well over half of the global population, mobile devices provide their main method of accessing the internet¹. If this seems significant for global society as a whole, then the effect of the mobile device with business is even more pronounced.

BY CHRIS STEINER, VP EMEA, ZIMPERIUM

AGILITY has become a fundamental asset for businesses. Mobile devices have provided the means to work from anywhere, to collaborate remotely and to join disparate parts of the global workforce into cohesive units. Developments like remote work would be nigh-on impossible were mobile devices not a cornerstone of modern, globalised businesses.

The Zimperium Global Mobile Threat Report (GMTR) shows that 60% of endpoints that access enterprise data are mobile devices. Most business is now happening on - or with the involvement of - a mobile device.



The data has migrated and so have the threats

The risks and threat actors that endanger our systems will always go where the data is. Mobile devices are no different. Now that they form such a central part of business infrastructure, they also present a huge - and often unguarded - attack

surface for cybercriminals to exploit and from which data can be compromised. The mobile device is now a key attack vector and offers attackers a route straight towards the enterprise network and the precious data it contains. The agility that the mobile device offers is now an indispensable business asset - but it also introduces previously "firewalled" network infrastructure to the insecurities of the wider world and the potentially dangerous security habits of users.

The potential points of vulnerability are numerous: Mobile apps and devices often get released with vulnerabilities due to oversights in the development process; unpatched mobile software can unearth yet more vulnerabilities; remote workers can be left exposed to the risks of public Wi-Fi or their ill-configured home networks and users even jailbreak their own devices, overriding native security measures and exposing the device. Amid this array of potential vulnerabilities, it's easy to see how a well-placed

attack on an employee can turn their mobile device into a corporate espionage tool. In fact, Verizon's 2022 Data Breach Investigations report found that 73% of the organisations that had undergone a mobile-related breach called it "major."

Threat actors have taken notice, and are flooding in to exploit this huge under-defended and over-exposed attack surface.

Mobile malware

Mobile malware - as you might expect - is on the rise. Zimperium's GMTR revealed that mobile malware grew 51% between 2021 and 2022. In 2021, Zimperium researchers found malware on one out of every 50 devices. The next year, we found malware on one of every 20.

It's not just a growth of the sheer amount of mobile malware, but also the sophistication. Take, for example, how mobile malware developers are evolving their ability to escape detection by using multi-platform development frameworks. These make it remarkably difficult for defenders to detect levels of maliciousness, thus hamstringing their ability to detect and mitigate threats. Ransomware has also been a particularly good example of this evolution. It has traditionally been very difficult to deploy on mobile devices because mobile devices often use sandboxing techniques which isolate apps from accessing device data and system resources. That's a problem for ransomware because it can't then use those apps as a foothold to dig deeper within the device.

However, ransomware authors have developed a number of families to avoid these natural protections. Locker ransomware doesn't go for the data but instead merely changes the device's pin number to lock the user out of the phone and adds an overlay informing them of their ransomware infection. Crypto Ransomware encrypts files on a device, and then calls out to a Command and Control server which provides it with a key that prevents victims from decrypting their files. When Leaker Locker infects a mobile device, it threatens its victim with the public release of the information within that device. If they don't pay - the infected data is then sent to the victim's entire contact list.

Phishing

Mobile phishing has also risen precipitously as attackers try to exploit the urgency and ease with which users interact with their devices. In 2021, Zimperium found that 75% of phishing sites targeted mobile and in 2022, that number had jumped 5% to 80%. This is an especially effective vector for attackers. The average user is apparently 6-10 times more likely to be compromised by a SMS phishing attack than an email-based one.

Supply chain attacks

Attackers are also trying to corrupt the software pipelines that deliver to mobile devices. The best

example of this is the attempt to insert malicious apps into legitimate app stores. Attackers can leverage the inherent trust that we put in the repositories like leading app stores.

These masquerade as legitimate apps - circumventing app store vetting procedures - but really contain malicious capabilities that can give attackers control over the victim's device. Attackers are working deeper within the supply chain too, infecting third party libraries and SDKs; tampering with development tools and Over-The-Air (OTA) updates and compromising ad networks. These all serve to spread malicious software as far and wide as possible, thus capturing the greatest number of devices and gaining access to the most lucrative targets.

Compliance

On top of that, pressure is coming from another direction: Regulators. There are already sweeping data protection regulations like the EU's General Data Protection Regulation (GDPR) or the California Consumer Privacy Act (CCPA) which cover huge markets with strict rules around the collection of personal data. These are backed by strict penalties for the non-compliant. Further government directives around mobile security and data handling are also forthcoming. In the private sector, mobile payments are also coming under greater scrutiny, with standards like Mobile Payments on COTS (MPoC) from the PCI Standards Security Council which demand security assurance from the compliant.

Many organisations satisfy themselves with policing the connections between mobile devices and the central network - but that's not enough to protect this all-too-soft underbelly. It might stop an attacker from getting to an enterprise's data centre, but it won't stop them from infecting a mobile device on which sensitive corporate data is stored and it won't stop them from using that device to set the stage for a larger attack - like listening in on a board meeting from the comfort of its victim's pocket. The mobile device is now the frontline in the war against threat actors and corporate spies, and that's where businesses need to set up their defences - on the mobile device itself.

Enterprises can look to Mobile Threat Defense (MTD) platforms which protect both devices and the apps within them. These platforms can ensure that individual devices haven't been infected, jailbroken or otherwise compromised and alert enterprises to on-device threats as they emerge, quarantining or blocking access as necessary.

FURTHER READING / REFERENCE

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How the energy sector will continue to thrive through HPC: Even as Moore’s Law comes to an end

High-Performance Computing (HPC), has become critical in assisting the energy sector, offering the capability to analyse complex data, simulate intricate processes, and optimise operations. While immensely powerful, HPC faces several challenges as it continues to evolve and respond to exponential demands for computational power. With the end of Moore’s Law looming ever closer, the energy sector will continue to thrive as HPC invariably moves to the cloud.

BY OWEN THOMAS, FOUNDER OF RED OAK CONSULTING

MOORE’S LAW, formulated by Gordon Moore in 1965, predicted that the number of transistors placed on a single square inch of an integrated circuit chip would double every two years, leading to an exponential increase in computing power. This Law has had profound implications for the development of HPC, not least in the energy sector, and the evolution of cloud computing, shaping the landscape of modern technology.



It is now well recognised that Moore’s Law is nearing its end. Since its formulation there has been about a one trillion-fold increase in the amount of computing power being used in predictive models and to improve these high-performance models further, we

need exponentially more computing power. Without it, the necessary gains in accuracy will diminish. But, with increasing costs and shrinking space available for the growing number of semiconductor chips involved in HPC compute, all sectors, including energy from oil & gas through to renewables, faces a new dilemma.

McKinsey estimates that global power consumption will triple by 2050. Energy suppliers are working on the development of new technologies that can more sustainably generate, store, and transport energy to consumers. With the impact of climate change adding urgency to reducing energy use and energy waste, the energy industry is accelerating innovation

to drive impact and outcomes at scale. Artificial intelligence (AI), advanced analytics, 3-D imaging, and the internet of things (IoT), supported by HPC, are all contributing to energy production to ensure a smoother transition to a more sustainable pathway.

HPC in practice in the energy sector

In the oil and gas industry, HPC is used extensively for contemporary scientific research, and the number of fields that it can be applied to is constantly growing, such as for weather forecasting, earthquake imaging or genetic analysis. Oil extraction can now utilise HPC to improve process efficiency and accuracy, and allow mining companies to save vast sums of money, affording them a greater competitive advantage in this market.

Advanced algorithms running on supercomputers can process huge amounts of data, enabling geoscientists to create detailed subsurface maps with higher accuracy and resolution. This capability enhances the success rate of exploration efforts, reduces drilling risks, and optimises resource extraction. Furthermore, HPC facilitates reservoir simulation, allowing engineers to predict fluid flow behaviours within underground formations. By simulating various production scenarios, companies can optimise well placement, extraction techniques, and reservoir management strategies. These simulations also aid in understanding the geo-mechanical complexities associated with hydraulic fracturing, enabling safer and more sustainable extraction practices.

HPC also is having a huge impact on the renewables sector in the modelling of weather patterns, energy demand fluctuations, and grid operations. Weather forecasting models powered by HPC accurately predict renewable energy generation potential, helping utilities optimise the integration of solar and wind power into the grid. By aligning generation with demand patterns, grid operators can enhance grid stability, minimise restrictions, and maximise renewable energy use through the Massive Internet of Things (MIoT).

Moreover, HPC contributes to the optimisation of power generation and distribution systems, including thermal power plants, nuclear reactors, and smart grids. Advanced simulation tools allow engineers to design more efficient turbines, boilers, and cooling systems, thereby reducing energy losses and environmental impacts. In addition, real-time monitoring and control systems empowered by HPC enhance grid resilience, enabling rapid response to outages, fluctuations, and even cyber threats.

Scalability has been key

The scalability and cost-effectiveness driven by Moore's Law has significantly influenced the development of cloud computing. The ability to pack more transistors onto a chip has led to more

powerful and affordable hardware, making it feasible for cloud service providers to offer robust computing resources at a lower cost whereby cloud computing leverages the principles of virtualisation and on-demand resource allocation. The technologies and innovation sitting behind Moore's Law have empowered cloud providers to continually enhance their infrastructure, providing energy companies with the ability to scale up or down as needed. Furthermore, the rapid evolution of semiconductor technology has spurred innovation in cloud services. Cloud providers can leverage the latest hardware advancements to offer new and improved services to their users. This continuous cycle of innovation enhances the agility of cloud platforms, allowing them to adapt to changing technological landscapes.

While growth of HPC and the Cloud aligns with Moore's predictions, it faces challenges such as physical limitations and the diminishing returns of miniaturisation. As transistors approach atomic scales, alternative technologies such as quantum computing may become necessary for sustaining the pace of progress.

Weather forecasting models powered by HPC accurately predict renewable energy generation potential, helping utilities optimise the integration of solar and wind power into the grid

The Implications of Moore's Law

It appears then that we could be forgiven for thinking that we are close to reaching the limits in available computational power. But that's not necessarily the case, indeed the Cloud will continue to be the principal catalyst for realising HPC's impact across all sectors, so long as we all work better with the tools we have to improve efficiencies and outcomes.

Much of that will be down to training, and much also down to funding, but crucially, it's about understanding where the true power lies, where petabytes of data are processed in milliseconds. This is echoed in our very own report, 'Incorporating the Cloud into the HPC Mix', where HPC and the Cloud are explained in greater detail.

Over time needs will evolve, as indeed does the nature of support required. What is critical, however, is that as the energy sector evolves with HPC, it needs support to get optimal use, and power, to realise HPC's benefits. And despite everything, Moore's Law is still guiding the energy sector to look at new ways of enhancing computational power to increase efficiencies for operators, and likewise to give greater power at the fingertips of consumers.

How data visualisation technology will deliver insight and data quality in 2024

It is commonly recognised that images are a powerful communication tool. This is summed up by the often repeated phrase that a picture is worth 1,000 words. With the deluge of data from 'big data', Internet of Things (IoT) and increasingly artificial intelligence (AI) activity, having access to data visualisation technology that's able to identify important trends and actionable insight is becoming key to business success.

BY BARLEY LAING, UK MANAGING DIRECTOR AT MELISSA



VISUALS based on data are so important because they can simplify complex data and reveal patterns, trends, and even issues with it, that informs effective decision making. This way you don't have to be a data scientist to understand, make learnings from and act on the data.

Organisational decisions are usually made with various internal stakeholders and sometimes external partners. Therefore, having simple but effective visuals to get points across to stakeholders who perhaps do not have any working knowledge of the data concerned, can provide a more compelling way to inform and gain progressive inputs from all involved.

Advent of smart graphics

Data visualisation technology has come a long way in recent years. It has moved beyond the delivery of basic pie or bar charts that don't add much value. Instead, particularly in the data quality space, it's smart graphics highlighting specific inaccuracies and abnormalities with records across a database, and also at an individual customer level, in real-time, that's offering significant value. This way any issues with customer contact data such as a postal or email address – which is vital for not only delivering insight on customers but effective customer relationship management (CRM) activity and a competitive advantage - can be identified and fixed in real-time.

At a glance understanding

To deliver confidence, or not, in the quality of data on your database any data quality platform you

source should be able to provide in real-time a visual with an overall score on the data, and across different aspects of it, such as name quality and email address quality. The score should be from high to low, for example A+ to F. Additionally, the data quality platform must be capable of providing at a glance visuals of any issues with the customer data, such as clear stats based graphics on the overall numbers of invalid postcodes, inconsistent names, even profanities in the data, for example - and be able to quickly take you to view them.

Customise visuals

Importantly, the visualisation part of the platform must be easy to use and versatile in allowing the creation of a wide variety of charts and graphs. This should include the ability to customise visuals, to provide a deep dive on any abnormalities with the data. As part of this the platform should have the power to create complex and insightful visualisations that drill down into specific data points. Along with highlighting inaccuracies in the data this approach supports decision making, because of the ability of such graphics to communicate decisions to stakeholders, as already mentioned above.

In the future, expect augmented reality (AR) – which overlays digital information in the real world – to play an important part in the data visualisation process. By its very nature it can provide 'a bit of fun' to data visualisation, and therefore help those utilising AR to more effectively interact with and make learnings from data.



Once data issues identified – correct them

Beyond providing access to smart visuals to spot any data issues, a data quality platform must also have the capability to correct any data inaccuracies in real-time – including names, addresses, email addresses, and telephone numbers, worldwide. It should ideally be able to enrich the data, for example add any missing data, such as a postcode, deduplicate data and undertake data profiling to source issues for further action. It's those tools that are available in the cloud, as software as a service (SaaS) or on-premise, and don't require any coding, integration, or training, which makes them easy to use and scalable.

One with a single, intuitive interface provides the opportunity for data standardisation, validation, and enrichment, resulting in high-quality contact

information across multiple databases. Furthermore, it's important to recognise that ensuring your database has clean data is a big first step in support of identity verification and therefore in preventing fraud.

Conclusion

In today's big data, IoT and AI world that's driving increased volumes of data, it's important to source data quality platforms and data analytics tools that offer easy to use, versatile data visualisation technology. It's the best way for staff at all levels, along with other stakeholders, to spot any abnormalities in customer data, so they can be easily fixed, and more widely provide insight that improves decision making. Such functionality will reduce costs and deliver improved engagement with customers and stakeholders. As a result, it will help to drive growth and business success in 2024.

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Digital evolution vs Digital transformation

How businesses can prevent digital transformation failure.

BY NEJ GAKENYI, CEO AND FOUNDER OF GRM DIGITAL



THE INFLUX of new digital technologies revolutionising workflows and processes across a range of industries has led many businesses to embark on their digital transformation journeys. Yet over 84% of these digital transformation journeys fail.

Digital transformation has often been treated as a project, with a clear beginning, middle and end, but this should not be the case. The digital transformation of any business must be approached as an ongoing investment, continually evolving and adapting to the latest tools and strategies. The inherent nature of digital transformation means it cannot be finished, so by approaching this as a digital evolution with an infinite mindset, businesses can recognise the process not as an event, but as a flexible innovation that will grow alongside the business.

A study by McKinsey & Company found that only 16% of large digital transformation initiatives succeed in achieving their desired outcomes. This is, in part, due to the approach and mindset of the business. The high failure rate of digital transformation initiatives stems from the lack of understanding of the vital stages of any digital evolution journey. This begins with the digitisation of all documents and

data within a business, before incorporating the digitalisation of all processes and workflows through digital procedures. And finally, there is infinite digital evolution, the process of enabling employees within a business to continually evolve, optimise and innovate by using the latest digital processes.

Dispelling this finite project mindset is key to ensuring a successful digital evolution for any business.

Defining a business's digital evolution mindset
Outlining your business's approach to digital evolution is vital to beginning a digital transformation journey. C-suite executives and IT teams must be aligned on their views of digitising their business, will this be a long-term commitment, or simply a one-off project? And this is where many businesses fall at the first hurdle.

For any business to reap the benefits of a digital transformation journey, it first needs to view this as an evolution, a continuous process that is constantly evolving and adapting along with the company as both grow together.

By establishing a digital evolution journey, IT teams can begin to ensure that c-suite executives and decision-makers are committed to a long-term investment in not only digitising their business processes but also continually adapting and implementing new technologies to stay abreast of the competition.

Digital evolution begins with changing this finite mindset, encouraging people to optimise and innovate their internal processes and fostering an ethos of continuous perpetual innovation at all levels of business. Shifting from a finite to an infinite mindset is what will set businesses apart and once this mindset shift has been embedded within stakeholders, the C-suite and decision-maker level, this can then permeate through all levels of a company. If a digital evolution journey is not adopted at the decision-maker/board level, it is never likely to succeed.

Creating a continuous culture of innovation
As with any new technologies, creators are



constantly evolving and innovating, and this is the same with a business's digital evolution.

Once a business's mindset has been challenged and changed, IT teams can begin their digital evolution process. Firstly, by creating a digital foundation, digitising and digitalising files, processes, and data throughout the company. Once this foundation has been secured, IT managers can look to implement stage two of their digital evolution, a siloed innovative effort across parts of a business. This process will look at the technologies in use across the company and create new ways to utilise these technologies to transform the organisation.

Following this, the third stage is to begin partial synchronisation across the various departments, allowing departments to collaborate and show what has worked well for them and what hasn't during their digital evolution journey. Now, the fourth stage is where many businesses fail, there is no end point with digital evolution, so the job is not done once stage three is complete.

Digital transformation is an evolving journey, a digital evolution, that needs to be continuously assessed and challenged. So, developing a continuous culture of constant innovation provides employees with the opportunity to take risks, be creative and not base success solely on KPIs but to analyse their progress by looking at their ROI and their competitor evaluation.

For any business to reap the benefits of a digital transformation journey, it first needs to view this as an evolution, a continuous process that is constantly evolving and adapting along with the company as both grow together

How to adapt to a 2024 business landscape
2024 is set to be very different to previous years and the business landscape will continue to change, alongside the creation of new technologies and advancements in tools, such as data analytics, AI and digital evolution.

If businesses focus on alignment, balance, and consistent perpetual innovation in 2024, more organisations will look to adopt a composable approach. Adopting breathable technologies that can adapt and evolve with businesses will be vital this year. Flexibility is the key to digital evolution and those businesses who adopt a composable architecture approach will not only see a significant return on investment but will reap the benefits of a successful beginning to their digital evolution journey.

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The CEO perspective - lessons on cloud migration

Moving a company’s data, applications, digital assets, IT resources and other operational elements into the cloud is something that every single business is going to be looking at, if they’ve not already done so.

BY RUSSELL CROWLEY, CO-FOUNDER AT PRINCIPLE NETWORKS

AS A BUSINESS LEADER, you’re going to need reassurances that the transition will go smoothly, that BAU can continue without disruption, and that your new IT infrastructure will be fit for purpose and futureproofed.

While it’s important to delegate the technical aspects of cloud migration to the experts, nobody wants to go into this important process blindly either. So, what are the key things that senior leaders should be aware of before embarking on their business’s move into the cloud?

Here we’ve collected some of the lessons that board level executives have shared with us on their experiences of cloud migration. It’s our take on the level of detail that every CEO should have in terms of understanding the impact of a cloud migration project on their business and how to make this transformational move as successful as possible.



Be prepared

The Scouts always tell us to ‘be prepared’, and they are not wrong. One of the main reasons

big cloud migration projects fail is a simple lack of planning. In 2022, TSB was fined £48mn by regulators for operational risk and governance failures due to a failed migration project that left millions of customers unable to access their online banking. The project was described by regulators as ‘ambitious and complex’ with a high level of risk, and that senior leaders had failed to plan for the migration properly.

While most cloud migration projects won’t carry this level of jeopardy, they will all be business critical projects, so don’t rush into it without first considering all possible ramifications. This starts with understanding your existing infrastructure, identifying the data you have and how it is used across all business processes.

Making sure that there is a full audit before anything is moved will help prevent surprises. It will uncover any interdependencies between different processes. You don’t want to end up switching all the lights out by accident as you move one aspect from its original home without being aware of how

it impacts connected processes. Aside from the disruption this would cause, it could also open the door to serious security vulnerabilities, accidentally exposing sensitive business information or disconnecting it from security procedures.

Day-to-day business will need to continue throughout the migration, so work with your digital transformation team to map out exactly what is moving to the cloud, and when it's going to happen. This will give you an overview of the full scope of the project and some peace of mind before the major work begins.

Success doesn't happen overnight, it takes time

Look to the long-term objectives and benefits that you will gain from the cloud migration project, such as better security, improved systems, integration of new technologies and software, and greater business agility. Or, to put it another way, don't expect there to be immediate cost savings or operational enhancements overnight, because that's not how it works.

Research suggests that 73% of cloud migration projects take a year or more to finish, and 62% of business leaders said the process was harder than they expected or failed. It's like anything in life, there will be bumps in the road and not everything will go exactly as planned, so you need to have a realistic timeline that has built-in contingencies. The last thing you want is for the board to expect a tight turnaround before another major business initiative is scheduled, as this will introduce unnecessary pressure and increased technical debt if shortcuts are used to meet deadlines.

Migrating staff to online tools

It's best to introduce staff to cloud-based tools such as Microsoft 365 and Teams as early as possible. This will help them to get used to working in the cloud with regards to things like saving and sharing files and collaborative working. There will invariably be a transition period as staff get used to the new systems when you have a hybrid server / cloud set up. This means that if there is a server outage during the migration, staff can continue working and your business doesn't come to a grinding halt.

It's also important to remember that a server or data centre isn't just a storage facility. The active directory within them manages all your users' login credentials and permissions, which need reconfiguring in the cloud. It will take several weeks to get everyone in the organisation updated, backed up and reconfigured on the new platform, so this staff transition period is really important.

An opportunity to streamline working practices

We've all got our favourite ways of doing things. Whether it's using Google Docs to create monthly financial reports, Slack to communicate with other

Migrating to the cloud is a chance for a bit of spring cleaning. You can review the different tools that are in use and then implement official guidelines for staff to follow. Some room for preferences might be fine, like choice of web browser, while using other tools correctly may be more business critical

departments, or Zoom to conduct external meetings. The problem is that these preferences could differ from one member of staff to the next. Over time, there will probably be a mix-and-match approach to completing similar tasks, and this becomes very inefficient in terms of data management. Valuable information is left in places where people can't find it, so you end up reinventing the wheel every time that similar jobs are repeated. The scattered nature of these tools is also a significant security risk, as they all have different security configurations and don't communicate on the same network.

Migrating to the cloud is a chance for a bit of spring cleaning. You can review the different tools that are in use and then implement official guidelines for staff to follow. Some room for preferences might be fine, like choice of web browser, while using other tools correctly may be more business critical. Cloud migration is the ideal opportunity to get people working to the same processes, and perhaps save costs by removing unnecessary licences and redundant or replicated processes.

Bring people with you

It's a brave person who ignores the human factor of cloud migration, because if your team isn't on board, the train isn't leaving the station. Research suggests that employee resistance to change is one of the top three causes of cloud migration failures in large enterprises. It's not just a technical shift. It can be a complete cultural transformation and some employees may struggle to adapt to new ways of working.

Successful migration hinges on cultivating a mindset within your organisation that embraces change. Offering training sessions, support mechanisms and rewarding adaptability can facilitate a more positive transition. Emphasising the benefits of working in the cloud and creating an environment that supports adaption should be central to any strategy for employee buy-in. Use proactive communication to share updates and new guidelines on things like data storage, sharing practices and collaboration with third parties, as this will help staff understand what's going on and why it's important for the business's success, and with it their own success.

AI and Automation: The key to navigating economic uncertainty?

When combined with an agile approach that aims at democratisation, the use of AI in the context of automated end-to-end processes will provide businesses with a foundation for competitive differentiation and growth.

BY MASSIMO PEZZINI, HEAD OF RESEARCH, FUTURE OF THE ENTERPRISE AT WORKATO



TODAY'S GEOPOLITICAL and economic environment is incredibly volatile. With 61% of chief economists predicting that the global economy will weaken further next year and 90% predicting geopolitics will be a source of global and economic volatility, organisations are increasingly seeking technological solutions, including automation and integration, to navigate the challenges posed by such a dynamic and unpredictable business environment.

Automation and integration tools have become highly sought after utilities for boosting efficiency and productivity, and the relevant strategies will continue to evolve as businesses look to use them to improve business agility amidst uncertainty and volatility. However, the 2024 automation and integration strategies will increasingly be impacted by AI technology, which will drastically change some of the well-established rules of the game.

The widespread recognition of AI's advantages in various business domains stems from remarkable advancements in AI tool sophistication and in the enormous popularity of generative AI tools like ChatGPT. Consequently, IT teams must devise how to effectively democratises and govern the use of AI tools among their employees to ensure that the utilisation of AI is not only advantageous but doesn't lead to security and compliance issues. Businesses are also increasingly realising that AI alone is not enough. Only by leveraging AI in combination with automation and integration platform, organisations can not only survive but also flourish in the face of uncertainty.



The use of AI and digital democratisation go hand-in-hand

According to multiple industry watchers (see Infosys' The Future of Work 2023 Report) the top investment priorities for progressive business

leaders include the adoption of automation tools. These are primarily focused on improving business processes efficiency and reducing their costs, both key objectives for every business.

Similarly, businesses have been using integrations for decades to synchronise data across different systems. Therefore, most businesses looking to take advantage of AI are already quite familiar with these tools.

Nonetheless, we believe that, at least 50% of generative AI initiatives in 2024 will fail to deliver the anticipated business benefits due to a lack of integration with business processes. In a nutshell, the potential business value of Generative AI can only be fully unleashed if generative AI is incorporated in end-to-end business processes. Otherwise, its contribution will remain limited to assisting individual and isolated tasks of possibly notable, but marginal business value.

Therefore, it is crucial that forward-thinking enterprises strive to unlock the untapped potential within their workforce by empowering both their business and IT teams by synergically leveraging AI, automation and integration technologies.

CIOs should make sure the combination of AI, automation and integration tools they provide to the organisation is inclusive and democratised, that is, available to the widest possible audience. Involving business teams favours the spread of the efficiency, agility and innovation benefits of these technologies throughout the organisation. This democratisation process should enable employees to leverage AI, automation and integration capabilities, but also avoid excessive complication of the technology stack. For example, enterprises should select automation and integration platforms that can both support IT experts and business experts and



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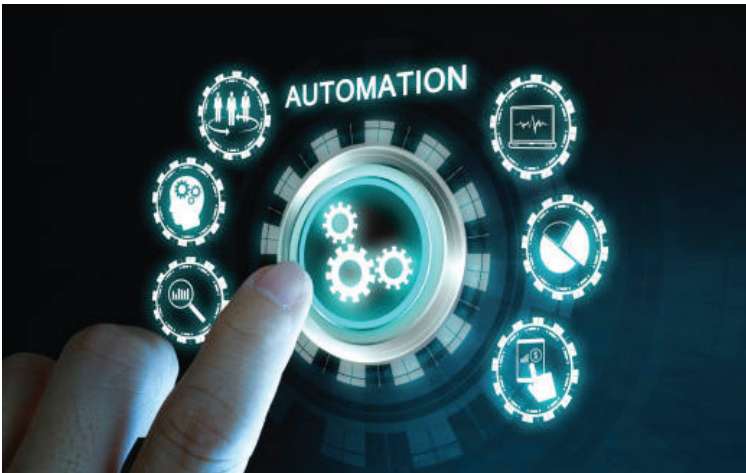
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are natively predisposed to work with a variety of AI platforms. During this process, organisations should steer clear of a common error: forgetting or postponing investments in governance. Given the short learning curve of these tools, their adoption can spread rapidly, and enterprises may end up with dozens of builders and hundreds of applications in few months or even weeks. The need for governance suddenly manifest, but it might be too late: at that stage regaining control and enforcing governance is a daunting task.

Similarly, enterprises should avoid introducing additional risks by paying close attention to security issues from day one of their adoption of AI in combination with automation and integration.

The role of integration and automation technology

Although many businesses still view AI in general, and generative AI specifically, as a cutting-edge and immature technology, many organisations' limitations, and risks, are shifting focus towards extensive operationalisation. They are finding that, to incorporate generative AI into their business processes, they must set up and optimise an underlying infrastructure designed for long-term strategic and effective use.

Considering how the value of AI is greater if integrated into business processes, an integral part of this infrastructure is a comprehensive integration and automation infrastructure capable of orchestrating AI functions with traditional systems that could potentially participate in AI "infused" business processes. This is critical because organisations that successfully infuse AI capabilities into their business processes will outperform their competitors and establish sustainable competitive differentiation.

The infrastructure must include different types of capabilities including integration, to make it possible to connect to any end-point system, and automation, to orchestrate AI and traditional systems in the context of end-to-end business processes. To maximise democratised access to the infrastructure

they must expose a low code development environment. Organisations should investigate to what extent AI can further help democratisation, and the infrastructure should include appropriate operation, management, security and governance capabilities to make it possible for IT teams to retain control even in a highly distributed, democratised environment.

A strong system of governance is essential to prevent the risk of descending into anarchy rather than fostering a truly democratised approach. Establishing guardrails is crucial to ensure security, scalability, manageability, change management, compliance, and other necessary requirements, forming the foundational support for democratisation.

For automation processes to truly impact real-time outcomes arising from actual business events, the focus must be on automating real-time processes. When the automation capabilities are powered by AI and accessible to employees, collaborative knowledge sharing enables colleagues and teams to collectively determine the best approaches to building automation processes.

CIOs should be ambitious and target the big picture

When organisations approach new technology, they initially target small, business challenges. They want to validate the supposed benefits and discover the pitfalls of the new technology by applying it to a relatively small scale, not overly complicated and "isolated" problem. This way they avoid the risk of compromising significant business activities because of the defects or misuse of a technology they do not yet know enough about. This is a wise approach but should not remain the prevailing attitude once the initial technology on-boarding is completed. Instead, CIOs should help the organisation "think big" and figure out how the new technology benefits can be experienced above and beyond scenarios that mimic the initial, experimental use case.

This may lead to a task-oriented approach, which is myopic and usually leads to suboptimal results. The key to success lies in adopting a new leadership mindset that takes a holistic view of end-to-end processes when incorporating AI, automation and integration, rather than succumbing to a narrow, task-oriented focus.

When combined with an agile approach that aims at democratisation, the use of AI in the context of automated end-to-end processes will provide businesses with a foundation for competitive differentiation and growth. CIOs that embrace and prove able to materialise this vision will provide a key contribution to their organisations long term viability by enabling it to rapidly adapt to the twists and turns of the volatile business environment and promptly reap the associated benefits.



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