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CIOs urged to be more courageous

By Kathy Gibson

The transformation to the digital enterprise requires that CIOs drive the creation of a digital platform in 2016 – but they need to be bold to ensure they embrace the opportunities.

George Ambler, executive partner of Gartner Executive Programmes, says the research company's latest CIO Agenda survey shows that organisations are starting to evolve to platform businesses.

He points to the world's first robotic hotel in Japan.

There is a robot at the front desk. Customers can choose to interact with humanoid robot, or a dinosaur-like one. Once a customer checks in, they will be escorted to their room by a robot which will display a video about the venue. On arrival at the room, your door opens with facial recognition.

Inside the room, a robot responds to instructions or dispenses information. Food, drink and amenities are available from vending machines throughout the hotel.

"This is not just a toy," says Ambler. "The management wanted to reduce their costs by a quarter. And the amount of data they are able to collect from a digital anthropology perspective is important. It will allow them to evolve the experience and make sure it is pleasant going forward."

Hospitality is not the only industry facing disruption, Ambler says. Industries across the world are being disrupted by digital technology.

Gartner asked CEOs and CIOs what percentage of their revenues would derive from digital over the five years, and found it rising dramatically to 37% from CIOs and 41% from CEOs.

"So digital is a serious area for CEOs," he says.

It's not just the private sector that's embracing digital; In the public sector, digital processes are expected to rise to 71% in the next five years.

Ambler points out that even non-traditionally tech-savvy areas like farming are embracing digital.

Enterprises are focusing on a number of areas when it comes to digital transformation. They are more revenue from better operations; more business through digital channels; and tighter partnerships.

"There seems to be a trend towards digitising what we do today," says Ambler. "But digital is not about automating processes – we can do that already. It's about new processes and products."

The amount of spend being put into digital budgets is going into BI/analytics at 39%; infrastructure and data centre at 27% and cloud at 25%.

In South Africa, CIOs are putting less emphasis on cloud, but this is expected to change going forward as pressure to adopt cloud grows.

South African companies also don't emphasise mobile as much as the rest of the world. Security is not given the same emphasis by South African CIOs

"But the threat is evolving," says Ambler. Now, 59% of CIOs believe the major risk is from security and cyber-related threats; while new competitive and commercial threats are ranked at 41%.

The risk is also split almost down the middle on competition from traditional competitors and competition from digital-enabled companies entering from other industries.

"So surely companies should be investing in disruptive technology rather than looking at automating traditional processes.

"Are we being courageous enough in dealing with the threats."

A major challenge for CIOs is that there is not enough budget available to fund digital transformation. "Budgets are under constraint but people are having to innovate. As CIOs we have to think creatively about how we can leverage resources across the enterprise to innovate – get more creative about funding the digital initiatives."

On the technology front, Gartner sees the world shifting to platform-based business rather than system-based business.

"Platform businesses have a different emphasis. System business is about functional areas of the business. Platform businesses are about connections between business functions.

"Uber is an example of this: it manages the connections between buyer and seller, and doesn't worry about the means of production.

"The benefit is in the network effects that you gain. So we see more and more businesses becoming platform businesses or a combination of both.

Platform businesses have porous boundaries, Ambler says. "Platforms are designed for learning and configuration. They are multi-disciplinary in design.

"But the essential difference is that the value is in the relationships."

Re-inventing the businesses isn't easy if there are no new resources, skills or thinking coming into the organisation. "In South Africa we tend not to refresh our gene pool with new ideas and resources," Ambler points out.

"So how do you move away from an industrial business to a platform business?" he asks. Things that need to change include the leadership platform, the talent platform, and the delivery platform. The infrastructure platform is also important, but CIOs have got that under control.

In terms of delivery, Ambler says Gartner recommends adopting a bimodal development model. "Moving from systems to platform business means you have to exploit the existing business model while exploring new models.

"To do both exploitation and exploration is not easy. Businesses need to have two ways of working: do predictable work while doing exploratory work at the same time."

In mode one, IT focuses on taking orders and executing. In mode two, there is a more innovative culture.

The Gartner CIO Agenda survey found that 38% of CIOs have now adopted bimodal. These organisations spend about 25% of their IT investments on Mode 2 development.

The practices that make for successful bimodal organisations are led by agile methodologies and multi-disciplinary teams, followed by adaptive sources, different funding, mode two is outside IT, different metrics, working with SMEs and start-ups, bimodal sub-structures, formal innovation management, and crowdsourcing.

Bimodal disciplines tend to lead to better digital performance, Ambler says. "Those organisations that have adopted at least five of the bimodal strategies are the best-placed in terms of digital transformation."

And, while many organisations have adopted some bimodal strategies, they are not sufficient on their own. They need to look at different funding and adaptive sourcing – strategies that are traditionally not part of the IT discipline.

"Moving from client/server to cloud is a paradigm shift," Ambler says. "We will have to invent new technologies, new ways of doing things."

Having accepted that the future of development and delivery is bimodal, CIOs need to look at the talent platform.

"Often this requires new people and new teams," Ambler says. "Talent is critical if you want to design a digital platform."

Skills are a major barrier to achieving digital transformation, named by 22% of CIOS; money is a problem for 15%, culture at 12%, alignment at 11% and technology at 9%.

Importantly, CIOs see the talent crisis more clearly than CEOs, with 66% believing that talent scarcity is reaching crisis proportions, compared to 49% of CEOs. Most CEOs still believe that the talent shortage is a business myth.

The short-supply skills are information/analytics at 40%, business knowledge and acumen at 18%, security and risk at 17%, digital at 15%, project management at 13%, software development at 13%, architecture at 12%, leadership at 9%, attracting and retaining skills at 8%, and technical skills at 8%.

Ambler points out that the vendor can be seen as an extension of their talent pool, and that CIOs should be embracing new partners who can help them make the digital shift.

Gartner believes that appointing a chief digital officer will help to accelerate the digital transformation – but the move to appointing this individual is not happening as fast as expected, with 6,6% in 2014, 9% in 2015 and just 9,3% in 2016.

"So this trend is losing momentum," Ambler says. A lot of the problem was that chief digital officers were appointed but given no resources or bimodal environment to operate in. Some of these functions have now devolved to the CIO, and 39% of CIOs are now driving digital transformation and innovation.

Today, CIOs are building a better trust relationship with the CEO than ever before, with 50% now in a true partnering relationship, compared to 23% as trusted allies and 25% as pure transactional.

CIOs are still being bogged down with administration and bureaucracy, politics, stress and workload, personnel, business as usual, financial constraints operational issue, change management, IT stigma, and governance. But Ambler says CIOs have to better their political acumen and become better businessmen.

Gartner asked CIOs how much courage CIOs are prepared to take to lead into the digital world: will they passively respond, take the lead or change the game? From a business perspective, are they digitising operations, extending products with digital, digitally driving new business models or exploring digital blue oceans?

"I think courage is lacking in some instances," Ambler says.

The CIO Agenda survey polled 2 944 CIOs, based in 84 countries and responsible for $250-billion in IT spend. ■

Smart home devices set to double

The raft of smart home devices displayed at the recent CES 2016 highlights the growth and potential of the smart home market.

Over the next 12 months, smart home devices sales will nearly double year-on-year, as the groundwork and service offerings developed over the past few years provide solid impetus for wider adoption, according to ABI Research.

However, while hardware sales will continue to drive smart home revenues over the next five years, a transition to recurring service revenues is well underway. In fact, by 2020, recurring service revenues will account for close to a quarter of smart home revenues, up from under 20%.

The transition to recurring revenues is fuelled by the growing adoption of managed smart home systems from a range of players, including home security, telco and cable companies and retailers. Vendors include ADT, Vivint, AT&T, Deutsche Telekom, Comcast, Lowes and Staples.

In addition, a new generation of self-install devices and systems from dedicated start-ups and tech giants like Google and Samsung are also fuelling recurring revenue services such as remote data collection and storage.

"As the smart home functionality continues to push into new homes, vendors are benefiting from initial device and system revenues but the goal is to bring these sales into long-term recurring revenue services," says Jonathan Collins, principal analyst at ABI Research. "Managed smart home system pricing, like traditional home security services, is geared to win new consumers with reduced device and equipment sales in return for long-term recurring revenues.

"Smart home service providers are increasingly bringing the most popular DIY devices, such as the Nest thermostat, into their managed service offerings. However, increasingly consumers will expect that integration to be available in an ad-hoc nature." ■

Digital disruption for motor industry

By Kathy Gibson

Digital disruption will be one of the major forces driving the automotive industry in the future and set to change cars as we know them.

This is the word from Innovation Group, which launched its "Automotive Future Now" report, which investigates and unpacks the global and local trends impacting the industry.

Glen Mollink, CEO of Innovation Group SA, comments: "The rise of the connected car and digitally-savvy customer is of particular interest.

"The connected customer will change the landscape of the automotive industry moving forward as they are demanding more interactive services and mobile apps that plug seamlessly into connected vehicles."

Mollink points out that consumers are demanding more interactive services and mobile apps that plug seamlessly into connected vehicles, and there is little doubt that the automotive industry is under pressure to adapt alongside these digital advancements.

A more tech-savvy customer means there is less reliance on dealerships to source suitable vehicles, with consumers now doing their own research into suitability and availability online. Consumers are also more demanding because they don't have to rely on what a particular dealership has available, but can source the most suitable vehicle online, quickly and easily.

The rise of the connected customers will have massive implications for the automotive industry, Mollink says, and we can expect to see greater collaboration between OEMs and dealerships in an attempt to attract and retain these customers.

Meanwhile, in-car services aimed at providing infotainment, location-based services and apps for driver assistance, are set to gain popularity in newer vehicle models in 2016 and beyond.

The key to success of this, however, relies on the relevance to the driver or service experience in the mind of the vehicle owner, Mollink says.

"Apps that warn about possible collisions will be at the forefront of this technology, giving drivers the ability to drive smarter and safer," he explains.

The Automotive Future Now report finds that the South African market in general is in for a tough rise in 2016 as a result of slow GDP growth and the steady decline in the rand's value.

Despite the economic pressures, though, there are positive influences that will carry the industry through tough times, says Mollink. "An increase in urbanisation and the growing middle class contributes to a stronger car ownership culture in South Africa."

However, the report also indicates that the upcoming generation of customers is likely to be more interested in mobility solutions like Uber and car sharing. This could be driven partly by affordability concerns among mid-level and aspirational buyers.

The Internet of Things (IoT) will also have an effect on the local automotive industry, says **Ricardo Coetzee, managing executive: automotive at Innovation Group SA,** signalling a major shift in what customers want from their car and the associated driving experience.

Coetzee points out that technological advances within the automotive industry as well as the consumer space is forever changing the relationship between the two.

The report outlines how the customer lifecycle has changed over the years and how the industry needs to address this moving forward.

"If you were to speak to car manufacturers years ago, they would almost always tell you that the most important aspect of their work was the product," says Coetzee. This is no longer the case, however, and it is now more important for manufacturers to consider their customers' needs and wants at every point in to the process – from design of the car to the communication mechanisms after a sale has been made.

This means newer and more effective ways of communicating with connected customers, and it becomes critically important for businesses to engage with their customers in a more meaningful way.

"Customers are looking to communicate with businesses in different ways," says Coetzee. "While connectivity within the industry is over primary interest, it is also important to customers that communication is a key focus." ■

Separate the **real** from the fluff

By Kate West

The digital space is always shifting, expanding, creating room for more. Our newsfeeds are inundated daily with fresh influxes of ICT-related information, and every week brings new advances in tech, big and small. With the constant buzz around innovation, we're not always sure what's really disrupting the industry, and what's just fluff.

Virtual reality (VR)

While the concept of VR has been around since the 1970s, the technology never seemed to catch up, and there was no way to distribute the service to the public, who generally couldn't afford the gadgetry required. Until now.

Smartphones have changed everything. With high-definition (HD) cameras, global positioning systems (GPS) and screen rotation functionality, as well as enhanced processing power, the smartphone is fully capable of running VR software. This not only makes for a seamless VR experience, but also makes it accessible to anyone with a mobile smart device.

This year, HTC, Sony and the Facebook-owned Oculus will each release their own VR headsets, VIVE, PlayStation VR and Oculus Rift, respectively. The much-anticipated Oculus Rift is set to hit shelves from April 2016. Robust user experience (UX) testing paired with a dose of healthy competition means that we're in for a life-changing VR experience.

Training simulators will not only be reserved for astronauts and pilots, but fire fighters, engineers, doctors and disaster relief professionals will be able to practice dealing with occupational curve balls too.

As a fully immersive experience, VR will change the way we work, learn and entertain ourselves.

Sharing economies

Uber. Airbnb. Gumtree. These are just some of the household names you've come to know. What you may not know, is that these innovative brands are part of what has now been dubbed the "sharing economy", and it's all the rage.

It's all about access, really. Most people, especially millennial consumers, can't afford to stay in hotels, buy high-end sports equipment or hire a full time employee at their start-up. This is what makes sharing communities so powerful - people can trade goods for goods, or get the experience, knowledge or help that they need at a fraction of what it would usually cost using traditional service providers.

Companies like Airbnb, TaskRabbit and Uber allow regular Joes who just aren't making enough money in their day jobs to turn their assets (such as apartments and cars) and skills into a means of earning a passive income. It's genius, and a mega disruptor for conventional business; companies will be competing with consumers who rent their goods out for a small fee, a bottle of wine or even a basket of home-grown vegetables. Who can compete with that?

User experience (UX) science

It's not news that the marketing landscape has changed drastically over the last decade. Digital communities have influenced the way we buy, sell and strategise, and the consumer is now informing the business, not the other way around.

While some companies were slow to realise this shift, for brands that are at the forefront of their fields, consumer behaviour intelligence now drives all their business – from product concept and design, to marketing execution and delivery.

UX is a vital element of product design – it is how the user feels when they interact with a digital product. For those new to this concept, think of it as a product's first impression on the user. You can already see why this is integral to brand adoption. There is a lot of competition out there; if a web site or app is unattractive or difficult to use in any way, users will spend their clicks somewhere else.

Companies are pouring funds into consumer research, conducting user testing, marrying findings with the relevant human interface guidelines (HIG) and using this precious data to advise on their product design. According to UX Motel, for every $1 spent on UX design, there is a $100 ROI.

Our new reality is that consumer attention is a commodity, which means that intelligent UX design is no longer an option - it's a top priority.

Artificial intelligence (AI) and robotics

Despite films that put the fear of machines into us (think Terminator, I Robot, The Matrix), the field of robotics and AI has never been as prolific as it is now. Last year the industry saw huge leaps in robotic capability.

International competitions, like Amazon's Picking Challenge, the DARPA Robotics Challenge and the RoboCup pushed innovators to their creative limits, and we saw robots that can pack shelves, operate in disaster situations and perform as proxy surgeons in remote locations.

While there are still many milestones to reach in the field, experimentation and field testing are gaining ground and developers are using glitches to learn and make adjustments. Despite the setbacks that Google faced with the testing of its self-driving cars, it's only a matter of time before the kinks are ironed out and they move on to the next "impossible".

One newsworthy development to look out for is in China, which will be investing $154-billion in installing robots in its

factories, replacing human workers in an effort to cut costs and make their production lines faster and more cost effective.

The increase in the threat of terror globally, along with major software enhancements, means that this could also be the year we have smart drones hovering in our skies, as well as robotic armed forces accompanying soldiers into war zones.

Widespread cyber crime

Imagine your child is playing innocently by herself with an electronic toy. She is chatting to the toy happily, when the toy starts to talk back – and not in a polite way. Entirely possible, as hackers proved when they breached digital toymaker VTech's network last November, exposing the account information of 6,4-million children around the world.

Hacking is more rife than ever before and last year saw some really big attacks. The federal Office of Personnel Management (OPM) had the sensitive details of over 21-million people stolen, as well as the finger print files of 5,6-million federal employees. The controversial website 'Ashley Madison' was hacked, and the data of 37-million users released publicly, including credit card information and login credentials. Other hacking victims of yesteryear include Experian's T-Mobile customers, the IRS, LastPass and CIA Director John Brennan.

What these breaches have taught us is that we need to tighten up security in an innovative way. Hackers and cyber security firms are neck-and-neck in the race to get ahead of the game, and with a predicted 30% increase in connected devices in 2016, there's a lot of work to be done.

Criminal ingenuity to look forward to:

- "Headless" worms or viruses that will target "headless" devices, such as smartwatches, smartphones and medical hardware;
- "Ghostware" designed to breach, steal and vanish before the break is discovered; and
- Cloud jailbreaks will become more frequent as more users migrate to virtual storage.

Vectra Networks CEO, Hitesh Sheth, said in a recent interview that cyber security firms need to think outside the box and spend more time developing software that tracks hackers once the inevitable breach is made, and alerts security immediately, as opposed to just focusing on firewalls. ■

Kate West is the digital learning manager at Shift ONE Digital.

On-board connectivity a must for tomorrow's car

The In-Vehicle UX (IVX) group at Strategy Analytics reports that consumer interest in -- and willingness to pay for -- rear-seat entertainment systems is robust among younger and middle age groups, but lower across all other demographics. Technologically, there increasing interest in video streaming and tablet docking solutions.

Surveying consumers in the US, the UK and China, Strategy Analytics found that interest in rear-seat entertainment systems is strong across all regions, but only among 25-34 and 35-44 age groups. Tablet docking stations and streaming video are often the most preferred method of delivery, which has important implications for the type of internet connection necessary in future car models.

"Connectivity is playing an increasingly important role in consumers' purchase decision," says Derek Viita, senior analyst and report author. "OEMs must consider the inclusion of reliable and fast on-board connectivity a 'must-have' in future models for a variety of reasons, and the increased usage of streaming media for rear-seat entertainment is certainly one of them."

Streaming video is a driver for adoption of in-vehicle WiFi hotspot solutions.

"Current WiFi options, such as OnStar, are more costly than having the consumer increase their data limit through their wireless carrier," adds Chris Schreiner, director: IVX at Strategy Analytics. "Furthermore, data limits on in-vehicle WiFi would not support consistent usage of streaming video, as only a few hours of usage per month would use up all allotted data. OEMs need to better align in-vehicle WiFi options with likely usage patterns in order to take advantage of this consumer preference toward streaming video content." ■

The future of work ...

One of the recurring themes at any technology or business conference these days is digital transformation; and how companies that fail to make the leap to digital enterprises are doomed to almost certain failure. As technologists we tend to focus on the smart devices, networks and applications that typify the digital enterprise, but this is only part of the story. To truly transform to a digital enterprise, much more needs to be done in terms of enabling a digital workforce and this means a complete rethink around the way people within the organisation work, right down to the desks they sit at. Kathy Gibson tried to get to grips with the 'softer' challenges inherent in digital transformation; and spent some time with a couple of organisations that have taken the plunge and redesigned their workplaces to align with the digital agenda.

Transforming to a digital enterprise is no easy task, as companies who have embarked on the journey can testify.

Not only will the company of the future look a lot different to the organisations of today that we are accustomed to, but the type of work that adds value to their companies will be completely different too.

In fact, the World Economic Forum concludes that as many as 7,1-million jobs could be lost through redundancy, automation or disintermediation, with the greatest losses in white-collar office and administrative roles. This loss is predicted to be partially offset by the creation of 2,1-million new jobs in more specialised areas.

This means that companies and governments need to manage a near-term transition in the nature of work, and build a workforce with futureproof skills.

The most significant driver of change across all industries, says the WEF, is the changing nature of work itself. As new technologies make "anytime, anywhere" work possible, companies are breaking up tasks in new ways, leading to a fragmentation of jobs across many industries. These effects are further compounded by the rise of mobile Internet and cloud technology, enabling the rapid spread of Internet-based service models.

Industry pundits talk a lot about the new group of Millennials about to enter the workforce, and how they are well-suited to the new way of working – or else the new way of working is being crafted to the Millennial way of doing things. These observers seem to imply that older workers will be moved aside for the new Millennial workforce; or else will have to radically adapt the way they think and work in order to still be relevant in the digital enterprise.

It's more complicated than that, says **Ricoh SA's chief operating officer Jacques van Wyk**. He points out that there are now four generations in the workplace – more than ever before – as Generation Z's eldest members, now 19, begin to work alongside the Baby Boomers in the top positions, Generation X in middle to senior management, and Generation Y beginning to climb the corporate ladder.

Those in Generation Z, the Millennials, have grown up in a mobile, digital world where cloud, big data, analytics and social networks are the norm. They'll expect the same and more in the workplace, Van Wyk says.

Millennials want to work for organisations that innovate and make a difference in the world, he points out, and companies face the challenge of how to route information through and around their organisations to meet the needs of all four generations.

However, the prevailing wisdom that says older workers are resistant to change is not strictly true either, according to a study by VMware.

Employees from a variety of organisations across Europe were interviewed, representing all jobs types and worker ages as well as all levels of seniority and aimed to determine people's ability to harness technology to change the way that they work.

The research findings show that it's not only Millennials who are interested in technology, but that digital skills are meaningful to all employees. In fact, most employees believe that digital skills are linked to competitive advantage or being organisationally efficient - and that it is important to the company.

Many of the respondents feel that they are not being enabled enough; or didn't have the right level of digital skills to be fully empowered – and they believe it is the role of the IT organisation to fix that.

In addition, most employees feel that IT and business leaders need to be more aligned to one another, that there is a perceived gap that they don't believe is being bridged.

First, change the mindset

Surveys and studies aside, it's clear that there can be no digital transformation for companies that don't bring their workforce along with them on the journey.

"The world is changing, and people are changing," says **Nir Tenzer, chief operating officer at Microsoft SA**. "We are more mobile today than ever before, and have access to more information. Technology has been a catalyst for massive changes."

But technology on its own is simply a tool that anyone can use to be more efficient, he says, and forms part of the conversation that we've always had about work: how to be more efficient.

"This is the cognitive layer, and organisations have generally got this right. But if they want to be successful in the new shape of the world, they need to add emotion. Work can no longer be just about performance, but about how individuals can be the best they can be."

The first thing that needs to go is the idea that work and life are somehow separate; and to recognise that people all wish to make a difference in their environments.

"There is no such thing as a work:life balance," says Tenzer. "It's about life balance. Everything I do is circles that merge together."

He explains that Microsoft came to the understanding that, to be successful in the new world and to keep up with the pace of change, it had to introduce these emotional layers into the organisation. "We had to change the mindset to focus on the human aspect of the business rather than the product."

Microsoft has adopted a "growth mindset" philosophy, where people are encouraged to the "learners" rather than "knowers" – a philosophy that sometimes runs counter to the way most of us were brought up or taught.

"We subscribe to the idea that everyone can evolve, develop and learn," says Tenzer. "And it's OK to make mistakes.

"This is important: it's OK not to know everything," he stresses. "It's OK to ask, to learn and share. It's OK to take risks. And it's OK to fail. The big thing is to learn.

"When people share, learn and take risks it can push the organisation to new levels."

Microsoft is a 40-year-old organisation that was founded by innovators not afraid to take risks. "So do we need to learn?" asks Tenzer. "The answer is yes – it is the only way to survive. Learning has to be continuous and it has to enable us to change and change fast."

This focus on learning is important, he adds, because the knowledge we have today won't be sufficient to ensure we succeed in the future. "The new ideas are not necessarily all yours. And if we have a mindset where we have fixed ideas of what we can do, it will pull us back."

Tenzer describes how failure is no longer hidden or justified, but aired so that more people within the organisation can learn from it, and gain fresh insights. "Now people admit if they have failed and look to what they have learnt from the experience."

The growth mindset philosophy says that culture is more important than strategy, and that culture can only work if it comes from the top down, with managers who lead by example.

"At Microsoft we do have a management team that leads by example, and is open to new ideas."

The growth mindset was introduced to Microsoft by its CEO Satya Nadella, and he was the first to adopt the new thinking and culture.

"The business transformation is an ongoing journey, but this is about making a difference – and, in order to make a difference, he realised we have to transform the organisation, and empower every person in it."

From Nadella, human resources, country MDs and the whole executive team had to understand and buy into the new mindset.

"The top management cannot pay lip service to the culture; and, without their buy-in, it won't be able to permeate through the organisation."

To make sure the culture works all through way through the organisation, managers have had to change the way they think about their roles. "The manager's role is people," says Tenzer. "To be a manager is not a hobby. Yes, there is prestige in the position, but they have to really care about the people. So managers have to buy into the culture."

They also have to buy into the fact that they no longer appraise employees solely on the measures that used to be important, like time-keeping or the figures they make – or even on their successes. "People have to be encouraged to take risks; and, if they fail, we need to celebrate the learnings that come out of that."

A new organisational culture would be just so much talk if it wasn't a reality for all of the employees, so a lot of work needs to go into ensuring that everyone in the company understands and buys into it.

Doing this, it helps if the management structures are flatter than in the past, without the strict hierarchies that characterise so many corporates.

"Communication is crucial," Tenzer says. "At Microsoft we treat our staff like customers, and they are no less important. In fact, our staff are very important; and we invest a tremendous amount in our people."

The first step is to introduce the culture to staff members. "This can't be a once-off thing, so we worked with small groups."

During these sessions, Tenzer finds that people start to open up as they embrace the culture. "By the end of it, people are not ashamed, or afraid, to raise their voices."

Management it totally invested in these sessions – they are not run by faceless lecturers – and both Tenzer and the Microsoft SA MD Zoaib Hoosen make sure they are involved in at least part of each session.

The next step is to change the way achievement is recognised and rewarded. "What we do is give people recognition in front of other people. And we don't always celebrate achievement either – often we celebrate the journey."

This type of recognition, and celebration, is more effective than monetary rewards, Tenzer says. "Money is sweet, but it doesn't last. The recognition in front of your peers is often more powerful than a monetary bonus."

Eliminating silos within the organisation is important, and there's a big focus on the idea of one team, one Microsoft. "As people build confidence in the system, they become more open to other opinions and ideas."

Once the culture is established within the company, Tenzer says the final step is to extend it from a purely internal focus and externalise it.

"This means that the relationships between Microsoft and its customers or vendors shifts to a different level. I need to really care about you, feel your pain and celebrate your successes. In fact, I need to be obsessed with your success. And then we will both be successful."

Critics might scoff at the idea of running a business on such a people-centric model, but Tenzer stresses that the business part of the equation is still there. "You can't run a company on emotion only – we are still a business. But there's a balance – a yin and a yan. You can't leave out either element or the balance will be lost."

In fact, allowing people to take risks and learn has led to them taking on bigger challenges and aspiring to greater heights.

"It has been an exciting time at Microsoft," Tenzer says. "The culture has allowed people to come up with technological innovations that make a difference to people's lives."

So far the new culture seems to be having a positive effect on the bottom line as well, he adds. "In a declining market, Microsoft is growing. I believe Microsoft SA is growing because people from different places and attitudes are aligned; we know why are doing things and so the motivation is high."

Not everyone is cut out for this type of corporate culture, Tenzer points out – but the culture embraces them anyway. "It can be hard for some people to make the shift and, inevitably, some people don't make it. Which is why you need to have the right change management, and even so it's not easy.

"But I believe that everyone can change and grow. They just have to want to have the alignment, and agree on the core."

Microsoft SA staff decided together that the organisation's core will be to make this country great, and staff members are all encouraged to align with this.

The ABCs of change management

Microsoft adopted an "ABC" of change management when it came to shifting the organisational culture to a growth mindset.

A – Alignment to the core: why the change needs to take place

B – Behaviours: how people are changed after aligning

C – Consequences: the celebration of good alignment, and good conclusions. Consequences are also seen in improved business results.

Next, change the workplace

As the nature of work changes, the offices designed for the industrialised workforces of the 1970s, with rigid hierarchies determining who sat in soulless open plan areas, or closed off in private offices, are no longer suitable or effective.

The new employee can work from anywhere and is a roving member of loosely-formed teams that come together dynamically to share and collaborate when it's relevant.

Working hours are only loosely defined in the modern digital workplace, with outcomes or value used as more accurate measures of productivity.

As the nature of work changes, so does the way of doing it: remote working is becoming commonplace, staff members are no longer strictly attached to one division or another; and KPIs have to be completely rethought.

This may necessitate a restructuring of the workforce, a new strategy on end user technology, and a complete rethink of the workplaces themselves.

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Telkom makes **the move**

Praven Naidoo

Telkom has had its fair share of media attention lately as the company makes what has sometimes been a painful move to becoming a modern, digitally transformed enterprise, able to hold its own in a dynamic market against growing ranks of agile competitors.

Arguably the most prominent symbol of the new-look organisation was the move to its new head office, ending more than four decades years at its Proes Street headquarters in Pretoria.

Centrally situated in Centurion's Highveld Techno-Park, Telkom's new head office is easily accessible from Johannesburg and Pretoria as well as from both the East and West Rand.

Arriving at Telkom, it's hard to believe that close to 5 000 people work here. The precinct is set in attractive gardens that mask the number and size of the office buildings; with indigenous planting and water features creating a pleasant ambiance.

Incredibly, the floor space in the new headquarters is significantly less than in the old Pretoria offices – but there's no feeling of being overcrowded.

Praven Naidoo, group executive: corporate real estate services at Telkom, has led the move since it was first mooted in 2014, and confirms that changing market dynamics largely informed many of the decisions.

It's obvious to any observers that the telecommunications industry is going through a prolonged period of profound changes, and its necessary to keep up-to-date to remain relevant.

"It's not just telecommunications that's changing," Naidoo says. "And we can't just look at the telecommunications industry to find better ways of doing things. There are lessons

to be learned from companies around the world, and we've looking at every industry from building and IT to manufacturing and transportation to learn as much as possible."

The visitor experience

As an example, he points out that the processes adopted in the reception area at Telkom have been loosely modelled on those used in Heathrow Airport's Terminal 5.

Within the next few weeks, the process will be completed with the installation of a number plate recognition system that will recognise a visitor's car as it arrives at the main gate.

The whole process will begin before that, though, when a visitor accepts a meeting request from a staff member. Part of this process will be the recording of the visitor's vehicle licence plate number as well as his or her mobile number.

Prior to the meeting, the system will generate a text to the visitor, reminding them of the meeting and allocating a parking space. On arrival, the number plate recognition system will kick in, facilitating access at the main gate, whereupon the visitor can proceed to their designated parking spot.

As soon as the visitor enters the main gate, a message will be sent to the host, or whoever generated the original meeting request, that their guest has arrived and they should start moving towards reception.

Once the visitor has made their way to the reception area, there will be three options for signing in: they can use a self-service terminal to enter their details and print out their name tag; they can report to the receptionist and sign in the usual way; or they can engage with one of the concierges who will help them either with the self-service terminals or sign them in using a tablet computer.

Guests will automatically receive free WiFi access while on the campus as well; and will also be able to use the monitors and projectors in meeting rooms.

The 220 meeting rooms, ranging from small to large and with a variety of electronic equipment on hand, are controlled by a smart centralised system, with scripts written specifically for Telkom's use. With such a number and variety of meeting rooms available, the system has to be intelligent enough to help staff select the right facility for their needs. And it learns from experience so it can help to guide relevant decisions down the line.

"We look at how people move around, what they do and why they do it," Naidoo explains. "The system tracks what equipment people use in the room so that future planning can be optimised. This extends to having heat sensors in each room that determine the number of people attending meetings, and helping us to ensure the most efficient use is made of the spaces."

These features all make for good customer relationship management, ensuring that guests have a pleasant and positive experience when they visit Telkom, Naidoo says.

Importantly, they also make life more pleasant for staff members too – and go a long way to increasing productivity, so the company benefits as well.

"We consider our staff members to be our customers, along with their customers. And we want everyone to have a better experience."

The staff experience

The better experience starts with getting to work: the new Telkom head office is right next to the highway, with easy access from north, south, east and west. It's also close to the Centurion Gautrain station, where a Telkom bus shuttles workers to the office; and a Gautrain bus stops by the campus entrance as well.

Inside, the workplace has been designed to allow flexible working, and the dynamic formation of project-based teams.

Well thought-out designs mean that staff share a smaller area but they don't feel crowded. "Our buildings are full to capacity," Naidoo says. "But only 40% of the fixed desks are used at any time.

"The next step is to achieve 150% capacity or more."

This goal may seem unreasonable, but agile working spaces should make it entirely possible.

Open plan offices may conjure up pictures of 1970s' industrial-style seating, with workers in long lines of identical desks, huddled over their keyboards, performing repetitive and mind-numbing tasks.

However, Naidoo explains that the new open place concept offers workers a choice of work spaces that is flexible according to the task at hand.

To start off with, remote working is encouraged for workers who have no need to physically be in the office. This has necessitated a new mindset from both workers and managers, but with performance appraisals based on outcomes rather than attendance, the trend is gaining traction.

Inside the office, workers share space with others in their department, and are located close to departments that they may need to collaborate with.

At this stage, each staff member has a desk allocated to him or her, but some of the teams where workers are not tied to a desk are already working in agile spaces where "hot-desking" is the norm.

Hot desks are a shared resource and can be occupied by any worker for as long as it's required. All user profiles and data is held in the corporate cloud – and with Telkom providing the campus network, connectivity isn't a problem – so users can literally connect their laptop, tablet or even smartphone to the network connection at any desk; then view their work on the fixed monitor.

Phone booths are available for workers who need privacy while making phone calls, and "confession booths" are dotted throughout each area for people who need to focus undisturbed on a task outside of the open plan environment.

While there are meeting rooms of various sizes, equipped for a variety of tasks, available, there are also "collaboration booths" that accommodate from two to six people in the main office areas, where workers can hold impromptu meetings, discussions, or just have face-to-face time without having to plan a formal meeting. There are 600 of these collaboration booths on the campus.

A state-of-the-art cloud-based network means that people are connected everywhere on campus, so they are not confined to meeting – or working – in the formal spaces. "You could sit in any space to work or meet," Naidoo says. "You could even sit outside under a tree if that's what you prefer."

With unified communications, phone calls can be routed to workers wherever they are: at work, at home or on the road, while colleagues can connect using the medium that is most efficient or convenient at the time: fixed line, mobile phone, video chat, e-mail or instant messaging.

"The over-arching theme is that workers are not residents of a particular desk, division, floor or building – they are residents of the campus. And this allows for a great deal of flexibility in how they work."

While the new head office boasts a wealth of features that allow employees to work more efficiently, Naidoo points out that

work is more than just a place that people go to between 9:00 and 5:00, so Telkom aims to make the working environment part of their overall lifestyle.

"People don't do just their work during the day," he says. "They also have work to do outside of what they get paid for, and it should be easy to do that on the campus."

To this end, there is a dry cleaner on the campus; four banks have branches there; there is a spa; and a wellness centre complete with doctors and other healthcare practitioners. A branch of DisChem means the staff can fill prescriptions on the campus as well as buy their regular wellness products. And an on-campus convenience store means that workers can stock up on basics without having to travel to a shopping centre.

A football field and cycle/running track form part of the campus design, and 50 cycles are available on the campus for staff to use. In addition, a well-equipped gym, complete with consultants and personal trainers, is available for a nominal membership fee.

A number of restaurants cater to any tastes and workers can order food ranging from quick snacks to full meals, all at very competitive prices. Naidoo says workers often order food for themselves and their families as a takeaway.

"The move to new premises has allowed us to make space and be more versatile in catering to what people do on a daily basis," Naidoo says.

Technology makes it possible

Of course, technology has played a leading role in making the move successful.

At their desks, staff members can connect to Telkom systems either via the wired LAN or wirelessly.

The WiFi coverage at Telkom Park is available to internal users in all Telkom Park public spaces, with the OneTelkom corporate network used by all managed laptops and desktops.

Non-managed devices, including laptops, tablets and smartphones, connect using the AccessTelkom network, although usage for staff on these devices is limited to email, calendar, Internet, the SAP portal, telephony via Jabber, Telkom intranet and intranet-hosted applications.

Telkom's bring your own device (BYOD) policy means that employees can use their own smartphones, tablets and laptops at home and for work, as long as they subscribe the Telkom's security standards.

Free guest WiFi is available, offering Internet access by invitation, for up to four weeks.

Employees utilising Telkom managed can also connect to Telkom's network devices and business systems from remote locations using the virtual private network (VPN).

For meetings with remote attendees, the WebEx system connects with anyone who has an Internet connection – including mobile users.

Managed print services, with a centralised "follow you" solution will help to cut the cost of printing and make it more sustainable.

Managing the change

As with any major change in people's lives, the move from the Pretoria head office to the new Centurion campus was initially met with some resistance.

Since most of the staff had private offices and designated undercover parking at the old premises, many of them considered the new working environment to be a "step down" from what they had before.

But Naidoo explains that, with careful and ongoing change management, it's been possible to reap a wealth of benefits – both anticipated and unexpected.

"People are able to collaborate a lot better now," he says. "In the past, everyone was behind a closed door, and generally only communicated with their peers in weekly meetings."

In the old offices, each worker occupied between 25m^2 and 35m^2 of space. "And it was all cellular, with people locked away in their offices," Naidoo adds. "In a cellular environment, it is very difficult to collaborate – a cellular environment engenders a cellular culture."

The open plan environment, where workers have an average of 8,5m^2 of space each, encourages workers to collaborate more: they are more aware of what's going on around them, and automatically feel that they are part of the team.

"Of course there was resistance to the move," he says. "People like change but they don't always like the results of change. But in the new set-up, people find that they are more productive."

Managing the change has been no easy task, but Naidoo believes it has been largely successful because it's had buy-in, from day one, from top management down.

He stresses that the move has been about more than simply changing offices, but about engendering a new culture at Telkom, and driving a new spirit of customer-centricity in a competitive market.

"We were fortunate to have complete buy-in from the top leadership at Telkom; the entire exco were advocates for change. When you are trying to achieve change of this magnitude, the top management has to lead from the front."

From there, the culture has to permeate through the organisation, and an important symbol is that managers have to walk the walk. "We have also had to adopt the new culture, and adapt our own working environment," Naidoo says.

This means that only the exco have private offices, and these are a fraction of the size of the offices they occupied in the old head office. For everyone else at Telkom, offices are all open plan. "Managers need to sit with the people they are managing," Naidoo explains. "Along with a flatter organisational structure, this helps the company to stay closer to its customers and be quicker to market.

"If people are sitting together and collaborating all the time, problems and opportunities are able to filter through to the right people quickly – and they can be addressed quickly.

"The block and stack structure, where synergistic departments work alongside each other, also limits the time it takes for information to travel between divisions. And this promotes faster decision-making."

Not everyone has been able to adapt quickly to the new environment, so Telkom has produced toolkits to help them make the transition with as little pain as possible.

"We've helped people learn how to work in an open plan environment, and how to deal with colleagues. Every worker has received a campus guide helping them to utilise the campus as fully as possible; and teaching them how to unlock the facilities on offer.

"Planning has been key to the move," Naidoo says. "My role has been 80% planning and 20% execution."

The results of the move are already apparent: people are collaborating more and are more productive, he adds.

What's next?

The next step for Telkom, says Naidoo, is to continually improve the environment, improve the way people work, and improve the experience for both staff and customers.

"We need to take the lessons we've learnt, and the successes that we've had, and build on these as we evolve. It's all about taking what's good and making it better." ■

The Microsoft workspace

Microsoft was one of the early pioneers of the new way of working. The company makes its living selling technology and talking about the digital enterprise, so it's not surprising that it was one of the first to transform to a digital enterprise – to "eat its own dogfood" as popular parlance would have it.

Microsoft SA's Uriel Rootshtain points out that knowledge workers are becoming more prevalent than task workers and so it's important that employees are given the tools they need to do their work more effectively.

There can be no doubt that the way companies have to run, and the nature of the work performed by employees, is undergoing some fundamental shifts.

Many of these changes are being driven by the over-arching theme of digitalisation, with technology changing the way people work and communicate.

"You've got unified communications, realtime communications that reach outside of the organisation's boundaries, and soon they'll transcend language boundaries as well. Technology is well on the way to overcoming language and social barriers, and allowing people to connect," Rootshtain says.

Traditional work systems help people to manage their line of business data and applications. But they are also starting to embrace unstructured data like e-mails, online content and document that connect different people.

Technology has always been one of the drivers of business change, and today the issue of IT consumerisation is a reality, with workers a lot more savvy than before.

"This data is unstructured but it can take up a lot of your workers' time. And there is still a lot of information work that happens outside the formal environment that is not measured or monitored, but digitisation has the potential to improve productivity tremendously."

Business models are changing significantly, and leaders are tending to be disruptive in the industries they touch which, in turn, forces competitors to look at their own business models, says Rootshtain.

"There are so many competitive forces in the market, and companies are trying to figure out how to make money in a sustainable way – and they are encouraging collaboration both inside and outside the organisation to enable this."

But there is no real "end state" that organisations can aim for, Rootshtain says. "We are always moving and we have got to get comfortable with the idea that change is constant – and accelerating.

"This isn't easy to do, so we have to try to build a learning organisation where everyone is able to adapt to changing circumstances, all the time."

As a high-tech company, Microsoft arguably had an easier time in turning around. "It really wasn't that hard," says Rootshtain. "Considering the size of the organisation, it was actually a fairly impressive turnaround.

"Just three years ago, the market and the media were saying that Microsoft was a difficult company to deal with, and wasn't strong in terms of innovation and creatively. Nowadays, the perception is much more positive."

The cultural change was arguably the most important part of the turnaround, followed by the way people work, and this was largely enabled by Microsoft's own technology.

Technology has always been one of the

drivers of business change, and today the issue of IT consumerisation is a reality, with workers a lot more savvy than before. "They know what they can achieve with their personal tools and want to be able to do the same at work," says Rootshtain. "20 years ago, people had low-tech at home and high-tech at work, but bow it's the other way around – the tools at work tend to be old and unsophisticated compared to what they have as a consumer.

"So people have freedom to interact and collaborate with other people in their personal lives, but then they feel constrained in the workplace."

Providing the kind of tools that people use at home in the workplace can make them more satisfied and productive, Rootshtain points out.

"Of course, you have to take regulation and security into account. We feel that we have found a good balance in people-centric compliance; and in protecting data without prohibiting flexibility, mobility and agility."

Having adopted a new way of working, the physical workspace was designed to catch up with that, and Microsoft SA referenced a wealth or research in its quest for the optimum environment.

"We learnt some interesting things, including that as many as 60% of an office's desks are unused at any time. That tells us that the traditional office layout is not optimal."

By factoring in a mobile workforce, and the time people are not in their offices, Microsoft was able to dramatically reduce the number of square meters per worker.

Although workers are encouraged to work remotely when it's most effective, open plan seating in the workplace helps to encourage more interaction.

Hot-desking is just the start. Telephone booths are scattered through the working spaces where employees can have private phone calls, a bit of privacy, or a quiet place where they can focus on getting a task done.

Team breakout areas let groups of people come together to brainstorm or meet with external people. Whiteboarding means that people sitting in different organisations, or even other parts of the world, can participate in a seamless and natural way. The traditional boardrooms and meeting rooms are also still available.

"In the past we had a chronic shortage of meeting rooms and people could never find a space where they could get together or talk – and people need to do that,"

Rootshtain says.

"Now, without having increased our physical office space at all, the number of meeting spaces has increased 10-fold."

Microsoft also adopted a matrix structure, where people can form part of more than one team, working with the relevant people when they need to, and shifting to other teams when their needs change.

As a communication-enabled business, this inter-team collaboration extends from brief encounters to indepth collaboration.

"We are really starting to see the impact now," says Rootshtain. "For instance, you can now have business processes that embed realtime communication, giving us the ability to increase productivity."

He cites the example of a purchase order that is being routed through its approval process, when there's a query. The person with the query would traditionally have sent the document all the way back down the line, or tried to resolve it via email. Now, the originator's name and presence is embedded into the document so a conversation – using whatever communication medium is most relevant – can be initiated immediately.

"And almost any process can be improved by embedding realtime processing," Rootshtain adds.

The new offices have also led to an increase in the transfer of tacit information, he points out. "With as much as six times more people in the same workspace, we are seeing much better collaboration and interaction between people."

This doesn't mean people are wasting time chatting instead of working: on the contrary, while collaboration is up so is productivity, by about 20%, says Rootshtain.

In terms of explicit information, he explains that the workspaces allow people to engage directly with subject matter experts, and encourage the formation of short-term teams as well as the solution of problems as they arise.

"And that can also have a massive improvement on productivity." ■

The **changing nature** of **work** – and its **implications**

The Fourth Industrial Revolution, which includes developments in previously disjointed fields such as artificial intelligence and machine-learning, robotics, nanotechnology, 3D printing, and genetics and biotechnology, will cause widespread disruption not only to business models but also to labour markets over the next five years, with enormous change predicted in the skill sets needed to thrive in the new landscape.

This is the finding of a new report, "The Future of Jobs", published by the World Economic Forum and based on a survey of chief human resources officers and top strategy executives from companies across nine broad industry categories, covering 15 of the world's largest economies. Together, these economies account for 65% of the global workforce. A major goal of the report is to analyse the impact of key drivers of change and provide specific information on the relative magnitude of these expected changes by industry and geography, and the expected time horizon for their impact to be felt on job functions, employment levels and skills.

In terms of overall impact, the report indicates that the nature of change over the next five years is such that as many as 7,1-million jobs could be lost through redundancy, automation or disintermediation, with the greatest losses in white-collar office and administrative roles. This loss is predicted to be partially offset by the creation of 2,1-million new jobs, mainly in more specialized "job families", such as Computer and Mathematical or Architecture and Engineering.

These predictions are likely to be relatively conservative and leave no room for complacency. Yet the impact of disruption will vary considerably across industry and gender as well as job type. For example, Healthcare is expected to experience the greatest negative impact in terms of jobs in the next five years, followed jointly by Energy and Financial Services and Investors. The industry that stands to create the most jobs, perhaps less surprisingly, is Information and Communication Technology, followed by Professional Services and Media, Entertainment and Information professionals.

"Without urgent and targeted action today to manage the near-term transition and build a workforce with futureproof skills, governments will have to cope with ever-growing unemployment and inequality, and businesses with a shrinking consumer base," says Klaus Schwab, founder and executive chairman of the World Economic Forum.

There is also a gender implication to the future of jobs. Based on the absolute job gains and losses mentioned above, the burden of job losses seems to fall equally on women (48%) and men (52%). However, given that men represent a larger share of the overall job market than women, this even spread translates into a widening of the employment gender gap, with women losing five jobs for every job gained compared with men losing three jobs for every job gained.

This is also partly explained by low participation by women in the "job families" that are expected to grow, such as Computers and Mathematics, thus adding to the urgency with which leaders must address the chronic problem of getting more women into STEM (science, technology, engineering, mathematics) professions.

When it comes to respondents' outlook on how best to deal with these sweeping changes, the news is more encouraging. The most popular workforce strategy across every industry is investing in reskilling current employees. Other practices, such as supporting mobility and job rotation, attracting female and foreign talent and offering apprenticeships, also scored high. Hiring more short-term or virtual workers are much less popular responses.

Indeed, the survey suggests that those companies that are treating future workforce planning as a priority are almost 50% more likely to invest in reskilling than those that do not. The report also indicates that those companies that report satisfaction in their future workforce strategy are more than twice as likely to be targeting female talent, and significantly less likely to be planning on hiring more short-term workers.

Drivers of change

The most significant driver of change – across all industries – is the changing nature of work itself. As new technologies make "anytime, anywhere" work possible, companies are breaking up tasks in new ways, leading to a fragmentation of jobs across many industries.

These effects are further compounded by the rise of mobile Internet and cloud technology, enabling the rapid spread of Internet-based service models. However, while the new "gig economy" may be one of the most visible and current manifestations of disruptions to the labour market, there is more change – both positive and negative – expected in specific industries, leading to new management and regulatory challenges.

Further unpacking the bundle of technological drivers of change in the Fourth Industrial Revolution yields a rather more optimistic picture on the job creation potential of technologies such as big data analytics, mobile internet, the Internet of Things and robotics. However, by far the biggest expected drivers of employment creation are demographic and socio-economic in nature; in particular, the opportunities offered by young demographics and rising middle classes in emerging markets and the rising economic power and aspirations of women.

Conversely, the survey respondents predict that increasing geopolitical volatility risks are the biggest threat – by far – to employment and job creation globally.

Regional analysis

At country level, expectations of the nature of upcoming disruptions are shaped by the demographic, economic and technological development of the country in question. Overall, changing and flexible work is seen as the most significant driver of change in advanced economies, whereas the rising middle class takes this role in emerging markets. New energy supplies and technologies are expected to play the largest role in the Gulf Cooperation Council (GCC) countries, while climate change adaptation is seen as a particularly major driver in Germany. A number of developing countries expect particularly large impact from the mobile Internet given that the technology has the potential to bring millions of formerly unconnected workers and consumers into the formal economy for the first time.

Skills instability – the rapid change in the skills requirements of all existing jobs – will also impact countries differently. While ASEAN, GCC and Japan will have only 25% instability in the top skills mix overall, in Turkey, China, India and Italy over 40% of the top skills required across all jobs will change in the next five years. In the UK, 28% of the top skills mix is expected to change by 2020 while in the US this number is expected to be 29%. In France (28%) and Germany (39%) the situation is even more challenging.

Employment outlook is net positive in only five of the 15 countries covered, but even in those countries there is significant job churn – with some functions becoming redundant as new ones emerge. Using the forecasts from chief human resource officers and current employment data, the highest ratios of jobs created per job lost is expected to be in ASEAN (3,72 jobs gained per job lost), Mexico (3,06), UK (2,91), US (1,37) and Turkey (1,14). In all other countries covered by the Future of Jobs report, there is an expected net loss in jobs.

Industry and occupation analysis

Drivers of change will also have a very disparate impact within specific industries. For example, new energy supplies and technologies will have a particular impact on Energy, Basic and Infrastructure, and Mobility. Processing power and big data will have an especially strong impact on Information and Communication Technology, Financial Services and Professional Services. The rising middle class in emerging markets will have the largest effect on Consumer, Financial Services and Mobility. Consumer ethics and privacy issues will have a significant impact on the Consumer, Financial Services and Information and Communication Technology sectors.

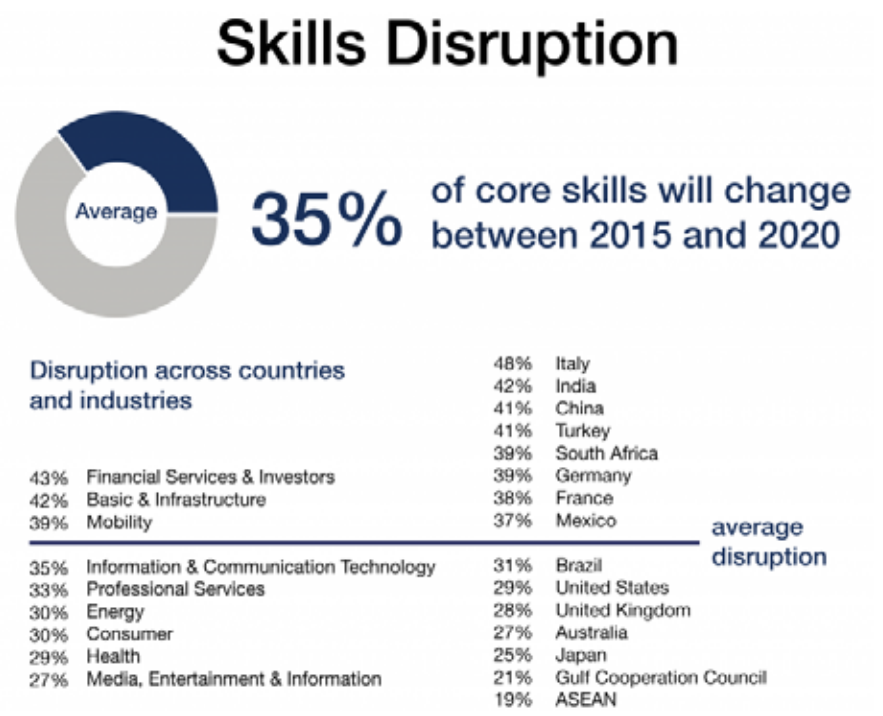
The business model changes created by these drivers will, in turn, have specific and different consequences for employment and skills needs in each industry. While there is a modestly positive outlook for employment across most sectors over the 2015-2020 period, underneath this aggregate outlook there is significant relative growth in some job families and significant relative decline in others.

Skills instability is expected to impact all industries but is particularly pronounced in Financial Services where 43% of the top skills needed in all job families across the industry are expected to change by 2020. The next most affected industries are Basics and Infrastructure (42%) and Mobility (39%). The least affected by 2020 are Media, Entertainment and Information (27%) – unsurprisingly, as the industry is already in the midst of a major skills displacement – and Consumer industry (30%).

The survey respondents expect strong employment growth across the Architecture and Engineering and Computer and Mathematical job families, a moderate decline in Manufacturing and Production roles and a significant decline in office and administrative roles. Other sizeable job families, such as Business and Financial Operations, Sales and Related and Construction and Extraction have a largely flat global employment outlook over the 2015-2020 period. However, across all job families, chief human resource officers expect major challenges in recruiting.

The research also explicitly asked respondents about new and emerging job categories and functions that they expect to become critically important to their industry by the year 2020, and where within their global operations they would expect to locate such roles.

Two job types stand out due to the frequency and consistency with which they were mentioned across practically all



industries and geographies. The first are data analysts, which companies expect will help them make sense of the torrent of data generated by the technological disruptions referenced above. The second are specialised sales representatives, as practically every industry will need to become skilled in commercialising and explaining their offerings to clients. Other new specialties frequently mentioned include new types of human resources and organisational development specialists, engineering specialties such as materials, biochemicals, nanotech and robotics, regulatory and government relations specialists, geospatial information systems experts, and commercial and industrial designers.

The case for co-operation

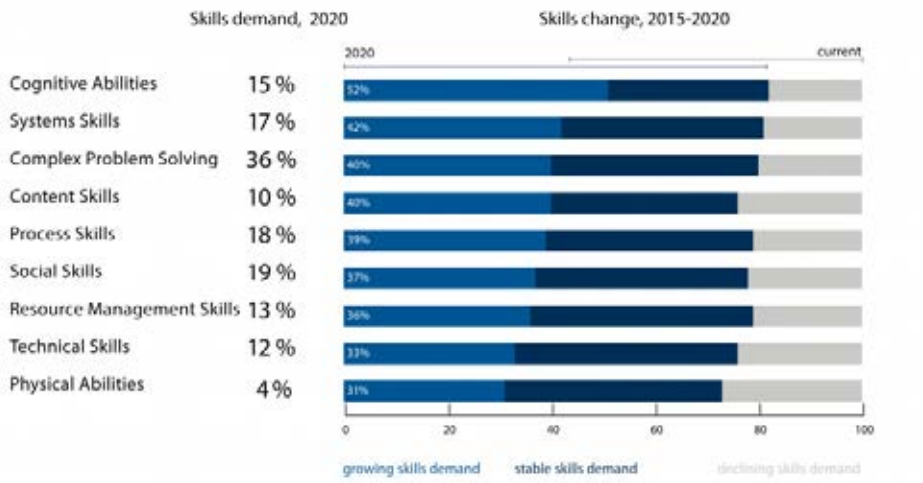
While forecasts vary by industry and region, momentous change is under way and, ultimately, it is our actions today that will determine whether that change mainly results in massive displacement of workers or the emergence of new opportunities.

One of the major barriers to change identified by chief human resource officers is the lack of specificity on the types of disruptive change under way. The new dataset aims to bring specificity to the debate and to the options for action by providing the perspective of chief human resources officers of leading employers who are among those at the frontline of the emerging trends and are key actors in implementing future workforce strategies.

"Our analysis reveals that upcoming disruptions to the employment landscape will be about much more than simply automation. It is essential that we act collectively now to prepare ourselves for the changes that we know the Fourth Industrial Revolution will bring," says Saadia Zahidi, head of the Global Challenge on Employment, Skills and Human Capital at the World Economic Forum.

In part, this will entail business taking more responsibility for upskilling, reskilling and collaborating rather than competing on talent. In addition, it is imperative that governments put in place rapid and fundamental change in education systems to prepare for the new labour market. The World Economic Forum's Global Challenge Initiative on Employment, Skills and Human Capital brings together businesses and governments to collaborate on making these solutions a reality. ■

Change in skills demand and composition



What's driving the future for SA?

The drivers of change impacting the future of jobs in South Africa are diverse.

The top trend is processing power and big data at 38%, followed closely by the changing nature of work at 34%, the middle class in emerging markets (31%), mobile Internet and cloud technology (25%), geopolitical volatility (25%), climate change and natural resources (22%), sharing economy and crowdsource (21%), and new energy supplies and technologies (19%).

The impact on employment from all these changes is expected to be negative, with only about half the number of jobs lost made up for in new types of work.

While Financial Services and Investment will see a slight gain in employment (1,25%) and mobility will drive slightly more new jobs (2,78%), these gains will be more than offset in declines within the Basic and Infrastructure sector (-3,79%), Information and Communication Technology (-3,75%), Consumer (-2%) and Professional Services (-1,25%).

As organisations make the transition to digital, workforces will have to change, and the majority of respondents (60%) believe that workforce planning has got to be a leadership priority.

However, the barriers to doing this successfully are not to be underestimated. Insufficient understanding of the disruptive changes is the biggest barrier, cited by 68% of respondents, followed by resource constraints at 52%, a workforce strategy not aligned to the innovation strategy (44%), pressure from shareholders for short-term profitability (36%) and insufficient priority given by line managers (28%).

The most popular strategy being adopted to align workforce strategy is investment in the reskilling of existing employees (56%), then targeting female talent (32%), supporting mobility and job rotation (32%), attracting foreign talent (16%), offering apprenticeships (12%), collaborating with educational institutions (12%), targeting minorities' talent (12%) and collaborating with other companies across the industry (4%). A solid 44% believe that these strategies will be successful.

Top 10 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Digital skills not just for the IT crowd

By Matthew Kibby

We live in a digital world, with 24/7 connectivity, news broken in under 140 characters and more mobile devices on the planet than people. And "digital" is all encompassing: we're not talking about hard, technical skills like coding or application development but the ability to behave digitally.

What does this mean for organisations? It's about employees being able to use the technology of their choosing to find, access, analyse, use and share information and data, to change and improve ways of working. This has rapidly shifted from being a nice-to-have and is now a concrete means of business differentiation: our recent study into the importance of digital skills found that nearly three-quarters of employees felt the use of digital skills could improve their company's competitive edge, while two-thirds added that it could impact the revenue and profitability of the business over the next five years.

The challenge, however, is that we also found that less than half of today's workforce are able to put their digital skills to use. It seems employees find themselves stuck within rigid structures that don't allow for new working practices or inter-departmental collaboration. Until these digital skills are unleashed, businesses will continue to lose out; unable to attract and retain the talent they want, unable to innovate and keep pace with the competition and unable to capitalise on the business opportunity right under their noses.

Of course, this can be easier said than done. The saving grace is that we're all in this together – the digital world is one that flattens traditional organisational hierarchies and challenges each of us to embrace new ways of thinking and doing business.

With this in mind, here are the key do's and don'ts (as we see them) for building digital skills into your business:

- **Do think carefully about the value digital skills offer your organisation** – Running into this blindly (or even vaguely) is pointless. Be specific about the ways in which digital skills and new ways of working are specifically relevant for your organisation and its current strategy. Start with why you are looking at this, then what it is going to do for you that you can't do today and, only after you've answered these, how you are going to make it work in your business.
- **Don't box digital skills up as an "IT project"** – This is an initiative for the entire organisation. It would be a huge mistake to limit it to the IT department – after all, technology is pervasive across areas of every aspect of the modern organisation, so why shouldn't everyone be involved in building out a digital skills strategy?
- **This is not IT's problem, it's everyone's opportunity** – Do reach out to your wider community. Go beyond the usual suspects. This is an opportunity for a "learning mashup" – whether that's mixing old and young, finance and creative teams, families and friends – it's amazing what people will find out from each other when it comes to something universal like this. Almost two thirds of employees, of all ages, are willing to use their own time to learn new digital skills. Organisations must capitalise on this enthusiasm.
- **Don't design this from the "top down"** – Very important: as far as possible, organisations should be encouraging ideas and inputs from a grass roots level. Building digital capabilities requires speaking to people on the frontline, that do the jobs. It's not a top down initiative; it cannot be about instructing employees as that won't lead to true engagement with the issue but is getting them involved in a meaningful way, so it's clear that it's

their opportunity.

- **Do invest properly** – Businesses must not only invest, they must be seen to be investing. Don't simply side-line it as some soon-to-be-forgotten project. There's an immense opportunity (internally and externally) to enhance your employer brand by positioning your organisation as a forward thinking one, tackling this complex issue in a significant way. It most certainly should not be treated as an obligation, tick box exercise or something to pay lip service to.
- **Don't be scared to fail** – A colleague, Joe Baguley, VMware's chief technology officer in EMEA, recently stated: "If you want to do innovation, you need to be prepared to let people fail." Wise words and 100% applicable to building your business' digital capabilities: this is not about passing a test or getting an accreditation. The point is to engage people in the new digital age and allow them to spring up with new ideas. Remember: there is no such thing as failure, just experience.

Matthew Kibby is the regional director for VMware Southern Africa

Strategy, alignment add value to workforce planning

Many businesses understand the need for workforce planning, but, like so many processes that define modern business management today, just as many struggle to effectively apply it.

The first step is to adopt a change in mindshift, and then link the workforce plan to the operational and production drivers, says **Gary Lane, CEO of NxGN.**

Lane describes workforce planning as an integrated planning process that breaks down the business silos between production, finance and human resource. It is not about a chosen technology, he says.

"It involves a different way of thinking around workforce planning that starts right from the strategic planning level to ensure the pipeline of the right skills will be available at the right time to meet the business strategy and then at an operational planning level to link the production planning with the workforce requirements," he explains.

This is not the traditional approach of ensuring that all roles are filled, but rather understanding the appropriate business drivers that determine the workforce requirements.

"This requires an understanding of business modelling and what operational and production drivers control workforce numbers. So, in summary, implementation of workforce planning is about breaking down business silos, integrating strategic and operational workforce planning and importantly linking the workforce plan to the operational and production drivers," says Lane.

Preparation is required

Although leadership at NxGN acknowledge that the concept of business modelling and linking operational and production drivers of workforce requirements is relatively new, they do warn of the consequences of not having a workforce plan.

"Most companies do have a workforce plan but I have found that generally this is based on defined roles and an organisational structure. Without a workforce plan that is based on the operational and production plan drivers there is very little chance that the organisation will actually meet its production planning targets," says Lane.

Another challenge to workforce planning and implementation is the unique skill requirements and the shortage of available skilled resources. "The business strategic objectives will require certain roles and skills into the future. Taking into account promotions, retirements, normal attrition and the training and experience time requirements of new appointments does the human resources department have a long-term recruitment plan that ensures that the right skills are available and trained at the right time," Lane adds.

He asserts that taking a more strategic view in order to ensure the right skills are available is an ongoing market trend, and one that also focuses on the workforce plan being linked to the operational and production drivers.

"Importantly, this then allows proper workforce planning optimisation by understanding the levers that management can control to achieve the efficiencies required to remain competitive. This is about business modelling, scenario planning and options analysis to test different operational assumptions to arrive at the best production and workforce plan that meets the business strategic objectives within the current market conditions," Lane adds. ■

Transforming into the **workplace** of the **future**

Technology and new workforce dynamics are disrupting all parts of organisations. Decision-makers need to carefully scrutinise their employee value positions, workflow and supporting technology systems and consider how they will meet the demands of the workplace of the future in 2016 and beyond.

Gys Kappers, CEO of Wyzetalk, believes that the biggest challenges in the coming years will need clear strategies on these three key areas: employee engagement, data and mobility.

Data-driven insight

We talk a lot about big data and the opportunity to know your customer, but we're still far off making it really work for us. Some of the challenges arise from the heavy duty software systems at play from big vendors. They have the data but not the workflow and flexibility to make the system or data easy to work with.

"Many are now considering the open ecosystem and allowing third-party developers to create overlay apps and micro-systems to plug into their systems," says Kappers. "This 'integration' creates systems that are easy to use, inherently mobile and focused in their user application.

"The always-on workforce needs to be able to access and input data in these systems, and most would prefer using a mobile apps or some kind of mobile menu to do this. Mobile is ideal to optimise workflow and employee services, resulting in things like self-drive payslips, leave applications, order processing," he adds. "We're going to see a lot more happen in this space, think of mobile intranets that connect companies with employees in a dynamic way to increase productivity not to mention create an immediate channel for direct feedback, both ways."

The importance of social

Increasingly, says Kappers, there is also the need for more functional and relevant business apps that incorporate a social layer.

"To enable collaboration, ideation, and knowledge sharing amongst users, more groups of people are taking to apps that provide functionality relevant to their style, content, and context of work. Company policies will need to accommodate these in their technology and security stacks.

"Despite the potential, the biggest challenge facing any organisation is to align its technology approach and content services to meet the needs of both the company and the end user. Companies should look beyond broadcast mode when defining their communications strategies. Blending this in order for all stakeholders to enjoy a mutually respectful and engaged environment is fundamentally shifting how a business needs to plan and develop its systems," adds Kappers.

Think different

Despite the opportunities, Kappers says many companies are approaching technology and the changing workplace dynamics with an old mindset. "More than ever the need for good change management capabilities is certain. Organisational disruption needn't be a chaotic it should be carefully considered and implemented with expert support."

With this, comes the rise of the individual in the workplace. Companies should ask how they get more from their employees by understanding their individual needs and engaging with them.

"Often companies will say that their employees are important to them, but they behave in a way contrary to that," Kappers says. "One of the problems is that the role of human resources continues to be seen as transactional and not strategic. Too often, companies see people as a way to meet the bottom line. The thinking needs to change and decision-makers should view employees as assets to the business. You treat assets very differently."

Stimulating education

For Henry Chandler, vice-president and chief operating officer of the African Society for Talent Development, this talent-driven business environment means the importance of learning and development has become greater than ever.

"South African firms have to focus on talent engagement, high performance, and efficiency, while building capacity for local, regional, and global growth. Despite the fact that South African firms are facing tough times at home, they are increasingly taking advantage of opportunities in sub-Saharan Africa."

Success in this market requires leaders with the skills to build a high performance culture, pointing to how investing in the holistic advancement of talent should be a business imperative.

"Such a focus must aim to build a sustainable and adaptive organisation of talented, diverse, competent, and inspired people. Many executives are becoming directly involved in global leadership development programmes related to increased employee engagement and overall business performance," says Chandler.

New environment, new approach

As a result, organisations require managers who can work in complex, multi-cultural situations. This means that leaders should be able to manage the balance between delivering for today and investing for tomorrow.

Says Chandler: "High value should be placed on leadership development offering programmes aimed at developing the skills and knowledge of managers and leaders at different stages of their careers. Engaged, skilled and inspired people are at the centre of delivering on the growth aspirations of organisations."

Sourcing talent

"The Internet has revolutionised the way people learn about companies and apply for jobs," Chandler says. "Company career sites remain the top channel for promoting the brand. But talent acquisition and recruiting are undergoing rapid changes, challenging companies to leverage social networks and other collaboration tools. Social media provides not only information about a candidate's experience and skills, but a better glimpse into their lifestyle, values, and their cultural fit."

As the economy continues to grow, employee skills are becoming more specialised, making engagement and culture, leadership and development top priorities for talent management stakeholders. The culture of the organisation should support high performance and talent engagement.

"Employers who fail to engage with workers and provide solutions to the increasing demands being placed on workforces today will struggle to stay abreast of the competition tomorrow," Chandler adds. ■

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What does the law say about **online vigilantes?**

By Amy Eliason

Batman. Superman. Iron Man. What do all of these characters have in common?

We have all sat in our comfy seats at the movie theatre and watched them defeat numerous supervillains with their superhuman strength and indomitable will. We have watched them save the world from impending doom. We have watched them take the law into their own hands. We have watched them do all of this in the name of the "greater good".

They are vigilantes. We call them heroes.

But these characters dwell in the realm of fantasy. We are not required to question the legal and ethical implications of their acts. We believe that Bruce Wayne is a hero because he looks good in a superhero costume and beats up bad guys. The question of his virtue is moot.

The world, however, is currently experiencing a real-life quandary of vigilante justice, in the form of what has become known as "hacktivism".

Hacktivism is the subversive use of technology to promote a political or social agenda. While there are those who view hacktivists as cyberterrorists, many hacktivist attacks are actually employed merely to voice civil protest, to promote freedom of information or to undermine terrorist groups' online operations.

One hacktivist group which has recently garnered attention is Anonymous. In a video which has been circulating on social media, a masked speaker warns the so-called Islamic State of Iraq and Syria (ISIS) to be prepared for a massive retaliation in the wake of the terrorist attacks committed by ISIS in Paris in November. Since the video surfaced, there are reports that Anonymous, along with other hacktivist entities, has been successful in disrupting ISIS's presence on internet platforms, thereby inhibiting its ability to disseminate extremist propaganda and to implement its recruitment drives.

There is an old proverb that states that "an Englishman's home is his castle", with the inference being that citizens should be entitled to protect their countries as they please, particularly if the government agencies tasked with this duty have failed to do so. For this reason, hacktivist attacks against ISIS have been widely lauded by the public. In a time when governments' anti-terrorism measures seem to be failing us, a vigilante group such as Anonymous is being glorified and extoled in the same manner as their fictional counterparts.

However, unlike in the movies, these hacktivist groups do not always get to ride out into the sunset, branded as heroes. Legal systems around the world do not allow for vigilante justice. It is generally accepted that vigilantes are acting outside of the purview of the law. There is a fine line between true vigilantism and anarchism, and it appears to be too onerous for the law to try and govern that line.

This is particularly relevant in the South African context, where a vigilante group known as People against Gangsterism and Drugs (PAGAD) was formed in 1996 as a response to the prevalence of drugs and gangsterism in the Cape Flats area of Cape Town. PAGAD, like Anonymous, was applauded by many for its efforts but eventually it was accused of facilitating murder and terrorism and its leader, Abdus Salaam Ebrahim, was convicted of public violence and imprisoned for seven years.

In the meantime, there is no doubt that hacktivist groups like Anonymous will continue to mete out their own personal versions of vigilante justice

If the Cape Flats were Gotham City, Batman would be in jail.

Hacktivist groups in particular are often amorphous beings, whose loose and decentralised systems of command can often lead to drastic shifts in motives and behaviours. Anonymous is currently focusing its attention on ISIS, but in previous years there have been accusations of tendencies by its members to engage in recreational hacking as opposed to political activism.

Ultimately, it is apparent that authorities around the world are struggling with how best to deal with cybercrimes and cybersecurity and the complexities that result therefrom - and South Africa is no exception. With the recent publication of the Cybercrimes and Cybersecurity Bill, our legislators have made the first step in attempting to regulate this world. It is clear that effective cybersecurity legislation is necessary, as South Africa currently has no co-ordinated legal framework and cybersecurity is regulated through a hybrid mix of legislation and the common law.

The bill's stated aims include the promotion of cybersecurity, the regulation of aspects of international cooperation in respect of the investigation of cybercrime, provision for the establishment of various structures to deal with cybersecurity and the imposition of obligations on electronic communication service providers regarding aspects which may impact on cybersecurity.

However, the bill, like its American counterpart, the Cybersecurity Information Sharing Act (CISA), has been criticised for being overbroad and for failing to take constitutional freedoms into account. Jane Duncan, a Professor of Journalism at the University of Johannesburg, has expressed concerns that the definition of cyberterrorism may be too broad and doesn't exclude acts committed in the context of "legitimate struggles for national self-determination or national liberation".

The bill, like other legislation, also does not make any distinction between cybercrime and vigilantism, and hackers are tarred with the same brush, irrespective of their motives. You will likely agree that this is the correct approach. In Hollywood, the superhero's good guy credentials are never tarnished but life doesn't always imitate art and, in the real world, vigilantism and hacktivism such as that practiced by PAGAD and Anonymous is a more complex, moral grey area. Society simply cannot legislate for it.

The Department of Justice and Constitutional Development invited the public to comment on the bill and it will be interesting to note whether any of the concerns which have been raised are suitably addressed. It is hoped that the department can strike the right balance between the promotion of the constitutional rights to privacy and free speech and the need to appropriately mitigate against cybersecurity threats and to implement innovative infiltration techniques - an achievement which has, thus far, eluded most legislators around the world.

In the meantime, there is no doubt that hacktivist groups like Anonymous will continue to mete out their own personal versions of vigilante justice, largely unabated and without consequence. As a famous web-shooting, costumed crime-fighter once said - "with great power comes great responsibility". One can only hope that hacktivists around the world aspire to this creed. ■

Amy Eliason is an associate at Webber Wentzel

Ownership, accountability, responsibility critical to ITSM success

By Edward Carbutt

IT service management (ITSM) initiatives still fail despite investment of both time and money into sophisticated solutions, improving processes along with aligning business and IT.

The main reason for this is a lack of ownership when it comes to tasks being executed or responsibilities and accountability assigned. Often, ownership roles are just not clearly defined, creating confusion and a lack of direction. Successful ITSM requires assigning responsibilities and identifying people who will be held accountable for all the tasks associated with delivering services and their associated processes.

ITIL, as the set of best practice guidelines around ITSM, can provide assistance. ITIL defines four generic ownership roles: service owner, process owner, process manager and process practitioner.

So why are service owners important? They are responsible to the customer and accountable to management for the delivery of a specific service. They also need to ensure services are delivered in line with customer requirements, and are continuously improved.

Every service needs an owner, but a single person can be the owner of multiple services. They represent the service across the organisation. As an example, the CIO is the ultimate owner of all IT services, although not necessarily of the lower-level technical services.

Services are underpinned by processes. In addition to service owners, it is imperative that process owners are assigned who are accountable for ensuring that processes are defined and support company policies. They need to make sure processes are improved to remain fit for purpose, and manage exceptions when they occur. They ensure that associated policies are properly defined, documented and publicised.

Process owners also define key performance indicators (KPIs) for process effectiveness and efficiency. These KPIs are used in performance reporting when doing continuous process improvement.

Process managers, on the other hand, are accountable for the operational management of a process – ensuring that it is executed effectively. In many organisations, the same person fulfils the roles of process owner and process manager. Process managers must co-ordinate activities, monitoring and reporting and also identify opportunities for improvement.

The third role is that of process practitioners. They are responsible for carrying out the process activities. An organisation may have many process practitioners – as many as needed to make sure the every process can be executed effectively.

While many people may be responsible for the delivery of services and processes, only one person can be held accountable, and the buck stops with them. Defining and assigning ownership, accountability and responsibility, and embedding this in the role of specific individuals with associated KPIs, is essential for ITSM.

Defining roles and their responsibilities across activities in a process are recorded and communicated via a responsibility/authority matrix, commonly referred to as a RACI (responsible, accountable, consulted, informed) chart. When this is clearly defined and communicated, then everyone concerned would know and understand their involvement at any given step in the process.

In the next article of this series, Carbutt will discuss the importance of service portfolios and catalogues, which alongside ownership roles, are critical to the successful delivery of IT service management and ITIL.

Edward Carbutt is the executive director of Marval Africa

Automate processes with enterprise quality management software

By Ian Huntly

Don't settle for something that can't keep up with your sequence of operations and doesn't deliver on productivity. In order to get the true value for money that an enterprise quality management software (EQMS) promises, it should have a number of processes automated.

Embarking on the journey to implement EQMS whether for small to large organisations can mean a significant financial and time investment, some disruption, and the allocation of resources to what could be a long-term, potentially multi-year or ongoing project. The process of ensuring that the right solution is selected has a number of steps that, if followed, increase the chances of success immensely.

Organisations have every right to demand that these highly valuable products should fit their business like a glove, but most of them do not deliver as well as you would expect. They are difficult to use, are bloated with unnecessary features and don't give any power to anyone outside the "control room".

To get the true value for money that a EQMS promises, it should at least have these 13 processes automated.

Document control – In large organisations, it's typical for different sites and even departments to have varying types of documents as well as methods for handling those documents. Without a centralised system to ensure uniformity, there tends to be redundancy in efforts to create and distribute them. EQMS consolidates these efforts, providing a single retrieval as well as archival resource for controlled documents, which is key for easily locating files and effective reporting.

Non-conformance/corrective and preventive actions (CAPA) – Part of the broader EQMS functionality portfolio, CAPA management is a tool utilised by many organisations to identify, resolve and avoid non-conformances. Just as it sounds, CAPA has two main elements, corrective and preventive actions, both of which aim to improve the quality of processes. Although CAPA processes have long been employed by companies, they have evolved correspondingly with new technologies and strategies. It's common today for the tool to be integrated with many applications in IT architectures and play a central role in global quality management initiatives.

Employee training – The impact of training management is often overlooked by executives, despite its grave importance and close connection to compliance, quality, health, safety and a wide variety of other key areas related to business performance. Fortunately, automation, combined with other next-generation software capabilities has transformed training management into a tool that's more useful than ever. The training features in EQMS, when applied correctly, can take non-value -add administration out of the equation, so more time can be focused on the quality of content and the effectiveness of the training itself.

Complaint handling – Although customer complaints may have a negative connotation, they provide valuable and voluntary post -production data that would otherwise be difficult to find. Companies leveraging technology such as EQMS are building complaint management into strategies to help close the loop on quality management. Complaint management, when managed as part of an EQMS system, drives business improvements in customer retention, warranty reserves, service hours, operational risk and other areas. By connecting customer complaint data with traditionally disparate business processes and units, market leading companies have been placing higher quality products on the shelves.

Statistical process control (SPC) – SPC is mainly a tool to help a company measure, analyse and reduce variability in important business processes. Most often companies start with manufacturing processes but the concepts can be applied to almost any process. SPC is also often a supporting tool in other quality or continuous improvement initiatives like TPM, TQM, or Six Sigma. When it comes to high-level strategic objectives, most companies are primarily focused on things like revenue or profitability growth. EQMS plays a supporting role in the achievement of these goals, specifically through variability reductions and the reduction of non-conformances and waste.

Change management – When implemented and managed successfully, an automated change control management solution improves a product's cycle time and time to market, supports global supply chain initiatives, enhances product quality and the flexibility to adapt to changing regulations and, in turn, reduces operational cost. A number of companies know from experience the issues that can occur from inadequately managing change across the business.

Reporting – To gain greater control of quality operations, leading manufacturing companies are implementing EQMS to standardise and harmonise quality processes, systems and data within a single integrated platform. Typically problems with data integrity arise when there are multiple sources of data and there is no single source of truth when it comes to master data. To overcome these complexities and inaccuracies with quality data, a manufacturer should leverage an EQMS with embedded analytics capabilities that support both business processes as well as in-depth analysis and reporting. By eliminating the need for data integration and migration for analytics, manufacturers can empower their quality people and cut costs, all while enhancing their quality management strategy.

Audit management – Audit management is an area where EQMS has a solid history in harmonising direct and indirect processes, and providing a strong ROI. A centralised, flexible audit management solution as part of EQMS drives sharing, learning, guidance and best practices, not to mention positive side-effects like that of a true corporate memory of all that came before.

Supplier quality management (SQM) – SQM is confidence in a supplier's ability to deliver a good or service that will satisfy the customer's needs. Achievable

through interactive relationship between the customer and the supplier, it aims at ensuring the product's "fit" to the customer's requirements with little or no adjustment or inspection. As SQM is an integral component to the total cost of quality, EQMS companies have begun incorporating it into available software. A quality manager should integrate his or her EQMS with that of the suppliers and, if possible, with the supplier's suppliers (often through a shared web-portal). This is an ideal method of obtaining a real-time performance assessment and greater visibility.

Calibration management – Calibration management allows you to better manage your workload, minimise costs, maintain production schedules and ensure customer approval while maintaining compliance with international quality standards such as FDA and ISO. As your business grows and changes, so will your calibration management needs.

Compliance management – In today's highly regulated, standards-driven world, organisations across the industry spectrum are facing mounting pressures relating to corporate governance, risk management and compliance. To reduce corporate risk and optimise performance, companies must effectively demonstrate compliance with a growing array of ISO standards, government regulations and quality initiatives. Finding the most efficient and flexible way to meet this challenge can transform compliance management from a burden to a benefit. An EQMS helps you to create a unified "culture of compliance" for managing the full spectrum of compliance management initiatives across your enterprise, from finance and manufacturing to marketing and distribution.

Failure modes and effects analysis (FMEA) – FMEA is a time-consuming process, even for top-tier manufacturers with the resources to invest heavily in customised IT systems. However, it is also a highly effective process when coordinated the right way. The challenge you face as a quality management professional is how to prepare, co-ordinate and (when necessary) revise FMEAs to harmonise with your company's Advanced Product Quality Planning (APQP) and beyond. FMEAs should be a key part of your company's APQP and cost containment strategy. Costs rise as quality defects come to light late in the production process. EQMS give you a systemic tool to identify potential failures, assign risk and move on to corrective and preventative actions.

Environmental health and safety – EQMS drives compliance with the OHSAS 18001 standard and establishes irrefutable sound occupational health and safety performance. EQMS provides the perfect framework to meet this challenge with an OHSAS 18001 compliant Health and Safety Management System that defines how you manage risk, identifies risk and implements suitable controls. EQMS provides effective communications across all levels of your organisation, manages the identification and correction of non -conformance and provides a platform for continuous improvement. ■

Ian Huntly is the CEO and MD of Rifle-Shot Performance Holdings

The real goal of IT service governance

IT service management is not about whether you implement ITIL of CoBit – it's about integrating people, processes and technology to increase business value and effective governance.

Marval's Edward Carbutt points out that service governance is a subset of IT governance, which is itself an extension of corporate governance.

"Service governance supports business processes by freeing reusable enterprise class services and monitoring their deployment," he says. "The effort involved in getting this to work is what governance is about."

One of the biggest pitfalls in any service implementation is lack of ownership and, where there are project owners, they don't necessarily understand their roles, Carbutt says.

"And the service definitions need to set the boundaries for service ownership and appoint service owners."

Carbutt adds that people expect service delivery to match their own standards. "Customer expect to get the right value from our services.

"We need to consider this in our service delivery framework. And we can't do so if there isn't a clear service framework."

By using standards and good practices we get the evidence that adequate service governance control, risk management audit evidence is in place.

"If IT is the nerve centre of our business, we should be protecting it and adhering to standards," Carbutt says. "Other areas of the business follow best practices, but there is no demand for IT standards. By having good service governance we can protect the investment in infrastructure and deliver services that create value."

Service control involves service level management that provides controls, compliancy measures, quality and warranty for services, and third party management.

The service catalogue – or service level agreement - is where service level requirements are documented, Carbutt says. And this needs to be aligned to the business needs, while documenting the level of quality that is required.

Meanwhile, risk management standards seek to establish a common view on frameworks, processes and risk management; and it ensures stakeholder protection.

The services lifecycle includes design, transition, operation, strategy and continual service improvement.

Bringing it all together, Carbutt stress that people, processes and technology are all necessary

"CoBit 5 gives us the guidance to do this, with service management, business continuity, security and risk all underpinned by quality management in ISO 9001."

To bring it together an integrated process management framework is vital.

"Can we use technology?" Carbutt asks. "Yes, we can - we can automate and integrate processes, aggregate data from multiple sources, perform quantities analysis, create reports and produce metrics, and clear linkages between people processes and technology."

Technology on its own won't let you cut costs or reduce headcount, however. An enterprise GRC (governance, risk and compliance) solution will require dedicated staff, Carbutt says. "You have to work at it, it won't happened by itself. Technology can help you bring the disparate pieces of risk into a single location, but it can be difficult to define and implement." ■

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Is whitelisting a solution in itself?

By Peter Cohen

Whitelisting is an important security control and is considered so effective against targeted attacks that the Australian DSD rated it one of the four most important controls.

By allowing only approved processes and DLLs to load, whitelisting can significantly raise the bar for attackers. Additionally, if blocked executions are investigated it can often be an early-day warning of an attack.

However, whitelisting does not prevent attack, it just makes it harder for the attacker, and organisations that may be targeted by more advanced actors need to consider whitelisting merely as a component of a mature set of security controls that provide much stronger holistic protection in combination than whitelisting would alone.

A number of actors have been observed using strategies that bypass the whitelisting in place and as it grows in popularity then this will only become more common.

Whitelisting bypasses

Memory-resident exploits

Many attacks exploit web browsers or common document editing software, such as Microsoft Office or Adobe Reader, in order to gain code execution inside the process that was exploited. At this point, more common attacks will use the code execution achieved to download full-feature malware as a binary executable to run on the system. This would be prevented by whitelisting as the downloaded malware would not be allowed to run.

However, more advanced attackers will not download a binary directly and may remain fully memory-resident within the memory space of the exploited process. To avoid losing control when the targeted software is exited, the memory-resident malware may migrate to the memory space of another approved process that is expected to remain running for as long as the system is powered on, such as explorer.exe.

Alternatively, a new approved process may be launched and used specifically to host the memory-resident malware. This technique is known as “process hollowing” and involves launching an approved process permitted by whitelisting and replacing the executable code in memory with malicious code. Recently, Duqu 2 made use of this technique to make it appear that legitimate security software was running and active while really rendering them inactive and simultaneously using them to host Duqu’s own malicious code.

While these techniques may sound advanced, many common malware families make use of them and even freely available penetration testing frameworks like Metasploit have supported fully memory-resident operation for years.

Privilege escalation and kernel exploits

Whitelists are only strongly enforceable against users who do not have local administrative access to their systems because administrative access can be used to disable the protection, add exceptions or otherwise render it ineffective. An attacker who exploits an administrative user could make configuration changes such that any further malware they wanted to use would be permitted.

However, this technique is not limited to use against administrative users. Privilege escalation attacks could be used as a second stage attack in order to get around whitelisting. For example, our security

consultants used a kernel exploit as part of a Chrome browser exploit in Pwn2Own to both gain remote code execution and escalate privileges to break out of the browser sandbox and gain administrative level access. At this point, whitelisting protection could be disabled.

Poorly configured whitelists

Whitelists are a good control but not all whitelists are created equal. Each organisation will set up a whitelist that suits its working habits and in our experience, there are often holes in the whitelisting that an attacker can exploit to gain persistence. Common flaws include:

- **Validating only the program name** – this can easily be circumvented by renaming;
- **No validation of DLL loads** – common tools such as rundll32.exe can be used to load executable content as DLLs instead; and
- **Writable paths** – Path rules are commonly used to allow execution and if these are writable then the whitelist can be bypassed by writing malicious executable content to the allowed paths.

By identifying a flaw such as these, the attacker can compromise a system with whitelisting in place.

Scripting and bytecode engines

Many whitelisting tools monitor native binary loads but do not appropriately account for other ways of executing arbitrary code. These are common scripting and bytecode engines that are either default or commonly installed by enterprises and can be used to achieve arbitrary code execution. Common examples include Java, PowerShell, Office macros, VBScript, batch files and InstallUtil bypass.

Our security consultants have successfully exploited environments with whitelisting in place using some of these technologies. Many whitelisting solutions cannot directly control these technologies other than to fully disable the entire scripting engine, which is often not viable when the technology is required for business applications.

Attacking hosts not subject to whitelisting

A simple bypass assumes not all hosts in an environment will be using whitelisting. While whitelisting might have been rolled out to the majority of corporate desktops, alternative operating systems such as servers, Linux desktops and OSX hosts may not be whitelisted so aggressively.

By targeting these hosts, attackers can gain the foothold on the network they need. For example, by targeting a Linux hosted web application or a marketing user with a MacBook, it may be that whitelisted solutions focused on Windows hosts can be avoided completely.

Similarly, not all user profiles are subjected to whitelisting restrictions. Typically administrators and sometimes developers are able to run arbitrary executable code and so whitelisting can often be avoided by targeted these users. They also often have the highest privileges on the network and so are particularly attractive targets for an attacker anyway.

Mitigations

Secure configuration

Organisations should ensure that whitelisting is robustly and aggressively configured so that there are not obvious gaps that an attacker can exploit to plant malicious code on a system. This includes ensuring whitelisting is present on all hosts, regardless of operating system, that can be reached by an attacker.

This should include tight control of scripting and bytecode engines such that they do not represent a generic way to bypass whitelisting controls in place. In many cases, most users will not require the use of technologies like powershell and other configuration controls exist for controlling execution of VBScript and Office macros. For technologies that may be more problematic to control directly, such as Java, centralised logging of process execution can be used to help detect malicious use of Java specifically.

Other whitelisting policy violations should be logged and exported to SIEM infrastructure so that they can be investigated by security analysts as it may be an indicator of a compromised system or failed attack.

Network defences

The vast majority of malware will depend on the use of the network for command and control and data exfiltration. Therefore, robust network monitoring that can detect malicious channels is important, especially in environments that may be targeted by any malware that is above commodity level.

Network monitoring should benefit from, but not rely on, signatures and indicators of compromise (IOCs) as more advanced attackers can typically evade these with ease. A historical investigation capability is important as in many cases organisations only learn about compromise by more advanced actors months or even years after the initial compromise. The ability to investigate the historic activity of compromised hosts to understand the full extent of the compromise is crucial.

Endpoint threat detection and response

Whitelisting is primarily an endpoint-focused preventative control and so it is also important that strong detection controls are in place on endpoints. Standard logging in Windows and Linux provides valuable information to investigators but much more advanced logging and analysis is required to detect more advanced threats.

For example, detection of the use of process hollowing or thread injection as a technique to bypass whitelisting will require detailed process execution logging and live memory analysis to detect properly. Dedicated endpoint threat detection and response software will generally be required to achieve this.

Prevention alone is not enough – attack detection is required

Application whitelisting is a great preventative security control and is arguably the most effective first line of defence against initial endpoint compromise. However, no security control can protect against every attack and so it does not replace the need for good attack detection for when preventative controls fail.

A large enterprise without strong whitelisting controls is likely to have endpoints compromised by generic malware and adware that anti-virus misses regularly. An advanced attack is likely to slip under the radar easily in this situation.

Whitelisting can help reduce the noise of common malware infections, such that if a confirmed compromise is detected on a well patched endpoint with strong application whitelisting in place, then it is immediately cause for a stringent investigation, as it is much more likely to be the result of an advanced, targeted attack. Additionally, due to the low noise from common malware infections there should be much more resource available for investigation. ■

Peter Cohen is the strategic business manager of Countercept by MWR InfoSecurity

IoT is the perfect storm of change

By Michael Needham

It is increasingly apparent that we are living through an age of rapid, unprecedented change. From the last decade of the previous century to today we have seen technology grow exponentially, to such an extent that the focus on IT has moved from a behind the scenes function, to the forefront of every business's consideration.

Back in the early 1990s, no-one could have fully predicted what a wide-reaching impact the Internet would have had a mere 10 years later, not to mention 20 years on. Now we are poised for yet another significant information revolution whose ends we cannot as yet fully fathom.

Laying claim to the honour of being the next steward of change is the Internet of Things (IoT). While it is expected to join the likes of cloud, big data and agile business as a movement that is reshaping businesses, IoT may prove to be an even more significant game changer.

According to research from International Data Corporation (IDC), the international IoT market is set to grow to a staggering $1,7-trillion in 2020. For the same year, Gartner predicts that 20,8-billion connected "things" will be in use.

Considering that during Q3 2015, 3,8-million smartphones were sold per day, Gartner's forecast of 5,5-million new "things" getting connected every day of 2016 is significant. In this light, clearly IoT is set to see an even greater proliferation in the years to come.

Where the rubber meets the road

The difference between being a business at the turn of the previous century, ahead of the burgeoning growth of the Internet, and being a business today, ahead of all the possibilities IoT portends, is that companies can at least prepare themselves for the next wave of change.

Part of this entails being cloud-savvy and having a working relationship with a cloud provider. Indeed, the cloud and IoT are in a symbiotic relationship, and it could be asserted that IoT would be little more than a pipe dream without a stable cloud backing it up.

No less important is having strategies in place to reap value from data, particularly as IoT will deliver volumes of data from billions of devices like we have never seen before.

To this end, Amazon Web Services (AWS) recently released its new cloud platform: AWS IoT, offering consistent connectivity and communication between hardware.

Concluding thoughts

Businesses hoping to take advantage of the upcoming wave of change, and the opportunities IoT will bring, would do well to refrain from viewing IoT as an isolated development. All indications are that, like the Internet, it too will touch everything and everyone in ways that are expected and as well as unanticipated. From everyday items such as fridges and vehicles used by consumers, to those things that we take for granted, such as streetlights, IoT will likely affect their management for the better.

Moreover, IoT's usefulness will also extend and have a potentially dramatic impact on the efficiency of industries, such as the utilities, transportation, oil and gas, and manufacturing sectors, to name just a few.

For those vendors seeking to provide IoT applications, we strongly suggest they consider the stability and strength of their cloud provider and partner with a company that has a proven track record. No less important is being cognisant of the security implications and confident in maintaining security as a priority.

Whether a vendor of IoT applications or just an everyday consumer, the advent of IoT should be embraced. As IDC has noted, the emergence of the IoT ecosystem is a key component of the "digital transformation revolution" starting to take place in South Africa, and is set to only accelerate the process. This should be a change that is enthusiastically welcomed by us all.

Michael Needham is senior manager solutions architecture: CIS Russia, Middle East and Africa at Amazon Web Services

Protect your **data** in a **mobile world**

By Nigel Tozer

Mobility and cloud are trends have caused major disruption for businesses and their IT departments, representative of a larger shift toward the consumerisation of IT.

While both of these technologies have the potential to offer numerous benefits to organisations, they also pose definite challenges in terms of data security.

The cost of data breaches is often significant and such events can have long-lasting effects including reputational and brand damage. Organisations need to more effectively control their data in the mobile era through effective risk mitigation and data protection strategies.

One of the biggest challenges around mobility is the fact that more and more sensitive data is now stored on portable devices that exist outside of the corporate network. If the device is lost or stolen, or becomes compromised with malware, the entire organisation can be at risk.

Further adding to this challenge is the expectation of users, who want to be able to access all of their own data, as well as all of the corporate data they need to do their job, anytime and anywhere. They also demand an experience consistent with what they have come to expect from consumer applications, and this means they want a way to easily share data with business partners, colleagues and customers.

Without a secure alternative, this leads to the growing concept of "bring your own cloud", which means that consumer devices being used for work purposes access unsecured public cloud ecosystems, opening up further vulnerabilities.

To tackle these challenges, CIOs need to balance the need of the workforce to be more mobile and use their own devices and familiar apps, with the needs of the enterprise to protect data regardless of delivery channel. Risk mitigation is essential to this balancing act, incorporating a number of elements like education, effective policies, and the right technology solution and services to facilitate effective data and end-point protection.

Technology solutions should provide enterprise-class alternatives for popular consumerised applications including file sharing and collaboration. Solutions also need to address the following five key areas to support risk mitigation and data protection.

- Enabling file synchronisation – in a mobile world people make use of multiple devices, from laptops and desktops to tablets and smartphones. Enabling them to effectively and securely synchronise files across devices not only enhances productivity, but negates the need to use unsecured third-party consumer based applications to achieve this.
- Efficiently protecting data – mobile devices often make use of 3G connections, so indiscriminately backing up all data at all times can be costly. Solutions need to enable smart backup of important files and file types, as well as enable policies for backup around the type and speed of the available connection. Tried and tested technology such as incremental backup needs to be combined with sophisticated deduplication to maximise the efficiency of data backup.
- Easily accessing files when mobile – instant access is something employees have become used to as consumers, and in an enterprise context it is therefore essential to provide the same experience to prevent them from making use of unsanctioned third party tools. It is also critical from a productivity perspective in order to ensure employees can work anytime, anywhere and on any device. End-point solutions need to backup and synchronise data from all devices and provide search tools that work across all available information for ease of access.

- Fast e-discovery – even in industries that are not heavily regulated it is still essential to prevent data breaches. Fast e-discovery helps organisations identify issues quickly as well as providing evidence should this become necessary. Compliance tools such as e-discovery can also help organisations to deal more effectively with daily issues such as HR queries, searching of files and emails across devices and more.
- Dealing with data on lost or stolen endpoints – with so much sensitive corporate information now stored on mobile devices, it is essential to be able to ensure this data does not fall into the wrong hands. Solutions need to provide features such as encryption, remote wipe capabilities and more to reduce the likelihood of a data breach if devices go missing.

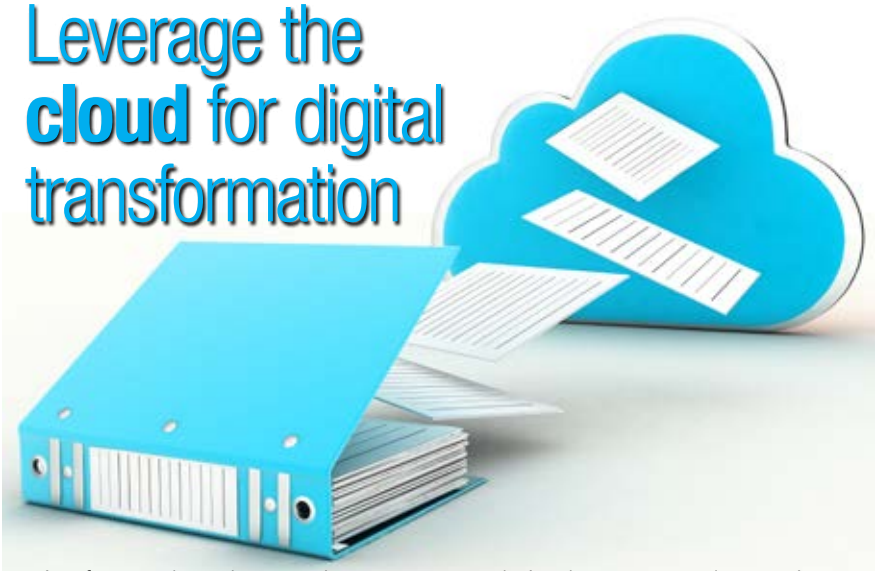
Organisations need to implement comprehensive end point protection and security solutions. From a security perspective, this assists with mitigating the risk of having multiple devices storing potentially critical business information.

In today's world, a large proportion of important data no longer resides in the data centre, and the consumerisation of IT as well as mobility introduces new risk to data. It is essential to incorporate a suite of solutions that can provide adequate protection as well as the services and applications users have come to expect, such as shared storage and collaboration, in order to prevent them from turning to unsecured third party services.

This, in turn, provides additional benefits, including enhanced productivity as well as a more satisfied workforce, both of which can contribute to improved competitiveness. ■

Nigel Tozer is the solutions marketing director: EMEA at Commvault

Leverage the **cloud** for digital transformation



It's safe to say that today we no longer conduct business in the same ways we did 20 years ago. As a result of new technologies, and the constantly changing dynamic of the workspace, workers and employers needs are changing and so are the ways they access information.

Cloud computing has been fundamental to this evolution, allowing remote access to corporate systems and applications, and enabling new ways of innovating in business.

"When it comes to making improvements in business – of any size and across just about every sector – embracing new technology and the benefits it can offer to both the company and its customers is a logical first-step," says Richard Vester, director of cloud services at EOH. "Cloud computing is the perfect example and cloud usage has risen dramatically in the last few years.

"While the number of businesses switching to cloud computing is impressive, the real success is the significant impact it has showed, not just for individual companies using this technology but across entire sectors, changing the way industry-specific tasks are managed for the better."

With cloud technology reshaping multiple industries, it is no longer viewed as merely a way to make use of on-demand servers. Vester adds that cloud is about leveraging economies of scale through automation, and about moving to global applications, not just enterprise applications.

"Many companies are using the mobility benefits that cloud brings with it, allowing for full control of their data while providing the flexibility their workforce needs these days," he says. "Going forward, in order to provide realtime access to company resources from anywhere and any device, complexity, data storage and computing will be removed from the mobile device and handled by the cloud provider."

Vester explains that beyond utility computing and the industrialisation of IT, cloud is now a major force that's systematically transforming the economy and helping every company on its digital business journey. "The job of the CIO is now more exciting - and much more challenging. In a few short years they have moved from architecting the enterprise to leading the digital enterprise forward."

This was nicely summarised in the recent State of the Market: Enterprise Cloud 2016 report by Verizon, which states: "In the past few years, we've seen cloud go from a newcomer to part of the established order. But despite the maturity of cloud, the market is still developing and most organisations are still finding new and exciting ways to take advantage of it …"

It adds that in many organisations, "the IT function is now much more closely aligned with the lines of business (LoBs) and is adept at managing a portfolio of cloud providers … Companies are combining public, private and on-premises infrastructure to create highly sophisticated, customised environments."

Vester says that this is enabling even the most established organisation to do things in new ways, but that as cloud increasingly becomes the norm, the edge it gives a company is falling. "It still has a major role to play in delivering competitive advantage, to derive significant competitive advantage from cloud you need to think how you can leverage it to enable digital transformation, change how you do business, and disrupt your market." ■

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Will bricks and mortar stores survive?

By Pieter Engelbrecht

A digital customer experience revolution will rejuvenate bricks-and-mortar retailing, but stores must start on the back foot

The retail model of the future will be a radically different experience from today, largely driven by the changing shopping demands of the younger hyper-connected consumer.

Bricks-and-mortar retailing will continue to be a very significant part in retail; however the lines between channels will erode to the benefit of both the customer and the business. Advances in technology will significantly improve the relationships between retailers and customers, much the way analytics is already doing in online shopping.

Real opportunity lies in responding to this change, focusing on delivering a truly integrated and seamless omni-channel experience. The future of retail is an exciting one, and over the next few years we expect to see a number of key developments taking place in stores around the globe.

The emergence of the smart personal shopper

Online retail will continue to exist for customers who want to buy a specific product and have it delivered to their home. But those who enter a store do so to learn, to view and feel items and to speak to a person. As the physical environment of a store changes, communication barriers between customers and employees such as counters will be removed, enabling staff to provide a more personalised experience.

Mobile technology will revolutionise the sales process and experience. Tomorrow's retail staff will be unleashed from the sales counter, and given the equipment to connect with customers across the entire store, offering a more consultative approach. In fashion retail for example, assistants will be able to show customers a range of outfits and styles a particular item could work with.

With a realtime view of stock and availability, they will be far more capable of closing sales, only recommending items that are both in stock and in size, while offering further choice and reducing wait time for shoppers.

The rise of immersive engagement

Walking past a store, a customer's phone buzzes, offering them to try on the same pair of jeans they saved in their online basket a few days ago. Enticing them in, as they've already shopped online, for today only they will get an additional 10% off all purchases.

Location-aware technology will identify customers' mobile devices, enabling upsell and cross-sell offers based not just on what they're viewing, but also what they've purchased before. As customers roam the store, engagement programmes will link with in-store beacons to dynamically offer suggestions at various points along the store path.

Here, the loyalty programme and the new found freedom of the retail assistant will combine and, with a shared purchase history, the best retailers will enable assistants to make personal style recommendations, based on customer preference and items they may already own.

Experiences will extend loyalty beyond purchases too, offering experience enhancements such as VIP parking spots when customers approach retail stores, and recognising regular customers on entry.

The end of cash and plastic

Part of matching the new connected consumers' expectations will be delivering a seamless, frictionless payment experience, removing any barriers slowing down the speed of a retail sale. Eliminating queues from stores, roaming staff, now empowered by mobile technology will be able to transact with customers in seconds, as shoppers keep focus on the purchase experience rather than the cost.

One of the most important factors to consumers, payment security requires additional compliance with higher security standards, ensuring consumers are protected from fraudulent activity and avoiding the irreparable reputational damage and financial costs associated with a breach in payment security for the retailer.

The adoption of mobile, digital payments will further enable retailers to offer things like on-demand delivery options, where products can be delivered straight to the customer's home or car.

For retail businesses, this will also likely lead to higher revenues. Just as the shift from cash to plastic showed consumers are willing to spend more when not parting with cash, so too will sales be further strengthened by further dissociation from the traditional bank instrument – the card.

The road to the future

These hyper-connected consumers already in the marketplace have a rapidly growing share of spending power. This always-on generation demand things like fast Internet access and a more seamless, digital experience they're already getting from other services.

While new innovations are being tested and tried in today's market, much of this development is stifled by existing and fragmented existing IT infrastructure, negatively impacting the customer experience, and slowing the consumer adoption of new technologies that could help drive the retail business forward.

Because of this, retailers are already starting on the back foot. To build a successful platform for innovation across multiple channels, they must ensure the technological needs of today's customers are fully met, otherwise they face being left in the dust. Focus on enriching the customer experience immediately, and set the stage for rapid innovation in the coming years.

Pieter Engelbrecht is the regional manager: sub-Saharan Africa at Aruba

Mind the app performance gap


Wimpie van Rensburg

There is a major performance gap between the needs of business and IT's current ability to deliver. While 98% of executives agree that optimal enterprise application performance is critical to achieving optimal business performance, 94% say the poor performance of enterprise applications has negatively impacted their work, and 59% say it impacts their work at least weekly.

This performance gap is causing a series of problems for companies, from lost revenue and customers to lower morale and a negative impact on brand image, according to the Riverbed Global Application Performance Survey 2015, which polled business decision-makers on the business impact of application performance.

Wimpie van Rensburg, country manager: sub-Saharan Africa at Riverbed, explains that the survey targeted business executives rather than CIOs specifically because it wanted to determine business impact.

In fact, app performance usually translates into direct impact on the business operations, and can have a real, measurable effect on revenue, he says. "If the app performs better, companies can services customers better. And the converse is true: if the app is down or not performing you will lose customers."

Van Rensburg shares stats that show not only will customers move away from a site if it performs badly, but most of them won't come back.

But customers are not the only people impacted by poor or irregular performance, staff members are unable to work effectively and many report being impacted daily or at least weekly.

Importantly, executives feel they are in the dark about the performance of their applications: they don't know what the issues are or when they will be corrected, further highlighting the gap between IT and business teams.

Companies universally agree that business performance relies on application performance. And yet nine out of 10 organisations suffer from poor performance on a regular basis. One cause of this performance gap is the move to hybrid IT. Migrating apps to the cloud brings agility and cost benefits, but, with other apps still on-premise, it also brings complexity. With apps, data and users literally everywhere, the work of optimising and delivering great app performance has become much tougher for IT organisations.

But you can't control what you can't see. And in order to close the performance gap, having a clear line of sight into how the apps are performing – and how the end user experience is being impacted – has also become a business imperative.

"The results of the survey reflect what we're hearing every day from IT leaders who are looking to deliver superior application performance in the midst of rapidly evolving, highly complex and hybrid IT environments," says Jerry Kennelly, chairman and CEO of Riverbed. "With apps, data and end users everywhere today, companies need end-to-end application visibility, optimisation, and control everywhere as well to close the performance gap. Riverbed helps organisations improve application performance to drive tangible business benefits and performance."

Survey respondents specified their top business benefits of optimal application performance versus the negative impact of poorly performing applications.

The benefits of optimal app performance are: improved employee productivity (48%); time savings (52%); cost savings (42%); improved customer satisfaction (40%); faster delivery of products to market (34%); and improved employee morale (28%).

The pitfalls of poor app performance are: dissatisfied clients or customers (43%); contract delays (42%); missed a critical deadline (32%); lost clients or customers (37%); negative impact on brand (31%); and decreased employee morale (28%).

The survey found that executives would be willing to sacrifice a lot for applications to work at peak performance at all times. In fact, 28% would give up their full lunch break. They would also give up a portion of their program budget (26%), caffeine (25%), and even chocolate (23%).

Given the universally recognised importance of optimal application performance, why is it so difficult for IT to deliver? Globally, 71% of respondents say they have felt frequently "in the dark" about why their enterprise applications are running slowly, spotlighting a disconnect between IT teams and business executives. And outside the Americas region, that number grows even larger at 76% in EMEA and 75% across Asia.

Troublingly, executives can contribute to the problem as they try to work around it: 35% of respondents say they have used unsupported apps when corporate apps run slowly or stop working altogether, thus adding to infrastructure complexity with more "shadow IT". Others have expressed frustration to colleagues (31%), taken an extended lunch (25%), used slow or down apps as an excuse for missing a deadline (28%), and

even left work early (23%). Migrating apps to the cloud has delivered benefits to the business, but also some challenges.

Nearly all (95%) of respondents use cloud-based enterprise applications in their work, 79% say their company's use of cloud-based enterprise applications will increase over the next two years, and 73% of respondents say that moving key enterprise applications to the cloud has increased productivity. Additional benefits of cloud-based enterprise apps include increased flexibility (50%), cost savings (39%), increased agility (36%), and increased collaboration (36%).

That's the good news about cloud apps. The bad news is that hybrid IT contributes to the performance gap. There is an increased difficulty in getting end-to-end visibility into the complex, hybrid IT architectures that result from the use of both cloud and on-premises apps.

Eighty-four percent of respondents say they believe trouble-shooting application performance issues is more difficult in a hybrid IT environment. In fact, according to a survey by Forrester, the majority of companies (51%) say that application complexity is now their primary obstacle to mastering application performance. On average, respondents estimate it takes nearly seven hours for serious app problems to be completely resolved.

In summary, business executives overwhelmingly agree that application performance is critical to business performance and driving results, yet the vast majority are impacted by poor app performance, creating a performance gap. At the same time, business executives are leveraging the power of cloud-based applications and hybrid networks to elevate productivity and create happier, more loyal customers and employees. However, cloud and hybrid environments add complexity and application performance challenges that can also negatively impact business operations, and too often executives feel "in the dark" as to why poor app performance is happening and how to stop it.

To deliver superior application performance in today's hybrid environments, enterprises need a comprehensive solution that provides end-to-end application visibility, optimisation and control. ■

Don't underestimate the power of social media

By Axel Bührmann

Social media has certainly become pervasive, and there can no longer be any doubt about its power.

But while some companies are still battling to come up with strategies that will let them "monetise" social media the market has swept past and left them standing.

The very simple fact that all organisations have got to face up to is that social media is here to stay; and companies that fail to integrate it into their communication, marketing, sales and customer relationship processes are going to lose out.

The obvious – and easiest – place to start thinking about an integrated social media strategy is in the marketing department, where practitioners are familiar with various different communications media.

But even within the marketing department, there are so many touchpoints it's important to have a cohesive strategy to deal with the various media.

First, understand – and try to get the company's executives to understand – why social media as part of the marketing mix is important in the first place.

Here are some areas where social media can enhance the marketing message:

Contact with customers

Using social media effectively allows companies to respond to queries in realtime. The channels are great for getting input and opinions from customers and, importantly, these can often be on an informal basis where customers are comfortable to speak their minds.

Overall, social media can be very effective in helping to improve customer insights and building up better customer service – based on what customers really think about a company's products and services.

Find new customers

Social media starts small but can very quickly snowball to encompass a much wider circle. Companies can widen their social net as new users follow their friends' discussions and referrals. This helps to increase a company's exposure to a wider market on both a local and global scale.

Axel Bührmann was one of the social media pioneers in South Africa, and arguably one of the market's most prolific practitioners. He is available to help companies formulate and execute a social media strategy, through individual training or workshops. He can also run corporate social media campaigns with companies; and assist with integrating them into the broader marketing mix. Contact him at axel@axelb.co.za.

Brand building

Social media can help to increase brand exposure. It is a great tool for building brand loyalty and it can be used to give a brand more authority.

Sales

It's been shown that the effective integration of social media into a communications strategy can have a positive impact on sales volumes. It's possible to use it for targeted sales campaigns that have a high conversion rate; or strategically to increase conversions from other sales and marketing channels.

Web site traffic

By integrating social media with other marketing and communication initiatives, it can be very effectively harnessed to increase inbound traffic to the company's web site. This drives up volume and also helps to gain the web site a better search engine ranking.

It's mostly free

Perhaps the most powerful part of the social media message is that it needn't cost an arm and a leg. Most social media platforms are free to join; and if its managed properly, marketing costs can be lower than traditional marketing platforms.

Competition

The bottom line when it comes to social media is that your customers are using the tools in their daily lives – and your competitors are already talking to them, and offering them real value, via social media interfaces. ■

What to do with your aging UPS?

By Jack Ward

Once a UPS has been in service for around five years, it becomes time to decide what should be done with the unit.

There are three key options: run the UPS until it fails completely; upgrade it; or retire the aging unit and purchase a new system.

What if a UPS system is supplied with basic, routine maintenance and left to function until it fails? While it may appear to be a cost-saving option, it is extremely risky, especially in South Africa's climate of power uncertainty. Moreover, as equipment ages, the need for maintenance increases along with the costs associate with it.

This is emphasised if direct manufacturer support is no longer available in the form of spare parts or if the UPS's capacity and efficiency ratings do not meet evolving business needs. The chances of the unit not meeting future performance criteria are thus magnified.

Can a UPS system be successfully upgraded? Some service providers claim to be able to revitalise or modernise an older UPS, extending its service life by several years. These services typically come with a limited-period warranty making the offer appear reasonable and sound.

However, what can be upgraded or replaced on a UPS varies depending on the manufacturer and model. In this light, note that as batteries, capacitors, fan assemblies and power supply units (PSUs) all have finite lifespans, this is usually not much longer than five years.

Many of these components, together with intelligence modules, controller boards and inverter assemblies are proprietary so the time spent on sourcing them may be disruptive and costly - and the improvements limited in scope.

While these types of revitalisation services can reduce the need for reactive maintenance, they do not always reduce it to the point where it outweighs the purchase of a new UPS from a cost-efficiency perspective.

While initial capital expenditures associated with replacing an older, legacy UPS with a new system will be higher than performing extended maintenance or opting for an upgrade, the lower operating expenses, higher performance, lower risk profile and the flexibility of a new, high-efficiency UPS system will outweigh them by a sizable margin.

High-efficiency UPS systems – unlike traditional systems of the past – are designed to reduce environmental impact by being more energy efficient thus minimising the user's carbon footprint while saving on electricity costs.

Every kilowatt of electricity ineffectively used costs in the region of R400 to R500 per month. High-efficiency, eco-aware UPS systems slash electricity costs by reducing the energy used and heat generated by the unit – both during normal running mode and under full load.

Older technology UPS systems are inefficient and waste power which is radiated as heat. This heat also requires data centre cooling systems to work harder, using even more electricity.

High-efficiency UPS systems feature the newest developments in componentry to deliver around a 0.9 output power factor and an overall efficiency rating as high as 92% to 98% – an improvement of between five and 10% on comparable, legacy systems, thus facilitating significant savings while cutting harmful CO2 emissions.

For a modest 20kW load, for example, CO2 emissions can be reduced by around 87 tons per year. In addition, over a five-year period, more than 80 000 kilowatt-hours of electricity can be saved – sufficient to power an average home for more than five years.

Features of the latest generation of UPS systems include integrated power management software and extendable run time options often backed by a breakthrough in battery management technology which enables the UPS and batteries to be remotely monitored and managed with alerts sent immediately via email or sms should an unlikely malfunction or breakdown occur.

This level of highly efficient technology provides on-line monitoring and control functionality which allows for small yet vital daily cost savings that amount to a considerable total in the long term.

Not only are the power losses associated with a new UPS system reduced but its increasingly-common modular design allows for the adoption of a "pay-as-you-grow" model that ensures the UPS is right-sized, optimally loaded and is thus operating at its efficiency peak at all times.

This feature represents one of the most important design elements associated with the latest, new-generation transformerless UPS systems. It gives them the ability to scale to meet future anticipated loads in N+N redundancy-type configurations with the inherent advantages of failover transparency which contributes towards hitting a continual (100%) uptime target.

It also gives users the benefit of flexibility to mirror corporate expansion and power demands without placing undue stress on a single (non-modular) system that might find itself overwhelmed by corporate growth and expansion – and thus prone to failure.

Another benefit linked to new technology UPSs is the ability to "hot-swap" faulty UPS modules, boosting overall system redundancy through an "auto-optimisation" process.

In South Africa, where load-shedding and regular power outages are a concern, modern UPS systems are almost always designed and built with a wide input voltage range to be compatible with standby generators, thus ensuring continuity of power delivery.

In addition, the chances are that a new UPS system will have a smaller footprint when compared to a legacy unit of the same capacity, freeing up valuable data centre space, for example.

When opting to replace a UPS system, it is vital to first consult a specialist supplier with a knowledge of applicable code requirements who will be able to verify that the feeder breakers and conductors powering the current UPS will support a specific replacement system.

Operational interaction of the new UPS system with a standby generator should also be included in this analysis. ■

Jack Ward is the MD of Powermode

Where eagles dare

Fundis predict more than 90-million consumer drones will invade the skies by 2025. As with any other technology, these unmanned aerial vehicles can be used for good or bad. It's the nefarious side the Dutch police are most concerned about. After all, drones can spy on people, drop bombs on unsuspecting crowds and even -- as depicted in an episode of NCIS – be used to murder people.

The Dutch solution involves trained eagles that capture renegade drones on command. It's considered a safer option than simply shooting down the drones as this could cause collateral damage.

The 1bn WhatsApp disconnect – Earlier this year, WhatsApp took to the rooftops to crow about its latest achievement – 1-billion active users. But there's a disconnect for the world's most popular chat application. While it may have captured one-seventh of the world's population, it has acknowledged its greatest challenge is connecting businesses to these consumers.

I believe I can fly – To the glee of a great many local consumers, Netflix has come to South Africa. Now there's a company called OneGo, which promises to do to air travel what the movie streaming service did to the DVD rental industry. On offer are monthly subscriptions that range from $1 500 to $2 950 per month. The model plans to take advantage of last-minute bookings to save its clients' money.

OneGo claims that by eliminating factors like price and payment, it will allow people to focus on their needs and where they need to be – whatever that means.

No blessing here – Typing "Amen" in the comment fields of images showing animals or children in distress will do nothing to save them. Indeed, a security warning circulated on Facebook alleges that "foreign men" will use that to hack your account. Sadly, it's false – these "Amen" types of posts are typically generated by people who are "like farming". That means they're simply collecting "likes" on posts to create lists that are then sold to advertisers.

Yesterday's Windows – If you find yourself getting nostalgic, you can now run Windows 95 through your web browser courtesy of a 19-year-old developer who uses emscripten, an emulator that compiles C++ code to JavaScript at runtime. Expect the same bugs to occur though. It's available at *win95.ajf.me*, and could take longer to load on your browser than it took on PCs of two decades ago.

You can't touchscreen me – Text media and social media interaction have positive benefits for a person's mental health, but as reported by PsychCentral, personal physical interaction is better. The combination of non-verbal signals, physical touch and the sound of people's voices result in lower stress symptoms in people dealing with emotional issues. Getting "virtually" social is fine but you need yourself some real lovin'. Get hugging baby.

Virtual sickness is real – Did you know you could get motion sickness without moving? The best virtual reality users - or those with the best 3D vision - are more susceptible to motion sickness. In a study conducted by the University of Wisconsin-Madison, motion-heavy videos were played through the Oculus Rift virtual reality headset. Some two-thirds of participants experienced real motion sickness and could not continue with the study, despite not actually moving.

Saved by the shell – 3D printing is being used in attempts to save dwindling desert tortoise population in the US. Printed "shells" are designed as decoys to combat predators. Fitted with sensors and a spray system that scares ravens away as they attempt to devour tortoises, the mock tortoises are also providing researchers with in-depth knowledge about ravens' behaviour patterns. Apparently the ravens find the fake shells hard nuts to crack, which encourages them to find other food sources.

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