

The Changing Priorities of the Modern IT Leader



Why agility, innovation
and focus will rival Cyber
Security for investment
in 2021 and beyond

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Executive Summary

This examination of the role of the CIO has captured a moment in which virtually every aspect of the job is in a state of flux. The big picture of a role which is shifting from functional to strategic in the broadest terms is bolstered by an array of smaller details. From recruitment to budgeting, innovation, organisational culture and beyond, the modern CIO is – in the more forward looking organisations – expected to work in close concert with executives, achieving the new CIO goals of driving growth, finding new revenue streams and pursuing innovation.

The reasons for this shift in the role of the CIO can be captured in two words – digital disruption. The way in which firstly big data and data analytics, and then newly maturing technologies such as AI, robotics and other cognitive technologies have transformed

organisations of every type has meant that digital disruption can no longer be viewed as the concern of just those organisations working mainly in the high tech and digital sectors. As captured in the quote which opens this white paper, from Robert Reeves, CTO of database automation experts Datical, industry after industry, from travel booking to taxi hire and entertainment provision, has been upended and transformed via digital disruption, and the CIO of the 21st century is charged, more than anything else, with making sure that there organisation doesn't fall by the wayside.

For those CIOs lucky enough to be working for the most forward-thinking organisations the budgeting and the tools are being provided for a task which involves working closely with departments such as HR in order to change the culture of a workforce entirely. For those CIOs who aren't yet in this position, conversations on topics such as cyber security (still a major concern of virtually all organisations) can be used to leverage the budget and freedom needed to begin the transformation. Although there may still, in some places, be a distinction between those CIOs operating in a tech silo and those with links to departments such as sales, marketing and product development, that distinction is breaking down at speed and, in some cases, the two 'types' of CIO are represented within the single IT department, overseen by an individual CIO.



Although it's possible and maybe even tempting to theorise about the new forms the role of CIO is taking, by far the most instructive method, as demonstrated by this paper, is to take a look at the tactics and techniques which CIOs from all over the world, involved in every type of industry, have adopted in order to meet the challenges and seize the opportunities presented by digital disruption. Amongst those featured in the case studies throughout the paper are the following:

Working with potential third party disrupters to embed disruption within an organisation before it becomes a threat from without. When this approach is taken then the power and resources of the larger organisation work in tandem with the fresh thinking and agility of the smaller, with the result being that both benefit.

Breaking down the barriers between departments within an organisation to transform the culture, by harnessing the ubiquity of technology in order to make the CIO and IT department the channel through which co-operation flows.

Setting up online 'collaboration labs' enabling all members of a distributed workforce to define problems and suggest solutions.

Taking control of the budget. This doesn't refer simply to ensuring that there is as much money available as possible, but also to putting

that budget directly in the hands of the CIO, and instigating a stripped down and simplified commissioning process in order to reduce the workload of administering that budget.

Revise recruitment policies in order to close the developing skills gap. Recruitment from a more diverse cross section of society means greatly expanding the pool of talent available. It should also be an easy 'sell' at executive level thanks to the proven economic benefits of greater employee diversity.

Use customer experience as the ultimate lens through which to focus all the work of the IT department.

Drive innovation through the creation of innovation labs – spaces within which members of the team are encouraged to experiment without fear of failure. Devise a new set of metrics to measure the impact of innovation by shifting the focus away from immediate economic benefit and on to fostering the ability to react quickly to potential digital disruption.

The final tip on the importance of integrating innovation within an organisation might seem slightly presumptuous in the earliest stages of change, but the examples of Xerox and Kodak serve as a stark reminder of the opportunities which can be lost if the power to innovate is not accompanied by a framework to harness that innovation. ■



The Changing Priorities of the Modern IT Leader

The role of the CIO in 2019 was fluid and transitional to an extent which simply hasn't been the case until now. Even as recently as 5 years ago, the job of a CIO was seen as being primarily to ensure that the IT systems of an organisation functioned as seamlessly as possible, protecting those systems from a range of cyber security threats and doing both of these while keeping the overall IT budget as low as possible.

That's not to say that the 'functional' side of the work has fallen completely by the wayside, more that keeping the lights on (metaphorically speaking) is now just a smaller part of a much wider, more strategic and business-oriented role. As we'll see, the CIO of today – and perhaps even more markedly the CIO of tomorrow – is expected to play a role in, business analytics, strategy creation, business transformation, employee engagement and retention, revenue growth, new market penetration, future scoping and executive decision making, to name just a few aspects of any ambitious, modern business.

The reach and pace of digital transformation is something which the world in general – from supra-national organisations down – is still struggling to get a firm handle on. The battles between regulators and tech giants like Facebook are the outward signs of this struggle, whilst the slow rate at which governments around the world are beginning to come to grips with the implacable rise of automation and AI is perhaps a more disturbing symptom.



The businesses in which the CIO is expected to simply fulfil the traditional, functional aspects of the role – or is happy or allowed to sit back and do just that – are the businesses which are most likely to be swept away by disrupters and at all levels, not just global monolithic markets where the likes of Uber, Netflix and Airbnb have been disruptive, but small businesses and localised businesses such as estate agents, disrupted by the like of Purple Bricks. As well as fighting or guarding against digital disruption, today's CIO has to be able to bring it into their organisation.



Disruption

The degree of disruption which a strategic CIO is likely to be planning on introducing into the average organisation is underlined by the findings of the 2019 Deloitte Global Human Capital Trends report. Of the respondents to the report, 64% predict a growth in the use of robotics, 81% in Artificial Intelligence and 80% in cognitive technologies. Given that the survey involved more than 10,000 participants from all over the world it can be assumed, as a CIO, you'll soon be dealing with those types of disruption. This could include dealing with anything from reskilling and work reinvention to the design of the jobs themselves, and this is going to involve much more than the technological expertise traditionally associated with the role of CIO.

As Rae Parent, CIO of Mass Mutual, a life insurance company with more than 10,000 employees around the world put it.

“The emerging CIO is less a career-deep technologist and more a technology-savvy business manager. It’s an incredibly complicated space, but the adept CIO of the next 10 to 15 years needs to have a deep understanding of

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I have a Google Alert for the phrase ‘Millennials are killing the...’ and pay close attention to whatever the industry is. Not surprisingly, it’s not millennials to blame, but the industry’s inability to engage disruptive technology and use it.

Robert Reeves CTO, Datical,
Database Automation Experts.

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business context and be able to synthesize it across all of the different and evolving technology domains. It’s not so much about going deep into IT as it is about customer experience. It’s about understanding organisational strategy and how technology enables that.”

The annual Gartner survey of CIOs brands itself the largest in the world, involving – in 2018 – 3,160 CIOs in 98 countries. Between them, these CIOs play a vital role in handling \$13 trillion in revenue or public sector budgets and \$277 billion in IT spending. The results, gathered together in the 2018 report, illustrate the degree to which the changing role of the CIO is a widely recognised phenomenon.

Industry Readiness

The survey found that 93% of CIOs at top performing organisations – defined by Gartner as being the most digitally mature – and 78% of the entire sample, reported that they are working in organisations which are adaptable and open to change. This is probably just as well, since 95% of the respondents firmly expect their jobs to change as a result of digital transformation. In most cases this means working with new technological trends, handling business expectations which have shifted and delivering on a new set of objectives.

The top priority, as identified by 58% of respondents, is growth, which is only to be expected. Perhaps of more interest are the ways in which CIOs think they will be able to deliver this growth, through the priorities which make up the rest of the list. These include:

- 1 Making more activities digital to drive economies of scale.
- 2 Identifying and accessing new revenue streams to drive profits.
- 3 Innovating to transform products and services.
- 4 Focusing on the customer experience.

The aspects of a CIOs job which aren't included are as interesting as those which are. There is no mention, when the top priorities are listed, of keeping costs down and bolstering cyber security. Vital as these aspects of a CIOs function

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The results, gathered together in the 2018 report, illustrate the degree to which the changing role of the CIO is a widely recognised phenomenon.

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are always going to be, we've reached the point in the evolution of the role in which these are the basic building blocks of the job and expect to be understood and delivered.

The good news is that, according to the Gartner survey, IT budgets around the world are going up at an average of between 2% and 5.1%. If CIOs are to be expected to deliver in the ever changing digital landscape then the very least they need is investment in systems, process, people and partners which make it easy for their IT team to maintain the functional side of the job while they concentrate on the strategic approach. In the past, CIOs have been divided on these lines – functional or strategic – and the less forward thinking businesses still tend to draw that line. The Gartner survey shows that this is changing, however, since 84% of the CIOs working at the most digitally mature organisations reported taking responsibility for issues such as innovation and transformation, and spending



more time delivering executive leadership. This last figure had risen by two days per month from that given two years ago, and shows that, at the best performing businesses, the role of CIO is shifting into the executive sphere with more and more market commentators seeing CIO to CEO being a new natural next step, one which was previously held by the CFO or COO, such is the importance of technology and digital to modern business success.

With 78% of all respondents, irrespective of the digital maturity of their organisations, reporting that they think their IT facilities are prepared for change, the time has never been better for CIOs to take control of the process and redefine the nature of their role.

A Changing Skill-Set

A survey carried out by Oxford Economics and commissioned by ServiceNow, a cloud computing company, questioned 516 CIOs across 12 countries and 24 industries. It found that a major shift is underway in the status which CIOs have within their organisations

and the skill-set which the revised role is now demanding, with 63% saying that business and leadership skills are now more important than technology skills.

In the same survey 20% of CIOs considered themselves to be effective in the areas newly identified as being the most important. Three things set this 20% apart from the rest of CIOs surveyed:

- 1 Their organisation was more digitally mature.
- 2 They had a strong influence on the C-suite of the organisation.
- 3 They focused beyond the working of the organisation, and on customer experience.

The same survey found that CEOs are now looking to CIOs to help transform the culture of the entire organisation in order to embrace digital transformation. In those organisations which are the most digitally mature, 93% of CIOs said that the organisation they work

for was effective at communicating business process changes from the IT department to the wider workforce. In addition, 77% of the CIOs in the survey listed working on talent strategies alongside the head of human resources as a core responsibility, while 69% included working alongside the CEO to draw up roadmaps for future progress.

The return on investment driven by giving this extra responsibility to CIOs was made plain in the survey. Comparing the most and least digitally mature organisations surveyed, the final report found that those in the most mature scored highly in the following key metrics when compared to CIOs in the least mature:

- 1 Increasing efficiency and speed to market – 48% to 32%.
- 2 Developing new services and products – 46% to 24%.
- 3 Attracting new customers – 45% to 24%.

In those organisations which don't identify as being adaptable and open to change then an issue such as cyber security or the money to be saved by switching to cloud computing can be leveraged to – at the very least – get the conversation started. Once that's happened, a CIO can work to find out what it is, across the organisation, that is keeping the decision makers awake at night. In most cases, this could well be a fear of digital disruption and of being left behind by competitors who are better prepared or by those who are set to emerge from nowhere thanks to the creation of a new app or process. By framing the conversation, initially, as being about saving money through cyber security and cloud computing, an effective CIO can then move on to talk about the other steps which need to be taken to achieve the required level of digital transformation. In the past, a CIO may

well have acted in something of a silo, regularly liaising with their IT team and only working closely with other parts of the organisations – such as sales, marketing or product development – when a problem arose (which is never the best time to start lobbying for a new approach). The technological demands now placed on every kind of business mean that this is no longer the case. The CIO will often be amongst the first to recognise this shift, and it is their task to transmit the message to every part of the business. The traditional CIO issues of budgeting and security can be just the way to initially push this door open.

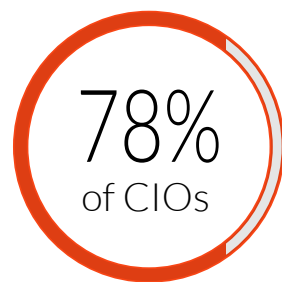
The fact that every aspect of the new CIOs role is intrinsically linked to the increasing drive toward digital transformation is confirmed by the IDG State of the CIO Report, published in 2019 and the 18th annual survey of its kind. Speaking to 683 IT leaders in organisations around the world, the survey found that digital transformation is a process which pulls aspects of an organisation, such as data analytics, into the realm of the CIO almost as a by-product.

According to the state of the CIO Report:

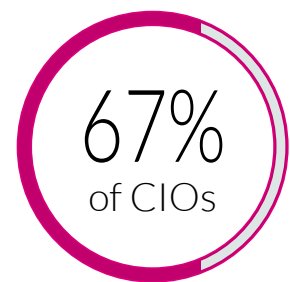


Almost two thirds of CIOs are now responsible for creating new revenue generating initiatives.

78% of CIOs are communicating with the Board of Directors more than ever, a figure which has risen from 67% in 2018.

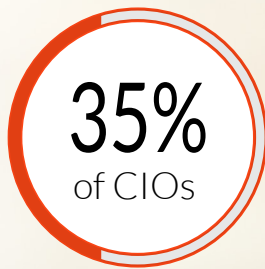


2019

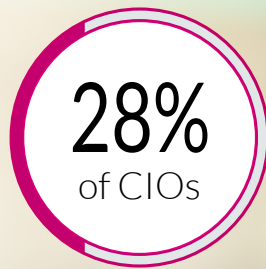


2018

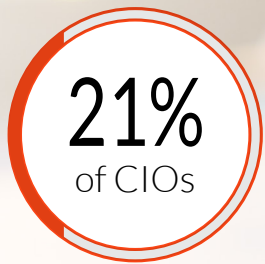
35% are responsible for driving business innovation (28% in 2018).



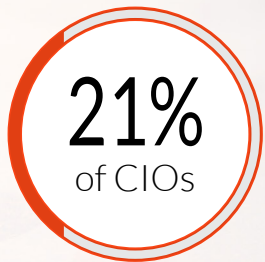
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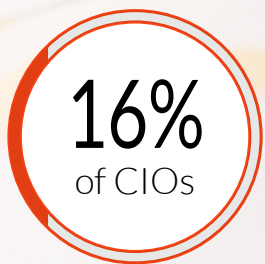
2018



Are involved in identifying chances to differentiate from the competition.

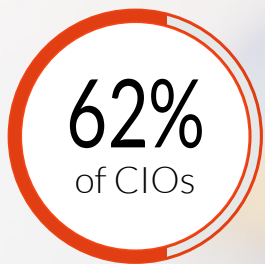


Are working on new strategies and technologies to bring products to market.

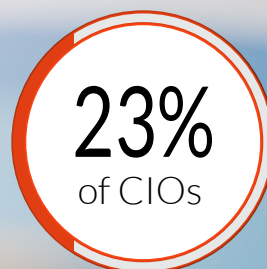


Are actively researching market trends and customer needs.

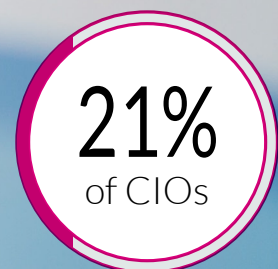
23% are responsible for developing and refining business strategy (21% last year).



For 62% of CIOs, this all amounts to adding the creation of revenue-generating initiatives to their job description.

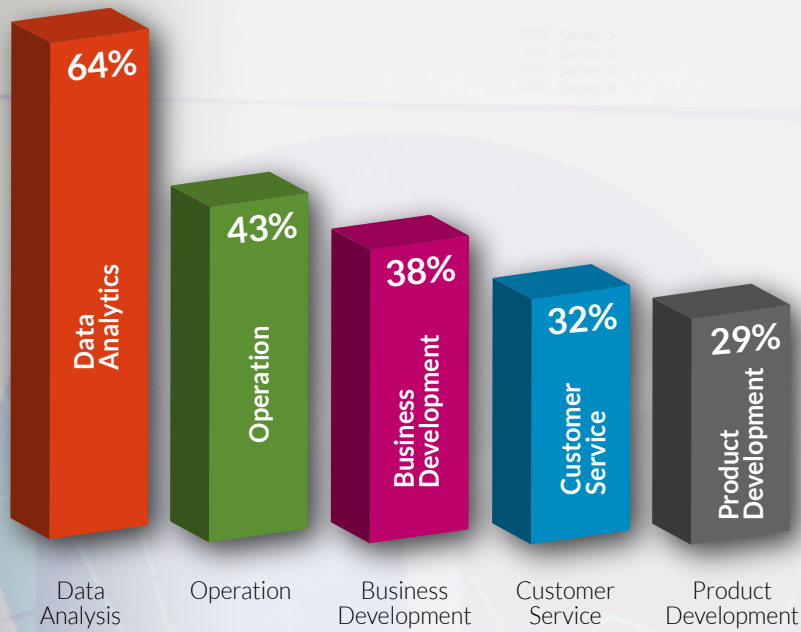


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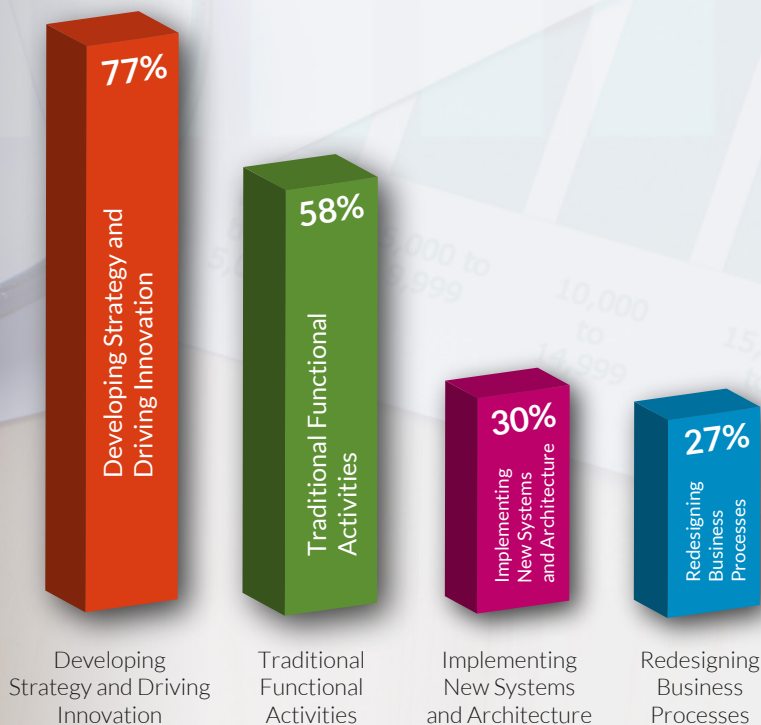


2018

The new responsibilities taken on by CIOs in light of this transformation include:



This is reinforced when the respondents take the time to look to the future. In the next 3 years, 77% of them plan to spend more time developing strategy and driving innovation in the business, compared to 58% who think they'll be busier with traditional functional activities. In slightly more detail, 30% think they'll be focusing on implementing new systems and architecture and 27% on redesigning business processes. A large part of any drive toward digital transformation has to be based



upon an analysis of what it is that the customers are looking for when they interact with an organisation. 55% of CIOs have now taken on the task of seeking this information out, and in 33% of organisations this information is being used within experimental labs or 'idea spaces' within which new, entrepreneurial thinking can be tried out. This kind of thinking is particularly prevalent in the high tech sector, where 61% of CIOs spend time focusing on data regarding customer requirements, and 40% have created their own test labs.

The emphasis placed on this kind of thinking by high tech companies makes perfect sense, since this is where the groundwork for the technological innovations of tomorrow often takes place.

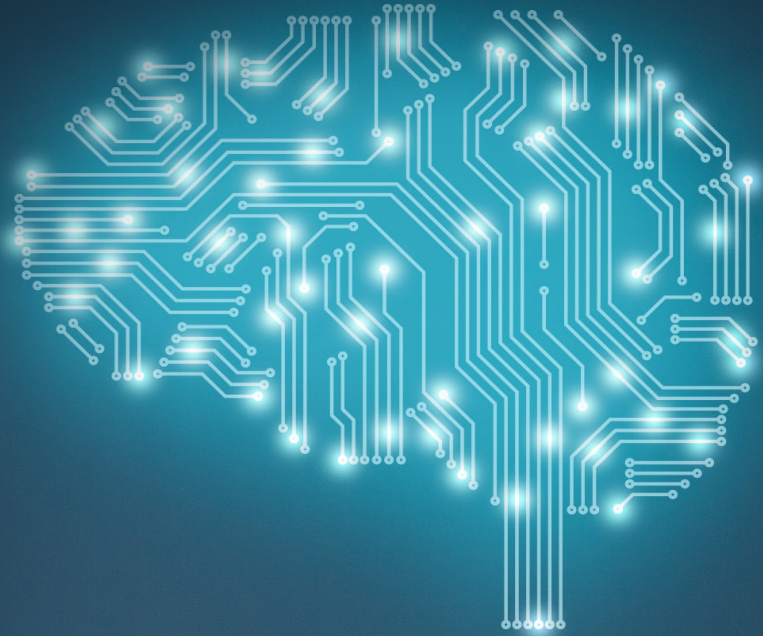
The idea that thinking of this kind can be left solely to high tech companies is a dangerous way of looking at things, however. After all, a few short years ago, applications were something which only coders and other members of a tech team fully understood, but then apps were suddenly disrupting the taxi hire and tourism businesses.



Innovation in Practice

A practical example of this principle is provided by Mark Browning, CIO of Exelon Utilities. This is a company delivering electricity and natural gas to more than 10 million customers in five US states. In addition to providing their customers with information and analytics on their energy usage, Exelon are now planning on offering digital tools which enable customers to evaluate for themselves whether they are the right candidates for solar energy. In a more innovative move, the company eventually intends to connect the customers who are eligible to an ecosystem of third party solar energy suppliers. By vetting and selecting these third-party suppliers, Exelon is shifting from being merely a provider to also being an adviser, in addition to offering installation and on-going support. To many this move – passing customers on to third party providers – may seem counter-intuitive, but Mark Browning explains it in the following terms:

“We look at other industries that have been disrupted, and those companies that get caught by surprise are the ones that didn’t get involved, didn’t actively participate. They bury their heads in the sand and hope the disruption is going to go away. Instead, we ask ourselves: How can we get involved in it, become a part of it, to help shape the future.”



This is a working example of a CIO using customer analysis and a strong knowledge of industry trends to shape the strategy of an organisation in a way designed to avoid the impact of digital disruption. By embracing and helping to shape the disruption Exelon Utilities clearly hope to avoid being impacted by it in the way that companies like Blockbuster were hit by earlier waves of disruption.

The simple truth is that there is no single correct road map for this particular journey, and that the best way to devise your own plan of action is to look at how CIOs in organisations of every type from all over the world have made the journey and have made it work.

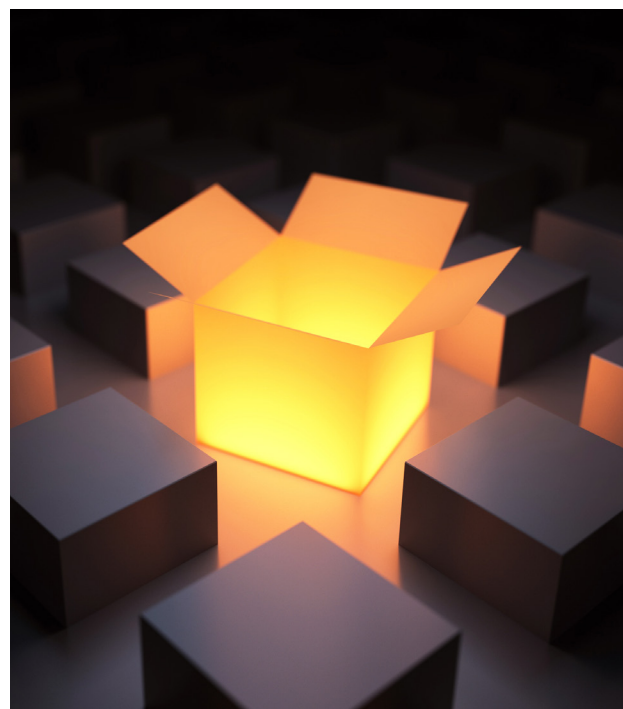


Frank Loydl has been CIO at auto-industry giants Audi since February 2018, having previously worked in IT management and software development at Volkswagen. In conversation with Sabine Bendiek, Managing Director of Microsoft Germany, Loydl pointed out that even in a company with the resources of Audi, the main challenge he faced as a strategic CIO was one of culture. The first step was to leave behind the silos traditionally separating the divisions of the company and create flexible interfaces within what had traditionally been strictly hierarchical structures. The key to this, Loydl found, lay not in technological solutions but in allowing the employees to play an active role in shaping processes, acting, in his words, 'not as spectators but as players'. This involved instilling a shared set of values – he lists respect, courage and openness – via which he was able to introduce agile ways of working. Although digital tools such as collaboration platforms played an important role, the first step was always to change the way of thinking of managers and the employees using the platforms.

IT LEADER *FUTURE THINKING*



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Iberdrola is a global energy company, originally based in the Basque region of Spain but now providing gas and electricity to customers across Europe and in the UK through ScottishPower, the US via Avangrid and Mexico and Brazil as Neoenergia.

The steps it has taken toward digital transformation have been driven by a desire to shift decisively toward renewable energy supply and have been facilitated by an ambitious IT operation making full use of an annual budget of €1 billion per year until 2022. CIO Fernando Lucero is convinced that the electricity utility industry is in the midst of the kind of large scale disruption which transformed the telecoms industry at the turn of the century, when the growth and advance of mobile technology transformed a moribund and highly regulated sector into one with a sharp focus on competition and customer choice.

According to Lucero, this will involve embracing a range of technologies including big data analytics, IoT, robotics, AI, VR and smart mobility, all utilised to disrupt an industry which, even following the kind of deregulation which took place in the UK in the 1990s, is still run along fairly traditional lines.

The developments instigated by Lucero are driven by a belief that utility customers now expect the same kind of experience they enjoy when interacting with other online retailers. This involves the creation and deployment of a range of new products and services, the majority of which are digital in nature.

One of the first manifestations of this change arrived with the range of tariff choice which Iberdrola offers to its customers. In contrast to the standard peak and off-peak tariffs traditionally offered by most providers, they

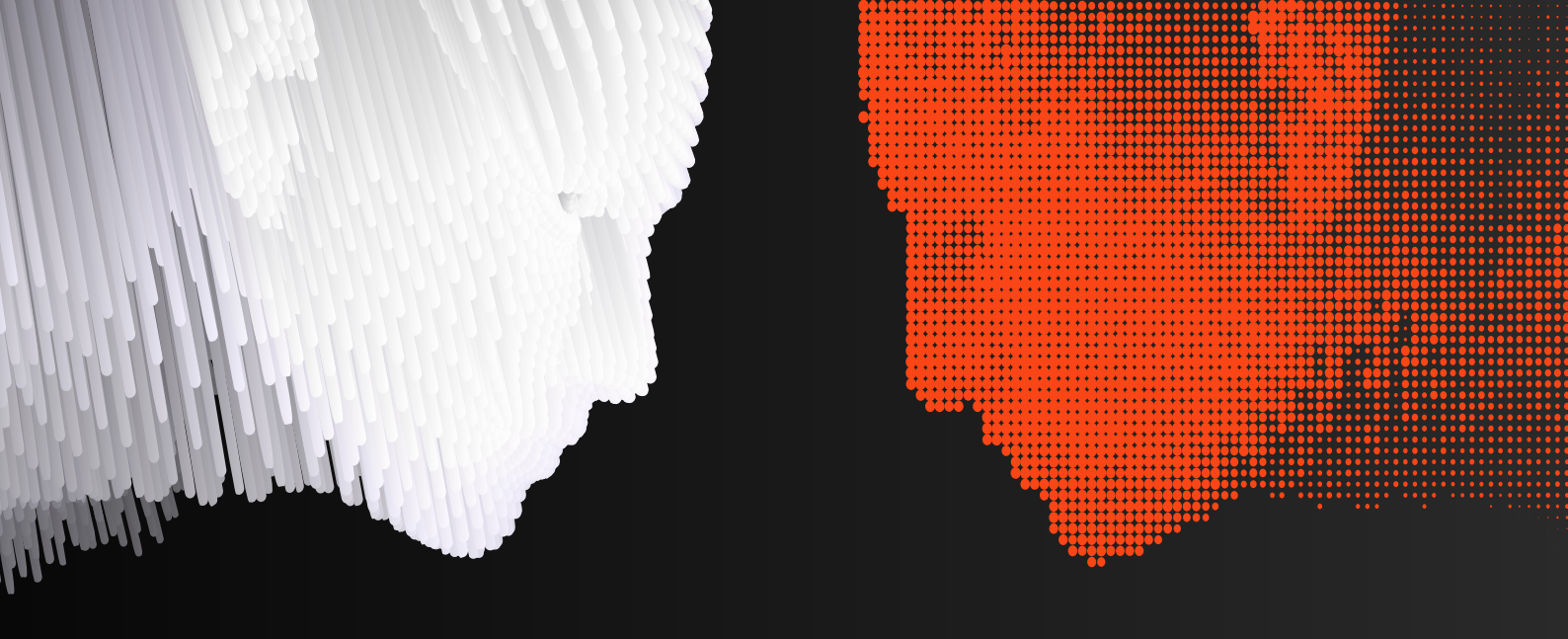
provide Weekend, Summer, Winter and Stable (constant, twenty-four-seven) pricing plans. Other options include a tariff which people with more than one home can shift from residence to residence, and a pricing plan which allows customers to take advantage of lower rates over a specified 8 hour peak period. Another innovation is the Energy Wallet, an app which enables customers to purchase energy units which they can then use themselves or transfer to friends and family.

The long term aim is to create a range of completely personalised products based on the energy use profile of individual customers.



If your records show, say, you run the dishwasher at 3am, you get up at 8am and put the washing machine on before leaving for work, then we can create a personalised tariff to reflect those energy requirements. At the end of the day, electricity is electricity, so we want to create products and services that are aligned to our customers' many different needs.





As Lucero explains, one key aspect of all of these services is that they will be linked to the companies Smart Home and Smart Solar generation solutions and can be controlled remotely via a mobile device:



...now the customer wants to have all capabilities in a mobile app, with consistent information and access across all channels – web, social media, contact centres. The customer is changing and we need to change to match that with mobile consistent, personalised energy services.



Of particular interest to other CIOs will be Lucero's description of what might be termed a 'dual headed' approach to IT. On the one hand, his team were performing the traditional IT functions of keeping operations running, infrastructure operational and the back-office reliable, but at the same time a separate IT team were busy engaging with the business side of operations. In areas such as retail the IT division eventually became inseparably intertwined with operational functions, to the point at which, on many individual projects, people from the company couldn't distinguish which members of a team represented IT and which were from the business side of the organisation. This dual structure has become so firmly entrenched that Lucero estimates that almost 50% of the IT division now operates in this forward thinking, innovation-oriented manner, with technologies currently being explored which include:

1

Virtual reality training for staff that have to work in dangerous environments.

2

Blockchain technology to ascertain the provenance of energy supplies.

3

AI to improve wind farm efficiency – using sensors to support features like predictive maintenance.

Lucero emphasises the fact that the change is reliant on culture as much as technology:



Years ago, the business saw its activities as separate from IT. Now it's 'thinking digital' about the uses of technology for transformation. The business assumes that it needs the IT organisation for its deeper knowledge and to lead the technology part of transformation. Now, if you are talking digital you're not necessarily part of IT or talking to IT; you are part of a wider digital transformation activity. And that's a huge change.



The Wood Group is one of the Big 5 players in the global energy industry engineering market, with its headquarters in Aberdeen, UK, and a value of \$11 billion. As the energy market continues the move (detailed in the Iberdrola

case study outlined above) away from a carbon-based heritage of gas and oil, digital innovation is regarded as being a key component of any future plans.



Wood Group recognised this in 2018 and appointed Darren Martin as their first CTO, tasking him, initially, with undertaking an audit of the entire company with the aim of discovering the areas in which digital technology could be used to help redefine the future of the business. The move was driven by an executive level recognition of the fact that the 'fourth industrial revolution' was disrupting global markets, and that technological innovation was an utterly critical component of any attempt to cope with and take advantage of this disruption.

Martin views the ideal approach as a blend of traditional, embedded engineering tools and expertise with disruptive technology chosen to deliver customer centred innovation.

The shift toward digital innovation of this kind is fuelled by the presence, in Wood Group head offices around the world, of CoLabs (collaboration laboratories) which have been set up to enable real-world experience of the kind of technological issues which Wood Group customers bring to them, allied to an online platform which enables all 60,000 employees to examine customer challenges and opportunities and work to devise solutions. In the future, Martin has plans to open up the CoLabs model to partner organisations in an attempt to bring in fresh ideas and new ways of thinking. Ideas of this kind mark a cultural shift in the idea of what a CTO should be delivering. In addition to constantly seeking out efficiencies in their core business, through innovations such as the automation of pipeline design and maintenance, and maintaining the technology functions

needed to run that business, Martin claims to be focused on the top challenges of their major clients. This marks a major shift from the days when a company like Wood Group would come up with solutions in isolation and present them to the market, to a situation in which they work in collaboration with clients and partners to deliver the innovative solutions needed. Martin likens the change to that undergone by a technology vendor such as Microsoft when transitioning from selling software licences to dealing in cloud-based subscriptions, wherein

the onus is on them to persuade clients that the new models deliver value.

He also points out that a trip to the Microsoft headquarters in Redmond Virginia was enough to persuade the upper echelons of management that technology providers, rather than being treated as competition in terms of being engineering problem-solvers, should be treated as partners, enabling the combination of tech know-how and engineering expertise to deliver problem solving innovation to clients.





Budgets

For many CIOs one of the main drag anchors on forward development is budgetary, and the issue is structural rather than quantitative. Even in organisations which devote ‘enough’ funding for IT, control of how funds are utilised often isn’t in the hands of the CIO. The 2019 State of CIO research found that only 11% of the IT organisations responding had control of 100% of the technology spend in their organisation. The average was just 51%, expected to rise to 55% in the next 3 years. Other departments likely to have control over their own IT budget were marketing, at 42%, followed by operations at 37% and finance and accounting at 35%.

Shannon Gath, vice president and head of technology at AMAG Pharmaceuticals, took the step of centralising the technology budget and creating a formal governance process and a cross functional committee. She feels that this move has played a huge part in increasing the influence which IT now has on the business strategy of AMAG. Formal governance ensures that the same set of criteria is applied to every demand for funding, while the entire process is completely transparent. At first glance this might seem to carry the risk of making the workload of the CIO even more complex, but the nature of the governance process set up by Gath has been optimised for simplicity. Gath herself likens it to a

one page PowerPoint slide, and it consists of the people proposing projects being asked a series of simple questions:

- 1 What problem are they trying to solve?
- 2 What will the value to the organisation be?
- 3 What are the risks if funding is not forthcoming?
- 4 What will the actual costs be?

In the words of Gath, this centralisation creates a situation in which every investment is examined as an ‘apples to apples’ comparison, and the IT department isn’t seen as being the ‘bad guy’ any more, playing the role of pointing out why things can’t be done, or afforded. In broader terms, and playing into the concept of making sure that everyone in an organisation is buying into the changes being made, it enables all employees to see how investments rank against each other and how decisions are made.



The Talent

In tandem with the issue of managing the employees they already have, the modern CIO has to think about finding and employing the right additional talent for the new roles and challenges being created by digital transformation. This is a point confirmed by Jim Swanson, senior vice president, CIO, and head of digital transformation at Bayer Crop Science. The strategy pursued by Swanson is one of embedding analytic driven decision models into every aspect of the business, making the data available to everyone across integrated platforms and leveraging it to act on data driven insights.

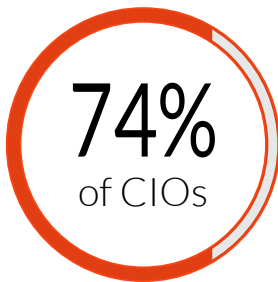
For Swanson, the challenge lies not in setting up the platforms or choosing and developing the right technology, but in tracking down the

right talent. This is something reflected across the 2019 State of CIO report, with 42% of respondents anticipating difficulties recruiting data science and analytics talent, while 33% currently have a hard time sourcing security and risk management skills and 31% feeling they will find it difficult to recruit AI and machine learning experts.

The solution to this problem pursued by Swanson involves looking for talent in the open source and data science communities. At the same time, they are endeavouring to plug the skills gap by establishing their own curriculum for data science and distributing a ladder of required skills so that interested employees know what it will take to move into one of these new roles.

A similar approach has been taken by Michael Mathias, CIO and executive vice president of customer experience at Blue Shield of California Life and Health Insurance. Despite being located in the heart of Silicon Valley, the company still finds itself struggling to recruit experts in machine learning and data interoperability, not least because of the proximity of a number of the largest global tech giants. Mathias ruefully recounts the experience of looking for a data architect only to find that another 27 local companies were simultaneously doing exactly the same. One of the solutions they've come up with is devoting time and money to retraining existing staff, which Mathias now regards as one of the most rewarding aspects of his role as CIO: "In the end, technology is not what I want my legacy to be — I want my legacy to be helping develop the next-generation of business leaders, not technology leaders."

The changing nature of the CIO role is underlined in a report published by Forbes with VMWare. Of the CIOs responding, the majority felt that the following were now important aspects of their job:



...felt that partnering with stakeholders were now important aspects of their job.



...felt that setting a common vision was now an important aspect of their job.



...felt that communicating and influencing were now important aspects of their job.

Marcus East, CTO of National Geographic, points out one positive change which could go a long way toward solving the recruitment issues and skills shortages which CIOs, particularly in Europe, are facing. This involves dealing with the deep-seated problem of diversity in the IT sector. As he puts it:



Even 25 years after I started my career, I go to too many events that are still dominated by men from traditional middle-class backgrounds. Bring new people into the profession by looking beyond the traditional university educations and the typical demographic. Some of the best engineers that I've worked with never went to university and come from radically different backgrounds from myself.



This is an approach which CIOs in a range of industries are adopting as a means of widening the talent pool they can draw on. Examples include:

CIO Thierry Bedos has driven attempts to create a more diverse IT workforce within the company. Initiatives have included work in schools to raise the awareness of science and technology careers among girls, and seeking suitable recruits at conferences such as Women of Silicon Roundabout.

He explains his thinking as follows:

“

There's lots of evidence that teams are more balanced and more diverse in nature perform much better. They bring better innovation to the customers out there. When you think about the fact that something like 90% of travel decisions are influenced or made by women, we need to bring more women to our teams to understand that and to design products that women will love and that will be useful for them.

”

CIO David Henderson made sure that Global Radio was a founding member of the Tech Talent

Charter, a collective of organisations committed to working toward a gender balance within the IT sector, and has backed this commitment through a range of initiatives including unconscious bias training. He explains the positive business impact of embracing and nurturing diversity in this manner:

“

From our partnership approach with key vendors to a more diverse talent strategy and attracting the best entry-level technologists, we have been able to execute an ambitious digital transformation that, in turn, has helped launch compelling new products and grow the business.

”

CIO Tiffany Hall has worked to deliver diversity within the IT sector of the charity. As well as working pro bono for the Tech Talent Charter steering groups, she acts as a STEM ambassador at STEM Learning UK, delivering talks at career events designed to encourage girls to consider a career in technology. Within the charity itself she has established staff networks for LGBTQ+ people and women, as well as sponsoring a BAME group and setting up a multi-faith group.

In order to also deal with the issue of social mobility, Cancer Research UK pays all of their interns (they were the first charity in the UK to do so), and creates employment opportunities for people with disabilities.

This last is something that Hall is particularly keen on, having previously worked in an organisation – the BBC – which placed great emphasis on accessibility and assistive technology for disabled people, making it a significantly scored criterion as part of their procurement processes:



...we were very often told by software vendors that nobody else was asking them this question, which surprised me, and even some government departments weren't asking this question and certainly not scoring it. I've introduced that here at Cancer Research UK now. We include it in the questions that we ask vendors now.



What all of that demonstrates is that the answer to one of the key issues facing any modern CIO, that of the on-going skills shortage, is to be found not in technology or software, but in a cultural shift and in close partnership with other departments such as HR. Widening the outlook and fine-tuning the approach of the company, from the IT sector outward, will in turn widen the talent pool from which CIOs are able to draw.

Of course, there's a moral argument to be made for more diversity, and there's the argument which says it will help you as a CIO to find the employees with the skills you're looking for, but

there's also a wider business argument. Any CIO facing resistance at board level to taking positive steps to increase diversity need only quote the following statistics, drawn from the McKinsey Diversity Matters report, which used information from 366 public companies across a range of industries in Canada, Latin America, the United Kingdom, and the United States. The measurements which the report made were relatively simple, in that they compared financial results with the composition of the management and the boards:

1

Companies scoring in the top 25% for racial and ethnic diversity are 35% more likely to achieve financial results above the median for the industry in their country.

2

Companies scoring in the top 25% for gender diversity are 15% more likely to achieve financial results above the median for the industry in their country.

3

Companies in the bottom 25% for gender and ethnic and race diversity are less likely to achieve above average financial results.

In the United Kingdom in particular, greater gender diversity within the senior executive team led to the biggest uplift seen in the survey as a whole – for every 10% increase in gender diversity, EBIT (earnings before interest and taxes) were seen to rise by 3.5%

So the CIO seeking to increase diversity within their team has two equally compelling arguments to present – it will counter the skills shortage so often seen in the areas fuelling digital transformation and it will drive the business forward across the board.



About More Than Technology

Taken across the board, the evidence about the changing role of the CIO underlines one thing above all else – that the position is becoming less and less about technology. This may seem counter-intuitive, given that digital transformation is built on a foundation of several different emerging technologies, but case after case demonstrates that a grasp of the technology and its possibilities is merely the starting point, and that the effective CIOs of today and tomorrow understand that they need a skill set extending far beyond handling software and hardware.

For Shaun Le Geyt, for example, CIO at Parkinson's UK, the role is about focusing on the end user – in this case people with the condition Parkinson's – rather than on the technology being implemented. As he puts it, 'managing cultural change is as important as managing technological change.' He also insists that "There's times when technology comes up and you know it's the right thing to discuss.

But you need to take a strategic, innovative and visionary approach. You must work closely with the leadership team to make sure that you're supporting the business strategy in the right way."

Chris Worle, chief digital officer at financial services firm Hargreaves Lansdown, insists that the key to making progress lies in the ability to tell stories effectively. He draws on his previous position in marketing and uses his skills as a storyteller to build a bridge between the IT department and the rest of the business.

This is another key asset for the modern CIO. All too often, the eyes of the rest of the C-suite tend to glaze over when the conversation switches to the topic of technology, even while that technology is helping to transform their business. An effective CIO has to learn to convey the power, effectiveness and impact of the technology they're using in a manner which is engaging and cuts through.

Ready to Innovate?



The question of how to prepare for digital transformation is one which every organisation is going to have to answer in line with their own individual circumstances and state of readiness. One option identified by CIO's 2019 State of the CIO research, which surveyed 683 IT leaders, and as referenced by the Wood Group, was the creation of 'innovation labs', spaces within which the kind of ideas which are driven by – and in turn drive – digital transformation can be tested and created, and within which a CIO can help to foster an entrepreneurial spirit whilst working within corporate structures.

Carol Juel is the CIO of Synchrony Financial, which was spun off from the GE Capital Retail Bank in 2014. Having rebuilt the technological infrastructure of the business from the ground

up, Carol set about creating the conditions to enable them to bring new products and services to market at speed, while driving innovation and building new revenue streams.

This took the form of a network of four innovation labs in the US and India which, collaborating with the company's retail and merchant partners, utilise agile processes in order to work with technologies such as chatbots and predictive modelling in order to solve problems their customers face in the real world. At the same time, the company operates Synchrony Ventures, a corporate arm which invests in start-up and early stage companies in order to develop emerging products and technology. As we'll see, the option of dedicated innovation spaces or collaboration with outside

agencies (sometimes both) is one which many forward thinking CIOs are utilising in order to maximise the speed and effectiveness with which they take control of digital disruption. Rather than seeing digital disruption as something external to be feared and, if possible, guarded against, the best CIOs invite it into the organisation and explore its potential within the parameters of day to day operations.

Two other companies opting for this approach are the US home improvement retailer Lowes and the pharmaceutical giant Bayer, which has a US Innovation Centre and Science Hub. Although both have gone down the innovation lab route, the difference in the founding charters set out by the pair highlights the flexibility of this particular model.

For Lowe, the lab is a place to think about the potential application of disruptive technologies and rapidly prototype new ideas that could play a role in the lives of customers and employees. In the case of Bayer, the lab is primarily a collaborative endeavour, via which they work with life-science firms and academic institutions to create new pharmaceutical based solutions.


While the different focus may be easy to grasp given the wildly different spheres the two companies operate in, perhaps Lowe's is the most interesting case. A world-leading pharmaceutical company might be expected to be at the forefront of technological development, whereas a home improvement store is exactly

the kind of 'traditional' business which has, time and time again, found itself left behind by the speed of digital transformation and the alacrity with which the competition grasped the opportunities offered.


The board at Lowe's were clearly alive to this possibility in November 2018 when they revamped their leadership structure and brought in Seemantini Godbole as CIO, having poached her from fellow retailer Target. She stated her aim as being "strengthening our competitiveness by developing a world-class technology team that will meet and exceed the evolving expectations of the customer while also providing the right tools and technology for our associates," which may seem like the kind of thing you'd expect a newly appointed CIO to come out with, but which was in this case backed up with positive action.

The results deriving from the Lowe's innovation lab included:

1 A 3D printer to be used in the International Space Station.



2 The Holoroom, a virtual reality environment in which customers can learn how to tackle difficult tasks like installing a toilet.




3 OSHbot, a robot which greets customers in a San Jose Orchard Supply Hardware store in English or Spanish and performs approximately 1000 product searches every few weeks.

Any or none of these innovations might eventually become fixtures in the home improvement retail landscape, but the point is that by fostering innovation of this kind, the CIO and tech team at Lowe's are insuring the company against the risk of being left behind by disruptive entrants to the sector.

Perhaps even more interesting than the results produced by the Lowe's Innovation Lab is the surprising method they use to identify potential customer problems and devise effective solutions.

The first stage is market research, which uses customer feedback combined with general trend data to identify pain points and needs which aren't being met. So far, pretty standard, but at Lowe's innovation lab this data is given to science fiction writers who use the information to create strategic documents. These strategic documents aren't written in the kind of dry corporate speak that might be expected, but take the form of comic books, in which a narrative is played out, pitching characters against problems and suggesting new solutions. The executives

at Lowe's then use these comic books to decide their priorities and the innovation lab takes these priorities and works with partners to create the solutions featured in the comics.

This may seem like an extreme approach to take, but it underlines the value of dismantling the standard corporate culture and finding new and high impact ways of communicating ideas which might otherwise be seen as too extreme. It's also instructive to note that it is a home improvement retailer, rather than a high tech social media company or cutting edge gadget manufacturer which is going to these lengths to take full advantage of digital disruption, emphasising the fact that no CIO can be complacent about the industry they work in and the possible effects of digital technology.

The advice given by experienced CIOs on the topic of creating innovation labs – or simply fostering a culture of innovation and entrepreneurship within their organisation, even if it is not formally described as such – revolves around innovation metrics, the process, recruitment and integration.



ANALYTICS DASHBOARD

Last Updated:
3 min ago

92%

Data Availability



More info

95%

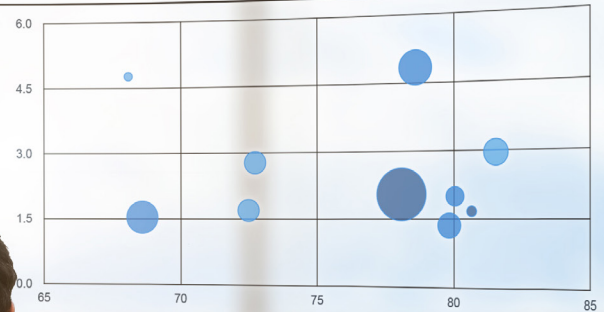
Actual vs Target



More info

Evolution	Metric	Actual vs Target	Actual	Target
	Revenue		\$3.4M	82.0%
	Profit		\$1.2M	108.7%
	Avg. Order Size		\$850.3	71.0%
	On Time Delivery		96.0%	96.0%
	New Customers		15432	145.0%
	Cust. Satisfaction		98.3%	105%
	Market Share		46.9%	80%

Products positioning



Top 10 products



Sales per countries



Metrics

Applying standard metrics to the kind of innovative concepts a forward-thinking CIO has to embrace is never going to accurately reflect the effectiveness of the concepts being tested. As Kyle Nel, who is the Executive Director at Lowe's innovation lab put it does not make sense to apply mature metrics to something in its nascent form."

Having accepted that fact, a CIO still has to come up with a set of metrics to present at board level. According to the Harvard Business Review, the metric most commonly sought by executives is the standard output metric 'revenue generated by new products', which is always going to be difficult to apply, as anything more than an educated forecast, to innovation in its earliest stages.

The metrics used for innovation of this kind need to focus also on input and development, in other words on painting a fuller picture of not merely the output of any innovation efforts but also the on-going evolution of the capability of the business to innovate in general. Metrics of this kind could be used to push back when executives look for instant revenue growth from new and disruptive products and services. The point of on-going innovation is as much the flexibility and agility it embeds at the heart of a business as it is the individual outputs resulting. By creating a set of metrics which measure the ability to innovate, via input and development, a CIO will be able to paint a picture of the value of a space such as an innovation lab, or even of the concept of pursuing innovation as an end in itself.



Process

If we accept the proposition that innovation is as much about the culture of a business as it is anything else (such as the technology or the corporate structure), then it follows that an innovation minded CIO has to:

- 1 Place the customer at the centre of their thinking.
- 2 Experiment with ideas and processes constantly and embrace failure as a chance to learn.
- 3 Keep a lookout for and use new technologies and business models.
- 4 Make the build/measure/learn cycle as fast as it possibly can be.

One organisation which operates using processes of this kind is X, the so-called 'moon-shot factory' at Alphabet, the parent company of Google and other subsidiaries. The role of X is nothing more or less than to come up with the next Google(s), and their formula for innovation is set out as follows:

- 1 Any idea must address a huge problem.
- 2 It must propose a radical solution.
- 3 It must make use of relatively feasible technology.

The practical results of working to this formula include Waymo, formerly the Google self-driving car project, which has been valued by Morgan Stanley as being worth \$70 billion.

Of course the talk of billions, and Google and the 'moon-shot factory' may make all of this seem like the kind of high level, well-funded thinking that is beyond the reach of the average CIO. The point, however, is that the principles embedded in these hugely successful businesses can be taken and applied at any level. Any CIO, in other words, can embrace innovation, seek a diverse workforce, focus on customer needs via direct communication and develop a vocabulary to express their intentions, ambitions and achievements at board level. The question of diversity in the workforce has already been addressed, but the practical steps taken by various CIOs to shake-up their recruitment methods are still worth examining.

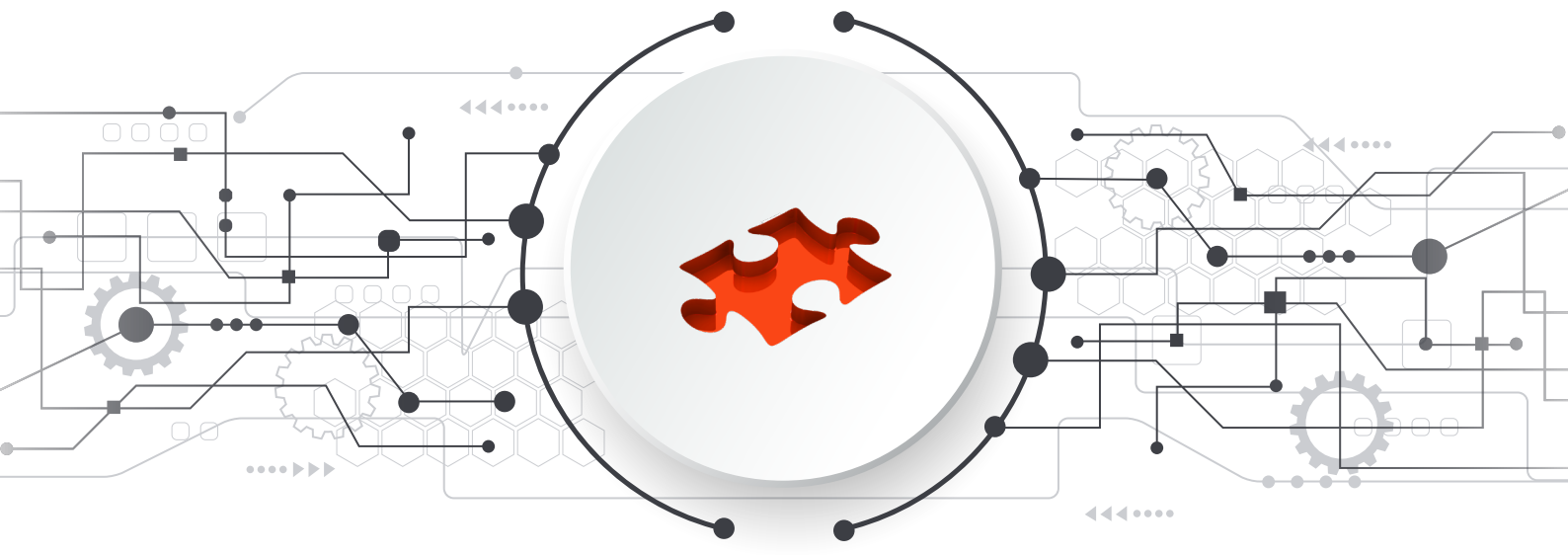


Recruitment

The key to many of the most successful innovation labs is that the recruitment policy is driven by more than just a search for technical skill. For a CIO determined to stay ahead of the next wave of digital disruption, it's imperative that a team, as well as having members with the requisite technological know-how, contains experts in the likes of data science, design and psychology. When success or failure hinges on being able to second-guess exactly what consumers and service users will be looking for in five or ten years' time, these are exactly the kind of skills needed in a combination which enables a team to come up with new ideas and solutions, and then turn them into a practical reality.

This is the point at which the job of CIO intersects most clearly with the role of HR, yet another example of the widening skill-set needed by the modern CIO. As stated earlier, changing the culture of an organisation can make it easier to recruit from within, with the added advantage that current employees are likely to be extremely well-versed on the needs of customers. Recruiting from without, however, can make it easier to find employees capable of taking a fresh

new look at the issues an organisation is facing. Different organisations have developed their own techniques for seeking out individuals with the right mind-set. At BuzzFeed, for example, an Open Lab for Journalism, Technology and the Arts targets specific individuals and groups on the basis of their past projects. These people are then offered the resources of BuzzFeed and the space in which to pursue their creative ideas. At Airbus, the targeting is done via a blog which reports on the activities of the Airbus innovation lab, Airbus Ventures, and from other parts of the business focused on innovation. The blog then acts as a magnet, pulling in individuals with an interest in/knowledge of the kind of innovation prevalent in the industry, and creating a pool of potential recruits for the company to draw from. Both of these approaches demonstrate a shift away from the standard model of simply advertising a vacancy, and action of this kind, when combined with establishing a culture of advancement within the company, makes it simpler to create the kind of diverse workforce needed to cope with digital transformation and disruption.



Integration



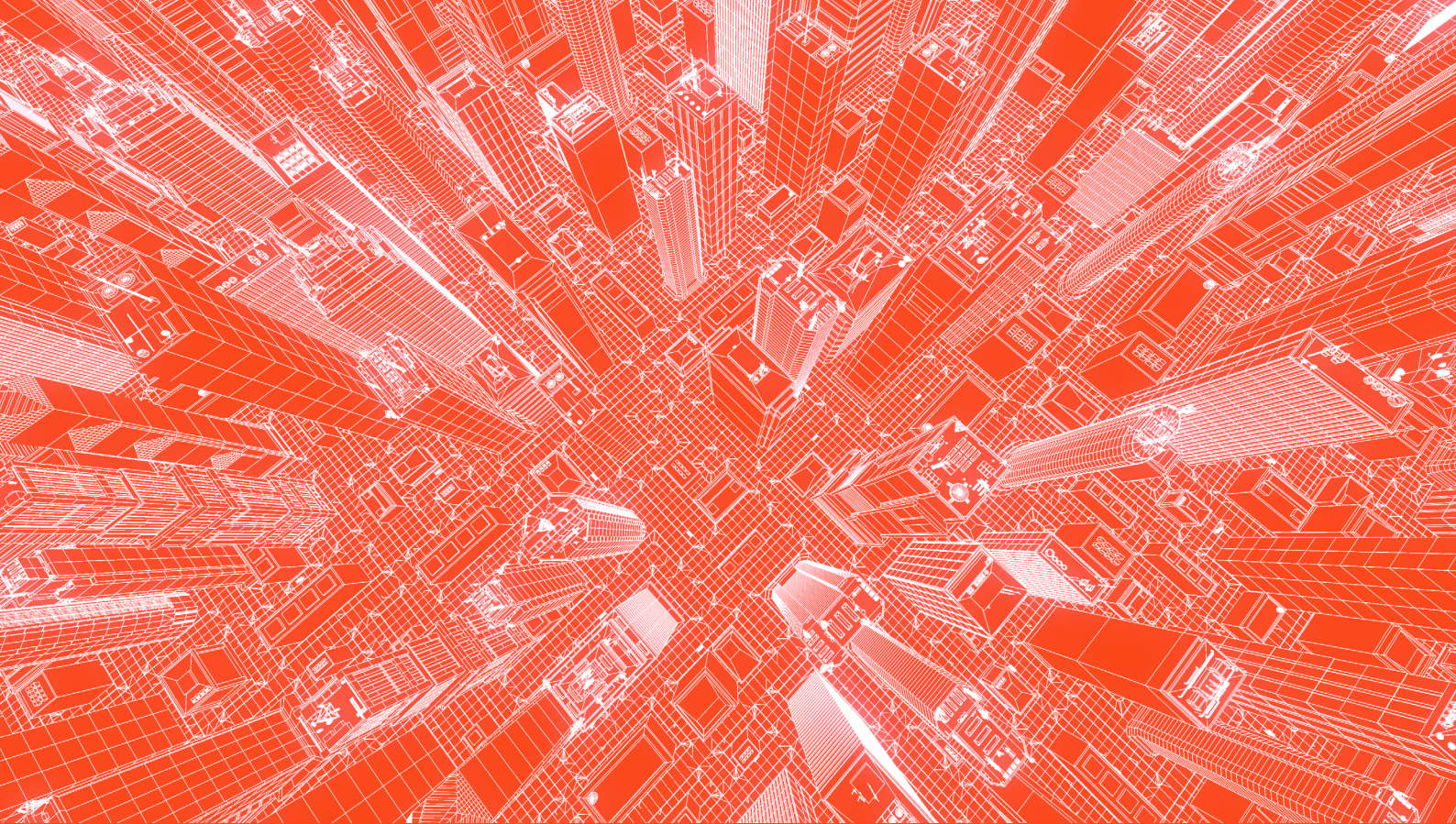
The final consideration when creating a culture of innovation is to ensure that the framework is in place for the innovations which emerge to be fully integrated into the wider organisation. The alternative is to run the risk of suffering the fate of Kodak or Xerox.

In 1975 the first ever digital camera was created by Kodak engineer Steve Sasson. That's an example of a company staying many years ahead of the next wave of digital disruption and yet, despite patenting several pieces of technology still present in digital cameras today, and bringing out its own range of digital cameras starting as early as the mid-90s, the company was never fully behind the technology, feeling it ate into the core concern of celluloid film. The result doesn't really need explaining.

Xerox was responsible for designing the first computer intended to operate via a Graphical User Interface (GUI). This was back in 1973 and took the form of the Xerox Alto. The initial pilot was produced by the company's Special Programs Group, and by the late 70's 2,000 units had been produced and were being used in Xerox labs and some universities. By 1979,

the sense that a GUI heralded the future of personal computing was so strong in Silicon Valley that Steve Jobs arranged for his Apple Computer personnel to visit Xerox and receive a demonstration of the relevant technology (the quid pro quo being Xerox receiving stock options in Apple). After just two visits, the Apple team decided to use the concept of a GUI in the Apple Macintosh and Apple Lisa products. Xerox itself didn't introduce a commercialised version of the concept - the Xerox Star - until 1981, and it pretty much sank without trace.

These are both examples - frankly terrifying for any CIO - of how even the best and most visionary ideas can be of little use to a business if the framework to take advantage of them is not in place. In the excitement of creating a culture of innovation it can be easy to forget the need to integrate those innovations, but it really needs to form part of the conversation from the earliest stages. Options which need to be considered include making an innovation a core part of the parent company, running with it as a separate business or wholly owned subsidiary and rolling it out to customers in the manner of the innovations delivered by Lowe's.



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