Born to be digital

How leading CIOs are preparing
for a digital transformation

EY

Building a better
working world

Our acknowledgments

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See demographics for a full overview of the research methodology.

In this report

Dear fellow CIOs,

What a difference a decade makes. Back then, the world of IT was a very different place. Social media was in its infancy. For the CIOs I worked with, smartphones essentially provided email on the move and little else. Cloud computing was hardly on the radar. For any CIOs wanting to introduce an innovative new application, one of the first steps would be to build the necessary infrastructure internally.

In today's more digital world, things look rather different. A cloud-based service can be provisioned and scaled from 1 to 100,000 users at the tap of a button. Customers expect to engage on a more real-time basis, using social media platforms. Staff members wonder why their work tools aren't all available as mobile apps, as they are in the rest of their lives.

All of these changes provide huge opportunities for those leading businesses able to move quickly to adopt and exploit these technologies. But they also present stark challenges to CIOs. Once the masters of their domains, this digital world is challenging them to change and to evolve their skill sets and thinking.

Those leading CIOs who are embracing digital find themselves grappling with a new set of demands: learning how to transform business processes around the potential of digital, or identifying where and how they can provide new product and service innovations. The CIOs who can master this, however, are finding their roles more influential and more strategically engaged than ever before. Unsurprisingly, they are more fulfilled.

From our experience in working with CIOs, and research on this characteristic group of executives, we know that there is a distinctive subset of CIOs who have already embraced the digital world and seem to have been born digital. With this timely report, we aim to provide help and advice for those CIOs seeking to navigate these shifts. I trust you will find it as useful as I would have if I was still a CIO at Anheuser-Busch International. I look forward to continuing the conversation with you in person.

Norman Lonergan, Global Advisory Leader at EY

In 2012, our research into the DNA of the CIO discovered the essential ingredients of a leading CIO (www.ey.com/dna-cio). It also detailed the career aspirations that many CIOs have, which largely center on expanding the scope of their responsibilities and influence. During this research, we found that CIOs and CTOs from certain industries tended to embrace more leading practices, while expressing greater satisfaction and holding a stronger voice within their respective organizations. (Note: for simplification reasons, from now on, we use the term CIOs to include both CIOs and CTOs.)

We also determined that these leaders were well positioned, in terms of their skills and mindset, to tackle the digital transformation that many businesses are now undertaking. This formed the basis for our new research, which seeks to provide new insights into what it takes to succeed in a more digital world.

To do so, *Born to be digital* explores three core areas:

▶ How CIOs with the widest remit and greatest responsibility – those in highly IT-intensive industries – differ from their peers

▶ What lessons CIOs can take from their peers who are leading the digital transformation efforts – in terms of their core tenets and mindset

▶ What career choices CIOs should make to help them fulfill their aspirations for broader roles and greater influence

51%

strongly agree that they are taking the lead in pioneering new digital approaches within their business.

53%

hold a seat at the executive management table, compared with just 17% of CIOs in all industries.

67%

show clear potential to provide a stronger and more strategic engagement with the business on digital transformation.

38%

of CIOs within IT-intensive industries are highly engaged on core strategic issues.

Executive summary

Digital technologies – including social media, the cloud, data analytics and mobile – are rapidly emerging as disruptive forces for businesses across all industries, from retailers and banks through to carmakers and energy companies. They are fundamentally changing the ways in which consumers interact with these companies, while also opening up new business models at the heart of these firms.

These changes are already apparent to nearly all of us as consumers. Just think: when did you last book a private flight without going online? Or go into a bank branch to transfer funds? Or use a phone book to find a restaurant's number? With every month that passes, more services go digital: from checking and adjusting your home's energy usage via a mobile app, to borrowing a stranger's car for an hour to pick up something urgent, or lending money to a tiny business you've never heard of in a foreign country in exchange for a better rate of return. All of these services now exist, and more are created every day.

This presents a huge opportunity for CIOs, especially those with the aspiration, as detailed in our previous *The DNA of the CIO* report, to have a bigger and more influential role within the business. But, as our new report shows, grappling with any digital transformation requires a shift in the skills, approach and mindset of a traditional CIO. Of course, given the varying priorities and constraints in different companies, some CIOs face a tougher battle to embrace digital than others. Ultimately, though, it is up to each CIO as an individual to take the proactive action to move their organization toward the digital era, rather than waiting to passively to react.

To help provide fresh insights and lessons on what it takes to succeed as a CIO in this digital era, this research sought to identify those leading CIOs who are most likely to be pioneering on this issue. To do so, we talked to over 180 CIOs and CTOs from a range of highly IT-intensive industries, as a proxy for those who are likely to be investing in digital, and compared these individuals with those in other sectors. Most revealingly, a core subset of this group of IT-intensive IT leaders – those who are most strategically engaged in their jobs – were seen to stand out from their peers – in terms of both influence and satisfaction. Career choices these CIOs have made en route to the top helped to verify the findings.

Some of our key findings include:

1 CIOs see digital as a major opportunity to fulfill their career aspirations.

From Nestlé's push into direct online selling as a consumer brand, to Caterpillar's creation of new lines of services for clients, CIOs at all kinds of firms are using digital technology to transform their businesses. These exciting possibilities align closely with the career aspirations of CIOs. However, even in IT-intensive industries, only half (51%) strongly agree that they are taking the lead in pioneering new digital approaches within their businesses, showing much scope for development here.

2 Proactive CIOs within IT-intensive sectors are better suited to transform their businesses, and their careers.

Companies investing the biggest share of their overall revenue in IT – typically IT companies, telecommunications firms, banks and life sciences firms – ought to be ideally placed to take the lead on digital. As might be expected, CIOs at these firms usually have more prominent roles than their peers elsewhere. For example, 53% hold a seat at the executive management table, compared with just 17% of CIOs in all industries. They also more often recognize the skills needed for success, such as communication and leadership, strong strategic engagement, and a clear focus on growth. More broadly, a majority of IT-intensive industry CIOs (67%) show clear potential to provide a stronger and more strategic engagement with the business on digital transformation.

65%

of digital-ready CIOs are highly engaged on helping develop new products and services.

How CIOs leading digital transformation think differently: six core traits

Our research shows that the elite CIOs leading digital transformation in their businesses differ in their mindset and thinking in six key ways. In particular, they:

1. Have a strategic vision of how technology will transform the business – and know how to implement it

2. Are relentless innovators

3. Focus closely on driving growth – and the relationships they need to support this

4. Ensure their vision is understood

5. Move beyond operations and infrastructure

6. Are courageous risk-takers

See page 20 for more insights on all of these.

3 Despite a seat at the top table, not enough CIOs are grasping the potential for digital transformation.

Despite the advantages offered to them, and their greater influence, many board-level CIOs in IT-intensive firms appear not to use them to push ahead on any strategic or transformational issues. They recognize the need to focus on bolstering growth, but too often fail to reach out to build relationships with the front of the business. Indeed, part of the risk that CIOs face on digital is that other business managers, or wholly new specialist roles, such as the chief digital officer, take the lead.

4 The CIOs most strongly aware of their task to develop the business show a distinct set of characteristics that help them stand out.

Nearly 4 in 10 (38%) of CIOs in IT-intensive industries are highly engaged in core strategic issues – delivering transformation and driving business model innovation – and they show a set of six unique traits (see text box above). These help to frame the mindset of a CIO who is leading the way on digital transformation; an individual we term the "digital-ready CIO." For example, these individuals have a close focus on the front office and innovation: 65% are highly engaged in helping develop new products and services, compared with just 50% of other CIOs. They show a much stronger appetite for risk and a greater ability to influence the rest of the business: 90% cite communication and influencing skills as strongly important to their role, compared with 79% of other CIOs.

5 Leading CIOs take a multidisciplinary approach to their careers.

In forging a path toward a more strategic leadership role, leading CIOs have made a series of deliberate choices throughout their career progression. This starts with their education, which more commonly involves a background in business, science or engineering, along with IT. But it also extends through their work experience: they actively seek out opportunities to work in other parts of the business and in other geographic regions. And they engage extensively outside the business by, for example, taking on external advisory roles or directorships. These CIOs express greater satisfaction with their career prospects, their status within the business, and their ability to influence corporate strategy.

The rise of the digital business

A core set of digital technologies – mobile, social, the cloud and data, among others – are transforming companies at both an operational and a strategic level. For leading CIOs, these present a major opportunity to expand their role and remit, especially for those engaged on the most strategic elements of their role.
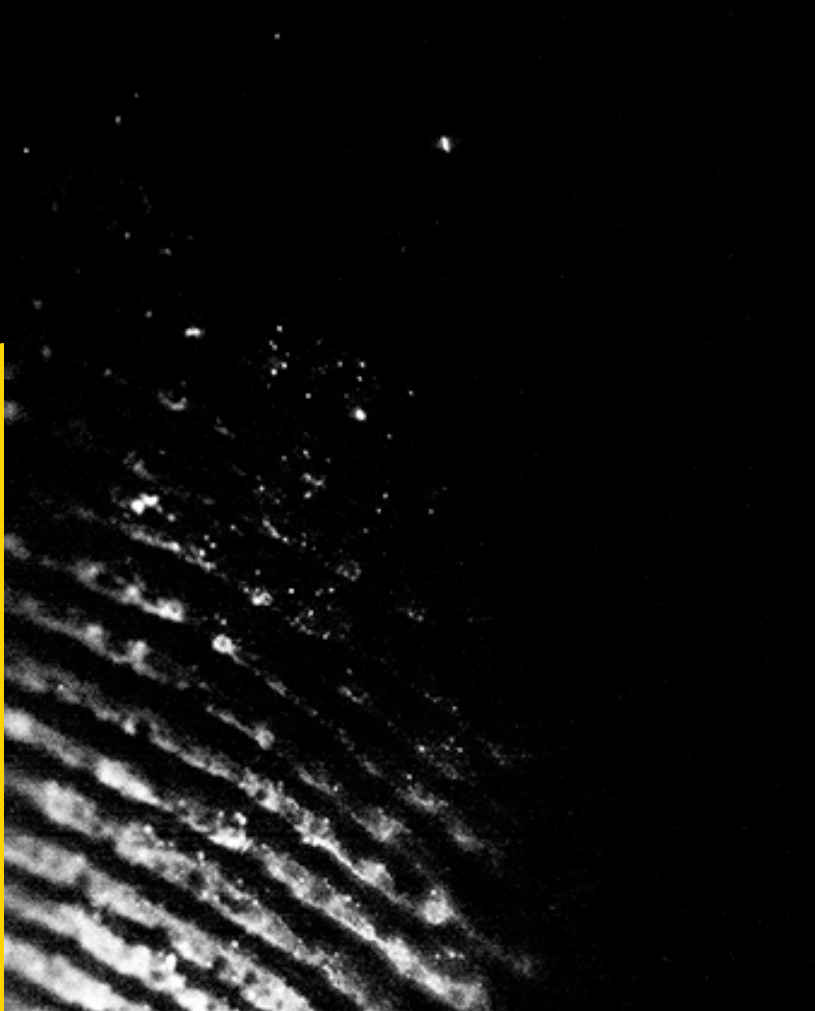
Across a range of industries and geographies, a core set of digital technologies – including mobile, social, the cloud and big data – are transforming the way companies and their customers interact. At the same time, these technologies are releasing a wave of IT-led innovation, and creating new revenue and cost-saving opportunities. This seems like a natural process within internet companies, which are born digital, but the digital transformation is now spreading rapidly to enable organizations of all shapes and sizes to reinvent themselves. For leading CIOs, this presents a major opportunity to expand their role and remit, especially for those who have grasped the more strategic elements of their role.

The wide range of examples is striking. At Nykredit, a Scandinavian bank, half of the customer interactions now come via mobile devices, explains CIO Lars Mathiesen, up from almost nothing just a couple of years ago. This is transforming the way the bank thinks about its customer service processes, and how such interactions work – opening up the potential for one-to-one video meetings instead. Amazon, an online retailer, is using digital to invent new ways of interacting with its customers. Its new Kindle tablet, for

example, has a dedicated button that connects users to a helpline attendant via video chat, bringing a human element back into a routine support function. Pharmaceutical firm Sanofi has launched a new device that can read blood glucose levels and transfer the data onto a smart phone to send to a health care provider. "This is an example of how technology contributes to generate new revenues for our firm," explains Sanofi's CIO Bruno Ménard.

Of course, digital goes much further. Nestlé, the Swiss food giant, has used digital technology to create a whole new business model for its Nespresso range of coffee capsules, which are largely delivered direct to consumers via the internet, rather than through traditional retail channels. Caterpillar is pushing to digitize the trucks, graders and other heavy equipment it sells, enabling it to identify proactively when vehicles require servicing or maintenance, and opening up a whole new line of service revenues for the business.

These are not isolated examples. They form part of a widespread shift underway across the corporate world, as companies reshape themselves around digital technologies.

An urgent, strategic shift

The digital transformation is moving extremely rapidly. In a survey, carried out by MITSloan,[1] of executives from different business functions across a wide range of industries, nearly eight out of ten respondents said that achieving digital transformation will be critical to their businesses within the next two years. The report argues that a range of digital technologies will enable major business improvements: better customer experiences, streamlined operations and new business models. Gartner[2] agrees: its *2013 CIO Agenda Report* notes that, while CIOs have spent the past decade dealing with tightening budgets, limited innovation and cost cutting, they have seen digital reach a tipping point across the business in the past 18 months. However, according to Gartner's *2014 CIO Agenda*, CIOs feel overwhelmed by the prospect of building digital leadership.

"Dealing with the challenge of digital change requires an end-to-end response, building a comprehensive digital strategy, and rethinking the business and operating models," says David Nichols, Americas IT Transformation Leader at EY.

There are three core changes here:[3]

1. Using digital to enhance traditional business models, such as moving from selling products to providing services – Streetcar and Xerox are two examples

2. Transforming existing business models to offer new digital services – such as 100Flowers selling via Facebook

3. Inventing wholly new types of business models – from virtual currencies in online games, to others selling its digital data

"In many cases, digital has moved technology toward becoming the front end of the spear rather than the tail feathers," argues Bob Concannon, a partner at executive recruitment firm KornFerry. "Companies are recognizing that a judicious use of IT can lead them toward increases in sales and returns on investment never before possible."

From McDonald's to NBC News, a new job title is taking grip in a rapidly expanding list of companies: the chief digital officer (CDO). Gartner[4] believes that at least 500 such roles already exist, many of which involve acting as strategic advisors to the board and CEO on their digital business strategy. Given the fact that many of the most promising digital technologies are directly supporting customer interaction and growth, these CDOs often hold close ties to marketing, sales, strategy, finance and, of course, IT.

So is the CDO emerging as is often the case with a threat that could replace CIOs, or as a new potential peer, as the CTO or chief data officer? In many respects, this depends on CIOs themselves, argues Bob Sydow, Americas IT Advisory Leader at EY, who sees a potential dividing line between overseeing "systems of records" (in the back office) and "systems of engagement" (revenue-generating and firmly in the front office). "Exceptional CIOs can play both of these roles, and it's better for the organization to have one person doing both."

The challenge, in his view, is that traditional IT functions are often not well set up for innovation and new ideas. They don't have the ability to sit with the sales and marketing organization and have an intelligent conversation about driving revenue. "To counter this, CIOs need to know what drives the business, how business processes work, and how these all fit together," adds Tom Velema, EY's EMEIA IT Advisory Leader. "Otherwise you can see why a CDO could step in instead."

For those CIOs willing to change and step up to the challenge, there is no reason why an existing CIO can't play a CDO's role, according to EY Americas IT Transformation Leader David Nichols. "CIOs can provide a high degree of innovation, especially as they already service many business units, from marketing and HR to the supply chain. But to get this right, companies need to rethink how they organize themselves to ensure the greatest impact from digital," says Nichols.

The CIO divide ahead

In the digital era, these kinds of transformations will be essential to business longevity. But they will also create profound challenges for the firms making them and seeking to make them. And, given the strategic nature of the changes that a digital transformation requires, they also hold major implications for CIOs. "What is keeping leading CIOs up at night? It's the challenge of how their business is going to be fundamentally transformed by digital," says Rob Preston, Editor in Chief of InformationWeek. "It's about the role of technology leaders in a world that puts a premium on innovation and growth, and considers everything else a cost center."

One key issue is the pace and sequencing of the move from today's systems to tomorrow's digital technologies. "It's easy to see and understand the opportunities for these changes, and for cutting capital spending and moving toward a more flexible business model," says Dave Ryerkerk, Global IT Advisory Leader at EY. "But what's really hard for CIOs to answer is this question of pace."

Case study

Zalando and Zooplus: CIOs in online retail

Philipp Erler, CIO, Zalando

Richard Alan Herz, CIO, Zooplus

Unlike most retailers, German-based pet supply company Zooplus was born digital. Launched during the dot-com era, it now operates across Europe, and has annual sales of more than €400m. Digital's rapidly evolving potential – not least the new retail sales channels it opens up and the radical new logistics ideas it can deliver – has made CIO Richard Alan Herz a vital voice in shaping the firm's future business model. "We need agility, given the technology changes emerging, such as new interaction technologies like Google Glass," he says.

But Herz says the firm was originally set up like a standard IT organization because of its strong focus on sales, marketing and logistics. This raises conflicts with sales and marketing who continue to view IT simply as a service provider. To reset this, Herz has been given a direct mandate from the board to be an active participant in core strategic decisions. He is now charged with providing a clear vision of where digital will take the business.

At Zalando, a pan-European online fashion retailer generating well over €1b in annual sales, despite having only been set up in 2008, the CIO shares the experience of being at the heart of setting the firm's digital strategy. However, as IT is decentralized, he has a quite different relationship with the rest of the business. "I don't have a bunch of people from business areas running in the door who think that they have to tell me something to get their requirements prioritized. I have a lot of peace of mind because teams organize things themselves," says CIO Philipp Erler.

This structure frees the CIO up for other responsibilities, from strategic engagement with the rest of the business, through to even acting as a marketer for technology recruitment. "I must manage to establish our firm as a software company and, if we can do that, then we will be a much more exciting proposition for talented developers," says Erler.

Indeed, relatively few CIOs are equipped for the demands of a digital world – and those who are not are increasingly at risk. "As more applications and infrastructure get moved to the cloud, IT leaders whose main job is to keep the lights on will be fewer and farther between," argues EY's Tom Velema, EMEIA IT Advisory Leader. These traditional elements to the role remain vital, but there is also a need for CIOs to be faster and more reactive in supporting innovation and growth. Bob Sydow, his counterpart in the Americas, agrees: "This is a major shift for CIOs, away from their historical focus on running an efficient IT center and toward a focus on innovation. Some are able to make that shift, but others don't have that ability."

Opportunities ahead for CIOs in IT-intensive industries

Previous research[5] revealed that about two-thirds of all CIOs (64%) are generally happy in their roles, but almost half of them (31% in total) want to move into bigger CIO roles, with a broader remit and greater influence over the rest of the business. For these CIOs, digital can provide this opportunity – at least for those who are able to recognize and adapt to this shift.

This is especially apparent in a core set of sectors – including technology companies, banks and life sciences firms – that already spend a high proportion of their revenue on IT. Accordingly, this study focuses on these IT-intensive sectors as they contain the companies that are most likely to have already begun their digital transformations.

The DNA of the IT-intensive industry CIO

CIOs in IT-intensive industries are far more likely to hold places on the executive leadership team and recognize the skills needed for success. They are more likely to be empowered to drive the significant changes associated with the digital business transformation underway and seem to be more satisfied with their posts.
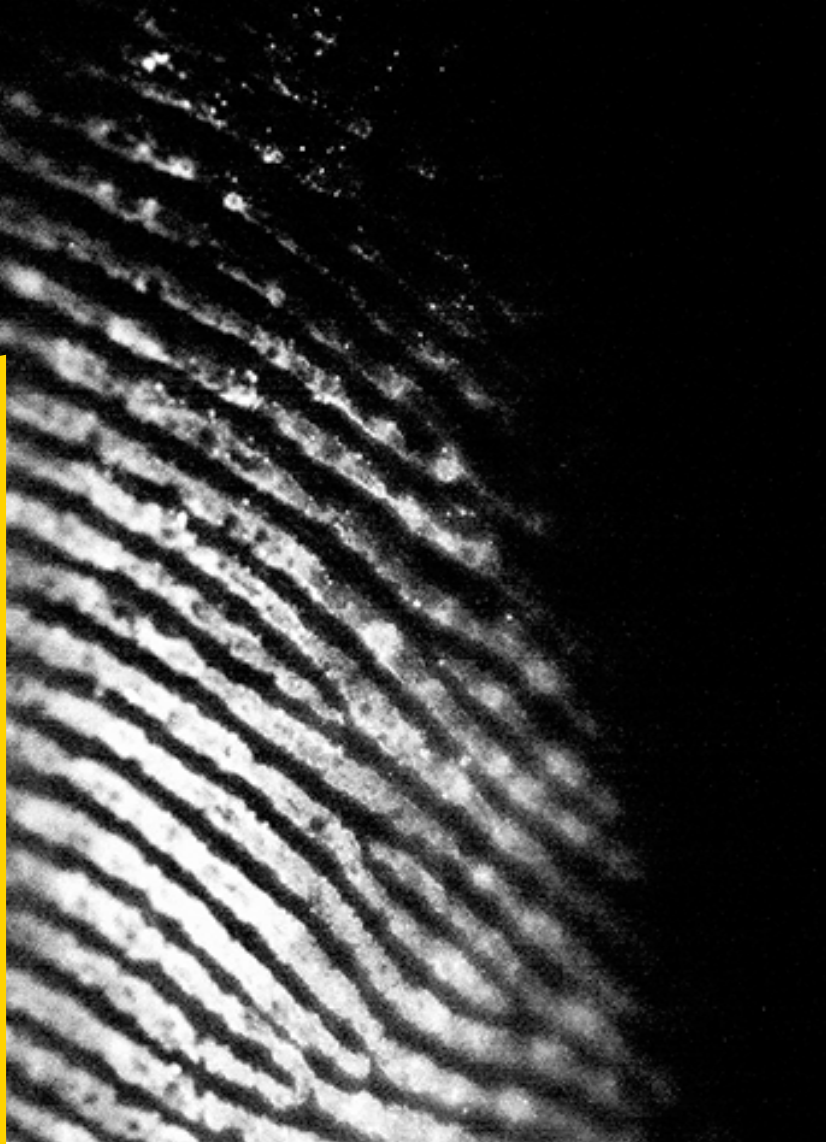
It's easy to pick Facebook as a truly digital business. But there are companies of all sizes that are embracing digital, and they can be found in all sectors, from power and utilities to retail. Given this challenge, we focused on the most IT-intensive industries globally – those with the highest average spend on IT as a percentage of total revenue – because these are the firms most likely to be engaging in digital.

This focus captures many of the firms that are using IT at the very core of their business – banks, pharmaceutical companies, telecommunications firms, media houses and, of course, technology firms themselves. Among these companies, there are some unsurprising names, but also many more traditional businesses.

As *The DNA of the CIO* showed, these firms all provide ideal launch pads for aspirational CIOs. Indeed, what is common across all these companies is that IT is a core boardroom topic, which receives strong engagement from senior executives across the business.

As would be expected, much is being done digitally in these IT-intensive industries: just over half (51%) of CIOs in these industries say that they are already strongly engaged in leading the implementation of such technologies.*

*   Whenever we refer to terms such as strong, deep or key, we refer to those respondents that chose 8, 9 or 10 on a scale from 1 to 10, where 1 is lowest and 10 is highest.
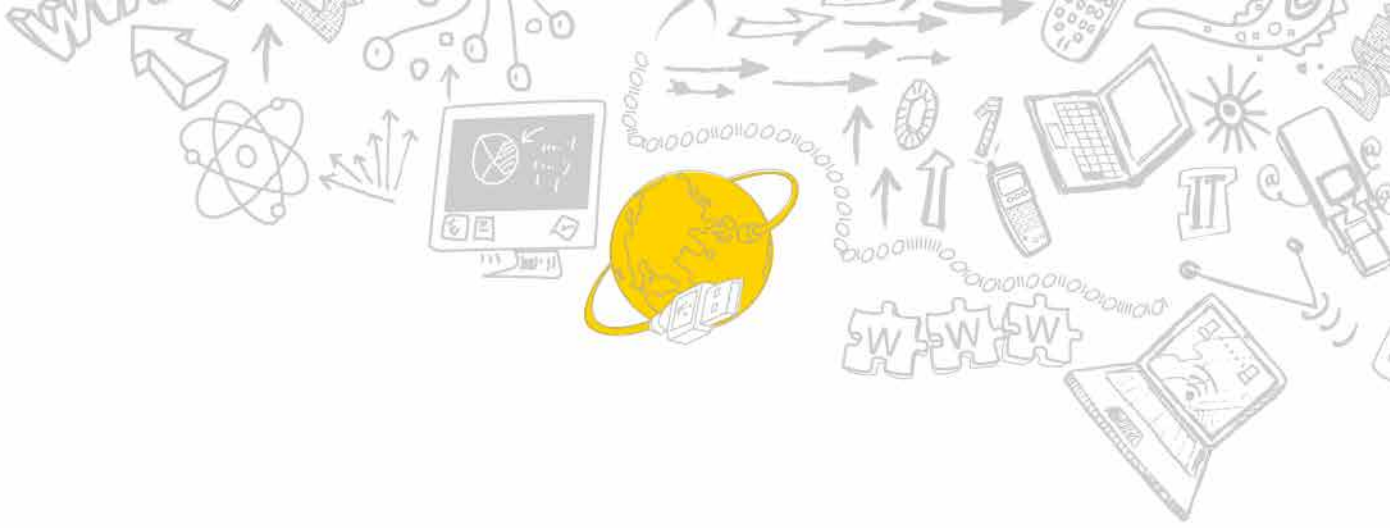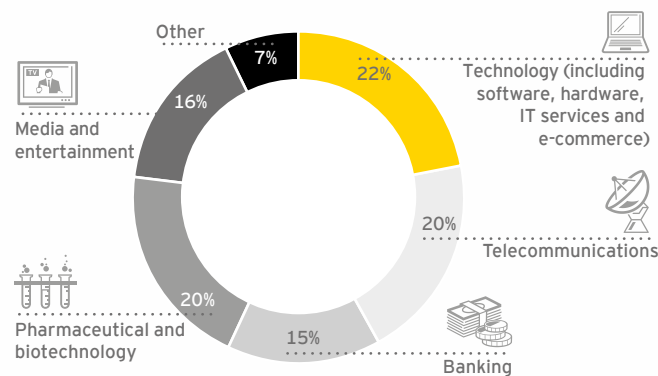
The most IT-intensive industries

An analysis of the top 100 companies, in terms of their total IT spending as a proportion of revenue, shows the key sectors that are investing most in technology to transform their businesses. Their spending ratio ranges from 1.02% to 3.99%, representing vast investments in IT, given that their average revenues far exceed US$1b.

Chart 1

Industry of top 100 companies with the highest IT spend as a % of their revenue

- Other 7%
- Technology (including software, hardware, IT services and e-commerce) 22%
- Telecommunications 20%
- Banking 15%
- Pharmaceutical and biotechnology 20%
- Media and entertainment 16%

Source: Vertical and company size survey, IDC, 2013.

! **"IT-intensive industry CIOs"** refers to the CIOs surveyed for this report, from those sectors that have higher than average ratios of IT spending as a proportion of total revenue.

! **"Typical CIOs"** refers to those CIOs surveyed across all industry sectors for *The DNA of the CIO* in 2012.

How IT-intensive industry CIOs stand out

Given where IT-intensive industry CIOs sit, they are clearly empowered to drive the significant changes associated with the digital transformation. So how do they differ from their peers, the "typical CIOs"?

More often a member of the executive management team

One of the most striking differences is that IT-intensive industry CIOs are far more likely to hold a place on the executive management team. A little more than half (53%) do, compared with just 17% of typical CIOs. In many respects, this makes intuitive sense: with IT having a much greater impact on the bottom line, these firms want someone accountable close at hand. It also highlights how much more influence these IT leaders potentially hold within the business. This is important: for CIOs to truly help address the opportunities and threats that digital transformation provides to their firms, they need to be a part of their executive management team.

However, it's also apparent that many IT-intensive industry CIOs are not making full use of their powerful position. "For years, CIOs have been fighting for a seat at the table. They've understood the importance of building relationships, and how to engage the business with a business-centric vocabulary, and so on. So many now have a seat at the boardroom table, but they don't know what to do with it," argues KornFerry's Concannon. Rather than simply holding budget discussions or operational IT reviews, they should be using this as a chance to make the case for a more strategic engagement on IT across the business, ensuring that technology is deeply represented within the corporate strategy. While many CIOs have to try and make this case via a proxy, often the CFO, a seat at the table gives them the chance to sell the rest of the board on a broader vision.

Why do CIOs often not get this right? In part, it has to do with the transition in mindset that comes with moving from a role that is more focused on the operational elements of the job, to one that is more strategic in nature. Encouragingly, IT-intensive industry CIOs who have reached the boardroom show stronger engagement on a wide range of issues. But those who are able to do more to prioritize the strategic elements of their role will do best over time.
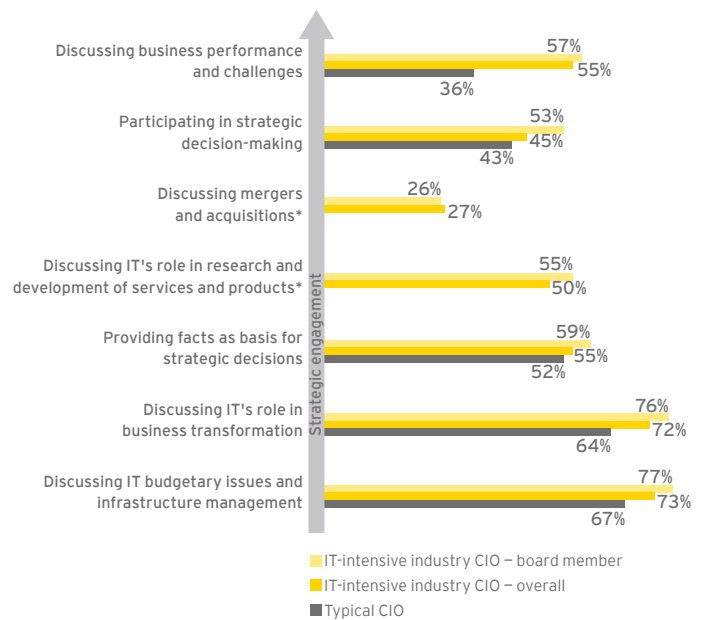
Typically more engaged on strategic issues

One of the clearest differences that mark out IT-intensive industry CIOs from typical CIOs is their far stronger focus on business performance. One in two (55%) regularly engages with the board on this topic – well ahead of just 36% of typical CIOs.

Take Fred Swanepoel, the CIO of Nedbank, one of South Africa's major retail banks, who is a member of the company's executive committee. He provides advice to the board on the strategic direction of the business and leveraging technology to achieve strategic objectives on at least a quarterly basis.

"In IT-intensive industries, you see a more centralized governance model, with IT issues pulled together at a board or executive committee level," he explains. In a business such as Nedbank, this is easy to understand: "We are constantly investigating technologies to improve client experience and operational efficiency, and to make sure the bank stays competitive. When you're talking about banking products today, there are very few products you can actually touch. The computer code facilitates the commitments we make to clients, so the technology environment is strategically important to building and maintaining trust in the organization," he says.

Areas in which CIOs actively engage with the executive management team

Discussing business performance and challenges
- 57%
- 55%
- 36%

Participating in strategic decision-making
- 53%
- 45%
- 43%

Discussing mergers and acquisitions*
- 26%
- 27%

Discussing IT's role in research and development of services and products*
- 55%
- 50%

Providing facts as basis for strategic decisions
- 59%
- 55%
- 52%

Discussing IT's role in business transformation
- 76%
- 72%
- 64%

Discussing IT budgetary issues and infrastructure management
- 77%
- 73%
- 67%

Strategic engagement

- IT-intensive industry CIO – board member
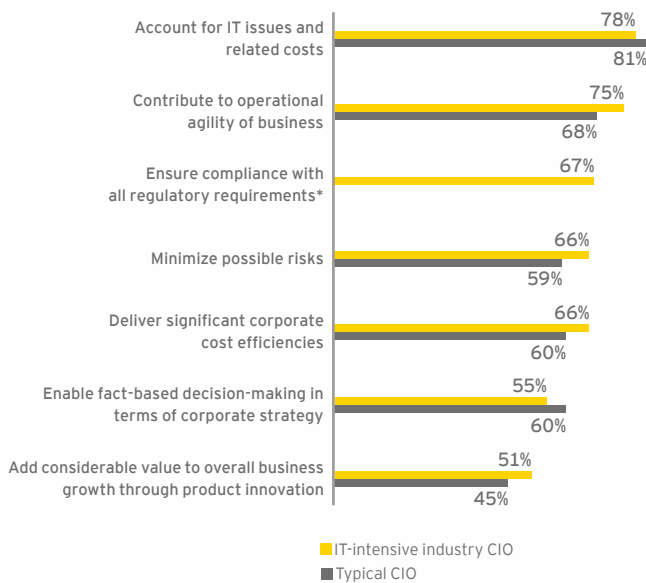- IT-intensive industry CIO – overall
- Typical CIO

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = do not engage at all to 10 = actively engage)
* Answer option was not included into typical CIO survey (*The DNA of the CIO*)

Chart 3
Areas in which CIOs feel they create value for companies

Area	IT-intensive industry CIO	Typical CIO
Account for IT issues and related costs	78%	81%
Contribute to operational agility of business	75%	68%
Ensure compliance with all regulatory requirements*	67%	
Minimize possible risks	66%	59%
Deliver significant corporate cost efficiencies	66%	60%
Enable fact-based decision-making in terms of corporate strategy	55%	60%
Add considerable value to overall business growth through product innovation	51%	45%

■ IT-intensive industry CIO
■ Typical CIO

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = do not add value at all to 10 = proactively add considerable value)

* Answer option was not included into typical CIO survey (*The DNA of the CIO*)

This more strategic focus is visible elsewhere too. When asked about the areas in which CIOs create value for the business, typical CIOs tended to focus on IT budgets and costs (78%). IT-intensive industry CIOs do this too – hardly surprising, given the sustained pressures on the bottom line across businesses of all kinds – but they also tend to show a clearer focus on supporting growth. For example, 51% note that they add significant value through product innovation, compared with just 45% of typical CIOs. Similarly, 75% believe that CIOs can contribute to the operational agility of the business, ahead of 68% of typical CIOs. Similar gains to the role can be seen in other areas too, such as in seeking to minimize risks.
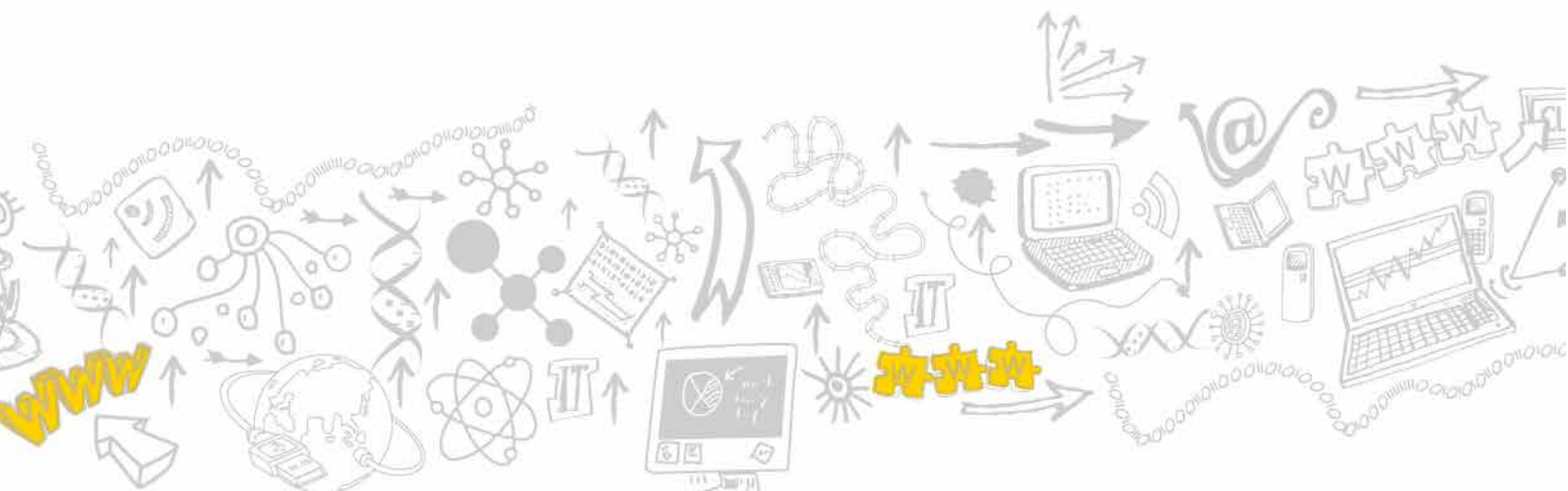
IBM's global-local IT transformation

Diego Calegari, Spanish South American CIO Executive, IBM

As might be expected of a leading technology brand, IBM is deeply engaged with digital. The company is transforming itself across the business – including HR, sales and all other functions – around a set of global tools based on digital technologies such as the cloud. While its global CIO leads this drive by setting the global strategy and driving the overall rollout, CIOs in every region are adapting and localizing the strategy. One such CIO is Diego Calegari of IBM South America: "We are in the middle of this shift, but the next phase of our local transformation will be to focus closely on mobile for our market," he says.

All this means that he has far more engagement with business transformation, in stark contrast to many local CIOs that Calegari knows. "I see many who are focused on operations and infrastructure issues, rather than working with the rest of the business to truly transform it," he says. "This has been a big shift for us over the past few years. Three years ago, I probably spent 30% of my time on innovation and transformation, and 70% on supporting operations and the business. It's now the opposite."
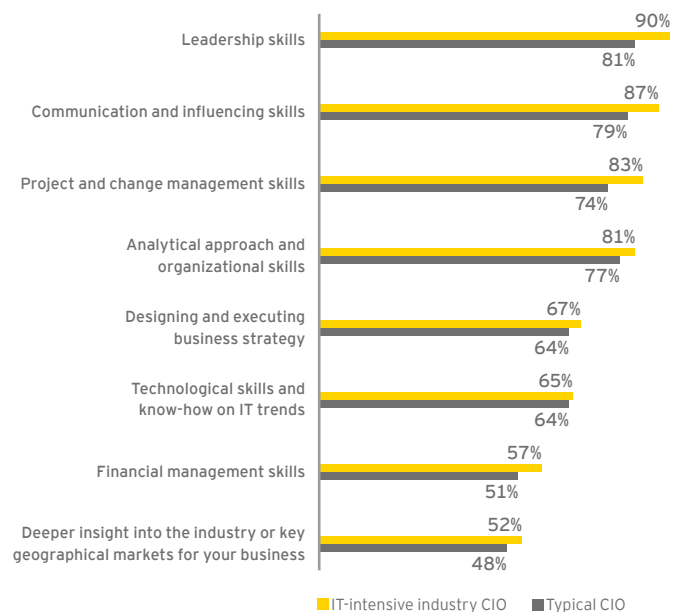
This is not the only practical change. He's now more closely engaged with the front office of the business, acts as the link between the firm's global IT strategy and its local implementation, and keeps a close eye on how these changes help to drive growth.

More aware of the skills needed to succeed

Inevitably, when executives are pushed to focus on higher-level strategic issues, there is a consequent shift in the skills that they need to succeed. IT-intensive industry CIOs acknowledged a greater need for softer skills such as leadership, influencing and change management. For example, 90% see leadership as strongly needed to perform best in their role, ahead of 81% of typical CIOs. The same pattern is seen for financial skills: 57% of IT-intensive industry CIOs said they strongly needed these skills, whereas only 51% of typical CIOs said the same. This recognition of the need for a broader palette of skills to draw upon, beyond any core IT competencies, is also reflected in the choices that many IT-intensive industry CIOs make with regard to their education and job experience, which more often shows a broader background than with typical CIOs (see section 4 for more).

Chart 4

Attributes required to perform best in CIO role

Attribute	IT-intensive industry CIO	Typical CIO
Leadership skills	90%	81%
Communication and influencing skills	87%	79%
Project and change management skills	83%	74%
Analytical approach and organizational skills	81%	77%
Designing and executing business strategy	67%	64%
Technological skills and know-how on IT trends	65%	64%
Financial management skills	57%	51%
Deeper insight into the industry or key geographical markets for your business	52%	48%

■ IT-intensive industry CIO ■ Typical CIO

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = not needed at all to 10 = absolutely needed)

However, it is also apparent that many IT-intensive industry CIOs still struggle to translate this need for stronger communication and influencing skills into practical reality. For example, few of them appear to hold stronger relationships across the business than typical CIOs do. In fact, they often have weaker relationships. This is true internally, where they have weaker links with core figures such as the CEO or CFO, but also externally, where ties both with regulators and end customers aren't as strong. For IT leaders who hold as much sway as they do to influence other parts of the business, this is a missed opportunity.

"Digital is creating new demands for leadership. Some CIOs are ready for that and some aren't," notes KornFerry's Concannon. "This talk about 'the CIO is dead' is sort of silly, but it's clear that the role is going to change a lot. I have to be a proactive advisor to the business, providing solutions and discussing new approaches," says Zalando CIO Philipp Erler. EY's Tom Velema adds that the biggest challenge for a CIO has always been about getting to be seen as a business enabler rather than a business problem. Digital presents CIOs with a fresh opportunity to become relevant to the business, but this digital CIO needs different DNA.
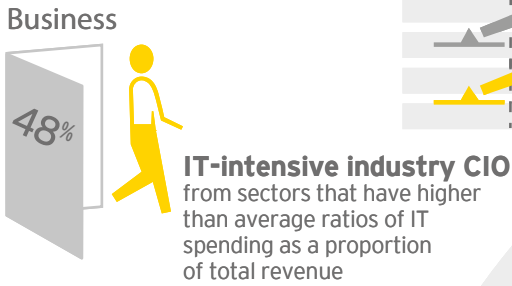
Inclusive technology?

Gender diversity in IT-intensive industries

CIOs are not the most gender-balanced group. For the most part, typical CIOs tend to be male: just 4% of IT leaders polled for *The DNA of the CIO* were female. In contrast, however, IT-intensive industries appear to be rather more inclusive, with three times as many female CIOs as other sectors. Unfortunately, they remain a clear minority – at just 12% of the sample – but it suggests that these businesses are making a greater effort to attract more female executives.

The IT industry is the sector that has been the most successful in attracting women to the highest roles in IT: 1 in 5 of the top 25 CIOs there are female – including Cisco's Rebecca Jacoby and Lenovo's Wang Xiaoyan. This is a far cry from the one woman among the top 25 companies in banking or life sciences, or the two within telecommunications. Much progress remains to be made, but the IT sector is clearly doing what it can to push ahead.
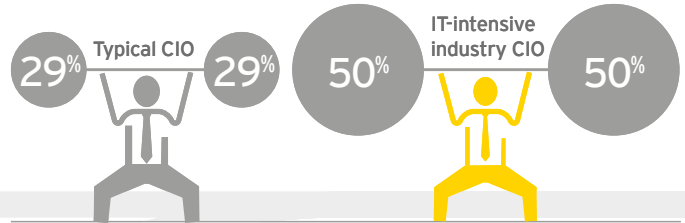
Chart 5

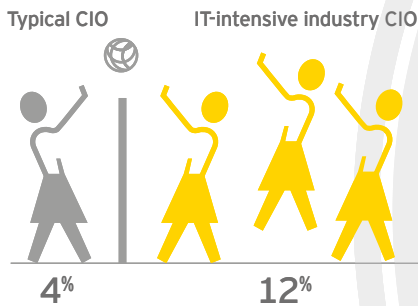# How IT-intensive industry CIOs stand out

Educational background

IT

46%

Typical CIO
from any sector and with manifold backgrounds

Business

48%

IT-intensive industry CIO
from sectors that have higher than average ratios of IT spending as a proportion of total revenue

The race to go digital

Appetite for strategic engagement

29% Typical CIO **29%**   **50%** IT-intensive industry CIO **50%**

They are typically more engaged in corporate strategy and development

Share of women

Typical CIO   IT-intensive industry CIO

4%   **12%**

Top three skills needed to succeed

Typical CIO   IT-intensive industry CIO

	Typical CIO			IT-intensive industry CIO	
79%	81%	74%	87%	90%	83%

■ Communication and influencing   ■ Leadership   ■ Change management
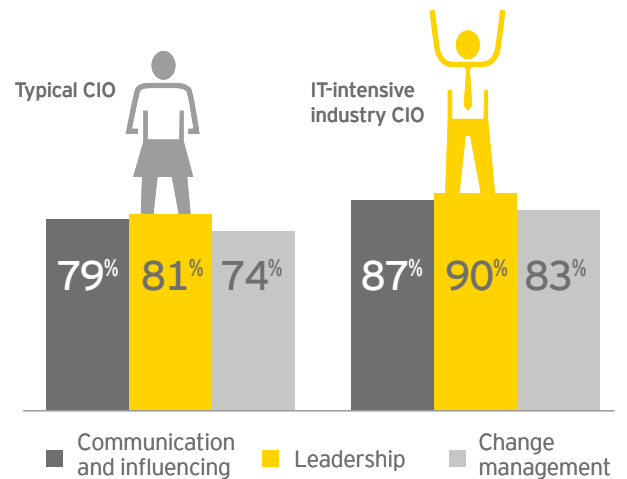
Satisfaction with the external perception of the CIO role

45%
IT-intensive industry CIO

Typical CIO
39%
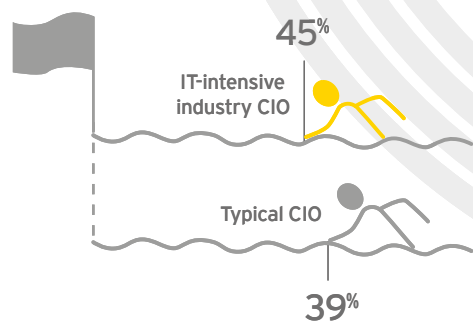
Career ambitions

IT-intensive industry CIO

Typical CIO
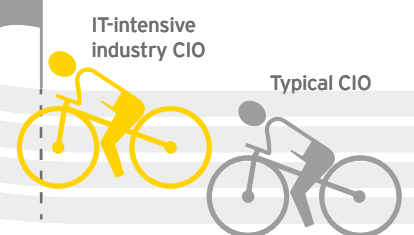
IT-intensive industry CIOs are more ambitious overall, but especially when it comes to aspiring business executive positions

Discussing business performance with the executive management team

IT-intensive industry CIO

55%

Typical CIO
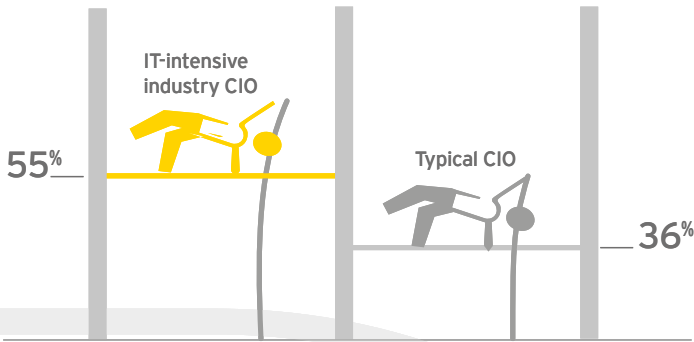
36%

Leading digital transformation

IT-intensive industry CIO

51%

IT-intensive industry CIOs are leading implementation of digital technologies such as cloud, mobile and analytics

Average age

Typical CIO 42.8

45.1 **IT-intensive industry CIO**

Seat at top table

Typical CIO

IT-intensive industry CIO

53%

17%
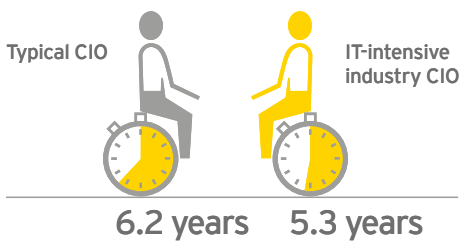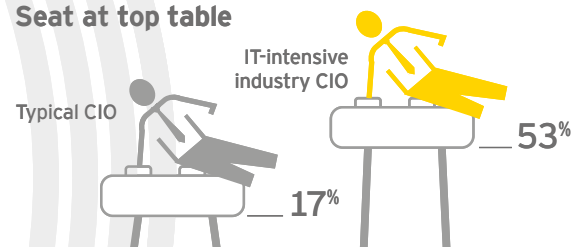
IT-intensive industry CIOs are more likely to hold a seat in the executive management team, offering huge chances to transform the business

Average time in role

Typical CIO

IT-intensive industry CIO

6.2 years   5.3 years

Involvement in innovation

IT-intensive industry CIO

50%
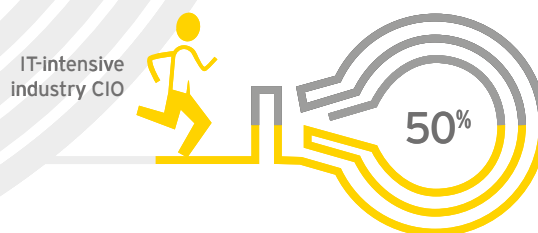
Relationships to succeed

IT-intensive industry CIO

Focus on front office

Typical CIO
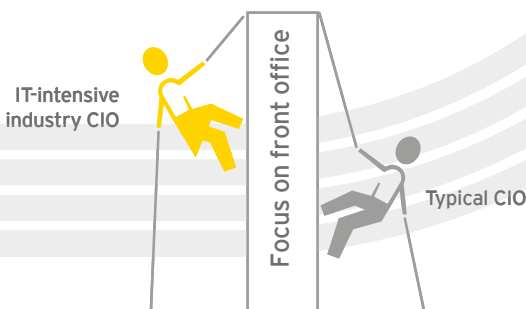
IT-intensive industry CIOs build closer relationships with the CMO and clients

A mindset for change: six traits of the digital-ready CIO

Those CIOs most engaged in corporate development show striking differences in how they approach their jobs. We find these attributes to be closest to the core set of skills and capabilities needed to drive the digital transformation, from vision and storytelling, to courage and a focus on growth. However, they're just as applicable to any CIO wanting to stand out and perform in their role.

An IT-intensive company can provide the ideal context for CIOs to embrace digital. But to actually do so still requires the individual in question to find the motivation to lead this change. In short, it demands a different mindset.

To delve deeper into this mindset, we assessed the characteristics of those CIOs most engaged in the strategic elements of their jobs, who are delivering both on business transformation as well as business model-related innovation. These are the two elements that *The DNA of the CIO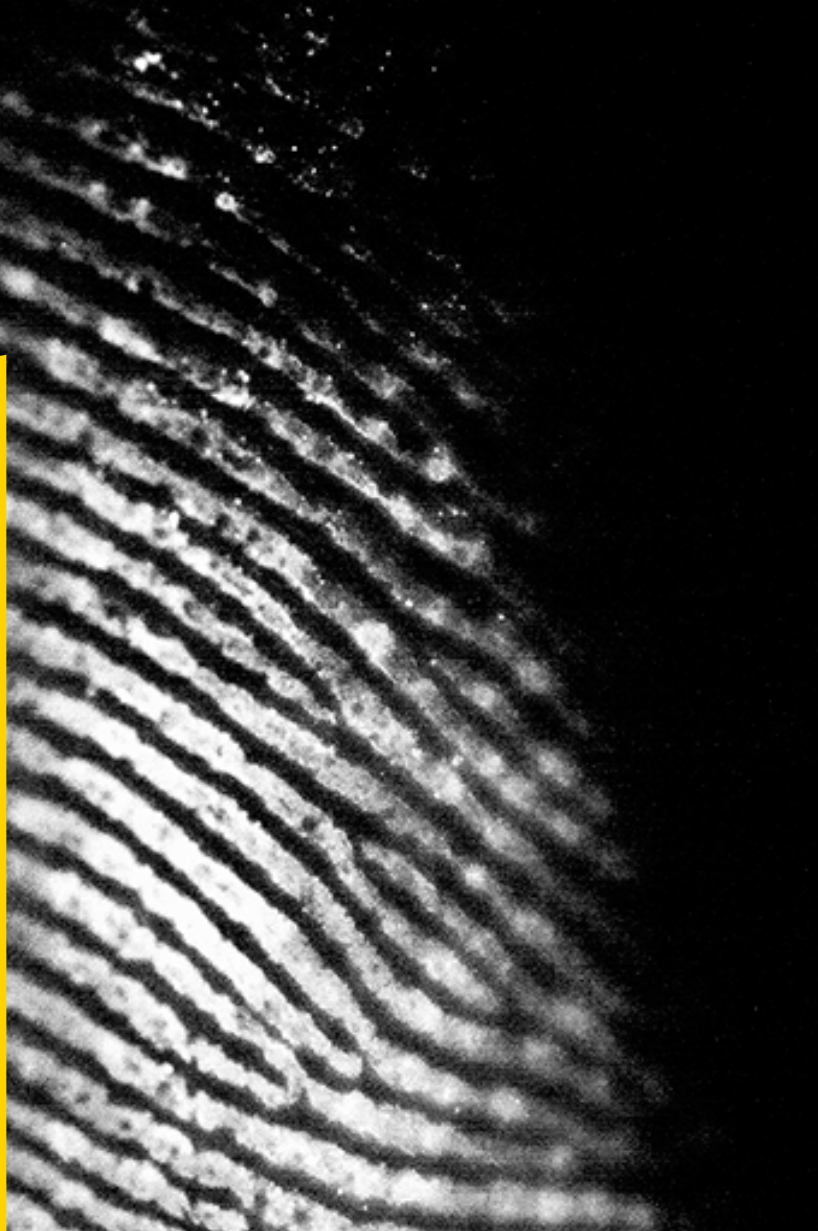* identified as the most helpful for CIOs trying to stand out in their role – and they are, as this research reveals, fundamental aspects of driving digital transformation. While all three sections of the wheel together represent the full remit of any given CIO, those IT leaders who push hardest and use innovation to change and develop their business are the ones most likely to be building a truly digital business.

Among the IT-intensive industry CIOs surveyed, nearly one in four (38%) were focusing far more on these most strategic elements of the job. These leading CIOs show an ability to reframe their thinking and present a positive story to the rest of the business about how technology can deliver a very different future. "A lot of this is about being proactive. Being able to walk in and suggest where the opportunities are for the organization. Too many CIOs are simply reactive, which is why they lose credibility with the rest of the business," explains EY's Americas IT Advisory Leader Bob Sydow.

This proactive approach is apparent in the wide range of areas in which these leading CIOs seek to create value, with strong engagement across everything from product innovation and operational agility, through to supporting decision-making. At the same time, they also carefully manage expectations, walking the fine line between keeping the business excited about the potential of IT, while keeping a realistic sense of what's truly possible.
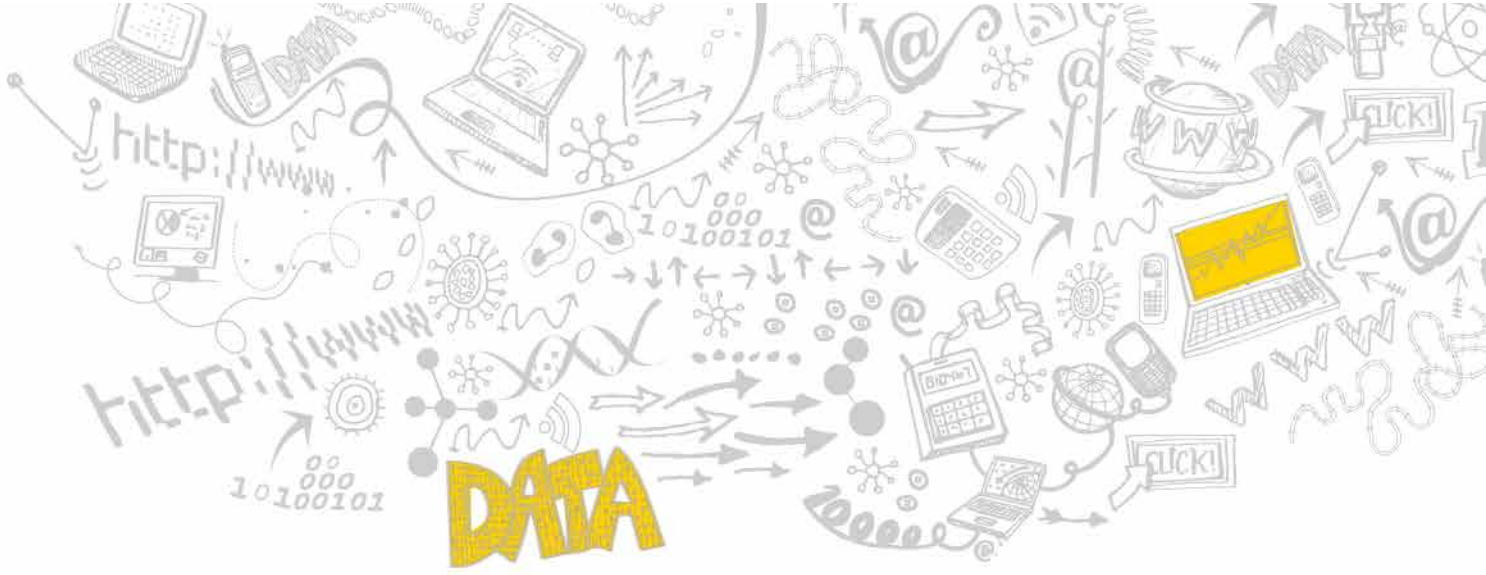
In return, they appear to benefit materially from this: 7 in 10 (71%) of these CIOs strongly agree that their standing within the business has materially improved over the past three years, well ahead of the 54% of IT-intensive industry CIOs overall — and even further ahead of those CIOs who had least prioritized the strategic elements of their role and their influence on corporate development (just 43%). In fact, across a broad sweep of areas, these CIOs stood out as natural leaders. Unsurprisingly, then, they have a far stronger voice in the business overall. But equally, despite already being highly skilled and well positioned within the business, they remain eager to keep developing their capabilities. We've called them the "digital-ready CIOs."

By focusing on how their views differed from others, we found that a set of six distinctive traits stood out. Collectively, these mark out the digital-ready CIOs as role models for any other CIOs seeking to stand out from the crowd and fulfill their career aspirations. This is certainly true for those CIOs getting engaged in a digital transformation, but it's just as applicable more generally for any CIOs simply wanting to gain a stronger voice in their organization. After all, these digital-ready CIOs can be seen to hold better career prospects and are more highly regarded in the business.
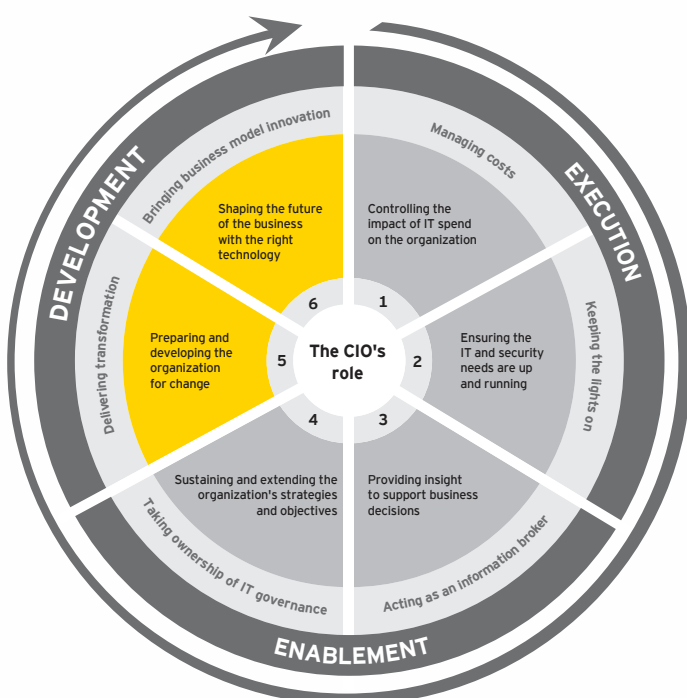
! "Digital-ready CIOs" are those CIOs who rated 8, 9 or 10 on a scale of 1 to 10 on the corporate development aspects of their roles based on the wheel model. As EY's *The DNA of the CIO* revealed, these qualities are what best enable CIOs to deliver on core business changes, such as the digital transformation now underway.

Six distinctive traits of digital-ready CIOs

1 Digital-ready CIOs have a strategic vision of how technology will transform the business – and know how to implement it.

2 Digital-ready CIOs innovate relentlessly.

3 Digital-ready CIOs focus closely on driving growth – and the relationships they need to support this.

4 Digital-ready CIOs ensure their vision is understood.

5 Digital-ready CIOs move beyond operations and infrastructure.

6 Digital-ready CIOs are courageous risk-takers.

Six distinctive traits of digital-ready CIOs:

1 Digital-ready CIOs have a strategic vision of how technology will transform the business – and know how to implement it.

By definition, all of these CIOs have a clear vision about the future state of the business. They have a powerful sense of how and where digital can transform product development or sales and marketing, and how it can open up new lines of revenue. While the CEO knows where the wider business is headed, the digital-ready CIO can show how technology can enable and support that journey. Close to 9 out of 10 (87%) digital-ready CIOs focus tightly on making the case to the executive management team for IT's role in business transformation. That figure is well ahead of the 72% of IT-intensive industry CIOs. "It's very important that a CIO has a vision for the company that is directly linked to its business model," says Nykredit CIO Lars Mathiesen. And as InformationWeek Editor in Chief Rob Preston puts it: "You need to be something of a visionary, an innovator and a big thinker, not just an order taker."

All this implies that the digital-ready CIOs have a close understanding of their companies' underlying business models, and products and services. EY's Dave Ryerkerk notes that, in the past, businesses would draw up a major initiative – setting out the required processes and the associated operating model – before "throwing it over the fence to IT to set it up and automate it." Today, digital technologies shape the design of a firm's processes and operating models. Indeed, Bob Sydow, Americas IT Advisory Leader at EY, notes that one of the core capabilities needed for digital-ready CIOs is an intimate knowledge of the firm's business architecture, along with the ability to manage and drive complex implementation programs. "Our technology team has an open process creation approach, rather than simply receiving processes and supporting them. We are able to describe the target processes, and define how to go about transforming them," explains Zalando's CIO Philipp Erler.
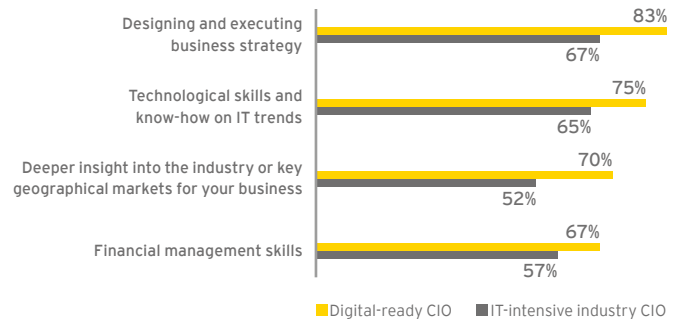
At the global software company SAP, for example, Americas CIO Michael Golz is clear on how digital has transformed the inner workings of the business. "When I look at the sales and marketing organization, the amount of automation and data-driven information that they use in their daily business is magnitudes bigger than just a couple of years ago," he says. Via mobile apps and analytics, IT provides real-time information about the health of the business at any given moment. "If we were to take this away, I would not know how we'd run this business. It takes out risk. It takes out a lot of the variations. It gives us insight into new opportunities to cross-sell or up-sell," he says.

As this implies, the ability to deliver on this vision is just as important as the vision itself. "You shouldn't talk about your vision if you're not able to execute on it," says Nykredit's Mathiesen. When asked what attributes are most needed to help them stand out in their roles, digital-ready CIOs place far more importance on the ability to design and execute business strategy. More than 8 out of 10 (83%) place a high focus on this, compared with just 67% of IT-intensive industry CIOs.

Digital-ready CIOs are also far more likely to recognize the breadth of skills needed to succeed in the role: they place more importance on their close understanding of their market or industry (70% compared with 52% of IT-intensive industry CIOs), on their financial skills (67% versus 57%), and on their technological know-how (75% versus 65%). "Just as importantly, this needs to be backed up with ruthless execution, which means CIOs need to really get their delivery organization in order," says EY's Tom Velema.

Attributes required to perform best in the CIO role

	Digital-ready CIO	IT-intensive industry CIO
Designing and executing business strategy	83%	67%
Technological skills and know-how on IT trends	75%	65%
Deeper insight into the industry or key geographical markets for your business	70%	52%
Financial management skills	67%	57%

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = not needed at all to 10 = absolutely needed)

"When I look at the sales and marketing organization, the amount of automation and data-driven information that they use in their daily business is magnitudes bigger than just a couple of years ago."

Michael Golz, CIO Americas, SAP

> ## "I spend at least 30% of my time on innovation."
>
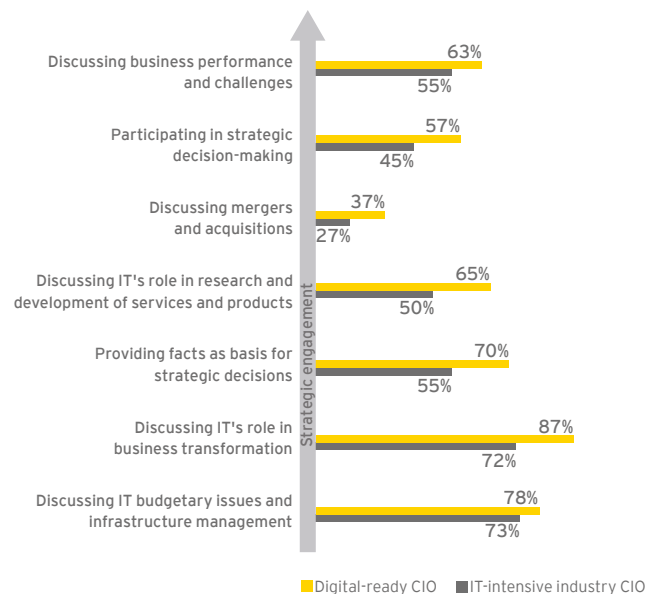> **Anonymous**, CIO, leading Chinese telecommunications company

2   Digital-ready CIOs innovate relentlessly.

Digital-ready CIOs strongly see the need to bring innovation both at a business model level and in terms of new products and services – something picked out by 81% of digital-ready CIOs, well ahead of the 64% of IT-intensive industry CIOs overall. They're far more often exploring how to create new mobile interfaces or e-commerce solutions, or considering how social media can be used to reinvent customer service, and uncovering new data-driven insights.

"My job is to find interesting new ideas and innovations, and bring them back to the CEO to discuss which of them could fit into our business," says Alexander Gornyi, the CIO of Mail.Ru, the Russian internet communication and entertainment company. "We don't trade in oil; we trade in innovation, so IT needs to be far closer to the decision-making in our business." Overall, 71% of digital-ready CIOs strongly affirm that they are responsible for driving disruptive new technologies – such as cloud, mobile and analytics – within the business, compared with just 51% of IT-intensive industry CIOs.

All CIOs focus on issues relating to business performance and IT budgets, but digital-ready CIOs are far more engaged in the question of how to open new markets. For example, about two-thirds (65%) of digital-ready CIOs are strongly engaged in discussing IT's role in researching and developing new services or products with the executive management team, compared with just 50% of IT-intensive industry CIOs overall. "I spend at least 30% of my time on innovation," remarks the CIO of a major telecommunications operator in China, who asked to remain anonymous. "I have 100% influence on technology innovation, which requires that I have both a technology background and also an understanding of corporate strategy and operations."

Chart 7

Areas in which CIOs actively engage with the executive management team

Area	Digital-ready CIO	IT-intensive industry CIO
Discussing business performance and challenges	63%	55%
Participating in strategic decision-making	57%	45%
Discussing mergers and acquisitions	37%	27%
Discussing IT's role in research and development of services and products	65%	50%
Providing facts as basis for strategic decisions	70%	55%
Discussing IT's role in business transformation	87%	72%
Discussing IT budgetary issues and infrastructure management	78%	73%

■ Digital-ready CIO   ■ IT-intensive industry CIO

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = do not engage at all to 10 = actively engage)

As CIOs show where and how they can use digital to innovate, innovation then becomes part of what is expected of them. "In our business, the board's expectation is that IT is the innovation force that can change the business in the future," explains the CIO of a major Chinese insurance firm, who asked to remain anonymous. Her work in using mobile and analytics to drive greater sales is representative of where this role is headed (see next trait for more).

Accordingly, digital-ready CIOs are keenly aware that they can add value by analyzing and innovating existing business processes. Seventy percent of digital-ready CIOs see this as the area in which they create the most value for the business, ahead of 61% of IT-intensive industry CIOs. Furthermore, in considering where CIOs ought to create value for their business, 68% of digital-ready CIOs point to the need to support growth through product innovation, compared with just 51% of IT-intensive industry CIOs.

Of course, all this is also a challenge, as EY's David Nichols warns: "The questions these CIOs are asking are: how best to handle the rapid pace of innovation going through the rest of the business, what it means for them, and how to build an IT organization that can react to that. These are the key themes that the digital CIO is going to have to be concerned with."

Case study

Why CIOs and CMOs must learn to love each other – not only at SAP

Michael Golz, Americas CIO, SAP   **Jonathan Becher**, CMO, SAP

Michael Golz and Jonathan Becher, respectively the Americas CIO and global CMO at SAP, believe their functions have changed so fundamentally with the advent of digital technologies – such as big data, mobile, social media and cloud – that marketing and IT have no choice but to forge ever closer relationships. Becher cites the adage that marketers know that half their marketing investment is wasted, but do not have any idea which half. "But there's no excuse any more. We know how to measure the return on everything we do. The single biggest trend for marketing is to be very data-oriented," he says.

Of course, this raises specific challenges in the interface between marketing, which is seeking this insight, and the IT team delivering it. "IT traditionally comes from the perspective of improving a business process with an implementation over a longer cycle," reflects Golz. "Now we're in a world where things are instant – whether it's data consumption, acquisition or analytics, people expect answers immediately. To deal with this, IT and marketing must get closer."

To achieve success, IT and marketing must learn to communicate more effectively and collaborate more closely. "There are so many different technologies that I think one of IT's biggest contributions right now is to guide on how to integrate these all, and bring these pieces together," says Golz. Unsurprisingly, this requires a far closer CIO-CMO relationship, so that IT can truly understand what marketing is aiming to deliver, and ensure that this is properly joined up with the rest of the business. This is especially true as CMOs spend an increasingly large proportion of their budgets on technology. For most, this is now 15%-20%, according to EY research.[6]

> "Now we're in a world where things are instant – whether it's data consumption, acquisition or analytics, people expect answers immediately. To deal with this, IT and marketing must get closer."
>
> **Michael Golz**, CIO Americas, SAP

3 Digital-ready CIOs focus closely on driving growth – and the relationships they need to support this.

One of the standout points about the digital-ready CIO is that they are looking toward the front of the business, seeing how technology can help to drive growth by changing the way the company markets and sells its wares. The CIO of a major Chinese insurance company explains how her firm is working closely with the front office to give them the mobile tools they need to boost sales. Building on this, she's working to improve the analysis and mining of data captured, to gain greater customer insights and design more effective sales campaigns. "We've seen a clear increase in sales efficiency already," she says. As a result, the executive management team has now tasked her with applying data analytics to generate new customer insights – and then to work with the business to apply those insights to sales and marketing, and even product design. "All our technology will be leaning toward increasing sales productivity, and giving our agents more tools to use when they are in the field," she says.

Clearly this implies a much closer emphasis on fostering relationships with the front of the business, rather than focusing predominantly on the back office. "We need to understand the company's business operations deeply and both its front- and back-end processes," says the CIO of a major Chinese telecommunications operator. Most obviously, while CIOs often fail to realize the value of their company's external clients to their careers, digital-ready CIOs are far more engaged here. Nearly twice as many (59% versus 33% of IT-intensive industry CIOs) cite end clients as being strongly important to their career. Many others also realize the importance of roles such as the CMO or head of sales to their career.

But this is not just about recognition. Digital CIOs also act on this: 59% say they have a very strong relationship with their CMO, compared with just 37% of IT-intensive industry CIOs. Modern CIOs need to be true partners with marketing and sales, forming an alliance whereby the CSO and CMO deliver insights on customer expectations and interests, and the CIO can deliver on these through new systems and processes that make the most of these insights.

Herman de Prins, the CIO at Belgian pharmaceuticals company UCB, explains how he spends a lot of time helping to facilitate multichannel marketing – and making sure the front office understands what's possible. "They also need to think differently in terms of integrating digital activities into their analog activities. You need to get them to look at their business in a completely new way, not just automating a particular process," he says.

The same need for stronger relationships applies outside the business too. CIOs must get closer to the firm's end customers, their needs and preferences. Half (52%) of digital-ready CIOs place a strong emphasis here, well ahead of their IT-intensive industry peers (37%). "Whenever we've asked CIOs, we find that those who regularly meet with customers are still very much the exception," notes InformationWeek's Preston.

Chart 8
Business relationship of CIOs with internal and external stakeholders

External

Direct reports and subordinates	94% / 90%
Chief financial officer (CFO)	75% / 63%
Department heads	75% / 59%
Chief executive officer (CEO)	73% / 58%
Chief operating officer (COO)	63% / 54%
Chief marketing officer (CMO)	59% / 37%
Chief sales officer (CSO)	44% / 39%

Internal

Clients	52% / 37%
Regulators	44% / 31%
Analysts	43% / 33%
Media	33% / 21%

■ Digital-ready CIO   ■ IT-intensive industry CIO
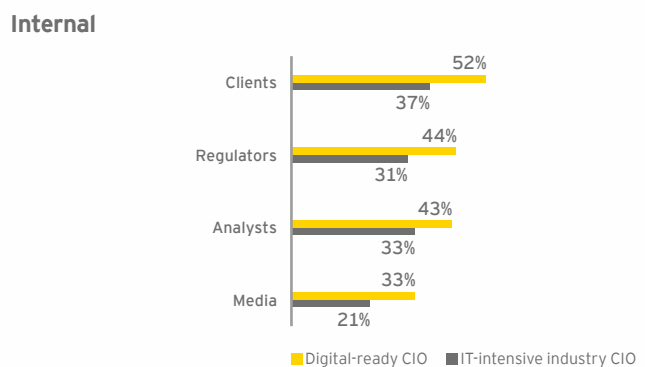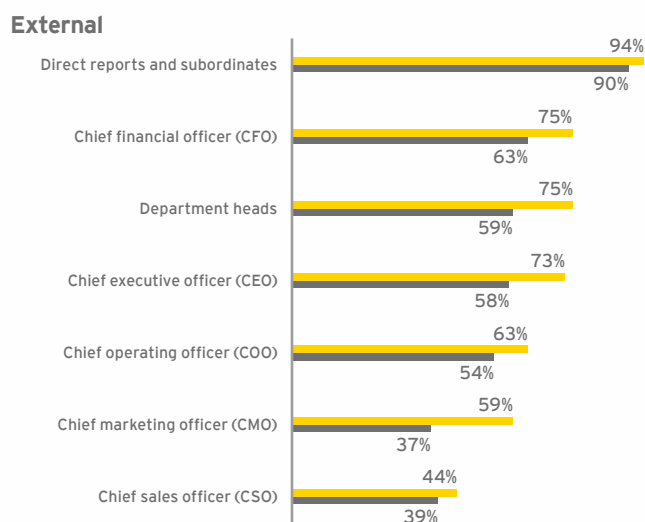
(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = needs substantial improvement to 10 = absolutely excellent)

"Storytelling is a key skill."

Diego Calegari, Spanish South American CIO Executive, IBM

4 Digital-ready CIOs ensure their vision is understood.

The next trait that stands out is the ability to craft a compelling story about how technology can transform the business. This is vital: digital changes the way many businesses work, opening up wholly new possibilities, but people have to buy into this vision, and understand how it might benefit them – in short, CIOs need to be master storytellers. Not with the aim of selling a fairytale, but rather in creating an exciting narrative that the rest of the business can buy into.

Communication is a vital part of any CIO's role, and one where many acknowledge the need for improvement. But the ability to craft a tale of how the business might look and work after a digital transformation further intensifies this need. "Storytelling is a key skill," says Diego Calegari, Spanish South American CIO Executive at IBM, who explains that true storytelling requires a deep grasp of the core of the business and how it works, in order to explain how it can change in future.

SAP Americas CIO Michael Golz cites examples of CIOs he meets in his peer-to-peer customer conversations, like the aerospace CIO who explains convincingly the impact of harnessing in-flight sensor data to transform their business model, or the medical device CIO who articulates the impact of information technology on their products to improve the well being of patients, while creating deep customer relationships. "These CIOs clearly know their industry business processes, the value of collecting data from their products, the business around monetizing that data, and creating value-added services. They know how to explain these new business models, which may be more profitable than actually building the physical products," says Golz. "So it's a true business conversation. It's not about upgrading system XYZ to improve efficiency by 0.5%."

In particular, a CIO should be able to explain the strategy of the company, the strength of its products, and its go-to-market strategy, using the relevant business terms and KPIs. Digital-ready CIOs more often recognize this need: 9 out of 10 cite communication and influencing skills as strongly important to their roles. "Now that technology-driven innovation has become critical to organizational success, there is more pressure on the CIO to communicate that importance," says Nedbank's CIO Fred Swanepoel. "It's about your ability to go head-to-head with business executives in discussions about IT's role in changing the core of the business. It's here that I often see the traditional techies struggle."

Swanepoel has sometimes engaged external management consultants to help bring a fresh perspective on what the core of the narrative ought to be: "If you are working in IT all day, you've got to concentrate on lifting the conversation to a level at which the board can be comfortable. But sometimes the story is just too complicated, and you need some external help to tell it in a compelling fashion. That was definitely an inflection point for me."

An important factor that can further put weight on CIOs' communication skills is their relative position within the business. This is extremely vital for those CIOs who don't hold board-level positions. With a seat at the top table, you have greater authority to push through changes directly. But others must rely more on their powers of persuasion, which makes a closer link to the CEO or other key executive stakeholders more vital. At the French-Japanese car alliance Renault-Nissan, Managing Director IT/IS Celso Guiotoko makes use of his strong relationship with the CEO, and of more informal approaches, to garner the necessary influence. "The fact that we have the corporate executive cafeteria is very useful for me, because I can sit with some of the corporate officers and talk about any issues and opportunities, or about how they can get more value from IT," he says. "In addition, I have a very good communication line to the CEO: we meet on a monthly basis."

At the same time, digital-ready CIOs are using media channels to drive influence. You can talk up the potential of IT and to help foster momentum internally. "That is one of the reasons why we go public on certain things, so that the media can come back and ask where we've gotten to on this. It puts a bit more pressure on us to get things done," says Guiotoko. The use of social media can also help to build a greater presence both internally and externally, and to make the CIO more approachable. For example, UCB's Herman de Prins, who prefers to keep work-related topics out of social media, uses his passion for cycling as a source for non-work-related updates and links them to technology, which in turn has helped him to forge a range of positive connections across the business.

5 Digital-ready CIOs move beyond operations and infrastructure.

Something common among many of the CIOs interviewed for this report is a desire to prevent their roles from being taken over by the operations and infrastructure elements. As Sanofi CIO Bruno Ménard points out, it is a question of CIOs deciding where they really want to invest their time. "If you want to run the operations yourself, that is a huge management demand, so it will affect your abilities on strategy and innovation. You cannot do both," he explains.

This isn't to suggest that leading CIOs think that operations and infrastructure are not important, but rather that they see these as foundational elements that should be run as efficiently as possible, to free up their time for the more strategic aspects of their role. "The first thing for digital CIOs is to move spending away from 'keep the lights on' kind of operational stuff that doesn't make their companies any money or serve their customers any better," argues InformationWeek's Rob Preston. "Those who focus solely on this are just chief infrastructure officers, and that's not a good long term career prospect."

A lot of CIOs agree, noting that many of the traditional IT leaders they meet at conferences appear to be no more than infrastructure managers. "They typically don't come close to having board-level discussions, and usually lie several layers away from the CEO," notes Zooplus CIO Richard Alan Herz. Nedbank's Fred Swanepoel adds: "In our business, sorting out the operational and efficiency side is just the foundation for reliably delivering excellent client service. We build on that foundation by focusing on innovation to drive sales, deliver product breakthroughs, and fine-tune pricing models to influence changes in client behavior."

"I spend little time on back office and a lot on what you could categorize as digital," explains UCB's Herman de Prins. "I made a choice not to micromanage projects and get caught up in steering committees and so forth. We do 150 projects per year but I trust my team to manage them well. That frees up my time to do different things, such as being more connected externally and focusing on a few areas that are transformational," he says. Even so, he still finds scope for innovation. For example, UCB's IT team deployed a new flash memory-based system that boosted the overall performance of the company's statistical programming by a factor of 20. "Is that a back-office thing? I don't think so, because efficiency is good for everybody and most importantly for patients."

SAP Americas CIO Michael Golz agrees. He sees that embracing digital has meant a much clearer focus on more radical innovation elsewhere in the business, rather than on trying to squeeze limited gains from the company's core IT systems. "You can optimize endlessly, and it's going to create some incremental improvements, but the real spending is being redirected into platforms, around analytics, big data, mobility and the cloud or whichever area has the highest benefit for your company," he says.

This is borne out in the survey results. While for IT-intensive industry CIOs, the most notable increase in their focus has been on issues relating to ensuring basic IT needs are up and running, digital-ready CIOs have been putting more attention on other issues, such as enhancing business processes and preparing the organization for change. Even so, they do not forget the operational elements – understanding that smooth operational running is what allows them to have other focuses.

Nevertheless, digital-ready CIOs do seek out bigger opportunities in IT infrastructure. But with one such opportunity, the cloud, the attraction for many IT leaders is that it has the potential to reduce the time and money spent on systems and infrastructure.

Chart 9
Priority of tasks compared with five years ago

Digital-ready CIO   IT-intensive industry CIO
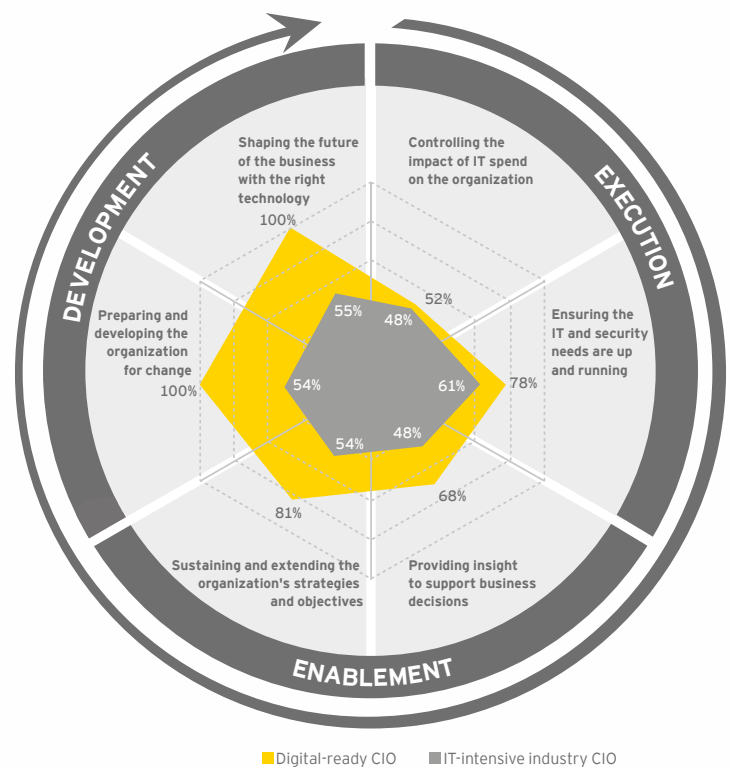
(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1= much less a priority to 10 = much more a priority)

6 Digital-ready CIOs are courageous risk-takers.

Getting ahead in life often requires a willingness to take calculated risks, and this is particularly true for digital-ready CIOs. They need to be brave enough to take a bet on emerging technologies. One of the aspects that sets any IT-intensive business apart from others is that, because IT is a bigger part of the bottom line, it's immediately a bigger risk for the business – and thus gets closer scrutiny. Accordingly, digital-ready CIOs need to be willing to embrace this risk in developing a more digital business.

This involves a willingness to risk failure: understanding that not all digital projects will deliver as hoped. As such, CIOs need to experiment widely to identify the biggest opportunities for the future. "Digital CIOs need to be more innovative and risk-taking. But it's a real change from the traditional way of doing things, where you argue for budgets, and fill in capital request forms with a business case and so on," says EY's Tom Velema.

"Many IT leaders are risk averse – they don't dare to take any step that isn't proven," argues UCB's Herman de Prins. For example, tight budgetary pressures faced by CIOs the world over are often cited as the reason why a new project can't push ahead – and are a common excuse used by many CIOs to avoid pushing ahead on new innovation or piloting exciting new digital projects. But digital-ready CIOs are more often willing to find ways to turn such pressures to their advantage. For example, de Prins has a clear focus on IT operational costs, which he has cut by 25% since joining the business, but he uses savings here to support his preferred focus on innovation: "If you think I have no cost pressure, then think again. I get beaten up on costs every day. But too many CIOs take the view that 'well, I have to cut costs, so I can't do anything else,'" he says.

Interestingly, just because they additionally have to deliver on innovation, it doesn't mean that digital-ready CIOs feel that they face fewer or lesser challenges on budgets, resources and the lack of an innovation culture. Nearly all CIOs have these concerns. Equally, digital-ready CIOs place no greater emphasis on IT budgets and spending than do IT-intensive industry CIOs. They recognize that their value comes from focusing instead on other enabling elements of the business – and from figuring out how to reallocate any savings from operational IT into new innovation elsewhere. "A key difference in non-IT-intensive businesses is that a lot of the IT spending is on operational excellence and cost efficiency; whereas in IT-intensive firms you're going to see a much bigger focus on revenue generation," argues the Managing Director IT/IS for Renault-Nissan, Celso Guiotoko.

Many CIOs face similar issues, but should determine not to be held back from taking risks by these issues. It is in their attitude to risk that typical CIOs often come unstuck.

"Like an iPad that even two-year olds can use by pure intuition, the success of digital transformation is defined by the simplicity of it plus a layer of abstraction."

Ashwin Goolab, IT Advisory Leader Africa, EY
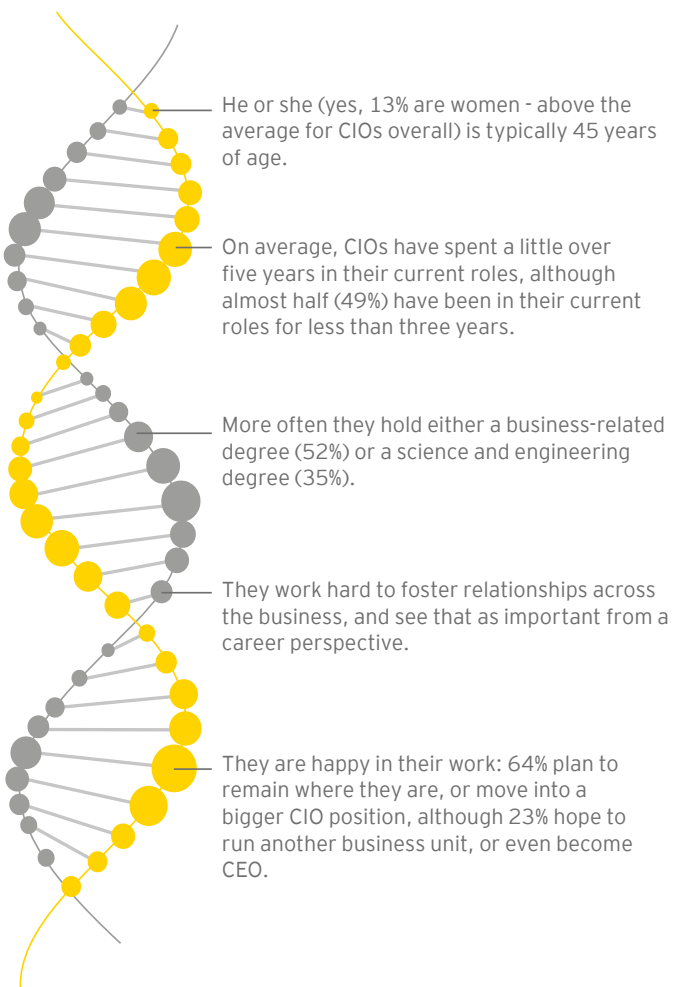
Could emerging markets leapfrog on digital?

One of the exciting prospects digital technology brings is that it could potentially allow emerging markets to leapfrog others. This is most easily seen at an infrastructure level, where adoption rates for mobile connectivity have often rapidly overtaken those for fixed-line connections. Indeed, many emerging markets have been pioneers: Kenya has been the leading country in developing a wholly mobile-based money system, bypassing traditional banks.[7]

Across the IT-intensive industries polled, similar potential can be seen in emerging market CIOs. Across a range of areas, they show greater potential to stand out than their peers from developed markets, as our analysis shows:

1. **They're more focused on the strategic elements of the role.** About two-thirds (64%) of emerging market CIOs are highly engaged in using technology to reshape the future of their businesses, compared with just 50% of their developed market peers. Similarly, they are also more strongly interested in gaining the chance to influence corporate strategy, whereas developed market CIOs are often more interested in personal development.

2. **They place less of a priority on the operational elements of the role, and see the most value in innovation.** Just 55% of emerging market CIOs think they should focus on operational technology as a priority, as opposed to 73% of developed market CIOs. Similarly, when asked where they create most value for the business, they are much more likely to point to things such as product innovation (60% versus 46%).

3. **They focus on a different set of barriers.** While developed market CIOs worry most about a lack of resources and head count, their emerging market peers are more concerned about dealing with a culture that often lacks a mindset for innovation.

4. **They realize the need for networking, both inside and outside the business.** Across a range of roles, emerging market CIOs show a clearer recognition of the need for improved relationships, not least in driving their careers, whether that relationship is with the CEO, the CMO, or is an external relationship with regulators and the media.

5. **They're typically more ambitious.** Many developed market CIOs appear to be happier with the status quo: 73% say they're very happy with the scope of their role, compared with just 55% of emerging market CIOs. Accordingly, emerging market CIOs are far more likely to want to move into a bigger CIO role (38% of those sampled) than to stay in the same position (19%). This compares with 19% and 45% of developed market CIOs with the same responses.

Chart 10
The DNA of the digital-ready CIO

He or she (yes, 13% are women - above the average for CIOs overall) is typically 45 years of age.

On average, CIOs have spent a little over five years in their current roles, although almost half (49%) have been in their current roles for less than three years.

More often they hold either a business-related degree (52%) or a science and engineering degree (35%).

They work hard to foster relationships across the business, and see that as important from a career perspective.

They are happy in their work: 64% plan to remain where they are, or move into a bigger CIO position, although 23% hope to run another business unit, or even become CEO.

Routes to the top: the career paths of digital-ready CIOs

The digital-ready CIOs that are most engaged in the business show high levels of satisfaction in their status, career prospects and ability to influence the corporate strategy. These CIOs also show several key differences in their approach to their personal development and career choices, most importantly around ensuring a multidisciplinary approach to their education and work experience.

It is clear that digital CIOs take a different approach to tackling their roles. But this research also reveals how they actively plan and shape their career paths – and how much they enjoy their jobs.

High job satisfaction

The first thing to point out is that digital-ready CIOs appreciate the opportunity they hold: 64% are either content to stay in their current position, or are simply seeking out a bigger CIO role. This is a similar proportion to other IT-intensive industry CIOs, but digging deeper reveals a much stronger core satisfaction with their positions and prospects. Across all elements of their jobs, they express greater satisfaction with their work than their IT-intensive industry peers do. This is especially striking in three areas:

▶ Their ability to influence corporate strategy, which is vital given how much this is a core part of their job: 60% find this strongly satisfying, compared with 45% of IT-intensive industry CIOs.

▶ The potential for future career development: 54% are strongly satisfied, compared with 43% of IT-intensive industry CIOs.

▶ Their status: 59% are strongly satisfied with how others in the business perceive their role, versus 45% of IT-intensive industry CIOs. This is unsurprising, given that they are more often called upon for advice by executives in the rest of the business.

Darryl West's path to the top job at Barclays

Darryl West, CIO, Barclays Group

Darryl West joined Barclays, one of the world's biggest banks, as its new CIO in November 2013. His placement there was the culmination of a long series of career moves that had started back when he chose to do an IT degree, and pushed himself to study accountancy at the same time, which eventually led to his qualifying as a chartered accountant (CA). He cites this choice to study both IT and accountancy as one of the crucial decisions early in his career. Another was his choice to join a global consulting firm, which gave him international exposure and significant personal and professional development opportunities. "It was one of the key points of my life," he says – not least in doubling up a new job with sideline classes to finish his CA studies. "I'm biased here, but I believe that accountancy training is one of the best ways to learn how a business operates," he says.
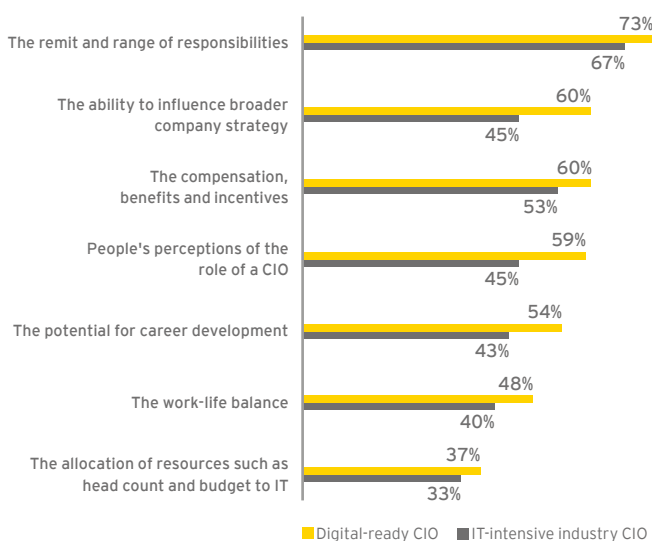
Other key choices came into play later on. He took an opportunity to transfer to France, which forced him to embrace a new culture and language, and gave him experience of a major IT project for the French financial market. "It was one of those sink or swim moments, but adaptability has been a key theme throughout my career," says West. This led to an operations role back in the UK with US bank JP Morgan. This gave him significantly wider exposure to how a finance business actually runs, and led to senior placements in Frankfurt on the bank's local management committee – and then later in New York and London. A further switch in role gave him control of the profit and loss business unit, and direct exposure to the front end of the business, before moving back into IT again. "It really helped me to understand the dynamics of the business world, including the customers and marketing side," he says.

Later positions at National Australia Bank and Lloyds Group gave him the chance to develop his influencing skills and his ability to manage organizational politics – not least when responsible for driving Lloyds' integration with HBOS, one of the biggest IT jobs in the UK over the past decade: "By this point, the functional skills are a given. It's more about how you survive the organizational politics and relationships," he says.

"Our company has a personnel arrangement mechanism that allows a CIO to switch roles with other executives."

Anonymous, CIO, leading Chinese telecommunications company

Chart 11
Satisfaction with aspects of CIO role

The remit and range of responsibilities — 73% / 67%
The ability to influence broader company strategy — 60% / 45%
The compensation, benefits and incentives — 60% / 53%
People's perceptions of the role of a CIO — 59% / 45%
The potential for career development — 54% / 43%
The work-life balance — 48% / 40%
The allocation of resources such as head count and budget to IT — 37% / 33%

■ Digital-ready CIO   ■ IT-intensive industry CIO

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1= not satisfied at all to 10 = absolutely satisfied)

Career lessons from digital-ready CIOs

For other IT leaders seeking to achieve similar outcomes in their careers, three key points stand out in the approach and career choices of digital-ready CIOs:
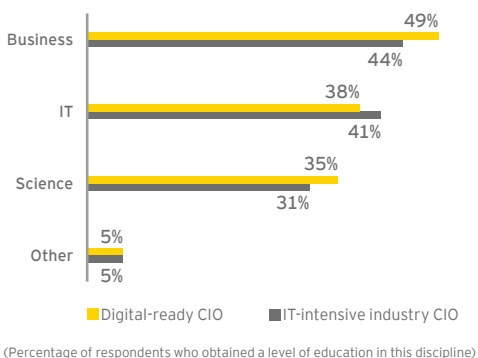
Digital-ready CIOs are far more open to taking advice and trying out new ideas.

"CIOs have to be open to new practices. To some extent, the CIO has to showcase new technologies, so it's a permanent challenge for CIOs to keep themselves occupied on new things," says Sanofi CIO Bruno Ménard. Mail.Ru CIO Alexander Gornyi also keeps an open mind about new things to learn: "I love what I am doing, and I am good at it; however, I continually strive for improvement. I believe a willingness to learn is an absolute must," he says. Furthermore, among digital-ready CIOs, nearly one in two (46%) remark that they could use some advice on their career progression, compared with 36% of IT-intensive industry CIOs. They also show a greater appetite for input from other sources, whether from their peers, external consultants, the print media, online webcasts or others.

They are strongly interested in building their career upon management skills.

Forty-nine percent of digital-ready CIOs hold a degree in business and 24% even an MBA, compared with 14% of IT-intensive industry CIOs. Similarly, a higher proportion of them (35%) hold a degree in science or engineering. And almost half of them (49%) believe that a business degree or MBA is strongly required for the CIO role, compared with 37% of IT-intensive industry CIOs.
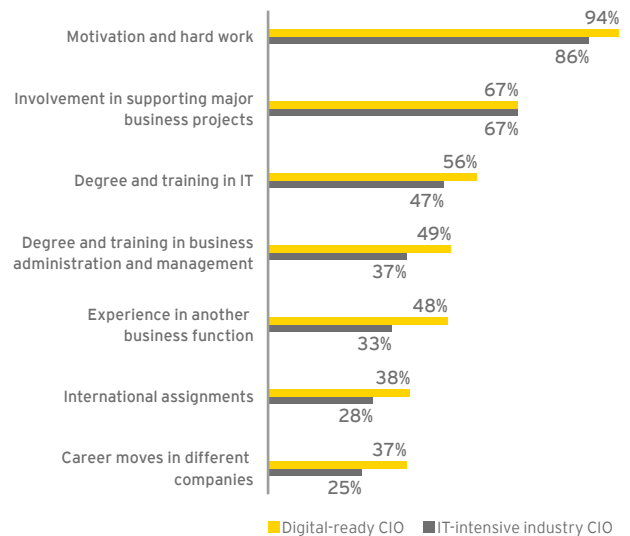
Chart 12
Discipline of education

	Digital-ready CIO	IT-intensive industry CIO
Business	49%	44%
IT	38%	41%
Science	35%	31%
Other	5%	5%

(Percentage of respondents who obtained a level of education in this discipline)

Digital-ready CIOs are willing to leave their home turf.

They show a greater enthusiasm to spend time elsewhere in the organization to get a deep understanding of the business. Nearly half (48%) believe that experience in another function is vital, compared with 33% of IT-intensive industry CIOs. Similarly, a greater proportion believes that it is necessary to have spent time in other companies, and that it's important to have been on international assignments. The CIO of a major Chinese telecommunications firm explains how, having initially graduated in engineering, her career path involved her becoming the head of a non-IT department, as well as the CEO of a subsidiary firm, before moving into her current role. This is explicitly supported by her firm: "Our company has a personnel arrangement mechanism that allows a CIO to switch roles with other executives," she notes.

Chart 13
Requirements for becoming a CIO

	Digital-ready CIO	IT-intensive industry CIO
Motivation and hard work	94%	86%
Involvement in supporting major business projects	67%	67%
Degree and training in IT	56%	47%
Degree and training in business administration and management	49%	37%
Experience in another business function	48%	33%
International assignments	38%	28%
Career moves in different companies	37%	25%

(Percentage of respondents who have chosen 8, 9 or 10 on a scale from 1 = not required at all to 10 = absolutely required)

Not only a CIO's responsibility

All of this highlights a further important point in CIOs' career paths, but one that is less often considered. It is just as much the firm's responsibility to find and develop tomorrow's digital CIOs, as it is the responsibility of those working in IT to embrace and pursue this path. "Firms know that many CIOs are not typically the most flamboyant, outgoing, risk-taking types. So companies may need to rethink their hiring processes to seek out a different caliber of candidate," argues EY's Tom Velema. "If their business focuses on CIOs who keep the lights on, they shouldn't be surprised that they've not found their change leaders."

CIO careers in focus

EY's analysis of the career paths of CIOs for the top 25 IT-intensive industry companies – determined by revenue or assets – confirms these findings. Although backgrounds and specific career paths vary slightly across each sector, several overall observations can be made from this global pool of 100 leading CIOs.

Multidisciplinary studies

The majority hold at least a master's-level degree, but very often in a field outside IT. Whether it is an MBA or an MSc in engineering, economics or physics, there is typically a dimension beyond IT to their studies. For example, Jeanette Horan, CIO at American IT company IBM, did a bachelor's degree in mathematics, before later adding an MBA to her qualifications. Similarly, the CIO of a leading Chinese bank holds degrees in electrical engineering and in software, along with an MBA. In the telecommunications sector, one in five of these leading CIOs hold a PhD on top of other qualifications.
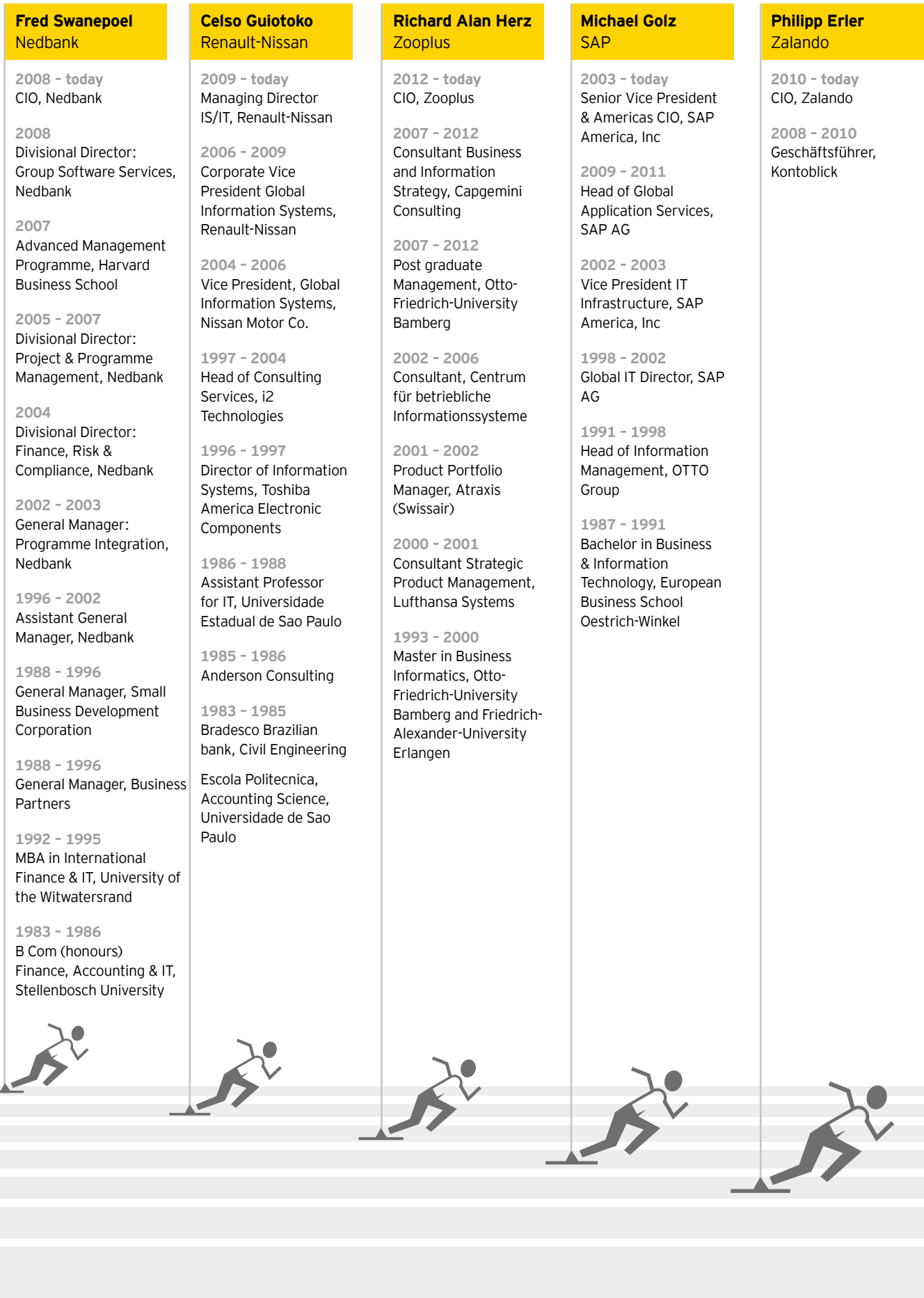
External advisory or directorship positions

In keeping with digital CIOs' tendency to actively engage externally, many of them hold an external post of some kind, or several such posts. Dr. Alan Hippe, the Chief Financial and IT Officer of Roche, a Swiss Pharmaceutical company, is an alumnus of the World Economic Forum's (WEF) Forum of Young Global Leaders and serves on the supervisory board of German engineering company Voith. Mark Sunday, the CIO at US computer company Oracle, is also the Vice-Chairman of the Utah Technology Council, and a trustee of the state's Economic Development Corporation, as well as an advisor to Epic Ventures, a venture capital firm, and an advisory board member of the David Eccles School of Business.

Cross-sector experience

Many leading CIOs have spent time working in different industries. For example, Adriana Karaboutis switched from a career in automotive, with roles at Ford and General Motors, to become the CIO of Dell, a US-based end-to-end solutions company. Anders Thulin, the CIO at Swedish telecommunications firm Ericsson, had worked in consulting, at McKinsey & Company. CIOs working in IT are more likely to have made such switches, but these switches are common throughout all four of these IT-intensive sectors. However, CIOs working in banking are much more likely to have had a prior role in financial services, rather than in a wholly different sector.

Shorter tenures

As a result of their greater willingness to pursue new opportunities, many of these leading CIOs have been in their posts for a relatively short amount of time. In the IT sector, for example, over half took up their current roles in 2010 or later. And this is even more prevalent in telecommunications, where 60% have taken up their current roles since 2010. Across the IT-intensive industries, over half the CIOs surveyed had been in their roles for less than three years.

Chart 14

Career paths of leading CIOs

Fred Swanepoel Nedbank	**Celso Guiotoko** Renault-Nissan	**Richard Alan Herz** Zooplus	**Michael Golz** SAP	**Philipp Erler** Zalando
2008 – today CIO, Nedbank	**2009 – today** Managing Director IS/IT, Renault-Nissan	**2012 – today** CIO, Zooplus	**2003 – today** Senior Vice President & Americas CIO, SAP America, Inc	**2010 – today** CIO, Zalando
2008 Divisional Director: Group Software Services, Nedbank	**2006 – 2009** Corporate Vice President Global Information Systems, Renault-Nissan	**2007 – 2012** Consultant Business and Information Strategy, Capgemini Consulting	**2009 – 2011** Head of Global Application Services, SAP AG	**2008 – 2010** Geschäftsführer, Kontoblick
2007 Advanced Management Programme, Harvard Business School	**2004 – 2006** Vice President, Global Information Systems, Nissan Motor Co.	**2007 – 2012** Post graduate Management, Otto-Friedrich-University Bamberg	**2002 – 2003** Vice President IT Infrastructure, SAP America, Inc	
2005 – 2007 Divisional Director: Project & Programme Management, Nedbank	**1997 – 2004** Head of Consulting Services, i2 Technologies	**2002 – 2006** Consultant, Centrum für betriebliche Informationssysteme	**1998 – 2002** Global IT Director, SAP AG	
2004 Divisional Director: Finance, Risk & Compliance, Nedbank	**1996 – 1997** Director of Information Systems, Toshiba America Electronic Components	**2001 – 2002** Product Portfolio Manager, Atraxis (Swissair)	**1991 – 1998** Head of Information Management, OTTO Group	
2002 – 2003 General Manager: Programme Integration, Nedbank	**1986 – 1988** Assistant Professor for IT, Universidade Estadual de Sao Paulo	**2000 – 2001** Consultant Strategic Product Management, Lufthansa Systems	**1987 – 1991** Bachelor in Business & Information Technology, European Business School Oestrich-Winkel	
1996 – 2002 Assistant General Manager, Nedbank	**1985 – 1986** Anderson Consulting	**1993 – 2000** Master in Business Informatics, Otto-Friedrich-University Bamberg and Friedrich-Alexander-University Erlangen		
1988 – 1996 General Manager, Small Business Development Corporation	**1983 – 1985** Bradesco Brazilian bank, Civil Engineering			
1988 – 1996 General Manager, Business Partners	Escola Politecnica, Accounting Science, Universidade de Sao Paulo			
1992 – 1995 MBA in International Finance & IT, University of the Witwatersrand				
1983 – 1986 B Com (honours) Finance, Accounting & IT, Stellenbosch University				

Herman de Prins
UCB

2009 – today
CIO, UCB

2007 – 2009
Vice President IT International, Medtronic

1995 – 2007
Director International IT, Guidant & Abbott Vascular

Alexander Gornyi
Mail.Ru

2012 – today
CIO, Mail.Ru

2010 – 2012
Head of ICQ, Mail.Ru

2007 – 2010
Deputy CEO, Media World (part of RosBusinessConsulting)

2006 – 2006
Director of Software Development Department, Rambler Internet Holding

2000 – 2006
Developer, Senior Developer, Head of Mail Development Department, Mail.Ru

1995 – 2000
Computer Science, Lomonosov Moscow State University (MSU)

Darryl West
Barclay's

2013 – today
CIO, Barclay's Group

2006 – 2013
Various positions, including Group CIO, Lloyds Banking Group

Accenture

JPMorgan Chase

National Australia Group (Europe)

Fellow, Institute of Chartered Accountants of Australia (ICAA)

Bachelor of Commerce with majors in Accountancy and Computer Science, Deakin University

Bruno Ménard
Sanofi

2011 – today
Group CIO, Sanofi

2004 – 2011
Vice President Information Solutions, Sanofi-Aventis

2001 – 2004
Vice President Information Systems, Sanofi-Synthelabo

1998 – 2001
Director of Resources, Sanofi Winthrop

1995 – 1998
General Manager Philippines, Sanofi-Winthrop

1994 – 1995
General Manager Singapore, Sanofi-Winthrop

1983 to 1986
Bachelor in Accounting and Master in Finance ESC Lille School of Management

Diego Calegari
IBM

2013 – today
Spanish South America CIO Executive, IBM

2010 – 2012
Latin America HR Transformation IT Leader, IBM

2006 – 2010
Spanish South America Integrated Supply Chain Leader, IBM

2002 – 2006
Global Logistics Americas IT Leader, IBM

1999 – 2002
Various leadership positions in Global Logistics IT, IBM Latin America

1994 – 1999
Various positions in Global Logistics IT, IBM Argentina

1990 – 1994
Bachelor in IT, Universidad del Salvador

Lars Mathiesen
Nykredit

2002 – today
CIO and Executive Vice President, Nykredit

1997 – 2002
Executive Vice President Retail Business and Development, Nykredit

1991 – 1997
CEO Nybolig Retail Estate Agency, Nykredit

1982 – 1991
Various executive posts at Nykredit, primarily on the business side within Nykredit retail customer segment and Nykredit estate agency services, Nykredit
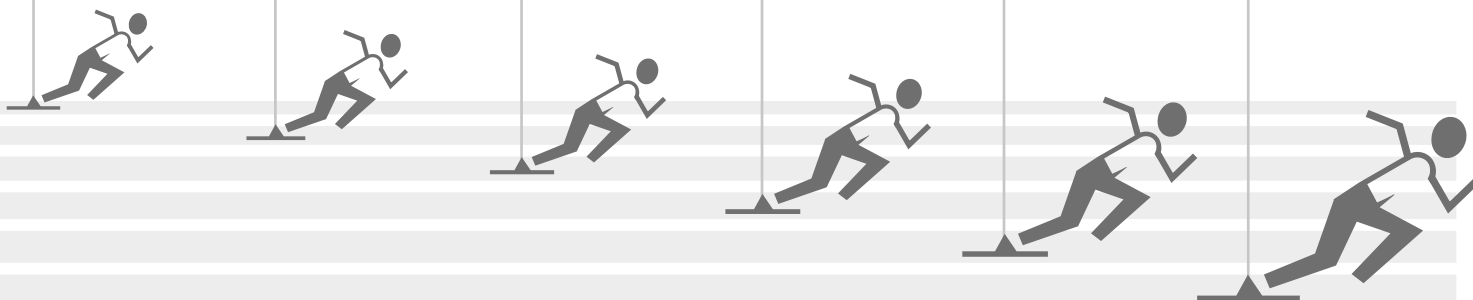
2011 – today
Member, IT think tank "Denmark 3.0"

2010 – today
Member, National IT project counsel

2006 – 2010
Chairman, CIO Innovation Forum

2006 – 2009
Chairman, DANSK IT

1975 – 1982
Master of Economics, University of Aarhus

1989
MDP program, Cranfield University

Preparing for a digital business

In recent years, the rollout of digital technologies has gathered momentum across nearly every industry. The early pioneers of digital have shown the disruptive potential that these tools hold – from new ways to communicate with customers, through to wholly new business model opportunities.

For CIOs, all this brings new demands and pressures to which they will have to react. In particular, successfully dealing with the digital revolution requires a far stronger focus on the strategic elements of the role as opposed to the basic execution chores. This shift in emphasis can be seen in the way that digital-ready CIOs set their priorities. While mastering the basic execution, they spend less time on it to free up capacity to do more on enablement and corporate development.

From our interviews with leading experts and CIOs, we gathered advice and guidance on how to prepare for a digital world – and to stand out from your peers.

None of these steps is inaccessible to any sufficiently motivated CIO, or aspiring CIO. The question, as ever, is whether you have the courage to pursue them. Are you ready to act?

▶ Tasks at a strategic level

Your personal agenda

Pushing the digital transformation agenda forward requires a compelling and credible vision, and understanding the necessary steps to achieve it.

Digital, in particular, provides wide-ranging new opportunities to deliver radically more efficient processes, as well as wholly new products and services. But to truly deliver on this, you'll need a firm grasp of the corporate business and operating model.

No CIO can get away from operational and infrastructure issues altogether. But leading CIOs ensure that operational issues are a side dish, not the main meal, in what they serve up to the rest of the business. Free yourself from these issues so you can truly focus on transformation.

Give a detailed vision for how technology can transform the business – and a plan to implement the transformation

Prioritize innovation wherever possible, at both a process and a business model level

Don't let operational IT overwhelm you

Steps to setting up a digital enterprise

1 Set up the right architectures for growth

CIOs taking the lead on digital need to enable the rapid assembly of new ideas and business initiatives. "You can't put up the regular hurdles you normally do for any sort of new functionality, so you need a foundational architecture – for mobile, cloud, data, applications, and so on. If you don't, you wind up connecting one dot to the next, and you get a spaghetti mess," argues David Nichols, Americas IT Transformation Leader at EY.

2 Get control of your data

For the past two decades, CIOs have been largely focused on application and infrastructure delivery, ahead of data. But a shift into the cloud reduces the emphasis on the application front, and makes data far more important again.

3 Set out the relevant standards

Digital transformation requires to radically simplify the business and to change the mindset around product development. New products and services should not be introduced unless the underlying technology is available to efficiently support these. CIOs will have to provide some foundational standards to guide technology selection. These will need to cover performance requirements, along with legal, security and other aspects.

4 Understand strategic alignment with the rest of the business

Digital technologies have a huge potential to change the underlying operating model and business processes of the company. Therefore, CIOs must have a close understanding of these aspects.

5 Take a fast, multidisciplinary approach to managing new projects

As a wave of new digital ideas emerges, CIOs will have to ensure that a lot of different internal functions and third parties can interconnect. "This demands rapid-assembly teams that represent views from across the business, including marketing, finance and IT," says Dave Ryerkerk, Global IT Advisory Leader at EY.

6 Plan the sequencing and pace of change

CIOs need to balance any new digital opportunities against their associated risks. While it may make a lot of sense to move email and CRM systems quickly to the cloud, it's a much more involved decision to know when to do the same for a company's core financial systems, such as their general ledgers. Getting the timing right will be vital.

▶ Tasks at a personal level

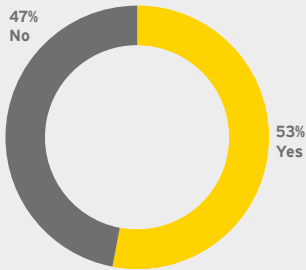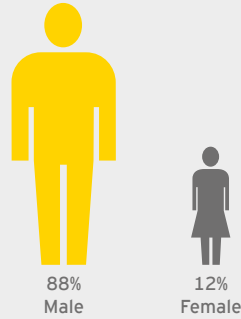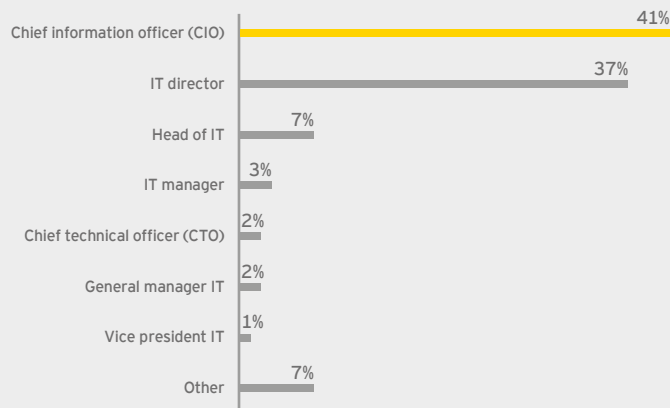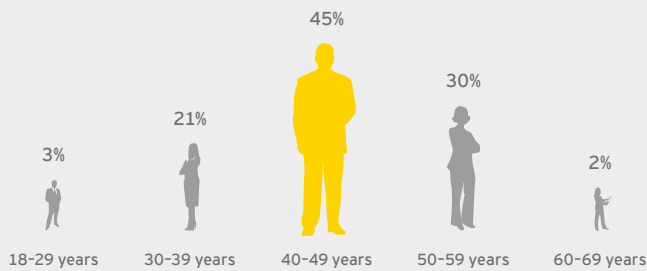|				
Digital technologies hold the promise to make IT a genuine source of growth. Getting this right, however, will require you to build tight relationships across the front office – starting with the CMO and extending to the end customers.	It is human nature to be swept up by a compelling storyline and the possibilities it contains. The best CIOs are able to provide a narrative about IT that the rest of the business can buy into – and then use it to extend their influence across the organization.	Embracing new technology involves a leap of faith. But, too often, CIOs get caught up in the downside to new developments, worrying about the small chance of failure, rather than the potential to transform the business. Have courage.	Many leading CIOs rarely spend their entire careers in one place, but hop around to gain exposure to different experiences and approaches, developing expertise along the way. Be open to these possibilities, including ones that take you into wholly new sectors.	Consider other ways to develop a more wide-ranging background to showcase your skills in another light. Many leading CIOs take non-executive directorships at other firms, or have joined external committees or think tanks. Others do MBAs to widen their educational backgrounds. All these help to develop a more powerful contact book.
Build close relationships with the front of the business	**Be a compelling storyteller**	**Be willing to take risks**	**Be willing to move around, across both functions and companies**	**Widen your resume**

Demographics

Board membership

47% No

53% Yes

Gender

88% Male

12% Female

Job title

Chief information officer (CIO)	41%
IT director	37%
Head of IT	7%
IT manager	3%
Chief technical officer (CTO)	2%
General manager IT	2%
Vice president IT	1%
Other	7%

Age

- 3% 18–29 years
- 21% 30–39 years
- 45% 40–49 years
- 30% 50–59 years
- 2% 60–69 years

Time in current role

- 8% Less than 1 year
- 46% 1–3 years
- 17% 4–6 years
- 12% 7–9 years
- 17% 10 years and more
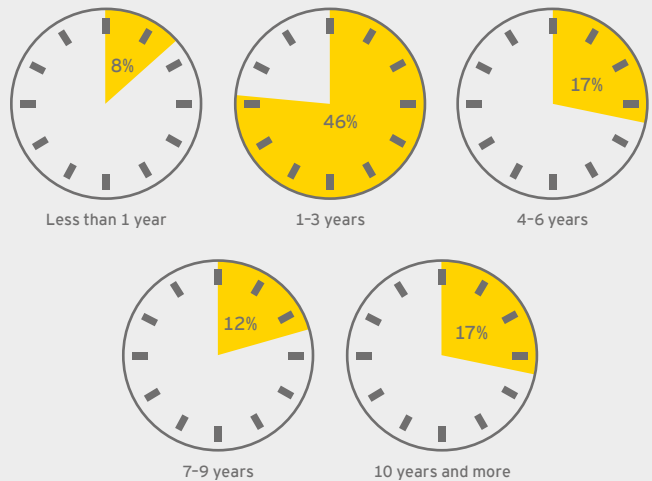
About the research

The research draws on a telephone survey of 166 (information) technology leaders from a range of IT-intensive industries, as these are the firms where CIOs are likely to have the greatest scope and widest remit in their roles.

The global survey, which spanned key markets across Europe, the Americas, Asia, the Middle East and Africa, focused primarily on large firms: 27% had annual revenues of between US$500m and US$1b, and the rest were larger, including 20% with revenues of at least US$10b.

We also conducted detailed interviews with a range of CIOs and IT experts, to add additional context to our data and findings.

We focused on those sectors independently identified as being the most IT-intensive, in terms of annual spending on IT as a percentage of revenue. These sectors included technology (including hardware, software and other IT services), financial services, life sciences, telecommunications, online and e-commerce.
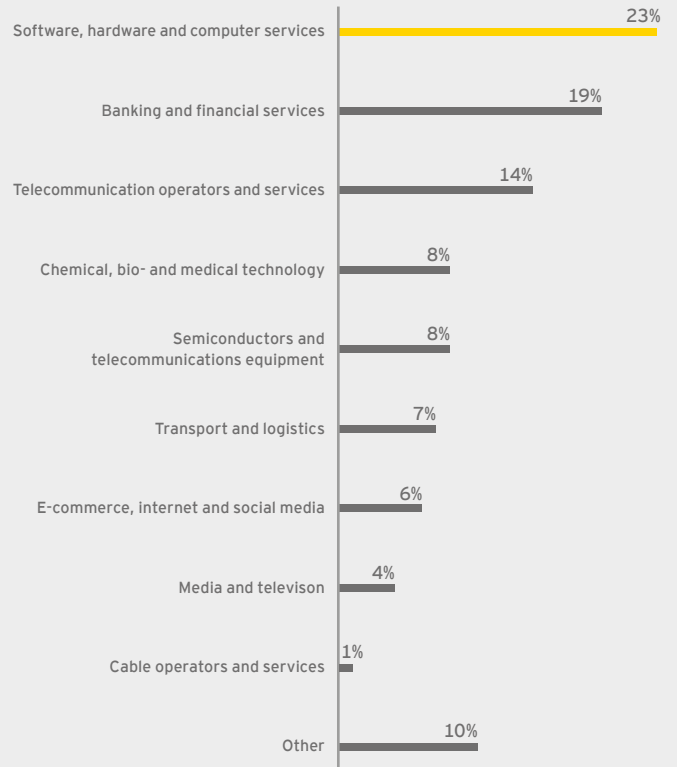
In addition to this survey, EY conducted an analysis of the career paths, education and background of over 100 leading CIOs, representing the top 25 largest companies – determined by revenue or assets – in four IT-intensive sectors: IT, telecommunications, life sciences and banking.
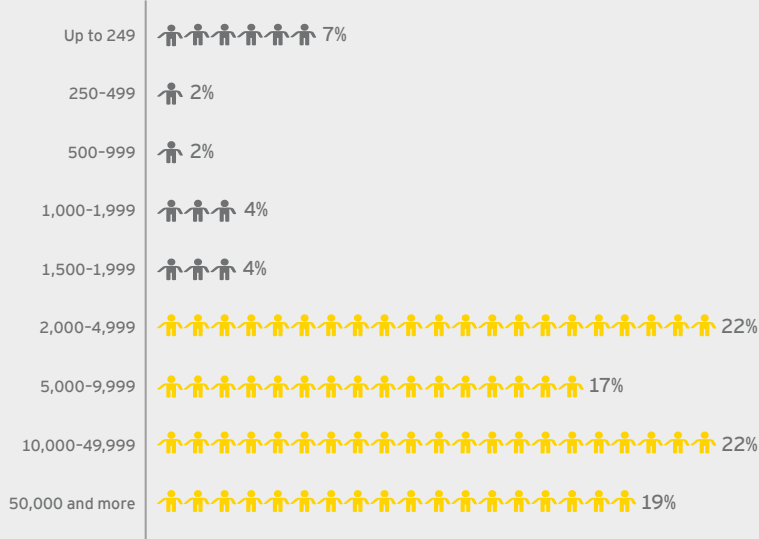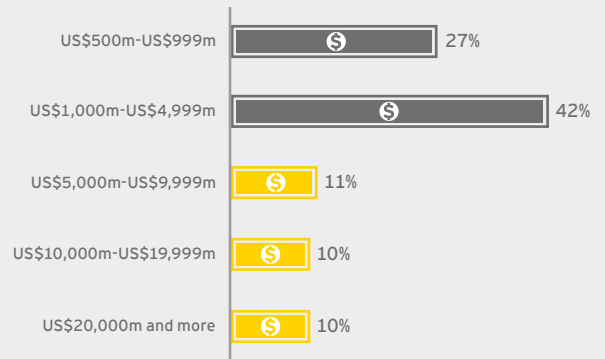
Highest qualification

Management 48%
- PhD in management or business administration 1%
- MBA 15%
- Master's degree in management or business administration 23%
- Bachelor's degree in management or business administration 9%

IT 43%
- PhD in IT 1%
- Master's degree in IT 18%
- Bachelor's degree in IT 24%

Science and engineering 30%
- PhD in science and engineering 3%
- Master's degree in science and engineering 12%
- Bachelor's degree in science and engineering 15%

Other 7%
- Other university degree 4%
- Other non-university degree 1%
- Other 1%
- No answer 1%

Sector

- Software, hardware and computer services 23%
- Banking and financial services 19%
- Telecommunication operators and services 14%
- Chemical, bio- and medical technology 8%
- Semiconductors and telecommunications equipment 8%
- Transport and logistics 7%
- E-commerce, internet and social media 6%
- Media and televison 4%
- Cable operators and services 1%
- Other 10%

Worldwide number of employees

- Up to 249 — 7%
- 250–499 — 2%
- 500–999 — 2%
- 1,000–1,999 — 4%
- 1,500–1,999 — 4%
- 2,000–4,999 — 22%
- 5,000–9,999 — 17%
- 10,000–49,999 — 22%
- 50,000 and more — 19%

Global annual turnover

- US$500m–US$999m — 27%
- US$1,000m–US$4,999m — 42%
- US$5,000m–US$9,999m — 11%
- US$10,000m–US$19,999m — 10%
- US$20,000m and more — 10%

Location of headquarter

List of countries			
Argentina	1%	Lithuania	1%
Australia	2%	Luxembourg	2%
Austria	5%	Mexico	2%
Brazil	4%	Netherlands	2%
Belgium	2%	Nigeria	1%
Czech Republic	1%	Norway	1%
China	1%	Poland	1%
Canada	6%	Portugal	1%
Denmark	2%	Russia	7%
Finland	1%	Slovakia	1%
France	1%	South Africa	4%
Germany	4%	Spain	3%
Greece	2%	Sweden	4%
India	6%	Switzerland	2%
Iran	1%	Turkey	1%
Israel	1%	United Kingdom	5%
Lebanon	1%	United States	19%
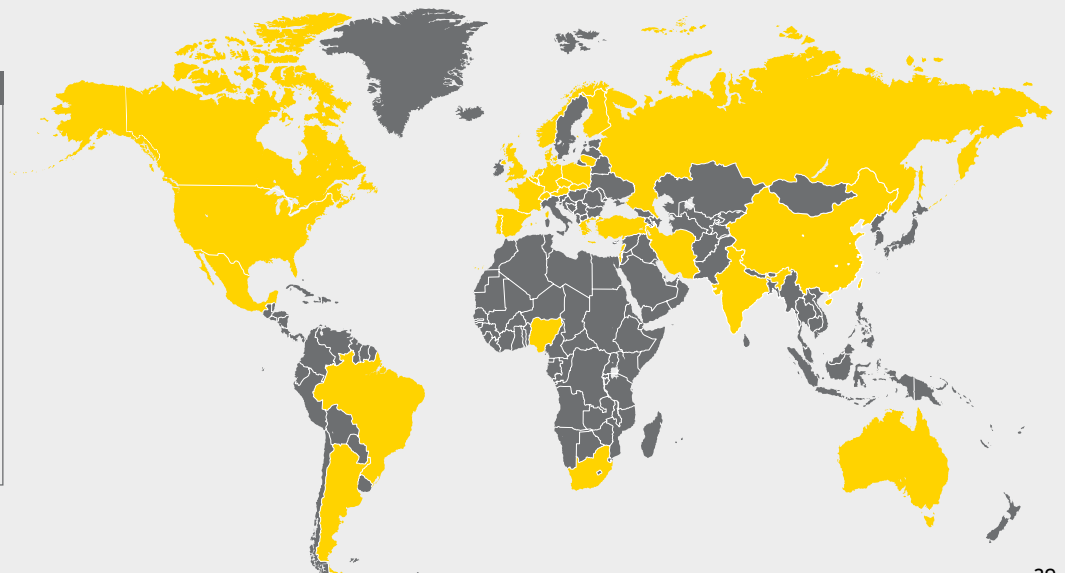
Endnotes

1. ''Embracing digital technology,'' *MITSloan Management Review*, MITSloan, 2013.

2. *Hunting and harvesting in a digital world: The 2013 CIO Agenda*, Gartner, 2013; *Taming the Digital Dragon: The 2014 CIO Agenda*, Gartner, 2014.

3. *The digitisation of everything: how organisations must adapt to changing consumer behaviour*, EY, 2011.

4. ''5 Facts about Chief Digital Officers,'' by Dave Aron, Gartner, 6 November 2013.

5. *The DNA of the CIO*, EY, 2012.

6. ''Marketing's two-headed beast,'' *5 insights for executives series*, EY, 2013.

7. ''Why does Kenya lead the world in mobile money?,'' *The Economist*, 27 May 2013.

Further reading

▶ *Ready for take off? How to make the business fly*, EY, 2014.

▶ *Designing your customer experience using digital analytics*, EY, 2013.

▶ *Digital data opportunities: using insight to drive relevance in the digital world*, EY, 2011.

▶ ''Predictive analytics: a CIO's key to the boardroom'', *5 insights for executives series*, EY, 2013.

▶ *The digitisation of everything: how organisations must adapt to changing consumer behaviour*, EY, 2011.

EY CIO program

The CIO program aims to support aspirational CIOs by offering peer-to-peer networking and addressing the personal and technical interest of CIOs as they seek to develop themselves, their teams, their functions and their careers. It was initiated in 2012 with a global survey of more than 350 CIOs and their C-suite peers, and has built upon this with regular publications and events.

To learn more, visit ey.com/cio or email cio@ey.com

Other main reports

The DNA of the CIO

This survey explores how CIOs will exceed their personal ambitions, along with the skills and relationships successful CIOs need to master. It is based on a global survey of more than 350 CIOs. A further 40 respondents from across the rest of the C-suite were polled to provide a perspective on how the CIO is perceived. Learn more on ey.com/dna-cio.

Personal agenda

CIOs' bag of tricks blog

Uwe Michael Mueller, EMEIA Advisory Performance Improvement Leader, discusses the softer topics for CIOs – along with specially selected guest bloggers. Learn more at cioblog.ey.com.

How-to articles

The series is designed to get right to the heart of the challenges CIOs face today. Examples are: *How to sharpen your career development skills* or *How to hit the ground running as a new CIO*. Learn more at ey.com/cio-personal.

Technical agenda

CIO perspectives

Short and concise booklets outlining the relevance of recent EY thought leadership for CIOs. Examples are: *Business Pulse*, *Delivering tomorrow's companies today* or *Innovating for growth*. Learn more at ey.com/cio-technical.

5: insights for executives

Short, snappy and to the point, 5's innovative format provides analysis of today's issues for the C-suite executive. Examples are: *Predictive analytics: the CIO's key to the boardroom* or *Building trust in the cloud*. Learn more on ey.com/cio-technical.

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