Great expectations or misplaced hopes?
Perceptions of business technology in the 21st century

A report from the Economist Intelligence Unit

Contents

About the research

Great expectations or misplaced hopes? Perceptions of business technology in the 21st century is an Economist Intelligence Unit report, sponsored by Hewlett-Packard. It reviews how expectations for technology are changing under the impact of numerous trends, and assesses the implications for CIOs, the IT function and the broader business. The Economist Intelligence Unit bears sole responsibility for the content of this report. The findings do not necessarily reflect the views of the sponsor.

The report draws on two main research inputs for its findings:

● A survey, conducted in August-September 2011, of 508 European executives from across Europe, the Middle East and Africa, representing both the IT function (25% of the sample) and the wider business (75%). All respondents were at a management level, with 50% from the board or C-suite. Respondents hailed from a wide range of industries. About one-half (49%) of firms polled had annual revenue of US$500m or more, while about one-quarter (26%) had revenue of US$1bn or more.

● A series of in-depth interviews with senior executives and industry experts, complemented with extensive desk research. The following individuals were interviewed for the study (listed alphabetically by organisation):

- ● Jane Scott, vice-president, IT, Baker Hughes
- ● Julian Gray, chief information officer, BP Alternative Energy
- ● Chris Edwards, professor of management information systems, Cranfield School of Management
- ● Rob Lambert, senior lecturer in management information systems, Cranfield School of Management
- ● Balazs Fejes, chief technology officer, EPAM Systems
- ● Jeremy Jackson, senior vice-president, marketing, IntraLinks
- ● Paul Coby, director of information technology, John Lewis
- ● Christian Risom, founder, Shape

The author of the report was James Watson and the editor was Denis McCauley. Our sincere thanks go to the survey respondents and the interviewees for their time and insight.

Executive summary

Technology advancement is a famously disruptive force, even with all the benefits it brings to users. The painful structural shifts experienced by the music, film and news industries—to name a few—are testament to the power of technology to upend business models. Within organisations, the changes it has wrought have been viewed mainly in a positive light as firms have found new ways to improve processes, reduce costs, speed time to market and enhance interaction with customers. In recent years, however, owing partly to the widespread adoption of consumer technologies in the workplace, CIOs and senior managers have taken to worrying about a disruptive technology effect within the business.

The "consumerisation" trend has fuelled concerns in the executive suite that employee expectations of enterprise technology—and the IT function—are rising beyond the reality of what it can deliver. Based on this view, the resulting expectations gaps could prove harmful to the business by generating dissension within the ranks and leading business units and employees to pursue their own technology solutions. In this study, the Economist Intelligence set out to determine to what extent such expectations gaps exist and the impact, if any, on the business.

Our analysis, based on a survey and interviews conducted among firms in Europe, the Middle East and Africa (EMEA), finds that differences in levels of technology knowledge exist, but they do not necessarily match popular perceptions of the "generation gap". Younger employees may be more comfortable with new devices and social media, but more senior staff are seen to be more knowledgeable about technology use in the business. And the value of such knowledge in high places is illustrated in the survey: firms where senior management is strong on IT are much more likely to be high-performers in profit-growth terms than those where technology knowledge at the top is weak.

Such knowledge gaps as exist do not appear to be harmful to the business. Moreover, the research suggests that technology expectations gaps are overstated: there is an overwhelming sense within EMEA organisations that technology and the IT function are meeting the objectives placed before them.

The key findings from the research are highlighted below.

● **Expectations gaps are overstated: IT is delivering the goods.** The survey suggests that IT is largely meeting the expectations of the rest of the business, a marked improvement from a decade ago. The

majority of respondents, representing all parts of the business, feel that their technology investments are largely delivering the benefits they promise. Among high-performing firms—those with recent profit growth of 20% or more annually—nearly one in four technology projects exceeds expectations, compared with less than 5% firms at firms experiencing flat or negative growth.

● **The generation gap is also exaggerated.** Technology aptitude in the workplace correlates with individual interest, not age. Survey respondents rate the technology knowledge of senior managers as higher than that of line employees, who are more closely correlated with "Generation Y". The influx of younger workers is not eliminating a need for training, but rather giving it a new focus: on good technology practices, rather than on technology itself.

● **Consumerisation can help CIOs to reposition IT.** The workplace use of popular consumer devices is clearly heightening expectations of technology from the rest of the business, but for many CIOs and IT directors this presents an opportunity. "The big challenge for IT is how can we make people's use of technology in the workplace as intuitive and fun as the technology they use at home," says Paul Coby, director of information technology at John Lewis, a British retailer. "This is very challenging for CIOs and corporate IT, but also a big opportunity to reposition IT."

● **The real challenge: managing expectations of faster innovation.** CIOs may partly be victims of their own success. One-half of firms polled have had a new technology initiative completed in the past three months alone. Rollouts are faster, too: the CIO of BP Alternative Energy says the implementation time for one initiative has been cut from 18 months to just a few weeks. Coupled with the rapid rate of change in consumer technology, this will continue to fuel higher expectations of CIOs in terms of the innovation they can deliver.

● **External expectations gaps are a bigger threat.** About one in three executives believe that the growth of their customers' technology expertise is outpacing their own. This gap is especially prominent between high- and low-profit-growth firms: companies in the latter category are nearly twice as likely to experience a technology gap between themselves and their clients. When it comes to expectations, this threatens to be the most dangerous gap of all.

Introduction

Just a decade ago, enterprise technology was in a very different place. Businesses had been making enormous investments in IT, but often with questionable returns. Probably the most dubious were initiatives to combat the "Y2K bug", where millions were spent to patch up IT systems against a threat that largely turned out to be innocuous. More strategic investments also proved challenging, whether on customer relationship management (CRM) software designed to track client interactions, or massive enterprise resource planning (ERP) systems to digitise the flows of goods and services through the supply chain. These often came at great expense and with significant business disruption. In short, many enterprise systems were expensive, difficult to implement and often did not match up to their expectations. One report cited at the time from Meta Group, a research firm, suggested that the average ERP implementation took 23 months and led to a negative overall net present value.[1]

Ten years on, enterprise technology is firmly back in focus, but with largely new fundamentals. Many new applications are now rolled out quickly via "cloud computing", with firms only paying for what they need and use, for example. Competition has driven down prices in many areas. Firms are no longer required to invest in huge server farms when they need to scale up, but can choose instead to buy capacity on demand. In the workplace itself, employees now use consumer technology that is increasingly commoditised, taking advantage of far simpler interfaces that are supported with easy-to-use applications.

All this ought to be something that chief information officers (CIOs) and corporate IT should celebrate: users actively embracing new platforms, with great potential to boost productivity. Instead, however, these trends seem to have created a new set of headaches for the organisation's technology leaders.

The impact of consumerisation

In early 2011, Ovum, an analyst firm, convened a group of CIOs to discuss what kept them up at night. Topping the list was the so-called "iPad effect". Not the device itself, but rather the iPad as a "powerful symbol of the widening chasm between employee expectations and corporate IT realities".[2] As Ovum outlines, tablet computers are seen as leading a "perfect storm" of technology changes. The idea goes that a generation of users are now widely tech-literate, thanks to easy-to-use consumer devices—from touch interfaces and the cloud to one-click-buying and app stores to get tools for any task—and they

expect to get the same in the workplace. Instead, according to this argument, many now find corporate IT stuck behind its own "firewall", dragging its feet and complaining about security and other concerns, rather than grabbing the opportunity.

Others have also been critical. One viewpoint, from the sales function's perspective, for example, is summed up in the article title: "The iPad proves CIOs are useless."[3] It argues that while sales teams are rushing to use tablet devices to bolster their pitches, corporate IT is blocking them, citing a range of concerns from security to compliance. Others are debating whether IT should even be involved in deciding what technology is best suited for varying departments.

Many CIOs indeed seem troubled by consumerisation. As one anonymously wrote last August on Silicon.com,[4] an IT news site: "The obsession now with consumer-driven technology … [is] driving a wedge into our ability to innovate applications and services. It's not getting better but rather worse."

To the casual observer, it seems like the expectations gap between IT departments and their users is widening, rather than narrowing. What is behind this? Are technology users now so tech-savvy that they refuse to accept IT's constraints? Has "technology democracy"—employees' freedom to choose the devices and applications they use to perform their work—reached a point where CIOs and IT are superfluous? Most importantly, are such expectations gaps constraining the business?

This report, based on research conducted in Europe, the Middle East and Africa, sets out to test whether this technology gap exists, and how, if at all, it is affecting business operations and results. The first sections of the study review a range of commonly debated issues, and the last section assesses what appears to be the greater challenge for CIOs: keeping pace with innovation.

[3] Geoffrey James, *The iPad proves CIOs are useless*, BNET, March 2nd 2011.

[4] Silicon.com, *Naked CIO: Apple's iPad – why it's iBad for business IT*, August 11th 2010.

■ Technology knowledge gaps exist, but senior managers are felt more savvy than younger colleagues

■ Although familiar with technology interfaces, "Gen Y" are less aware of good technology practices

■ Consumerisation and "technology democracy" debates are a distraction for CIOs

Generation Y and other CIO distractions

Much has been said about the impact of a generation of tech-savvy workers, those for whom technology has been an intimate part of their lives since childhood. But their impact on the workplace is not necessarily what many assume it would be. For example, executives polled for this report highlight a rising gap in technology knowledge between management and employees, but not necessarily in favour of the newcomers. On average, respondents rated the technology knowledge of leaders, such as the chief executive officer (CEO) and chief financial officer (CFO), as far ahead of line employees, even though the latter are more likely to be correlated with the so-called "Generation Y", or those born between the late 1970s and the early 1990s, and are thus more likely to have embraced technology from a young age.

Our survey suggests that not only does this gap in technology knowledge between workers and leaders exist, but that it is widening. Far more respondents believe that this is the case (60%) than those that do not (36%), which is at odds with common perceptions. But the picture is more nuanced, argues Julian Gray, the CIO of BP Alternative Energy, a division of the oil major that explores new sources of energy, such as wind and solar. "The younger generation are tech-savvy, but we tend to find that it's the people who want to be tech-savvy, compared with those who don't," he says. "We have many engineers in our business, many of them grey-haired, but they know all the technology, while some younger ones know little. It comes down to the individual."

If the knowledge gaps are growing within the organisation, for most firms this does not appear to be

> "The younger generation are tech-savvy, but … it's the people who want to be tech-savvy, compared with those who don't."
>
> *Julian Gray, CIO, BP Alternative Energy*

How would you rate the technology knowledge of the following groups or individuals in your organisation?
(Share of respondents saying "excellent" or "good")
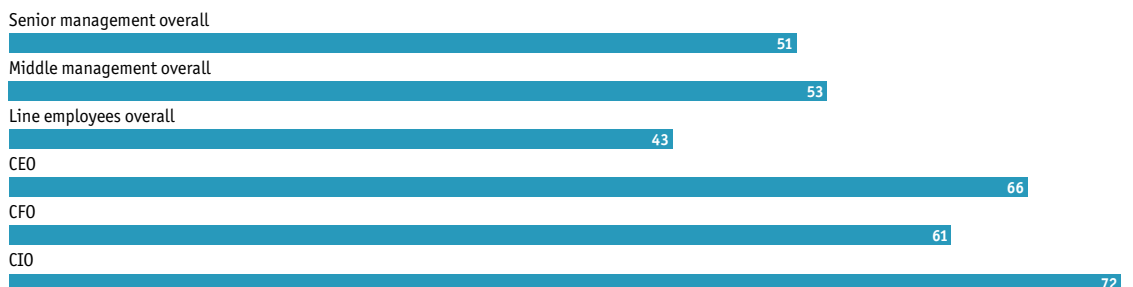
Group	Value
Senior management overall	51
Middle management overall	53
Line employees overall	43
CEO	66
CFO	61
CIO	72

Do you agree or disagree? "Growing differences in technology knowledge between senior management and lower-level managers and employees are causing serious problems in our business."
(% respondents)

■ Total ■ High-performing firms

Strongly agree
5
4

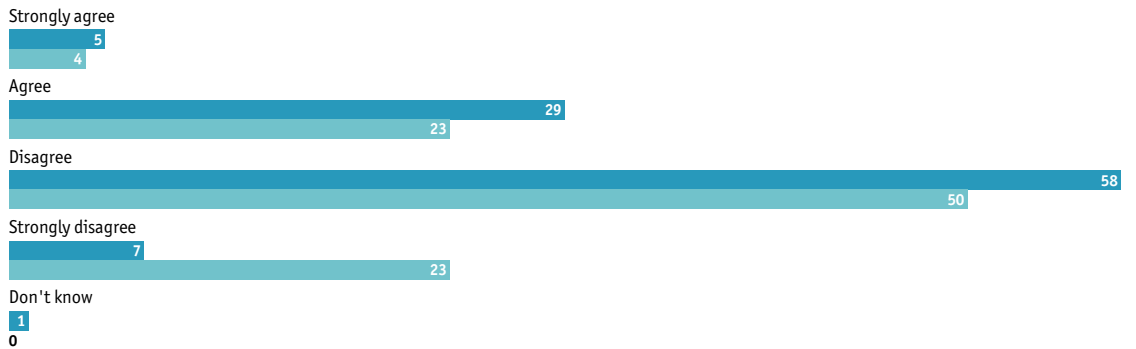Agree
29
23

Disagree
58
50

Strongly disagree
7
23

Don't know
1
0

Note: "High-performing firms" are those with annual profit growth of 20% or more in the previous three years.

having a harmful effect on performance. Nearly two-thirds (65%) of executives to the survey dispute the notion that growing differences in technology knowledge between senior management and lower-level managers and employees are causing serious problems in their business. This response is more emphatic among high-performing companies in the survey—those with annual profit growth of 20% or more in the last three years.

Familiar with technology, not technology practices

Firms now assume that younger recruits are thoroughly familiar with using technology in their daily lives. However, Generation Y employees have been far less exposed to what constitutes good technology practices within the workplace, and their technology familiarity can cause some new concerns just as they solve others. While the need to train new employees on standardised tools may be declining, some are finding that they need to do more to train new workers about what constitutes good technology practices—sharing and storing corporate information, for example, or on using social networking.

Also, although Generation Y may be more familiar with technology interfaces, they are not necessarily fully aware of how technology works behind the scenes. Some struggle to understand the challenges of coping with legacy IT systems, for example. Jane Scott, vice-president for IT at Baker Hughes, a global oil and gas services firm, observes that while younger workers are quick learners when it comes to using business applications, understanding the design and back-end integration of such systems, especially into legacy platforms, is much tougher. "This is probably a battle we'll increasingly fight," she says: "How to match what most end-users expect in terms of applications being quick to set up and easy to use, in an environment [with] legacy and data constraints."

Outside of technology itself, there is also a soft skills issue to address, such as the propensity for sharing information. This can certainly be put to good use, but it also needs to be managed more carefully than before. Balazs Fejes, the Zurich-based chief technology officer (CTO) of EPAM Systems, a technology integrator, thinks that many younger workers who grew up using social collaboration tools have a higher propensity towards open communication, which his firm has to clamp down on. "For them it's surprising, and they don't know why it's happening," says Mr Fejes.

He notes that many will quite easily discuss confidential client information with a relative stranger, as one example. "It's hard to convince them that they shouldn't do this or to be careful what they post to a blog site. Maybe it's not a good idea to put the customer's source code up on a blog." This may seem laughable to some, but examples are all too easy to find. Most recently, a Japanese air traffic controller posted photos to his personal blog of the flight details of the US president, Barack Obama, which are kept confidential for security reasons.

None of this is especially new. Firms have always had to train workers on corporate practices. What is more difficult is assessing how much recruits truly know about utilising their undoubted technology aptitude for business purposes.

Many simply do not buy the argument of a generational gap at all. "Mark Zuckerberg may be alarmingly young, but Bill Gates has been around for a long time," reminds Paul Coby, director of information technology at John Lewis, a British retailer. In short, technology aptitude in today's workplace is now less correlated with age, and more with individual interests and enthusiasm for technology. What is far more important is for firms to ensure that they have strong, technology-savvy leadership in place. Firms that believe their senior management is strong on IT were about ten times more likely to be high performers in profit-growth terms than firms with weak technology knowledge at the top.
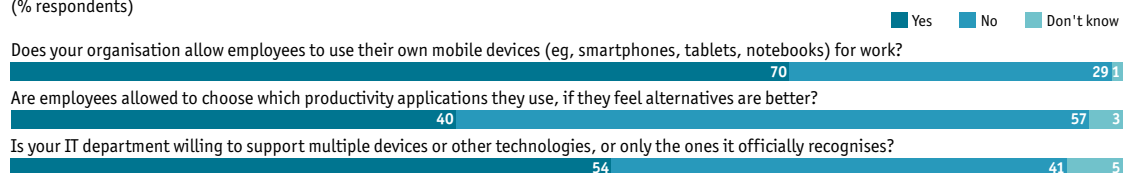
Distracted by democracy

Some CIOs have also been distracted by the technology democracy debate: how much autonomy should individual business units and employees have to choose their technologies? It is easy to point the finger at disruptive new devices, such as smart phones and tablet devices, which staff are eager to adopt. This is linked to a widely noted uptick in "buy your own" policies being instituted at firms ranging from Kraft, a food company, to SNR Denton, a law firm. They are far from alone: seven in ten firms polled say that they now allow staff to use their own mobile devices for work. This is especially prevalent among smaller firms. About one-half are even willing to support such devices. As might be expected, there is a lower appetite for free choice among actual applications, although 40% of respondents suggest they allow workers to choose these tools, too.

This all seems more of a burden than it might be worth, not least in terms of corporate security. But firms are clearly exploring the trade-offs. On the one hand, management want to encourage greater productivity, which can clearly be boosted by allowing people to use the devices with which they are most comfortable. On the other hand, they need to ensure that security measures are upheld.

Some believe that the security concerns are overblown. Few young workers, especially in an era of high unemployment, would join a firm and then complain about not being able to use one device over another, argues Chris Edwards, professor of management information systems at the Cranfield School

> "Mark Zuckerberg may be alarmingly young, but Bill Gates has been around for a long time."
>
> *Paul Coby, director of information technology, John Lewis*

Policies toward employee use of own devices and applications, and IT support for them
(% respondents)

Yes | No | Don't know

Does your organisation allow employees to use their own mobile devices (eg, smartphones, tablets, notebooks) for work?

| 70 | 29 | 1 |

Are employees allowed to choose which productivity applications they use, if they feel alternatives are better?

| 40 | 57 | 3 |

Is your IT department willing to support multiple devices or other technologies, or only the ones it officially recognises?

| 54 | 41 | 5 |

of Management. "When one joins a company, one takes on the company's way of behaving and its processes include technology," he says. He believes that decentralising technology procurement could increase costs through the reduction of volume purchasing.

The reverse perspective from technology users, however, is that if IT does not facilitate the tools that workers prefer to use, the latter will simply find ways to circumvent policies, which can lead to greater risks. Jeremy Jackson, senior vice-president for marketing at IntraLinks, a technology firm, says the effect of this has been starkly highlighted following the launch of the iPad, iPhone, tablets and Androids, when "everyone suddenly turned up at work with one". His firm has responded by finding a way to support such devices; if it did not, he argues, staff would have either circumvented policies, prejudicing security, or else "kicked down the door of IT" and put pressure on them to change. This is particularly pertinent for sales units, where staff are highly mobile and want to be seen at the cutting edge of technology.

Outside of these two extremes, most CIOs seem keen to enable people to work how they prefer. A popular view is that people should be freed to work as and when they want, while IT should try to enable them to do so. This is now part of the 21st century workplace bargain that firms strike with staff, many believe. To paraphrase a common perception: "Yes, we may demand that you respond to e-mails over weekends and in the evenings, but in exchange we'll give you greater personal freedom to decide when and how you'd like to work."

In aggregate, while there is often a heated debate back and forth about the merits and pitfalls of technology democracy, much of it seems overblown. No correlation is evident between the freedom to choose devices and applications and overall corporate performance. "You need to strike a balance," says Ms Scott of Baker Hughes. "We're firmly in the camp that if you don't embrace these technologies and make them work, then people will go and find ways around this." Baker Hughes has experimented with allowing workers to use their own devices in the workplace in exchange for signing up to a policy that clarifies what practices are expected and allows the company to wipe data on the devices if needed. "It's well received," says Ms Scott. "People understand the need for control, but it's not draconian."

Technology leader: Jane Scott of Baker Hughes
Managing expectations in a globalised world

Baker Hughes, an oil and gas services firm, is a sprawling global enterprise, with over 50,000 employers operating in 90 countries. Staff often travel to some of the most challenging environments on the planet for their jobs. One of IT's roles is to ensure that wherever they are, they can remain connected to the rest of the enterprise.

This is already challenging for a workforce that expects literally to be able to work anywhere. But in trying to ensure that corporate applications keep pace with consumer technology, expectations are often stretched. One example comes with staff travelling to Africa. "We have challenges in getting similar response rates as in the UK

[for communication platforms], but people often quote the fact that they can travel from the US to Africa and use Skype [to call]," explains Jane Scott, the firm's vice-president for IT. In a globalised world, technology expectations have to be met in a wide range of operating environments.

A related challenge comes in ensuring high performance from corporate applications for a workforce that no longer follows set patterns of working. "Historically, the demand for a particular set of services was predictable: busy in the mornings, drop off at lunch, and so on," says Ms Scott. "But people's working day is now blurred with their personal lives. Our work day in any given country is less 9 to 5 and more 24/7, so controlling for peaks and troughs is harder than before."

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Key points

- Most executives believe technology projects are delivering the expected benefits
- Technology projects are also delivering much faster than previously
- Conflicts between IT and business units are common, but appear not to be harmful

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Beyond the distractions, IT usually delivers

[5] The Standish Group, *Chaos*, 1995.

[6] National Audit Office, *The National Programme for IT in the NHS: an update on the delivery of care records systems*, May 2011.

Technology projects have long been given a bad press. As early as 1995, a widely cited report from the Standish Group argued that as few as 16% of IT projects were delivered successfully, on time and within budget.[5] In its annual reports published since then, this figure has crept up but still remains under 50%. Some have questioned the accuracy of this measure, but anecdotal examples of IT project failure litter the press. A particularly high-profile one in the UK is the £11.4bn IT programme for the National Health Service (NHS), which includes the roll out of digital patient records. A May 2011 notice from the UK National Audit Office highlighted that despite huge cost overruns and delays, the "original vision for the National Programme for IT in the NHS will not be realised".[6]

Such headlines, however, mask a different picture within business. A striking 84% of executives to our survey believe that technology investments in their firm aimed at delivering greater efficiency have succeeded as planned. Just 13% disagree. Nearly eight in ten (78%) feel that investments aimed at cutting costs have succeeded. There is still scope for improvement, but the results suggest that, for the most part, technology investments are delivering on their core promises. This is an area where our high-performing firms stand out: about one in four delivers IT projects that exceed expectations, compared with less than 5% at poorly performing firms.

Please indicate whether you think your organisation's technology investments have succeeded in producing these benefits for the business?
(% respondents)

■ Have succeeded ■ Have not succeeded ■ Don't know/Not applicable

Benefit	Have succeeded	Have not succeeded	Don't know/Not applicable
Greater security	85	15	
Improved operating efficiency	84	13	2
Improved compliance with regulatory requirements	79	18	3
Reduced costs	78	15	7
Improved management of risks facing the business	78	22	
Streamlined management decision-making	74	22	4
Better quality information about customers and/or markets	69	25	5
Improved agility (being able to adapt rapidly and cost-efficiently to changes in the environment)	67	32	1

How would you characterise the business results of technology initiatives undertaken in your part of the organisation in the past three years?
(% respondents)

Total   High-performing firms

Exceeded our expectations
8
23

Met our expectations
71
67

Did not meet our expectations
19
8

Don't know
2
2

> "The majority of IT projects are actually quite small, not the huge ones you see in the press. Most of them deliver to time and cost."
>
> *Chris Edwards, professor of management information systems, Cranfield School of Management*

Delivering on some expectations is clearly harder. A smaller number of respondents (albeit still over two-thirds) report project success in increasing agility or obtaining better-quality information about customers and/or markets. On the whole, however, it is hard to extract a story of limited value being delivered. Eight in ten respondents say that their most recent technology initiatives either met or exceeded expectations. "The majority of IT projects are actually quite small, not the huge ones you see reported in the press. Most of them deliver to time and cost," says Mr Edwards of Cranfield. "The ones that go wrong are virtually always the very big ones with lots of interfaces, and those appear in the press. You never hear about the successes!"

Also of note is that technology projects now typically deliver far faster than before, owing to the general maturing of enterprise software over the past decade and ongoing innovation that has helped to simplify both development and implementation. Some years ago, setting up a CRM system was a major undertaking stretching over 18 months; today, observes Mr Gray of BP, it can be up and running in under six weeks and scaled to as many users as needed.

But this acceleration of IT delivery can in turn serve to raise expectations further. From a development perspective, notes Mr Fejes of EPAM Systems, employees used to applications working "at the speed of Google" need to be reminded that this is often beyond the budgets and capacity of in-house IT.

Good for the business—even with the conflicts

This is not to suggest that IT's relationship with the rest of the business is conflict-free. Many of the concerns cited in this chapter are very real ones within many organisations. But some oft-voiced perceptions about the failure of technology and IT to meet business objectives appear to be exaggerated, at least based on experiences in EMEA. Technology knowledge and expectations gaps still exist in many businesses, just as they do between finance or production, or other functions. Just 10% of respondents say they never disagree with IT about major technology issues; nearly four in ten argue quite regularly. But none of this appears to be hindering business performance. Rather, it is merely a distraction from how the CIO and corporate IT is helping the business to use technology to innovate. In the decade ahead, this will be the most crucial facet of many a CIO's job.

Technology leader: Paul Coby of John Lewis
The myth of a generational divide

Paul Coby does not buy the argument of a generational difference between young and old. Instead, he sees a wider societal change that has been sparked by several technologies that are sufficiently simplified—while remaining powerful tools—to appeal to a far greater audience. Much of this is encapsulated in touch-screen tablet devices, but it is also wider than that. With more than 800m active users on Facebook today, technology is getting about as mainstream as it could ever be. "There's something broader going on," says Mr Coby. "The combination of tablets and smart phones and a world of apps, rather than systems, has made technology fun, exciting and easy to use."

All this is very clear within his role at John Lewis. "We find that our Facebook site is used by all generations of customers," confirms Mr Coby. "So I think it doesn't quite do it justice to see this as a generational thing."

In turn, this consumerisation trend affects the demands made on the CIO, especially in terms of ensuring that systems are sufficiently simple to use. "Corporate systems must be secure [but] they're not always very easy to use," he says. This, however, creates other challenges, such as determining which technology investments are most important. "Most wise organisations invest in the customer-facing areas. This is especially important in a world with multiple channels: not just shops and online, but call centres, mobile and social media as well. You've got to make sure that you're in the channel your customers want to use."

- Companies are looking mainly to the CIO and IT to drive innovation
- CIOs must look both inside and outside the firm for innovative ideas
- A more serious expectations gap may exist between firms and their customers

The real challenge: Managing innovation expectations in a disruptive decade

Disruption caused by technology innovation has made the past decade a challenging one for many businesses. Music retailers found their stores emptying as users started downloading songs online; bookstores are now suffering similar pressures as e-books take off. Airlines have gone from selling via travel agencies to largely selling direct. Insurers are using both analytics and tracking technology to identify entirely new market niches. The examples are plentiful.

Behind the scenes, technology innovation has been constant, ranging from applications that help to optimise and cut costs from supply chains to devices that help shoppers to pay for their goods more quickly. All businesses rely on technology to some degree to improve efficiency and gain a competitive edge. The real weight of expectation on corporate IT is thus about being an enabler of innovation. Rob Lambert, a senior lecturer in management information systems at the Cranfield School of Management, believes that coping with innovation, and working out how best to manage this, will be a key issue in coming years. "Organisations will be unrecognisable in five years' time," he argues. "From social media to cloud computing, there is a whole range of things that firms need to come to grips with."

Technology leader: Julian Gray of BP Alternative Energy:
IT-enabled energy innovation

For many consumers, technology innovation is often seen as an Internet-led phenomenon. Many of the most high-profile technology innovators are wholly online—from Facebook to Google. However, although older industrial sectors are less high-profile, they are often at the cutting edge of technology. BP Alternative Energy is one such example. It uses IT in a range of ways to speed its core task of exploring new sources of energy. From complex modelling to a better understanding of wind flows for turbines, to seismic imagery to assess geological forces, IT is at the heart of much of its efforts.

"We're very innovative when it comes to the technology outside of IT, but also within IT," asserts Julian Gray, the firm's CIO. This innovation extends to how the firm collaborates: the BP Group has developed its own internal social network, dubbed "The Link", which has been enthusiastically embraced by both younger and older employees. Mr Gray noted concerns that the take-up of such a platform would be poor, given that the firm is "relatively grey-haired", but such concerns have been allayed. This has furthered his view that technology aptitude and interest has nothing to do with age, but rather personal interest.

However, even in such an innovative firm, not all technology expectations can be met. Mr Gray cites one IT worker who moved on in order to get closer to online technologies. "He thought BP wasn't innovative enough in the Internet space. We're a resources company, so our websites have a different purpose to, say, Facebook or Google where they are the core of their business model."

In turn, this raises the question of who will lead such innovation. "Will it be the CIO, or someone who looks after core technology?" asks Mr Edwards of Cranfield. "Who will manage the change wrapped around the technology? Who is planning the organisation and how is it to be managed five years from now?"

CIOs at the heart of innovation

Our survey makes clear that, in EMEA at least, the bulk of the business is looking to the CIO and IT to initiate technology-led efforts to change business processes and develop new products and services. The greatest share (45%) of respondents already see IT as a source for such technology-led innovation today, ahead of research and development (R&D) and other functions, with no expectation that this will change in the near future (see chart below). Needless to say, IT must continue to collaborate closely with all parts of the business in order to push innovation. "I do think IT should be a source of innovation, but not in isolation," says Mr Coby. "The trick as ever is to inspire the business as to what technology can do in terms of serving customers better or being more efficient in the way it works."

Where do you think most new ideas for technology-enabled innovation will originate three years from now? Select up to two.
(% respondents)

IT	42
R&D	28
Marketing	23
Operations & production	20
General management	20
Sales	13
Customer service	12
Finance	9
HR	2
Other, please specify	2

John Lewis's work to revamp its website and store payment systems highlights the importance of IT working smoothly with other parts of the business. This will have a significant bearing on the experience that millions of customers encounter in its stores, but a major challenge is that payment technology continues to change rapidly, from near-field communications and contactless cards to mobile phones and Bluetooth. "IT sits at the intersection of fast-moving technologies, especially in retail—a business that is being revolutionised by technology," says Mr Coby. "We need to demystify it and see which way things are headed."

In turn, while the steady consumerisation of IT has made technology increasingly exciting and easy to use, it has also created a new set of expectations for corporate IT. "How can we make people's use of technology in the workplace as intuitive and as fun as their use of technology at home,"
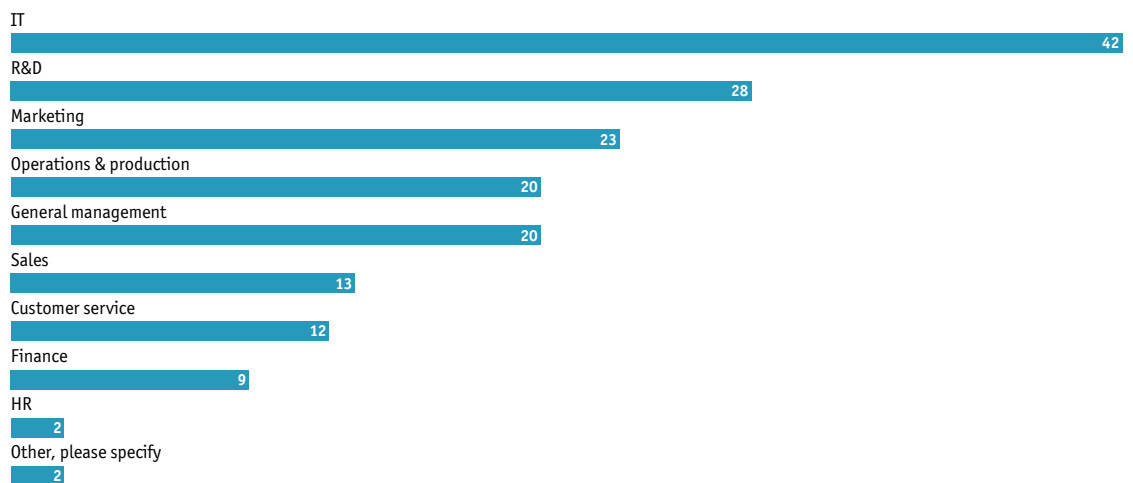
If you think of the most recent technology-led change or innovation in your area, what would you say is the most likely type of benefit that will be gained, and how would you characterise it?
(% respondents)

Dramatic | Modest | None

Increase in sales revenue
24 | 58 | 18

Increase in profitability
26 | 56 | 18

Increase in efficiency
48 | 46 | 6

Increase in knowledge of customers and/or markets
34 | 52 | 14

Increase in responsiveness
38 | 51 | 12

Other, please specify
10 | 15 | 75
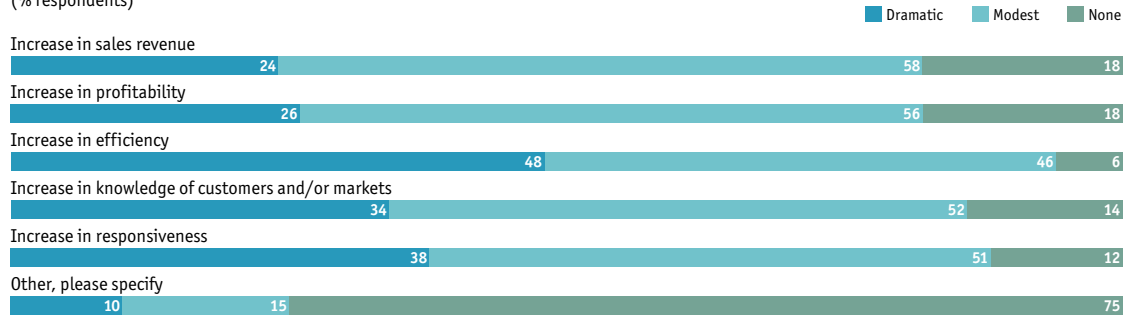
asks Mr Coby. "This is going to be very challenging for IT directors, but also a big opportunity to reposition corporate IT."

Encouragingly, considerable progress already appears to be under way. In the survey, nearly one-half (48%) of executives anticipate a "dramatic" increase in efficiency as a result of their firm's most recent technology-led innovation, while one in four (24%) says the same of the impact on sales revenue. This may not necessarily be related to making tools simpler or more user-friendly, but the ability for IT to deliver on innovation is hardly absent.

The speed of innovation is also rapid. One-half of all executives polled say that the last technology-led change or innovation in their department was completed in the past three months. The advent of cloud computing is one commonly cited factor. Ms Scott of Baker Hughes notes the potential for rapidly scaling up cloud-based systems to cope for specific processing tasks, such as data gathered from the firm's exploration activities. "This involves a huge amount of data for limited periods of time, so the idea of expanding capacity for a limited period and then scaling down is extremely attractive," she says.

Build, buy or broker?
But this rapid pace of change, combined with technology's potential for transforming—or

In your department or part of the business, when was the last technology-led change or innovation (eg, a change in process, introduction of a new application or device, development of a new web portal, etc) introduced?
(% respondents)

In the past month — 23
In the past two months — 15
In the past three months — 13
In the past six months — 20
In the past year — 18
In the past two years — 4
In the past three years — 3
Longer than three years — 2
Don't know/Not applicable — 2
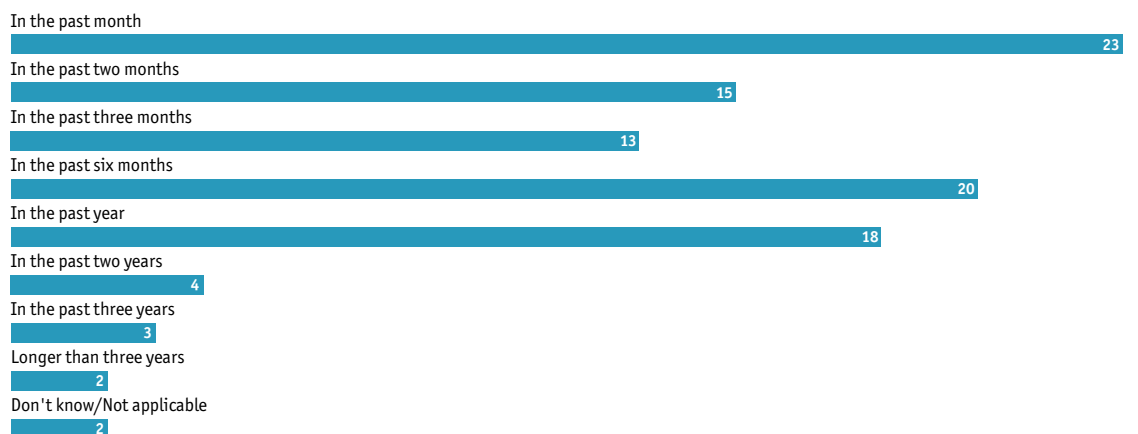
undermining—business models, makes it a tough challenge to manage. Firms not only have to scour for potential innovations within their own sector, but also within others. Nokia provides a striking example. Entirely new rivals that had never previously competed in its market have disrupted its core handset business in just a few years. In the US smart phone market, Google's Android now holds 39% of the market, while Apple's iOS holds 28%; Nokia languishes on just 2%, according to Nielsen.[7]

This requires CIOs to identify innovation from all sources, both internally and externally. IT teams naturally need to collaborate closely with other business units, to identify and respond to new needs. "If someone is having a debate about how to optimise an ethanol supply chain, the power of what we do is in the fact that we're invited to the conversation at the start," says Mr Gray of BP. "It's not people going off and coming up with ideas and then asking IT afterwards."

At Baker Hughes, the IT team also seeks to bring new ideas to the table. "We have a clear strategy. Make sure we understand the business, then look at our rivals in the sector, as well as other firms in [non-competitive sectors]," says Ms Scott. One example might be in considering how to streamline cash collection processes: direct rivals may have better systems, but firms in wholly unrelated areas may well have the best approaches of all.

Firms also need to look well beyond their own walls, whether in terms of innovating with partners, or buying in new technologies or promising start-ups. "It tends to be the smaller firms, the start-ups, that do something differently," confirms Mr Edwards. "If you're a bigger firm, with healthy profits, you don't want to change." He cites the example of HMV, which was happy with its old model. "But why didn't it invent its equivalent of iTunes?" he asks.

To counter this, firms such as BP have a dedicated technology innovation team, which identifies and tests new technologies. These may range from promising devices or applications to high-tech start-ups that can be acquired. For firms such as Shape, a Danish app developer, this is a prime opportunity for growth. In the view of its co-founder and CEO, Christian Risom, most innovation will come from cash-rich corporates buying creative young start-ups (see case study). Even Facebook, itself an innovative

[7] Nielsen, *Manufacturer operating system share-smartphones*, June 2011

Do you agree or disagree? "Our customers' expertise with technology is increasing faster than our own."
(% respondents)

■ Total ■ High-performing firms ■ Poorly performing firms

Strongly agree
6
0
10

Agree
29
23
31

Disagree
50
44
49

Strongly disagree
11
29
7

Don't know
4
4
3
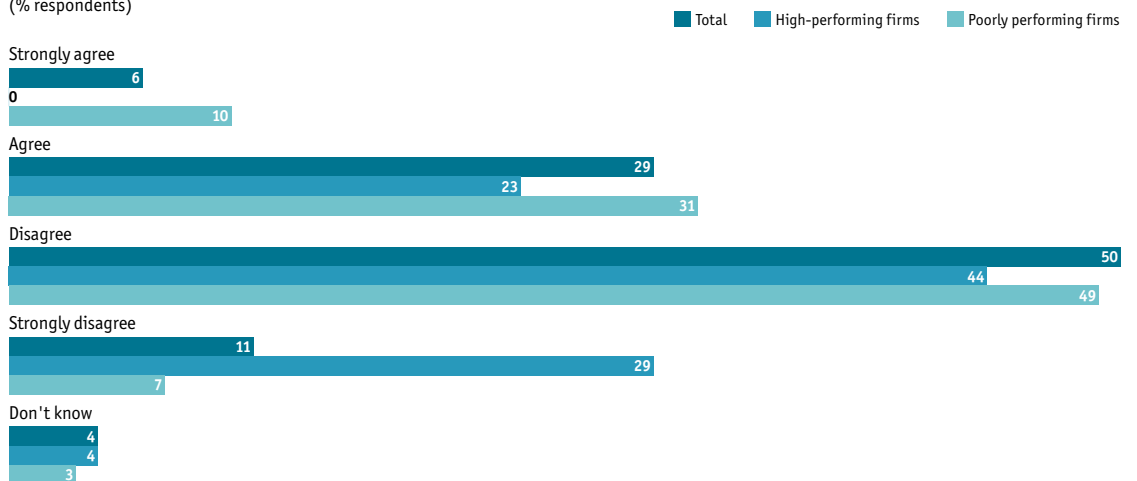
Note: "High-performing firms" are those with annual profit growth of 20% or more in the past three years, while the figure for "poorly performing" ones is between 0% and -5%.

young firm, aggressively buys start-ups to help it develop faster, he notes.

The real gap to mind

Approaches to innovation will naturally vary widely between firms and sectors. Amid all this, CIOs will typically seek to co-ordinate the process of introducing new technologies and innovations. Furthermore, as this report has made clear, an encouragingly high proportion of IT functions are keeping pace with corporate expectations—despite ongoing and healthy disagreements. However, although the expectations gap between IT and the rest of the business may no longer be as large, a more important gap for many to watch is that between companies and their customers.

Overall, 35% of executives agree that their customers' expertise with technology is increasing faster than their own. This is already a concern, but there is also a far larger gap between high-performing firms and those that have performed poorly in recent years. Nearly twice as many poorly performing firms (having recent profit growth between 0% and -5% annually) as high-performing ones agree that their customers' technology knowledge is outpacing their own.

Of all the expectations gaps outlined in this report—either real or perceived—this is probably the most dangerous of all. Once customers think firms are behind the curve in terms of technology and innovation, they will naturally gravitate to new rivals. "Look at what's happened to Nokia," warns Mr Risom of Shape. "They didn't embrace development, and now they're being beaten at their own game."

CASE STUDY **Selling fast-moving innovation to slow-moving corporates**

One of the most remarkable surges in innovation in recent years has been the boom in the development of apps for mobile devices. Apple's dedicated app store, launched only in mid-2008, already hosts hundreds of thousands of applications. These have been at the heart of technology consumerisation, inspiring people to use simple apps to help them to do anything from catching trains to cooking better.

But for the thousands of small firms at the cutting edge of app innovation, trying to collaborate with often slower-moving corporate IT systems can be a challenge. Shape, a young Copenhagen-based firm that develops independent apps of its own and also builds them for corporate clients, provides one example. In the view of its co-founder and CEO, Christian Risom, the challenge is

not in convincing its clients' marketing functions about the benefits of using innovative apps; it is in getting corporate IT to buy into the vision. "The CIO or CTO of some corporation is likely to have a certain way he likes to do things or certain technologies he likes to use, and it can be a very hard sell trying to get him to do something different," he explains.

This can manifest itself in various forms: the programming language used, or the security protocols put in place, or in how it integrates with legacy systems. "In development, like everything else, there's a trend. Some languages are hotter than others, and it keeps changing," says Mr Risom. "And you see this collision between those two ways of thinking." The result is that some corporate clients could miss out on new innovations, by failing to embrace new platforms or approaches that a hungry young start-up might help to deliver. "I think a lot of companies are going to innovate in future by buying small companies for the cutting edge know-how instead of doing traditional in-house R&D," believes Mr Risom.

Conclusion

"We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten," Bill Gates once observed. Ten years on from the collapse of the dotcom bubble, the seemingly wild promises of that era are now largely a reality today. By and large, we have become an online society. But this in turn has raised concerns within much of the CIO community about a widening technology expectations gap as well as over-consumerisation and the impact of Generation Y. While such issues cannot be ignored, they are essentially distractions from the main task at hand, which is about ensuring that the firm remains technologically relevant and competitive in a rapidly changing marketplace.

Rapid technological development will not cease in the decade ahead. At a corporate level, many aspects of IT will become increasingly commoditised, thanks to ongoing advancements such as the cloud. This will continue to push the IT function towards being an enabler of innovation. For long-standing IT veterans, this is not a new role: they have long been introducing innovation and new ways to work. But the consumerisation of technology has shifted expectations of what IT could and should be able to deliver, in part from internal stakeholders, but more importantly from external ones. Delivering on such expectations will be the biggest challenge facing CIOs, IT and technology.

Appendix: Survey results

In August-September 2011 the Economist Intelligence Unit conducted a survey of 508 executives across Europe, the Middle East and Africa. Our sincere thanks go to all those who took part in the survey.

Please note that not all answers add up to 100%, either because of rounding or because respondents were able to provide multiple answers to some questions.

What has been your firm's annual growth of operating profit over the past three years, on average?
(% respondents)

20% or higher
9

10-20%
21

5-10%
29

0-5%
17

Decline
11

Don't know/not applicable
11

How would you rate the technology knowledge of the following groups or individuals in your organisation?
Rate on a 1-5 scale where 1 = excellent and 5 = poor.
(% respondents)

■ 1 Excellent ■ 2 ■ 3 ■ 4 ■ 5 Poor ■ Don't know/Not applicable

Senior management overall
13 | 37 | 32 | 12 | 4 | 1

Middle management overall
11 | 42 | 33 | 10 | 2 | 3

Line employees overall
9 | 34 | 36 | 15 | 3 | 3

CEO
25 | 41 | 19 | 8 | 4 | 2

CFO
23 | 38 | 24 | 7 | 4 | 4

CIO
41 | 31 | 13 | 3 | 2 | 10

Do you agree or disagree with the following statements?
(% respondents)

■ Strongly agree ■ Agree ■ Disagree ■ Strongly disagree ■ Don't know/Not applicable

The differences in technology knowledge between senior management, on the one hand, and lower-level managers and employees, on the other, have increased dramatically in the past five years

| 12 | 48 | 31 | 5 | 3 |

Growing differences in technology knowledge between senior management and lower-level managers and employees are causing serious problems in our business

| 5 | 29 | 57 | 7 | 2 |

Our customers' expertise with technology is increasing faster than our own

| 6 | 29 | 50 | 11 | 4 |

Our suppliers' expertise with technology is increasing faster than our own

| 5 | 32 | 50 | 9 | 5 |

How would you rate the technology knowledge of the following functions or departments in your organisation?
Rate on a 1-5 scale where 1 = excellent and 5 = poor.
(% respondents)

■ 1 Excellent ■ 2 ■ 3 ■ 4 ■ 5 Poor ■ Don't know/Not applicable

Marketing

| 10 | 35 | 37 | 11 | 3 | 5 |

Sales

| 8 | 31 | 40 | 11 | 4 | 7 |

Finance

| 11 | 40 | 32 | 13 | 3 | 2 |

HR

| 7 | 30 | 33 | 18 | 8 | 4 |

IT

| 48 | 36 | 7 | 4 | 2 | 3 |

R&D

| 28 | 33 | 15 | 4 | 1 | 18 |

Operations & production

| 17 | 36 | 29 | 8 | 1 | 8 |
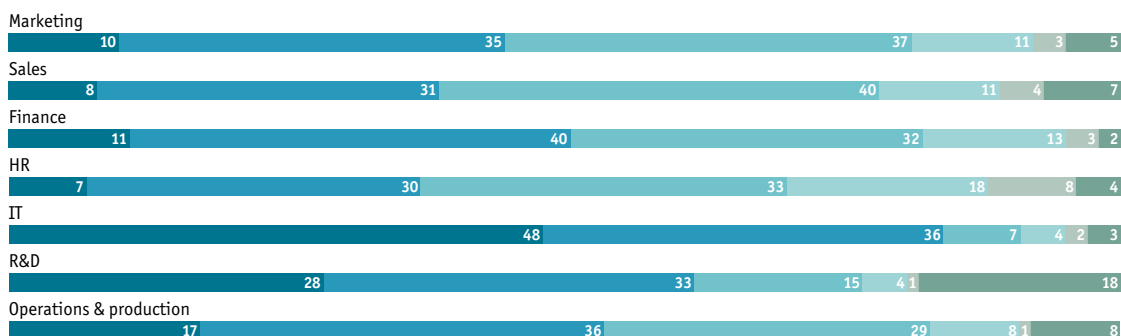
If you believe that technology knowledge has increased across one or more of the above functions or departments in recent years, what has been the effect on their performance?
(% respondents)

■ Significant improvement ■ Little or no improvement ■ Deterioration ■ Don't know/Not applicable

Marketing

| 33 | 53 | 2 | 11 |

Sales

| 33 | 53 | 3 | 12 |

Finance

| 37 | 52 | 3 | 8 |

HR

| 28 | 56 | 5 | 11 |

IT

| 62 | 30 | 2 | 7 |

R&D

| 41 | 34 | 2 | 23 |

Operations & production

| 40 | 44 | 2 | 13 |
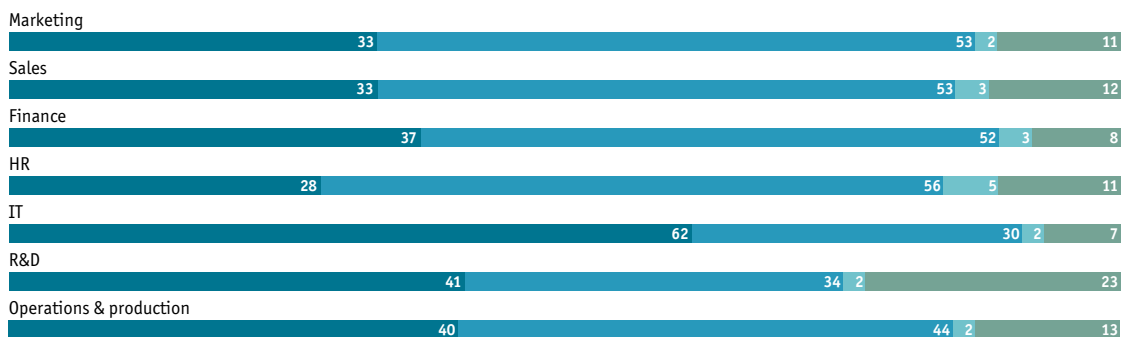
Please respond to the following questions:
(% respondents)

Yes ■ No ■ Don't know/Not applicable ■

Does your organisation allow employees to use their own mobile devices (eg, smartphones, tablets, notebooks) for work?

| 70 | 29 | 1 |

Is your IT department willing to support multiple devices or other technologies, or only the ones it officially recognises?

| 54 | 31 | 5 |

Are employees allowed to choose which productivity applications they use, if they feel alternatives are better?

| 40 | 57 | 3 |

In general what do you think should be the chief benefits that your organisation's technology investments bring to the business? Select up to two.
(% respondents)

Improved operating efficiency
64

Reduced costs
32

Improved agility (being able to adapt rapidly and cost-efficiently to changes in the environment)
28

Better quality information about customers and/or markets
23

Streamlined management decision-making
15

Greater security
11

Improved compliance with regulatory requirements
7

Improved management of risks facing the business
6

Other, please specify
1

Please indicate whether you think your organisation's technology investments have succeeded in producing these benefits for the business?
(% respondents)

Have succeeded ■ Have not succeeded ■ Don't know/Not applicable ■

Reduced costs

| 78 | 15 | 7 |

Improved operating efficiency

| 84 | 13 | 2 |

Improved agility (being able to adapt rapidly and cost-efficiently to changes in the environment)

| 67 | 32 | 1 |

Better quality information about customers and/or markets

| 69 | 25 | 5 |

Greater security

| 85 | 15 |

Improved compliance with regulatory requirements

| 79 | 18 | 3 |

Streamlined management decision-making

| 74 | 22 | 4 |

Improved management of risks facing the business

| 78 | 22 |

Other, please specify

| 25 | 50 | 25 |

When it comes to technology-enabled innovation (using technology to change processes, develop new products or services, etc), where in your organisation did most new ideas originate three years ago? Select up to two.
(% respondents)
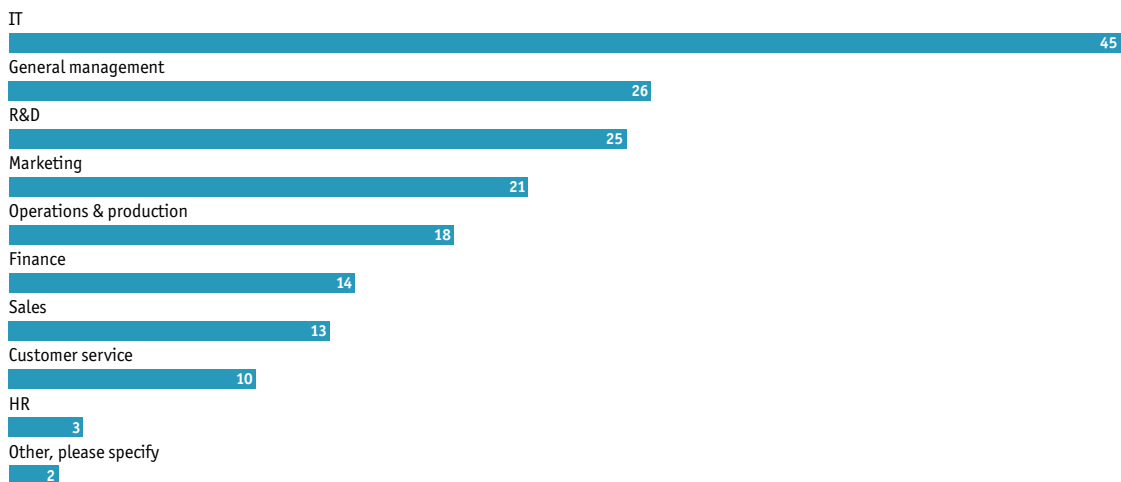
IT
45

General management
26

R&D
25

Marketing
21

Operations & production
18

Finance
14

Sales
13

Customer service
10

HR
3

Other, please specify
2

Where do you think most new ideas for technology-enabled innovation will originate three years from now? Select up to two.
(% respondents)

IT
42

R&D
28

Marketing
23

Operations & production
20

General management
20

Sales
13

Customer service
12

Finance
9

HR
2

Other, please specify
2

In your department or part of the business, when was the last technology-led change or innovation (eg, a change in process, introduction of a new application or device, development of a new web portal, etc) introduced?
(% respondents)

In the past month
23

In the past two months
15

In the past three months
13

In the past six months
20

In the past year
18

In the past two years
4

In the past three years
3

Longer than three years
2

Don't know/Not applicable
2

If you think of the most recent technology-led change or innovation in your area, what would you say is the most likely type of benefit that will be gained, and how would you characterise it?
(% respondents)

■ Dramatic ■ Modest ■ None

Increase in sales revenue
24 | 58 | 18

Increase in profitability
26 | 56 | 18

Increase in efficiency
48 | 46 | 6

Increase in knowledge of customers and/or markets
34 | 52 | 14

Increase in responsiveness
38 | 51 | 12

Other, please specify
10 | 15 | 75
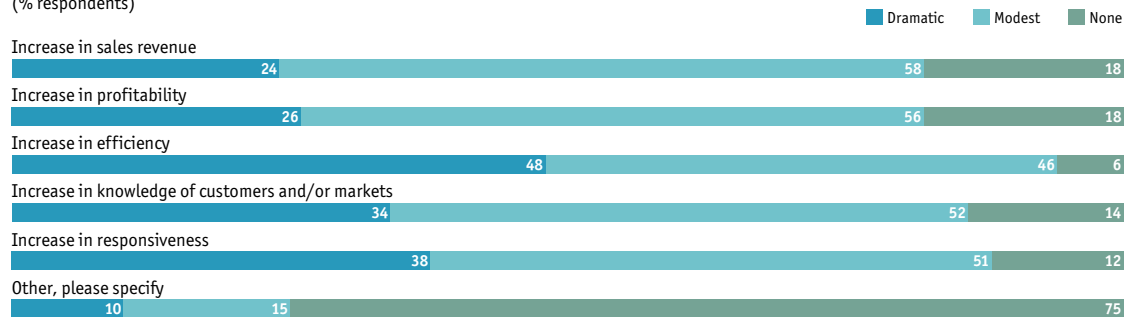
In general, how would you characterise the business results of technology initiatives undertaken in your part of the organisation in the past three years?
(% respondents)

Exceeded our expectations
8

Met our expectations
71

Did not meet our expectations
19

Don't know/Not applicable
2

If you responded "Did not meet our expectations" to the previous question, what have been the main reasons for this?
Select up to two.
(% respondents)

Poor implementation of the initiatives
8

Disconnects between IT and the main technology users
8

Poor user knowledge of the technology
6

Lack of support from senior management
4

Inadequate performance of the given technology
4

Market expectations/standards moved faster than our initiatives
3

Cost overruns
3

Excessive complexity of the technology
2

Change of business objectives before initiatives were completed
1

Other, please specify
1

When it comes to ease of communication with external stakeholders (ability to interact through multiple channels — email, messaging, the website, data interchange, etc), do you believe that your organisation is meeting the expectations of the following groups?
(% respondents)

■ Yes ■ No ■ Don't know/Not applicable

Customers
76 | 18 | 6

Suppliers
72 | 16 | 11

Marketing/distribution partners
64 | 20 | 15

In the past year, how often would you say that IT and key technology users in your part of the organisation have disagreed about major technology issues (eg, purchases, use of certain devices or applications, etc)?
(% respondents)

Frequently
11

Sometimes
31

Occasionally
43

Never
10

Don't know
6

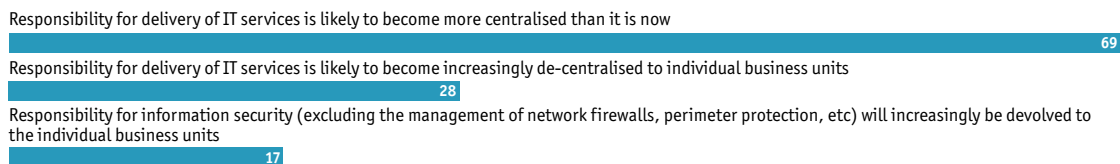**How do you think responsibility for the delivery of IT services in your organisation will evolve over the next three years?**
Select all that apply.
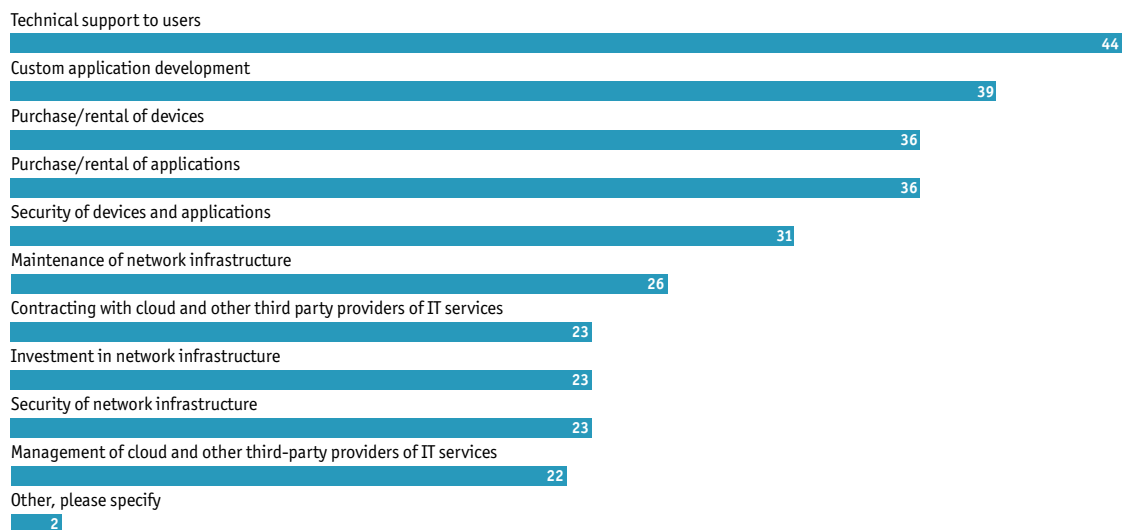(% respondents)

Responsibility for delivery of IT services is likely to become more centralised than it is now
| 69 |

Responsibility for delivery of IT services is likely to become increasingly de-centralised to individual business units
| 28 |

Responsibility for information security (excluding the management of network firewalls, perimeter protection, etc) will increasingly be devolved to the individual business units
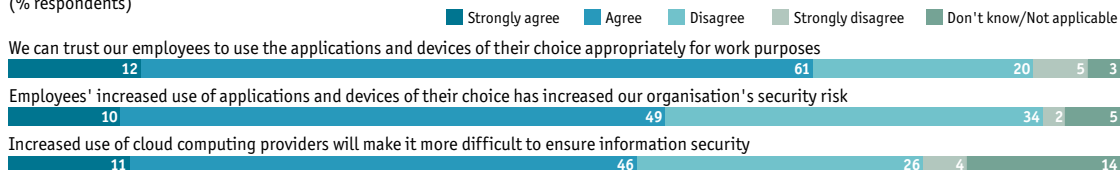| 17 |

In your view, which of the following aspects of IT management should individual business units assume primary responsibility for? Select all that apply.
(% respondents)

Technical support to users
| 44 |

Custom application development
| 39 |

Purchase/rental of devices
| 36 |

Purchase/rental of applications
| 36 |

Security of devices and applications
| 31 |

Maintenance of network infrastructure
| 26 |

Contracting with cloud and other third party providers of IT services
| 23 |

Investment in network infrastructure
| 23 |

Security of network infrastructure
| 23 |

Management of cloud and other third-party providers of IT services
| 22 |

Other, please specify
| 2 |

Do you agree or disagree with the following statements?
(% respondents)

| Strongly agree | Agree | Disagree | Strongly disagree | Don't know/Not applicable |

We can trust our employees to use the applications and devices of their choice appropriately for work purposes
| 12 | 61 | 20 | 5 | 3 |

Employees' increased use of applications and devices of their choice has increased our organisation's security risk
| 10 | 49 | 34 | 2 | 5 |

Increased use of cloud computing providers will make it more difficult to ensure information security
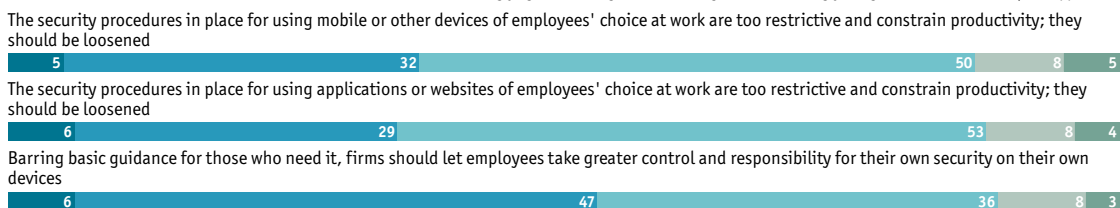| 11 | 46 | 26 | 4 | 14 |

Do you agree or disagree with the following statements?
(% respondents)

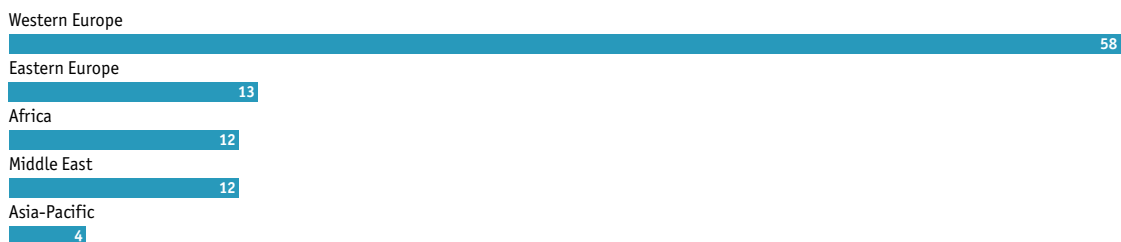█ Strongly agree █ Agree █ Disagree █ Strongly disagree █ Don't know/Not applicable

The security procedures in place for using mobile or other devices of employees' choice at work are too restrictive and constrain productivity; they should be loosened

| 5 | 32 | 50 | 8 | 5 |

The security procedures in place for using applications or websites of employees' choice at work are too restrictive and constrain productivity; they should be loosened

| 6 | 29 | 53 | 8 | 4 |

Barring basic guidance for those who need it, firms should let employees take greater control and responsibility for their own security on their own devices

| 6 | 47 | 36 | 8 | 3 |

In which country are you personally located?
(% respondents)

Country	%
South Africa	11
France	8
Italy	7
United Kingdom	7
Germany	6
Russia	6
Spain	6
Netherlands	5
United Arab Emirates	5
Sweden	4
Poland	4
Belgium	4
Portugal	3
Nigeria	2
Romania	2
Other	21
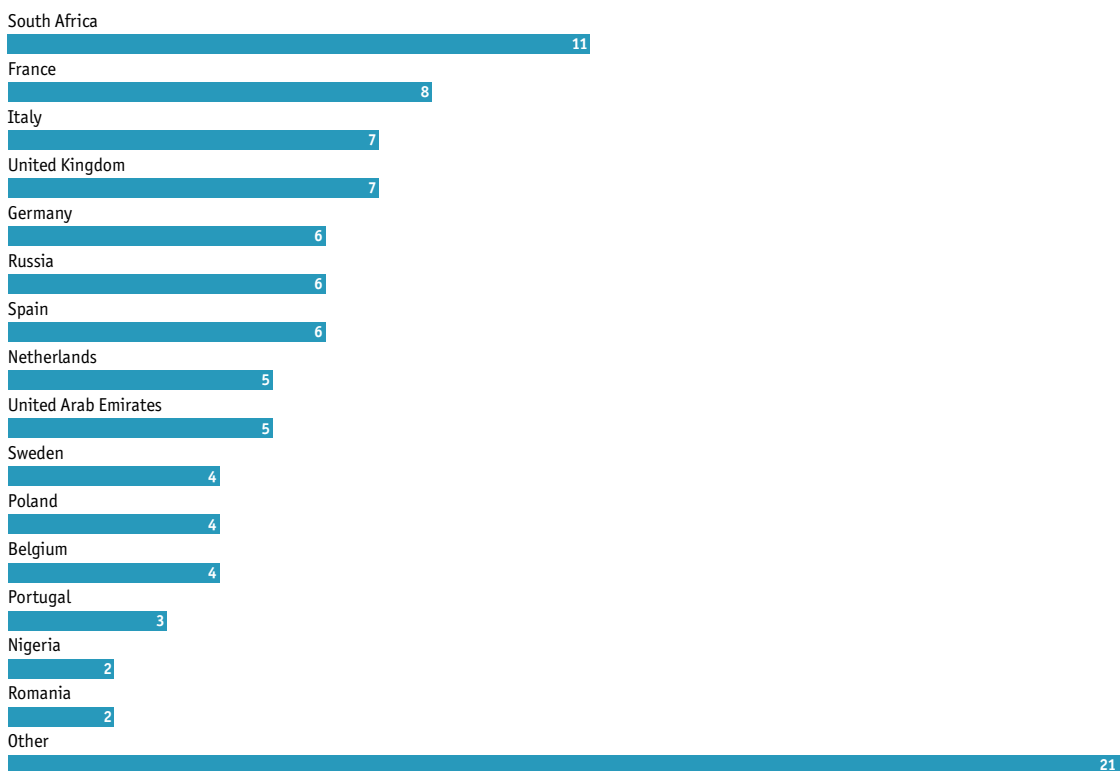
In which region are you personally based?
(% respondents)

Western Europe
58

Eastern Europe
13

Africa
12

Middle East
12

Asia-Pacific
4

What is your primary industry?
(% respondents)

Financial services
15

IT and technology
12

Professional services
11

Manufacturing
10

Consumer goods
7

Energy and natural resources
6

Construction and real estate
5

Healthcare, pharmaceuticals and biotechnology
5

Government/Public sector
5

Retailing
5

Telecommunications
3

Automotive
3

Entertainment, media and publishing
3

Agriculture and agribusiness
2

Logistics and distribution
2

Transportation, travel and tourism
2

Aerospace/Defence
2

Chemicals
2

Education
1

What are your company's annual global revenues in US dollars?
(% respondents)

$500m or less
51

$500m to $1bn
23

$1bn to $5bn
12

$5bn to $10bn
5

$10bn or more
9

Which of the following best describes your job title?
(% respondents)

Board member
6

CEO/President/Managing director
23

CFO/Treasurer/Comptroller
7

CIO/Technology director
6

Other C-level executive
9

SVP/VP/Director
12

Head of business unit
4

Head of department
12

Manager
21

Other
2
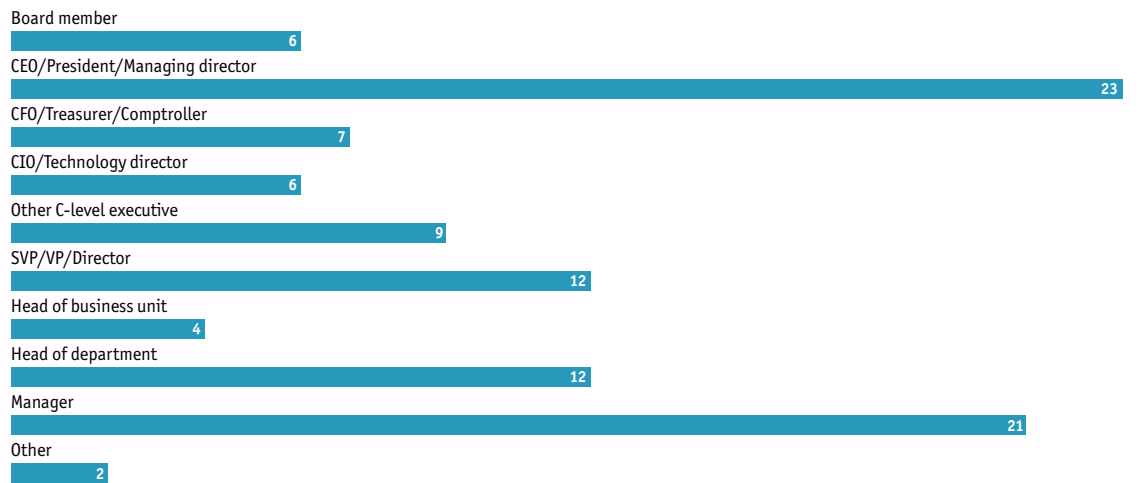
What are your main functional roles? Choose up to three.
(% respondents)

General management
41

Strategy and business development
29

IT
25

Marketing and sales
20

Finance
17

Operations and production
12

Human resources
10

Information and research
8

Risk
7

R&D
6

Customer service
5

Legal
4

Procurement
1

Supply-chain management
1

Other
1
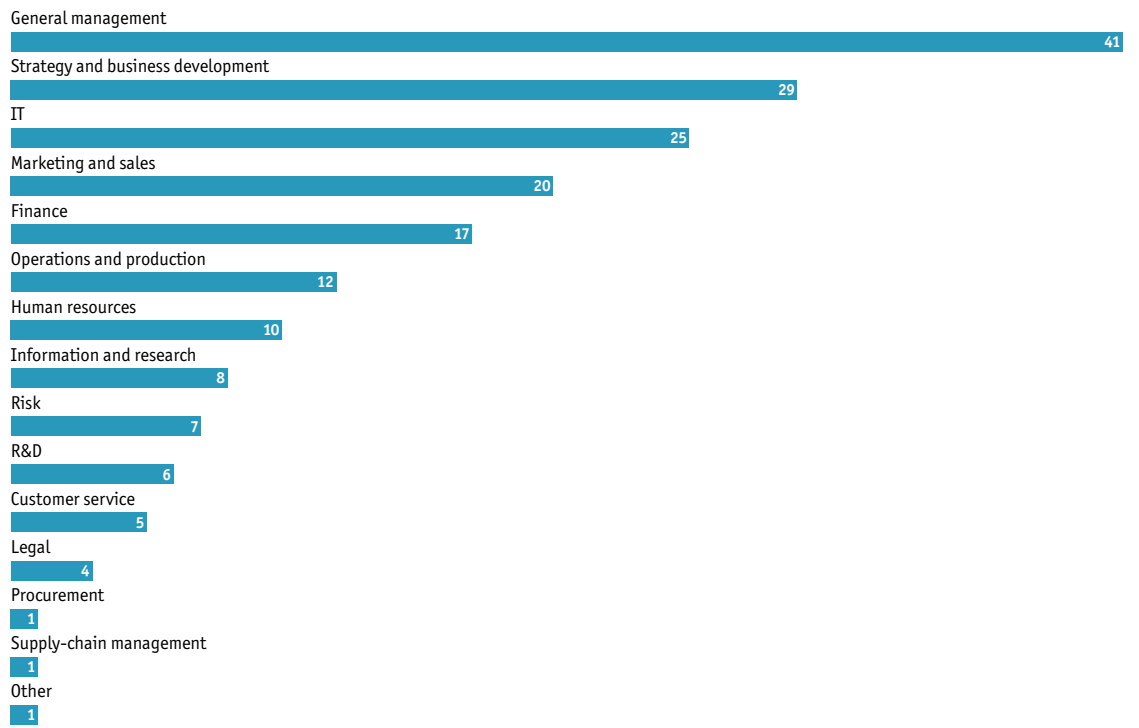
What is your age group?
(% respondents)

25-29
2

30-34
11

35-39
20

40-44
25

45-49
16

50-54
11

55-59
7

60 or older
6
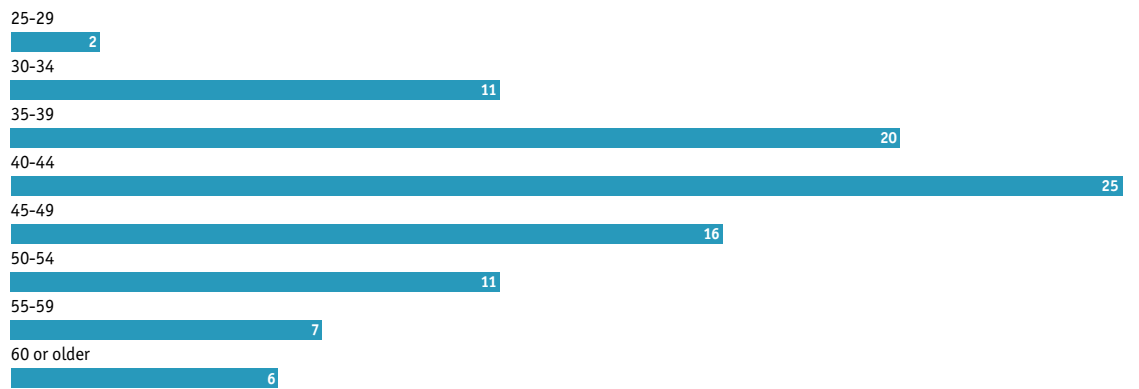
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