The digital company 2013 Freedom to collaborate

A report from the Economist Intelligence Unit Sponsored by:

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About the research

The digital company 2013: Freedom to collaborate is the second of two Economist Intelligence Unit reports in a research programme that explores the impact that technology advances will have on how companies do business. Lead sponsors of the programme are AT&T, Nokia, PricewaterhouseCoopers and SAP, and supporting sponsors are Concep, Return Path and WebEx.

The Economist Intelligence Unit bears sole responsibility for this research. The Economist Intelligence Unit's editorial team executed the survey, conducted the analysis and wrote the report. The findings and views expressed here do not necessarily reflect the views of the sponsors.

Our research draws on three main initiatives:

- •In March 2008 we conducted a wide-ranging survey of senior executives from around the world. A total of 661 executives took part, more than one-half of them from the C-suite. They represent a cross-section of industries and a range of company sizes.
- •To supplement the survey results, we also conducted in-depth interviews with 16 practitioners and experts, including CIOs, managing directors and other senior managers, as well as academics and other leading authorities on the use of technology in the enterprise.
- Finally, we conducted an extensive programme of desk research, including a wide-ranging review of existing literature.

The author of this report was Kim Thomas and the editors were Denis McCauley and Debra D'Agostino. Our sincere thanks go to the survey participants and interviewees for sharing their insights on this topic.

September 2008



Executive summary

Over the past two decades, liberalisation and deregulation have transformed several industries, partly because technology advances have made it possible for multiple firms to compete autonomously without generating market chaos. In the next five years, it may be the turn of companies themselves to "liberalise and deregulate" within. Partly as a result of the wide-scale adoption of collaborative technologies by employees, customers and partners, information will flow more freely in 2013—within and outside of companies. Rather than combat this, successful firms in 2013 will have learned to harness the information and productive energy generated by this collaboration in ways that benefit the business.

For business leaders, realising this vision means coming to terms with autonomy: for employees, in how they access information and spend their work time; for the business units, in what technologies they purchase and how they use them. Above all, it will require from senior executives a great deal of courage and trust—courage to let technology bring customers and other external parties into the company's operations, and trust in their employees to do the right thing.

This is the major message of an Economist Intelligence Unit research programme that explores the impact that technology is likely to have on business in five years' time. In the first paper of this two-part study, we explored the changes to come in how companies interact with their customers and how they innovate. In this paper, we focus on what types of workplace practices, information management and IT delivery structures will be needed to operate and secure the open enterprise. Our analysis draws on a global survey of over 600 senior executives, as well as several in-depth interviews with business leaders and independent technology experts.

Key findings from this report include the following:

- •Technology ignorance will (almost) be a thing of the past. At its lower and middle levels, the 2013 workforce is likely to be fully at home with digital technologies in the workplace—or able to master them quickly. Business leaders may be concerned about the size of the talent pool available to them, but they are confident that those they do employ in 2013 will know how to use technology effectively. A total of 82% of survey respondents share this optimism. Three-quarters also believe that senior executives like themselves will at least have a clear understanding of how technology supports the business objectives.
- •Social networks will be common in the workplace, like it or not. Ambivalence reigns among surveyed executives when it comes to the role of social networks and similar collaborative applications: 44% say their firms will embrace these by 2013, but a large number are either undecided or say the reverse. Nonetheless, despite the doubts and perceived risks, these applications are likely to be a fixture in tomorrow's workplace.
- Rethinking performance measurement will help manage risk. The use of digital tools makes problematic the assessment of employee performance. Employers do not know how much time their employees spend with social applications, and how they spend it. An effective way to deal with this will be to change the way overall performance is measured—judging employees not based on the hours they



work but on the quality of the work they produce.

- •Virtual teams will need a dose of the traditional. The wider adoption of collaboration technologies will give wings to virtual team-working, within and between organisations. But the tele-working experience has taught firms that, if not carefully managed, team cohesion can suffer and may even outweigh the benefits gained by workforce flexibility. Traditional meetings and office time will need to be factored into most virtual working arrangements.
- Beware new mountains of information. Already awash in data, vast new stores of information will be generated for companies by their employees' and customers' use of digital collaboration tools. Many respondents fear business-process paralysis as a result, but most will learn to channel effectively new information filtered from discussions in blogs, wikis and instant messaging, not to mention e-mails and more traditional forms of communication.
- **Digital tools will democratise access to information.** Digital tools provide individual employees with greater control over the information they can access. This means that control of information will be taken out of the hands of managers. Wider access to information will lead to flatter, less hierarchical organisations. It will also lead to greater autonomy for employees, who will need to be trusted to find the information they need and act on it.
- •IT will also need to loosen the reins. In the open and collaborative enterprise of tomorrow, IT delivery will be less centralised. More surveyed executives believe new IT investment will be funded mainly through the individual business units than think it will remain centralised. More activities will be outsourced, and the "cloud computing" model, whereby computing services are managed by external, web-based parties, will gain adherents.
- •Ceding technology control will be good medicine. Ensuring security and performance in this environment will be a challenge, but interviewees and survey respondents are optimistic that, with the help of a more strategic-thinking CIO, IT will find the right balance. While only 27% consider IT a true partner in the business today and able to help the firm achieve most of its strategic objectives, 57% think this will come to be the case in five years' time.



Key points

- Technology will empower customers in their relationships with companies to a much greater extent than today.
- Firms will need to be ready to handle such interaction with customers and third parties—and use the knowledge gained to benefit the business.

Introduction

In our first report in *The digital company 2013* series¹ we suggested that the most profound technology impact on companies over the next five years will occur in how they interact with their customers. Beyond gaining the ability to deliver customer service in new and better ways, many firms will also draw customers—as well as partners—more closely into their innovation and product development processes. Web-based communities and other technology platforms for gathering customer and third-party input will feature prominently in these efforts. According to our survey respondents, in 2013 customers will have supplanted in-house research and development (R&D) as the primary source of innovative new ideas for their companies.

Make no mistake—technology will empower customers in their relationships with companies to a much greater extent than is the case today. But will companies be ready to handle such levels of interaction with customers and third parties? For one thing, dealing with technology-empowered consumers will require technology-savvy employees. Few executives are worried that the individuals they will employ in the front and back offices in 2013 will lack technology knowledge. Doubts abound, however, as to whether companies will be able to tap this knowledge sufficiently to benefit the business.

Firms that succeed in using technology to engage customers, employees and interested third parties in business innovation will be rewarded with a wealth of new information. But firms are already awash in data today. As our research shows, more than a few executives are worried about business-process paralysis in 2013 if their knowledge- and information-management practices are not vastly improved.

Needless to say, the integration of customers and third parties into the firm's business processes, and an expanded sharing by employees of information and ideas with outsiders—often outside the firewall—will pose enormous difficulties for the information technology (IT) function. The IT department as we know it is not likely to disappear within the next five years, but some decentralisation of responsibilities to business units is inevitable, as are continued efforts to unlock new efficiencies through outsourcing.

¹ Economist Intelligence Unit, The digital company 2013: How technology will empower the customer, June 2008.



The digital company 2013 survey

A total of 661 executives from around the world participated in *The digital company 2013* survey.

The sample was very senior: over one-half (53%) of all respondents held C-suite titles, with CEOs and board members alone representing 35% of the sample. It was also cosmopolitan: 31% of respondents were

based in Europe, 30% in Asia-Pacific and 30% in North America, with the remainder coming from the Middle East, Africa and Latin America. Respondents hailed from across 20 industries, and they represented a range of company sizes, with one-half from firms with annual revenue of US\$500m or more. More detail on the survey respondents and results can be found in the appendix.

Will such developments finally enable the long-awaited meeting of minds between the firm's IT professionals and those who staff its business units? Will they finally allow the CIO to assume a "strategic" role in the creation and securing of the open enterprise?

This second report in our two-part study addresses the implications of customer-driven innovation for the workforce and work practices, and for how IT is delivered in the enterprise.



Key points

- The "millennials" will expect to use technology at work as freely as they do in their personal lives. They will also be ready to collaborate.
- The 2013 workforce will be fully at home with most applications and devices—or able to master them quickly.
- Senior management will have a clearer understanding of IT capabilities than is the case today.

The 2013 workplace

Today, few trends worry business leaders more than the prospect of finding their companies short of the talent they will need to compete in the future. When asked which developments will have the greatest impact on their business in 2013, more than one-fifth of executives in *The digital company 2013* survey point to greater difficulty in acquiring and retaining employees with the right skills. Only technology innovation, macroeconomic uncertainty and changes in demand are of greater significance to respondents.

Business leaders also recognise that, over the next half-decade, new recruits will need to come equipped with a combination of advanced technology skills and "soft" aptitudes such as communication and team-working, as well as the ability to think strategically and manage change². Employees armed with these skills will undoubtedly be needed to deal with the more knowledgeable (and demanding), technology-savvy customers and partners of tomorrow, and to ensure that this more open enterprise operates smoothly and securely.

In many countries, employers are rightly concerned about the size of the talent pool that will be available to them, but happily there is every likelihood that the workforce they do maintain in 2013 will have the technology skills they will need. More than four-fifths of executives surveyed for this report are confident that most of their employees in 2013 will know how to use technology effectively.

Of greater import, however, are two other questions. Will companies prove able to make effective use of their employees' technology skills? How will workplace dynamics change as this younger generation of tech-savvy employees filters through the workforce and older workers retire?

The march of generations

The bulk of managers and skilled employees in the middle and lower levels of the 2013 enterprise—as well as many higher level executives—will hail from "Generation Y". Also known as the "millennials", this is the generation of people born between the early 1980s and the mid-1990s. Their entrance into the workplace

² Economist Intelligence Unit, *Talent wars: The struggle* for tomorrow's workforce, sponsored by SAP, May 2008.



% agreeing with the following statement: "The vast majority of our employees will know how to use technology effectively in 2013." (% respondents)



is already beginning to influence working practices in many organisations; by 2013, the effects will be substantially more pronounced.

To understand how technology will have an impact on the workplace of tomorrow, it is necessary to explore briefly how millennials use technology today.

In contrast to its predecessors, this generation has grown up using computing and communications devices as commonly as they would toys or games. "Twenty years ago, the sort of person you would recruit had a limited technical awareness," says Peter Hambling, CIO of Lloyd's of London, an insurance market. "Anyone you recruit now will be fluent in desktop applications, at the very least, and will understand how to research the web. They start from a higher place, and technological literacy is common currency."

Many millennials use instant messaging (IM), texting and social applications such as Bebo and Myspace on a daily basis to stay in touch with their friends. A recent study of US youth found that 76% of university students use IM and social networking sites, and 75% have a Facebook account³. The millennials bring to the workplace an expectation that they will be able to use technology at work as freely as they do in their personal lives. They also bring a readiness to network and to collaborate.

What of today's older workers? Differences in attitude of older and younger employees to social networking, for example, are already marked. While older employees are comfortable with e-mail, they are less familiar with IM and social networking tools. Jim Barrington, CIO of Novartis, a global pharmaceutical company headquartered in Switzerland, confirms that older workers in his industry are still not comfortable with the use of digital technologies as a whole.

These employees, mainly from the generation born between the mid-1960s and late 1970s, will form the bulk of tomorrow's force of senior executives. They may not need to utilise new technologies in order

% agreeing with the following statement: "In 2013, our senior executives will have a clear understanding of IT capabilities and how technology will support business objectives."
(subtitle)



³ Reynol Junco and Jeanna Mastrodicasa, Connecting to the Net. Generation: What Higher Education Professionals Need to Know About Today's Students, NASPA, 2007.



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for their firms to compete, but they will clearly need to understand their uses and benefits. Optimism abounds in our survey group on this score too: three-quarters of respondents believe that senior executives in their firm will have a clear understanding of IT capabilities and how technology supports the business objectives. This is of no small importance to the effectiveness of the IT function, discussed later in this report.

A picture thus forms of a 2013 workforce that at its lower and middle levels is fully at home with most consumer and enterprise applications and devices—or able to master them quickly—and at its upper levels has at least an understanding of how these technologies can be used in the business.



Key points

- Social networks will be a fixture in the 2013 workplace, despite executives' ambivalence on their role.
- The use of collaborative technologies will help cut through geographical and organisational barriers, and will give wings to virtual team-working.
- Changing the way employee performance is measured will help reduce the risks posed by social networks and similar applications.

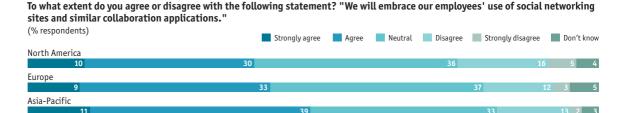
Technologies to collaborate

Given what are certain to be greater levels of employee comfort with digital technology, does it follow that the favoured technologies of today's younger generation will be commonplace in tomorrow's workplace? Opinions are mixed. Boet Kreiken, CIO of Netherlands-based airline KLM, is optimistic when it comes to the use of social networks. He observes that many younger employees in his firm are already using such applications productively: "They have huge networks inside and outside the company, and all over the world. These employees have no barriers to contacting people."

Mr Barrington of Novartis, however, believes it will be many more years before social networking technologies are widely adopted within organisations in his industry. "If you are going to have true collaboration, which is part of our strategy, you cannot isolate half your internal workforce and have people who are inside the club and people who are outside the club. So I suspect the real business benefit of Web 2.0 will be slower to come to maturity than perhaps in some other industries."

Our survey group reflects this ambivalence on the future use of social networks and other Web 2.0 technologies in the enterprise. While 44% of respondents say their firms will embrace the use of social networking sites and similar collaboration applications in 2013, almost as many are neutral or undecided, and 18% say these technologies will not have a place in their business.

Executives are similarly undecided on the balance of opportunity and risk presented by employees'





Please indicate whether the empowerment of employees through technology will, on balance, present more opportunity or risk for your company over the next five years.

(% respondents)



technology "empowerment". While 46% of respondents see mainly opportunity to be derived from technology-savvy employees, over one-third see as much risk as opportunity, and many see primarily risk.

Charting the opportunities

The business impact on firms that embrace new collaborative technologies of the type described above could be far-reaching. Used effectively, they will make it possible to cut through geographical, divisional and hierarchical barriers, as well as barriers between the organisation and the outside world.

At their simplest, such technologies make it easier to collaborate and to co-ordinate projects internally. Eric Tsui, associate director of the Knowledge Management Research Centre at The Hong Kong Polytechnic University, cites a Hong Kong government department with 2,000 employees that uses a wiki (a type of website that allows visitors to add, remove and sometimes edit the content) to co-ordinate the compilation of its annual report, taking input from teams across the department.

Collaborative technologies will also enable firms to reach out to a wider constituency. Marie Puybaraud, director of global workplace innovation at Johnson Controls, a US-based supplier of automotive, power and building systems, notes that some companies now invite undergraduates to join Facebook's special interest groups as a means of attracting their interest and finding out about them. This approach has the potential to cut through traditional recruitment procedures and go straight to the most promising potential hires. "Corporations will in future be searching the world for new talent. They will need to find ways to keep in touch with talented individuals," says Ms Puybaraud.

Tele-working revisited?

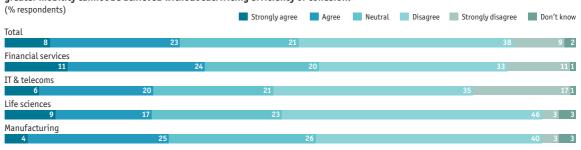
Distinctions of geography will become less relevant as social networking tools become more widely adopted. Project teams will no longer need to sit together in the same office: they can be made up of employees in different offices or in different time zones. Applications such as videoconferencing and IM will allow team members to communicate in real time, while blogs, wikis and other forums will provide an efficient way of collaborating and sharing information asynchronously.

The availability of sophisticated mobile devices with greater processing power means that team members will no longer need even to be based in an office. "There will be less need for desks in future and more interactive spaces—meeting rooms and places where teams can interact with other teams—via video, for example. Currently most offices have more desk space than collaborative space—that will be reversed," says Ms Puybaraud.

Howard Watson, the CIO of Virgin Media, a UK telecoms and media company, says that the ratio of desktops to laptops in the company is already about 65% to 35%. "Knowledge workers increasingly



To what extent do you agree or disagree with the following statement? "Our workforce will be no more mobile than it is now; greater mobility cannot be achieved without sacrificing efficiency or cohesion."



work at home or hot desk," he says, and he predicts that in the next five years, "desk-to-desk videoconferencing will become routine".

Crayon, a new US-based marketing firm, gives a hint of how smaller service companies of the future might be organised. President Joseph Jaffe describes his company as having a solid core of professionals with networks of freelancers, forming alliances and "assembling dynamic teams if, when and as needed". The firm does not maintain a physical office. Staff communicate via IP (Internet protocol)-based voice and video, and hold meetings on the virtual world site, Second Life. An advantage of such virtual teams, explains Mr Jaffe, is that they can assemble resources for specific projects from anywhere around the world relatively cheaply.

Because it has no business premises and few salary costs, Crayon's overheads are extremely low. But Mr Jaffe acknowledges that even virtual teams need to have regular face-to-face meetings, and is limiting the geographical range in which the main team operates, so that all members are one-to-two hours'drive from each other. In five years Mr Jaffe aims to build a core of no more than 20-25 people for each market at Crayon. "Like globules of mercury, we'll focus on several smaller groups of like-minded people, who are unified by factors such as geographic location, skillset or client mandate."

This example underscores the importance of careful management if virtual teams and similar initiatives are to work. At least a few firms that have embarked on tele-working initiatives for their workforce have reversed course after weighing the cost of reduced team cohesion. Tora Bikson, a senior behavioural scientist at RAND, an American research firm, says that virtual teams work best if members occasionally meet face-to-face. "Senior managers will have to work out the frequency and types of meeting required for dispersed teams—and the cost," she says.

The use of collaboration technologies will also give wings to project team-working across company borders. Technology firms—sometimes even rivals—often carry out joint application development projects today. This model, in which a project team may be composed of members from different organisations and different countries, will be more widespread by 2013, according to Anil Gupta of the Indian Institute of Management: "In a world where knowledge is so distributed and so specialised, new companies are realising that one cannot retain all the experts within the boundaries of the organisation, so there is no choice but to create knowledge networks."

As a consequence, Mr Gupta believes that the concept of the "employee"—a person tied to one organisation—may become less prevalent, while the freelance model becomes more widespread. A worker



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equipped with the right digital tools can sell those skills to any number of organisations, he argues, and he believes freelance workers may be rewarded with stock options in the organisations they work for. This vision may not be mainstream within the next five years, but the changes that will enable it are beginning to take shape now.

Managing the risks

By removing traditional barriers to communication, whether horizontal or vertical, companies open themselves up to obvious problems from the widespread use of social networks in the enterprise. In particular, widely used tools such as Facebook and Bebo can soak up hours of employee time, and there is a risk that employees can carelessly disseminate company-confidential information on them. Customerfacing blogs and wikis present a similar risk that users will post confidential information or break libel or other laws.

In Hong Kong, estimates Mr Tsui of Knowledge Management, one in four large corporations is using Facebook enthusiastically. But others regard it as a threat. "Many organisations have prohibited users from using the software because of concerns about security, confidentiality and leakage of sensitive issues to the public, misalignment with corporate communications and fear about the loss of power," he says.

A major difficulty for employers is that they do not know how much time their employees spend working. As Will Hutton, chief executive of the Work Foundation, a UK-based not-for-profit consultancy, points out, the use of digital tools "does not permit the kind of detailed micromanagement that more conventional behaviours do." On the other hand, argues Ms Bikson: "There is no way of avoiding having to be accessible—at home or in the office. Managers will have to address this. Employees need to be reasonably compensated, and also to be self-motivated."

The most effective way to deal with this will not be to set limits on the use of social applications and

CASE STUDY Novartis seeks new forms of collaboration

Novartis, a pharmaceutical company based in Switzerland, has 98,000 employees and operates in 140 countries. In a sector focused on continuous innovation, the ability offered by new technology to share insights, gain quick access to new information and collaborate on projects with people inside and outside the company is essential.

Jim Barrington, the firm's Corporate CIO, believes that within five years, collaborative tools will be used to share knowledge across Novartis's multiple divisions, such as pharmaceuticals, generics, vaccines and consumer health: "There are a lot of traditional ways that people communicate within those divisions—committees, and groups of all descriptions—but across those divisions it is very difficult because they're different businesses. We have researchers in different divisions working on similar diseases, working with similar compounds, and if we can somehow share all that information, it will be a tremendous benefit

and competitive advantage."

Mr Barrington also believes that pharmaceutical companies will start using the web to interact with patient groups or with expert opinion leader groups. Novartis is already looking at the potential of establishing patient groups for a particular disease, and setting up the infrastructure for the groups to interact with each other. "You cannot regard it [information from patient groups] as you would that from a clinical trial, but it is very valuable information. We can use it to help patients or modify products or treatment types." Because the pharmaceutical sector is highly regulated, however, with strong privacy legislation and restrictions on advertising, adoption may take some time, he acknowledges.

In the pharmaceutical sector, the adoption of new technologies is more commonplace in the functions engaged with drug discovery and research than in sales, marketing and finance. Mr Barrington expects the adoption of collaboration technologies in this industry to follow the same pattern.



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other technologies, but to change the way performance is measured—judging employees not based on the hours they work but on the quality of the work they produce, however they get it done.

This is how Mr Hutton sums up the necessary change in management approach: "These are the outputs I expect over the next week, month or three months. Please go and deliver them, and how you manage those inputs is your business. If you spend an hour a day on Facebook, that's fine. I am going to measure you on the outputs." Such an approach, maintains Mr Hutton, will "create high trust relationships".

Many businesses will struggle to make this change, argues Gareth Lewis, CIO of Centrica, a UK-headquartered energy firm. "It is very common to find a command and control management system in business. In some parts of the business, companies need to move towards a culture akin to consulting partnerships, as in Google or Microsoft. They shouldn't hire people because they're good followers of orders. They should get people who are great in a team, understand the business and product set."

Despite the doubts and perceived risks, social networking applications in all likelihood will be a fixture in the workplace of 2013, whether today's executives like it or not. Firms will need to manage the risks, including those highlighted above. CIOs and security experts increasingly report that their approach to employee use of such applications is indeed shifting from prohibition to education on how to use them safely. Clever firms will go further and begin thinking about how to tap such activity to enhance innovation and improve how the enterprise operates.

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Key points

- Companies will generate vast new stores of information through the use of digital collaboration tools.
- Fears of business-process paralysis exist, but most firms will learn to channel effectively new information gained through these technologies.
- Digital tools will give employees greater control over the information they can access, which means less control for managers.

Capturing the information

Companies' burgeoning use of online communities, other web-based platforms and customer service technologies to help improve innovation and product development (explored in depth in our previous white paper) will bring them a wealth of new information from customers and third parties. Moreover, as social networking and similar collaborative technologies become common features of the workplace, employees will likewise generate vast new stores of information for use in the business.

Many firms will learn to channel this mountain of information effectively and, after undertaking sophisticated analysis, will use it to deliver better products and services to the right markets and find new efficiencies in their operations. Over four-fifths of executives in our survey agree, for example, that how companies analyse and respond to customer information will become the foremost competitive differentiator in the markets in which they operate.

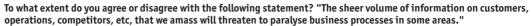
Other firms, however, will struggle to use this information effectively, and more than a few may be paralysed by it. One-third of global respondents (40% in Asia-Pacific) consider it likely that at least some business processes will be paralysed in 2013 by the mass of information their companies generate on customers, operations, competitors and other aspects of the business. Another 23% are undecided, and only a minority of executives are certain this will not come to pass.

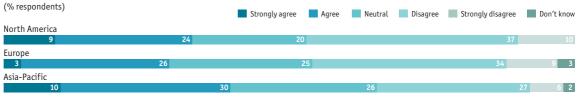
Today's business is already swamped in information. Says Mr Barrington of Novartis: "Our ability to generate information has far outpaced our ability to manage it." He is confident, however, that tools to enable better information search, for example, are about to be developed.

Traditional methods of managing and analysing these kinds of data have been inadequate, according to Thornton May, futurist and dean of the US-based IT Leadership Academy: "So far, business intelligence has been a failed experiment. The balanced scorecard has not happened. It's been 'death by dashboard'—executives overloaded with KPIs [key performance indicators] and SLAs [service level agreements]. A dashboard with 250 KPIs is too complicated."

So how will the organisation of 2013 be able to cope more effectively with the management of information, and how will new technologies help?







Towards new models of knowledge management

The approach to knowledge management based on the need to find relevant facts in a mountain of other information is beginning to look outdated, asserts Dave Pollard, vice-president of Chartered Accountants of Canada, a professional association. Instead, he argues, knowledge management should be about "enabling conversations between people who have a passion about a particular subject".

For example, many would argue that e-mail, if not used properly, could hinder productivity instead of increasing it. Uncontrolled use of e-mail can slow down progress on a project, as people send each other files for comments and then wait for responses before doing additional work. Mr Watson of Virgin Media comments: "We are drowning under the need to answer e-mails now. We've gone from groups of four to five to 40 or 50 people being copied."

Many organisations have archives consisting of millions of e-mails and have developed ways of searching them. Mr Pollard believes that the use of IM will help firms develop more efficient ways of finding information. He recounts the experience of working with a group of young epidemiologists at the Ontario Ministry of Health: "If they need information they look at their IM list to see who is online and they click on them and send them a one-sentence message. It is simple and in real time; they do this instead of doing searches for information, even on their own hard drives." Mr Pollard also points to another advantage of IM for information management: at the end of each day, the user's inbox is empty.

Lest there be any doubts, e-mail will clearly remain a prominent—if not the most prominent—form of workplace communication in 2013. When it comes to communication with customers, for example, 87% of survey respondents expect e-mail will remain the primary medium in five years. By contrast, less than one-half expect IM and collaborative tools such as blogs and wikis to figure as important channels of customer interaction in their firms.

The latter will certainly have found a place in knowledge management strategies, however. Blogs and wikis enable employees to tap into the expertise of others very easily. Like e-mail, communication is asynchronous, but unlike e-mail, only interested parties need participate. A question posted on a wiki can be seen by hundreds (or thousands) of people, and answered by the person with the relevant expertise. Similarly, a blog can be used to generate discussion on a company's products, services or proposed innovations, either internally or externally.

For project teams, blogs and wikis represent a way of sharing knowledge that bypasses the need to search through hundreds or thousands of documents, e-mails or presentations. "In the early days of knowledge management, where you tried to force everybody to put information into large central repositories, it was largely unsuccesful. The social tools allow you to manage the information you need in a much more human sort of way," says David Gurteen, an independent knowledge management consultant.



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Ms Puybaraud of Johnson Controls agrees. In the future, she argues, social networks will be used to track down expertise much more quickly than was possible in old-fashioned directories: "There may be just ten people in a particular [social networking] group, but members have connections to many others. What looks like a fairly small network can be much larger and more dynamic. Corporate global directories are very static by comparison. Companies can also use the tools to get hold of innovative ideas both internally and externally. There are no boundaries."

To borrow a phrase from James Surowiecki, the author, social applications tap into the "wisdom of crowds"—making the most of the most talented and knowledgeable people inside and outside your organisation. "Organisations need to open up their workload," says Mr May of the IT Leadership Academy. "People like working on information—they are prepared to give their time away for free on things like Wikipedia and product support forums. For your organisation to succeed in 2013, you will need to get people to create your products for you."

Organisations now find that they have to manage information coming from multiple sources. To do this effectively, they need to be clear about exactly what information they want and how they plan to use it. Mr Watson of Virgin Media says that data from different sources can be usefully combined to provide valuable new information: "One of the main ways IT can add value is, for example, by processing detailed customer insight and linking the data to demographics. I do not think we will hit a problem managing the volume of data—the depth of analysis is not constrained, provided the business knows what information it needs."

CASE STUDY Lloyd's of London: mashups today to gauge risk tomorrow

Blogs and wikis are not the only tools that firms will use to cut through organisational silos. Lloyd's of London is an insurance market that enables multiple financial backers, including both corporations and individuals, to insure risks. Lloyd's has been using mashups—web applications that combine data or functionality from more than one source—to create a clearer picture of where risk exists. The experience of Lloyd's provides a picture of how firms in other industries may use mashups in the future.

Complex insurance risk data are combined with data from geographical information systems (GIS) and displayed in Google Earth to create clear visual pictures of the places most at risk from, for example, earthquakes or hurricanes. In 2007, when the UK experienced heavy flooding, for example, Lloyd's underwriters found that the maps of flooded areas they could obtain this way were a useful means of assessing the level of risk in different parts of the country.

According to Peter Hambling, the CIO of Lloyd's, this means that information that was traditionally accessible only to highly specialised actuaries is now accessible to everyone.

In another example, by using mashups, Lloyd's was able to take the US coastline satellite image, add modelling information based on sophisticated algorithms of the exposure to hurricane hits at various points on the coastline, and then colour code it according to which companies carried the risk. The beauty of this, recalls Mr Hambling, is that a very complex picture was made understandable: "You could look at this very quickly and say, 'If a hurricane hit in that point, the damage would be roughly this in millions of dollars, and it would be spread across these companies." This enables insurers to see, quickly and easily, what their liability would be in the event of, for example, an earthquake in San Francisco or a hurricane in Florida.

Mr Hambling believes that this information will prove valuable to different groups of employees: "The exercise created a set of tools that brokers found very useful in conversations with their customers, because they could show what risk areas people were in, and show what the exposures were. The underwriters found it very interesting because they could work out when they needed to spread the risk out."

It is not the case that the data was new, notes Mr Hambling, but simply that there is now a new way of analysing and presenting it: "It is an example of using data in a slightly different way that just unlocks more value from it. With technology comes a phenomenal amount of information availability."

Freedom to collaborate

What will be the most troublesome impediments in your company to employees' productive use of technology in 2013? (Top responses; % respondents)



The growing use of mashups—in which data is brought together from different sources—is a promising example of how combining different sets of data will provide new insights. The Lloyd's of London example (see case study) is one of several instances where geographical data and Google Earth images are being brought together to highlight areas of risk.

Information democracy

Digital tools provide individual employees with much greater control over the information they can access. RSS feeds, for example, which allow users to subscribe to particular industry blogs or websites, enable knowledge workers to choose the kind of information they are receiving. "If you have an RSS reader, you are determining who you're connecting with and what feeds you're reading. You are in control of that, and you're fine-tuning it to meet your information and knowledge needs," says Mr Gurteen.

What this means, he argues, is that control of information will be taken out of the hands of managers: "In the past, it was only the marketing people who could pay for the expensive news feeds and intelligence reports. Now anyone and everyone will be able to get it. The new graduate who's tuned into this can have better insight and knowledge of what's going on in the market than the corporate marketing VP."

Mr Kreiken of KLM agrees. Managers' ability to use access to information as a means of maintaining their status will become obsolete, he believes, because staff will be able to access information easily and make decisions based on it. "If your authority or position as a manager is still dependent on information," he asserts, "you will be out of the game."

The implications of this are far-reaching. Wider access to information will lead to flatter, less hierarchical organisations. But it will also, inevitably, lead to greater autonomy for employees, who will need to be trusted to find the information they need and act on it. Employers will have to accept a loss of control, and to allow employees the freedom to manage their own knowledge work. In exchange, the employer will have a workforce that is more motivated, quicker to respond to challenges and better able to collaborate.

Key points

- In the open and collaborative enterprise of 2013, IT delivery will be less centralised.
- More activities will be outsourced, and "cloud computing" will gain adherents.
- Most executives are confident that IT will finally be a true partner in the business in 2013.

A tough road ahead for IT

magine this picture of 2013: customers are more closely integrated into innovation, product development and other enterprise processes; employees located inside and outside company offices are communicating with colleagues, customers and partners using myriad social applications and devices; and new mountains of information are being generated as a result. A CIO or IT director may be forgiven for seeing 2013 as a year of headaches.

CIOs and the IT function have traditionally been tasked with delivering and controlling access to applications, managing the technology infrastructure and keeping the perimeter secure. Managing and delivering IT in the environment above will require a very different set of skills. Users will increasingly be familiar with technology and want to use their own hardware and access their chosen web applications rather than deferring to decisions made by the IT department.

Ceding autonomy

For the IT function, this presents a significant change to the traditional way of working. IT departments have long been in the position of controlling the organisation's IT systems from the centre by, for example, authorising the purchase of new software or hardware. This has enabled them to maintain a consistent set of standards in the organisation and manage security threats effectively.

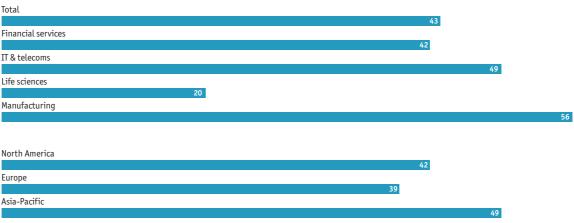
But if users expect a degree of autonomy in their hardware and software choices, some loss of central control is inevitable. The IT function will need to give greater autonomy to the business to decide how it uses applications, notes Thomas Mendel, a research director at Forrester, a US-based analyst firm. As employees come into the workplace with more IT skills than ever before, it is unlikely that the IT function will be able to provide everything the business needs on its own. Over the next few years, he argues, "the IT function will become more a mediator of service provisioning than a provider of services in and of itself".

The views of survey respondents confirm that IT in many organisations will be in for a considerable



% agreeing with the following statement: "New IT investment will mainly be funded through the individual business units, rather than through a central IT budget."





degree of decentralisation over the next five years. Fully 43% of the survey group believe that new Π investment will be funded mainly through the individual business units, rather than through a central Π budget, more than those who think that central funding will predominate.

These services will often be found outside the organisation. The management of IT infrastructure by third parties will continue to grow. Here too more surveyed executives agree than disagree with this proposition. In Novartis, says Mr Barrington, several IT infrastructure services have been outsourced. Today, data centres are managed by IBM, networks are managed by BT and printers are managed by HP: "We're trying to shift more commodity work outside the company in order to unburden our IT people from the more mundane stuff, and then we want to concentrate on building our internal skills on the more futuristic and innovative projects."

Happily, IT departments are already responding more quickly to the needs of the business, believes Mr Watson of Virgin Media, partly as a result of service-oriented architecture (SOA): "We are at a watershed

% agreeing with the following statement: "Most of our IT services will be outsourced to third-party providers." (% respondents)





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now: development and programming methods are getting more agile, especially with re-use and SOA. Development methods will shorten the IT development life cycle and will meet the needs of the business better."

In some organisations, the move away from a centralised IT function will happen because business units will have very different requirements from each other. This is certainly the case in the pharmaceutical sector, confirms Mr Barrington: "You need multiple IT groups by area because their uptake of technology happens at a different pace, and their need for new technologies is guite different."

Finally, the strategic CIO

In many organisations, the CIO is no longer weighed down with the same expectations posed towards the IT department, and has managed to hand off responsibility for IT delivery. Mr Hambling of Lloyd's comments: "Twenty years ago the role was very much about wrestling with technology, doing basic things such as gathering requirements and creating a product. The CIO role now has matured into someone who is expected to participate in the business process from end to end. The expectation in Lloyd's is certainly that I can understand and speak to the commercial side of the business we operate. I can also provide a lot of solutions into how we can do things, along with some options that may change the outcome."

For CIOs, the next five years will be one of consolidating and expanding this strategic advisory role—or in some cases attaining it if it has not been realised. But future CIOs will nevertheless need to keep up with a rapidly changing IT landscape. Says Mr Lewis of Centrica: "The kind of person that will be needed will have a great appreciation of the business combined with a consultative approach. They will be able to articulate business requirements into an architecture."

The CIO of the future will act as adviser and manager to all parts of the business where technology plays a key role. The days of implementing organisation-wide enterprise resource planning (ERP) systems, dealing with broken printers and worrying about network capacity are vanishing. Many—if not most—back office processes have now been automated, and the management of basic IT infrastructure is increasingly outsourced to third parties.

This means that a typical CIO will need to be an effective manager of outsourcing relationships and have an excellent understanding of the needs of the business, in order to respond quickly to changing requirements. "The IT organisation has to continuously evolve and reinvent itself, and that's why you need people with high degrees of flexibility," says Mr Barrington.

To succeed in this, the CIO will need closer working relationships with the CEO and CFO, so that the IT function can remain aligned with the business. Mr May of the IT Leadership Academy insists that will also require a change in approach from other board members: "There must be an upgrade of competence on boards—executives will have to be on top of multiple games, and better schooled. They'll have to be able to understand other C-level colleagues. Their jobs will overlap more, for example in addressing new legislation and what needs to be done across departments to implement it."

The CIO's success will go a long way towards determining whether or not IT truly becomes a partner in the business. On this score our survey respondents are optimistic: while only 27% consider IT a true partner in the business today and able to help the firm achieve most of its strategic objectives, 57% think this will come to be the case in five years' time.

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Securing the open enterprise

A more dispersed use of IT, in which employees use their own mobile devices to work from different locations, and in which collaboration with partners outside the organisation is the norm, will be harder to manage and control. If users are sharing data with outsourcers, for example, the job of quarding sensitive information becomes much harder. The CIO has to both encourage collaboration and the sharing of information and make sure that confidential data are completely secure.

Mr Barrington of Novartis points out that for over a period of many years, the IT function has successfully managed to secure internal IT systems through the uses of access management, firewalls and intrusion detection. "It took years to get a good handle on that and now it's all blown open again," he says.

Approaching the problem by securing the perimeter no longer works, he points out, because there have to be holes in the perimeter to let third parties through. IT now has to approach the problem from scratch: "In the future, we're going to have to be able to connect to anybody in a secure way and get authentication on a global basis. Today that isn't possible." Access will have to be managed at the level of each individual application, he arques, which means that internal data will have to be classified as a way of determining who can and cannot access it.

IT governance becomes a crucial part of the CIO's role in an environment in which the barriers between the organisation and the outside world are diminishing. CIOs will ignore what is happening outside the organisation at their peril, says Mr Kreiken of KLM. He arques that the corporate infrastructure is in competition with commodity services outside the company—what he refers to as the "extra structure". The IT department needs to either govern or contain the use of these services, otherwise corporate users will choose to make use of them anyway, at a potentially high risk to the organisation. CIOs of 2013 will have to manage the extra structure as effectively as their own internal infrastructure.

Into a cloud

Many parts of the IT function are already outsourced, but the applications themselves can be expected to be managed by external suppliers in the "cloud"—a term used to denote Internet-based computing.

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Instead of buying a licence for office applications that will then sit on the company server and be managed internally, the IT function will increasingly buy a web-based service from a company such as Google or Amazon. In theory at least, the use of a host to manage the firm's core applications will give the CIO a greater opportunity to focus on the business, and not worry about licence agreements or secure access.

Says Mr Lewis: "Companies have moved from owning computers to outsourcing them based on a fixed charge, and will increasingly use cloud computing where you just dial up computing horsepower. It is already there for some products such as virus checking and e-mail archiving."

Beyond the benefit of saving money, this development will make it easier for home and mobile workers to access their applications; a virtual private network (VPN) will not be needed because the applications will no longer sit behind a firewall. Collaboration with third parties will also become easier for the same reason.

Like any new model, however, this one has risks. A world in which data are held by multiple third parties, in multiple geographies, will provide a headache for the CIO, argues Mr Hambling of Lloyd's: "Someone might subscribe to collaboration services run through several third parties, and then the issues are: What are the service levels? What's the security? What's the protection? If these data are living in the cloud, where is it?" These will pose operational and compliance challenges, he maintains.

Mr Hambling sees another risk: after years of moving towards standardisation and interoperability, the development of cloud computing could mean a return to the days in which applications from different vendors do not work together. "I see a Google cloud, a Microsoft cloud, an HP cloud—each with their own

CASE STUDY KLM—autonomy, security and the IT future

KLM, a Netherlands-based airline, is already putting social applications to work in both external and internal operations. The firm's CIO, Boet Kreiken, believes this is part of a larger process of the blurring of boundaries between the company, its customers and its partners. For IT to manage this, he holds, it will need to cede greater autonomy to employees.

Through its online customer clubs, such as Club China and Club Africa, users can contact each other to ask for advice and information about the countries they are travelling to. They can also see who else is travelling to the same place at the same time, make new business contacts or meet their contacts at offline club events. The company has sites for its stewards and stewardesses, enabling them to share information about clubs, hotels and restaurants in the cities they have visited.

Information-sharing applications are being used internally too. Employees that need to learn PowerPoint or Excel are no longer sent on training courses, but directed to relevant presentations on YouTube. Mr Kreiken says that younger employees use social

applications widely as a way of keeping in touch with global contacts, both inside and outside the company. He believes that in the future there will be much wider collaboration with third parties outside the company, and the boundaries between the internal infrastructure and the external infrastructure will blur.

CIOs will need to accept, argues Mr Kreiken, that many users will expect to work from home or on the move, and that as a result the IT function will have to support a wide range of devices. "We do business with 70m customers and they have all kinds of devices, all kinds of different PCs, all kinds of different infrastructure." KLM's employees, he expects, will need to do the same to interact with customers effectively.

He anticipates that employees will be given a "digital allowance" to spend on the tools, such as laptops and smartphones, that they need for work, and that they will then be free to work wherever they want. "The new workforce, the millennials, already have the competence to maintain their own IT tools."

While CIOs must accept the need to open up the organisation, maintains Mr Kreiken, they will also have to put in place very strong security measures and policies, backed by firm disciplinary procedures for security breaches, tougher than are in place at most firms today.



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attributes and not talking to each other. This would be history repeating itself."

The cloud will not cover the entire business computing world in 2013—issues such as these will hold back many firms from adopting the model, unless interoperability and standards issues are addressed. Some firms will also prefer to create their own highly customised applications specific to their business, and will choose not to entrust them to the cloud. It is likely nonetheless to have gained a large number of adherents among firms eager to allow the CIO and IT function to focus much more on the business.



Conclusion

The technology-driven changes that we have anticipated in this two-part study suggest a different enterprise in 2013 from that which exists today. But how different will it really be? Five years, after all, is not the distant future. We do not expect in this time frame "big-bang" technology-enabled leaps of the sort provided in the past by the emergence of the Internet or the proliferation of mobile phones. New "killer" applications—as elusive as ever to identify—are unlikely to emerge.

Employees, meanwhile, will be engaging in much the same activities as today, using computing devices and enterprise or web-based applications to collect and analyse information, develop new ideas, and produce and deliver products and services. Likewise they will communicate with colleagues, customers and partners using essentially the same technologies they use, to one degree or another, today.

The main difference, we argue, will lie not in what devices and applications customers, employees and other stakeholders will use to work and interact with one another, but in how much more effectively they use the ones that already exist. Over the next five years, enterprise technology will advance incrementally; the uses that companies put it to, we believe, will improve substantially.

In particular, the mastering of collaborative technologies—and applications that channel and analyse the information gained from them—will make widespread in 2013 what a handful of companies are beginning to do today. Using online communities to involve customers closely in innovation and product development, providing highly customised products and services to individual customers thanks to more sophisticated analysis of information, tapping the depth of employees' creative and productive energy through the use of social networking applications and other workplace collaboration tools—these are a few of the benefits that the better use of today's technology will deliver to firms tomorrow.

Needless to say, far from all companies will make this a reality. Any number of obstacles—organisational rigidities, tight budgets, skills shortages, security concerns—will prevent many from utilising technology to this effect. Preparing for it will require a thorough review now of existing policies



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towards the use of collaborative technologies, hiring practices and workplace organisation, the roles planned for the IT function, and many other aspects of operation.

As for senior management, realising the vision of the digital company 2013 will require above all courage and trust—courage to let technology bring customers and other external parties into the company's operations, and trust in their employees to do the right thing.

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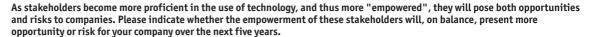
Appendix: Survey results

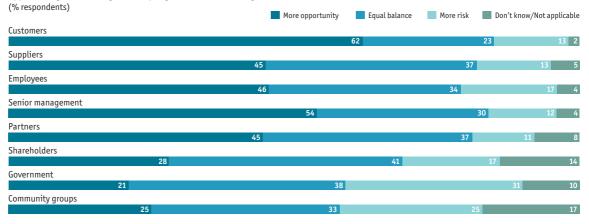
In March 2008, the Economist Intelligence Unit conducted a survey of 661 executives of companies from around the world. Our sincere thanks go to all those who took part in the survey.

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

In your view, which of the following developments will have the greatest impact on your business between now and 2013? Select up to two (% of respondents) Change in business models due to technology innovation 31 Greater political and macroeconomic uncertainty 29 Changing nature of demand for your products/services 28 Greater difficulty in acquiring and retaining employees with the right skills 21 Increasing competition from lower-cost rivals 21 Greater complexity of regulatory and compliance requirements 19 Rising wealth levels in emerging markets 15 Higher cost of energy resources 13 Rising security threats 5 Increasing corporate social responsibility (CSR) requirements 2 Other, please specify 3

To what extent do you agree or disagree with the following statements? (% respondents) Strongly agree Agree Neutral Disagree Strongly disagree Don't know were concerned that an economic downturn over the next two years will have a negative impact on our business. 49 20 10 2 An economic downturn over the next two years will limit the impact of technology advances on our business in the longer term. 4 21 27 37 11 Technology advances will help our business to overcome the negative effects of an economic downturn. 9 41 32 14 3 Technology advances will increase both business and technology complexity to the extent of limiting our competitiveness. 5 24 23 37 10 2





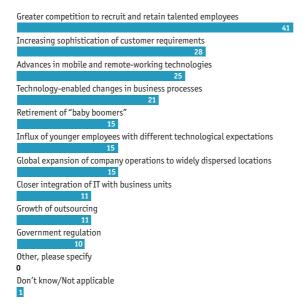
To what extent do you agree or disagree with the following statements about the use of data in 2013?



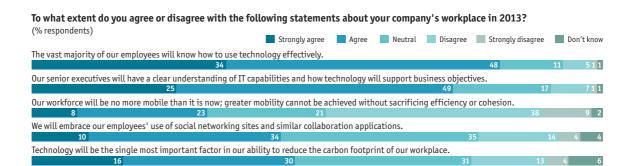
Which of the following will have the biggest impact on the shape of your workplace over the next five years?

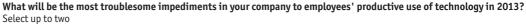
Select up to two

(% respondents)

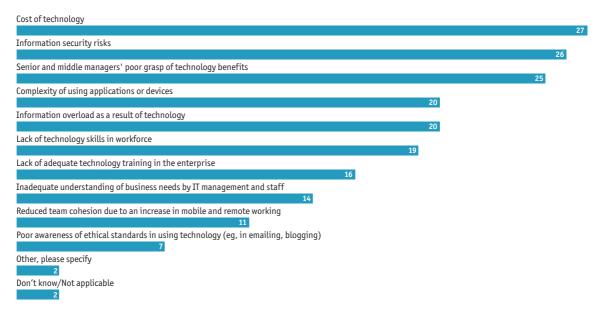


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(% respondents)



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Which of the following best characterises the role that IT plays in your company today?

(% respondents)

Along with technical support, it is influential in helping us to improve operating efficiency and reduce costs

41

It is mainly a technical support function, to keep our systems up and running

32

It is a full partner in our business, helping us to meet strategic objectives in most areas of operation

27

And in five years' time?

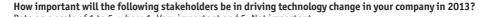
(% respondents)

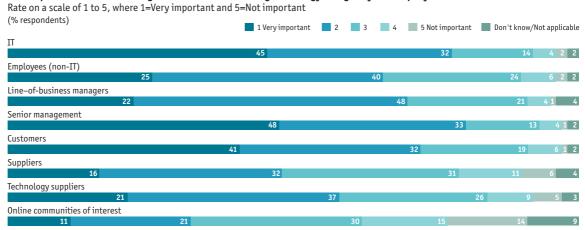
It will be a full partner in our business, helping us to meet strategic objectives in most areas of operation

Along with technical support, it will be influential in helping us to improve operating efficiency and reduce costs

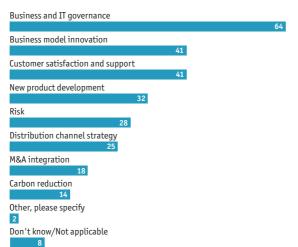
34

It will mainly be a technical support function, to keep our systems up and running

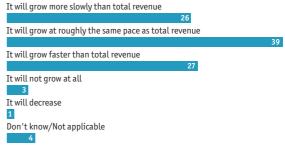




In 2013, in which of the following areas will the CIO exercise strategic leadership in your company? Select all that apply (% respondents)

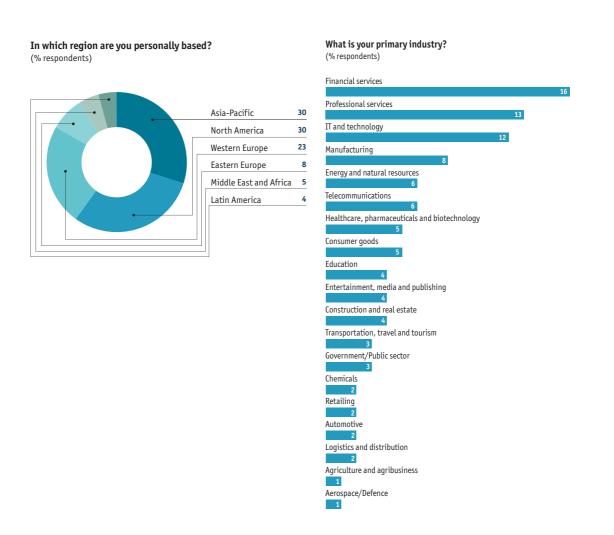


Given your firm's strategic objectives, what expectations do you have of its annual level of spending on IT and communications networks between now and 2013? (% respondents)



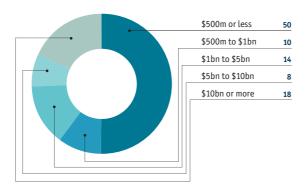


About the respondents

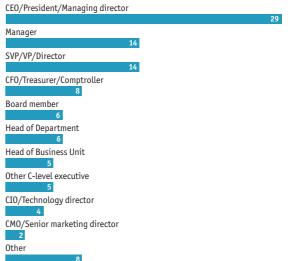


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What are your company's annual global revenues in US dollars? (% respondents)

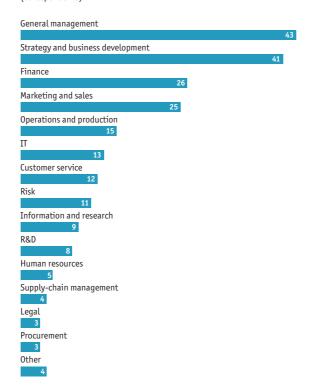


Which of the following best describes your job title? (% respondents)



What are your main functional roles?

Please choose no more than three functions (% respondents)



Whilst every effort has been taken to verify the accuracy of this information, neither The Economist Intelligence Unit Ltd. nor the sponsor of this report can accept any responsibility or liability for reliance by any person on this white paper or any of the information, opinions or conclusions set out in the white paper.

LONDON
26 Red Lion Square
London
WC1R 4HQ
United Kingdom
Tel: (44.20) 7576 8000

Fax: (44.20) 7576 8476 E-mail: london@eiu.com

NEW YORK 111 West 57th Street New York NY 10019 United States

Tel: (1.212) 554 0600 Fax: (1.212) 586 1181/2 E-mail: newyork@eiu.com

HONG KONG 6001, Central Plaza 18 Harbour Road Wanchai Hong Kong

Tel: (852) 2585 3888 Fax: (852) 2802 7638

E-mail: hongkong@eiu.com