

The advance of automation

Business hopes, fears and realities

Briefing paper



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About the report

Hopes, fears and reality is an Economist Intelligence Unit report, sponsored by UiPath, which explores the current and likely future progress of automation in organisations.

The analysis in this report is based on a survey of 502 executives conducted in May 2019. The respondents are based in eight countries—Canada, France, Germany, India, Japan, Singapore, the UK and the US. They hold senior roles, half being C-level executives and the other half directors and other senior managers (each representing one of 11 different functions). Their organisations operate in one of seven sectors: energy/natural resources, financial services (including insurance), healthcare, manufacturing, technology, professional services and government/public sector. Half the respondents work in businesses with annual revenue of between US\$250m and US\$1bn, and the other half in US\$1bn+ companies.

Additional insights were obtained from in-depth interviews with four experts on different facets of automation:

- **Scott Likens**, new services and emerging technologies leader, PwC
- **Byron Reese**, CEO and publisher, Gigaom
- **Manuela Veloso**, managing director, JP Morgan AI Research (on leave as university professor, Carnegie Mellon University)
- **Meredith Whittaker**, co-founder, AI Now Institute, New York University

Executive summary

Automation was once a term associated exclusively with manufacturing. Today, after three decades of advances in digital technology, there are few fields of organisational activity left untouched by it. Businesses in every industry are using software to automate the processes that guide their daily operations as they seek the efficiencies that come from replacing manual tasks with machine-operated ones. However, its usage is accelerating and widening to create opportunities for business growth, and to encourage greater creativity and innovation from employees. Such hopes are buoyed as artificial intelligence (AI) gives rise to intelligent automation technologies.

The automation of business processes has made considerable headway, according to the results of a survey conducted for this report. Over 90% of respondents' organisations are using automation technologies, and just over half extensively, particularly for processes relating to IT, operations and production, and finance. Most are satisfied with the returns they are seeing from automation, which so far mainly take the form of higher productivity. Most also say that automation has helped their organisation to kickstart digital transformation. Not all expectations are yet being met. However, there is clearly room for organisations to improve their utilisation of automation.

Other findings of the research include:

Automation maturity is highest in the US, and in manufacturing. The progress of automation is markedly different between some countries. For example, 61% of US organisations make extensive use of automation compared with 28% of Canadian ones. When it comes to sectors, the analogous figure in manufacturing (61%) far exceeds that in government (35%) and healthcare (49%).

Automation is a C-level issue. It is coming to be seen as a technology initiative of strategic importance to the organisation. This is the case at 84% of surveyed firms where a C-level executive—most often the chief technology officer, followed by the CEO—is responsible for the success of automation.

Data privacy and security concerns hinder automation initiatives more than other factors. But many organisations are also held back by a lack of skills and by employee resistance to change. The skills gap is felt most acutely in Asia, particularly Japan, while change resistance is most prominent in the UK.

Fears of worker displacement by AI are limited. Most organisations in the survey are prioritising the implementation of AI-based technologies. Neither the experts interviewed for the study nor survey respondents have grave fears of worker displacement by AI, although many respondents remain unsure. Conversely, there is a strong belief that automation is most effective when it complements humans. The belief is equally strong that it will accelerate human achievement.

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Chapter 1: Assessing automation maturity

Few technological developments of the modern age have elicited as many contradictory emotions as automation. It has been so since Henry Ford perfected the assembly line in the early 20th century. Automation has progressed steadily since then in factories, back offices and shop fronts, but these emotions are bubbling up again as intelligent, data-driven automation technologies make their presence felt.

Along with fears about the impact of such technologies—for example, widespread worker displacement—comes a great deal of optimism in organisations, and not just about the oft-cited area of efficiency gains. “I’m not sure the fear ever goes away,” says Scott Likens, new services and emerging technologies leader at PwC, a consultancy. “But there’s much more acceptance of the value that automation can add to the business. Managers are now saying, ‘This is great—we can upskill our entire workforce.’”

Evidence of automation’s perceived importance to businesses is the attention it is getting within senior management. At 84% of respondents’ organisations, automation is the responsibility of a C-level executive. This is most often the chief technology officer (29% of respondents), but also frequently the CEO (22%).



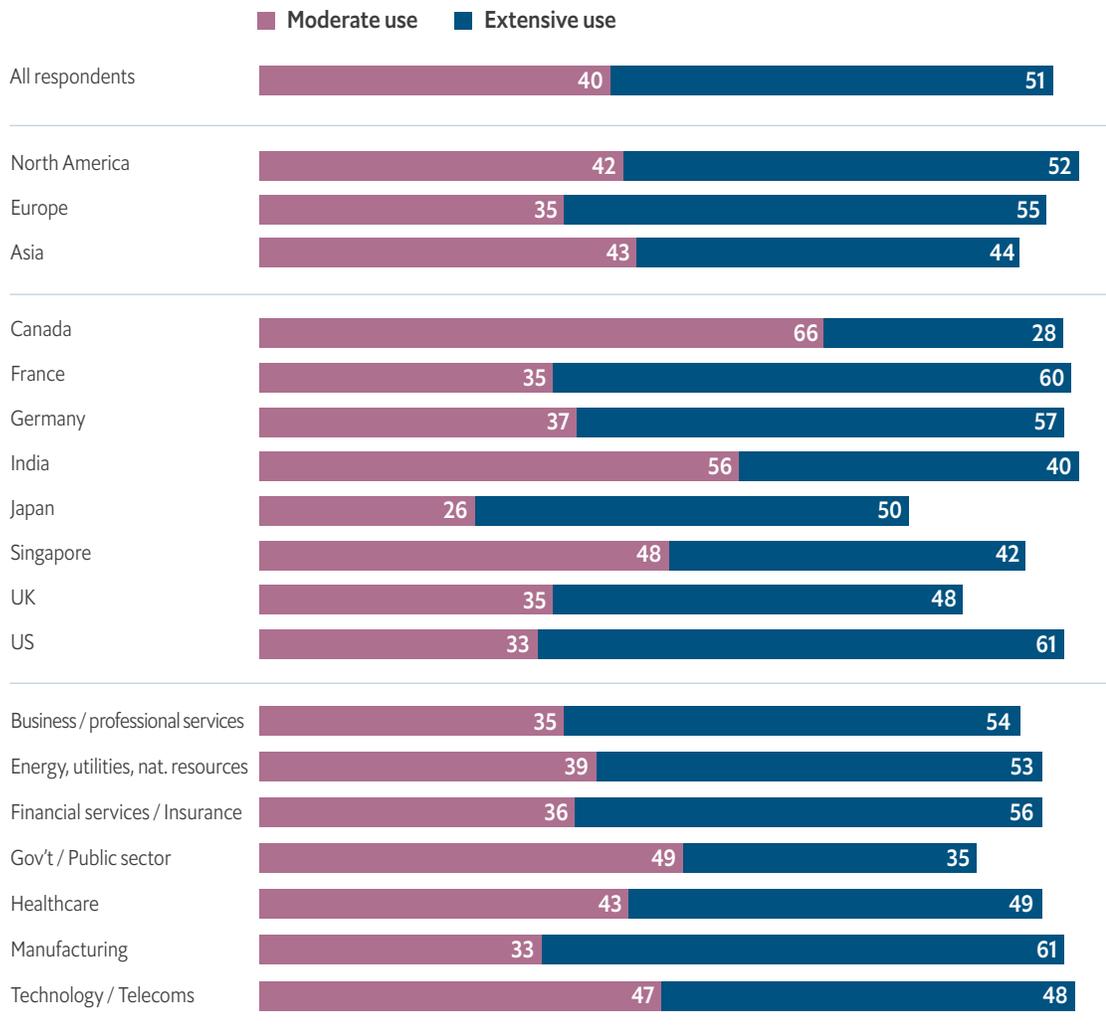
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Scott Likens, new services and emerging technologies leader, PwC

How far has automation advanced? Of the 502 participants in our survey, more than nine in ten say their organisation uses technology to automate business processes: 51% confirm extensive use and 40% moderate use. Progress varies considerably by country and industry: automation is extensive in around 60% of US- and France-based organisations, for example, compared with 40% in India and 28% in Canada (see Figure 1). When it comes to sectors, automation appears to have advanced furthest in manufacturing—perhaps not surprising given its long history with earlier generations of such technologies. Government and public-sector institutions, by contrast, have made the least headway among the surveyed sectors.

Figure 1: To what extent does your organisation currently use technologies to automate business processes?

(% of respondents)



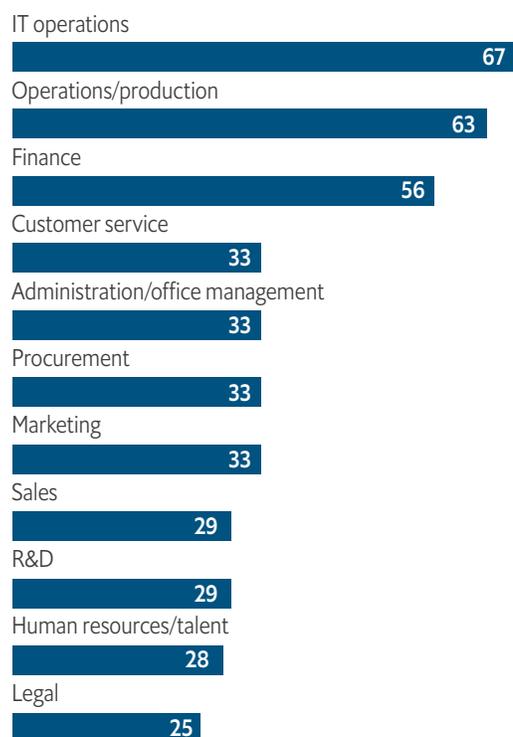
Source: The Economist Intelligence Unit

What's being automated

Thus far, organisations have mostly automated highly repetitive back-office functions. According to Mr Likens, these have been in areas such as finance that incorporate a large number of manual processes that lend themselves to robotic process automation (RPA). Among the surveyed organisations, the automation of processes is most extensive in IT, operations and production, and finance (see Figure 2). Typical candidates for automation in IT have been processes such as password management and the logging of service requests. In operations, maintenance scheduling is frequently automated, as are, in the finance function, invoicing and accounts payable.

Figure 2: Enterprise functions where process automation has penetrated furthest

(% of respondents stating that more than half of processes have been automated)



Source: The Economist Intelligence Unit



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Manuela Veloso, managing director, JP Morgan AI Research (currently on leave as university professor, Carnegie Mellon University)

The reach of automation technologies is now widening, Mr Likens observes, to touch areas that involve a high degree of human interaction, such as customer service. (This is supported by the view of 71% of respondents that increased automation of customer service processes will be extremely important to their firm’s competitiveness.) “It is more difficult to automate these processes using standard RPA,” he says. “These demand the integration of more AI capabilities so that the software can actually carry out interactions and make decisions on the fly.”

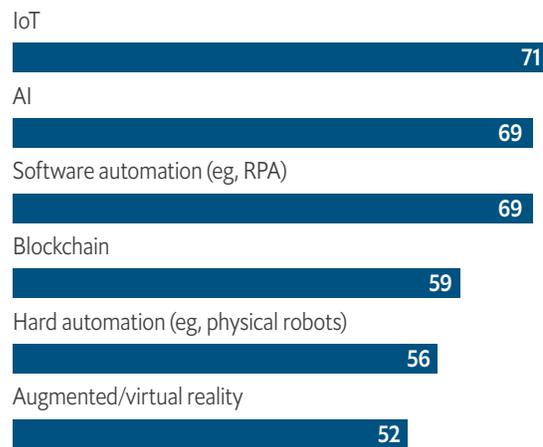
Proposing actions and making decisions are capabilities that Manuela Veloso, managing director of JP Morgan AI Research (and currently on leave as university professor, Carnegie Mellon University), thinks automation technologies will soon master. It is AI that will impart them, she says: “AI doesn’t just look at data, it suggests appropriate actions based on the data and will ultimately be able to execute those actions.”

Instruments of automation

The surveyed executives are thinking along these lines. Asked about technology implementation in their organisation, as many respondents (69%) cite AI as a high or essential priority as do those who cite software-based technologies such as RPA. (Fewer respondents consider physical robots to be a priority, although manufacturers and energy businesses place higher store in them for their roles in production, logistics and field operations.) Companies in the energy sector, as well as those in technology and telecommunications, appear the most eager of those surveyed to put AI-based automation to work, and public-sector institutions the least. Energy firms are also the most likely among those surveyed, along with manufacturers and technology companies, to prioritise the deployment of RPA and IoT technologies.

Figure 3: Priorities for technology implementation to meet strategic objectives

(% of respondents citing each technology as a “high or essential priority”)



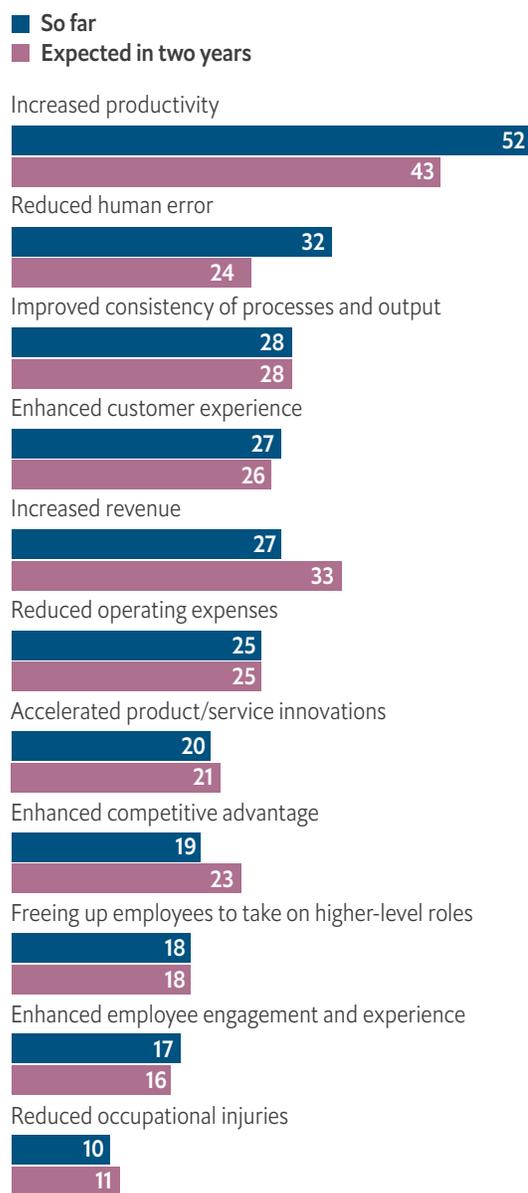
Source: The Economist Intelligence Unit

Chapter 2: Returns to date

Business executives are clearly pleased with the results of their automation initiatives so far. Nearly three-quarters of survey respondents (73%) are “very” or “entirely satisfied” with the automation benefits they are seeing. Chief among these are operational gains in the form of increased productivity, cited by over half of respondents (Figure 4). This indicates that the elimination of repetitive manual tasks, particularly in operations and the back office, is delivering tangible efficiency gains. For around a third of respondents’ organisations, error reduction has also been an important benefit, and another 28% report greater consistency (reliability) of processes and production. Looking ahead, businesses hope to see more top-line benefits from automation, for example in the form of increased revenue and enhanced competitive advantage, signalling a shift to more strategic benefits as the technology matures.

Business executives are clearly pleased with the results of their automation initiatives so far.

Figure 4: The chief benefits from automating business processes
(% of respondents)



Source: The Economist Intelligence Unit

The respondents see automation conferring other advantages as well. Responding to a different survey question, a large majority believe it is leading to better customer engagement and the ability to find new sources of revenue. Most also say it is giving organisations the ability to scale more easily (increased capacity to handle volume). More than nine in ten state (55% “strongly”) that automation has kickstarted digital transformation in their organisation.

At the same time, it is worth noting where automation is not yet meeting executives’ expectations. For example, a potential benefit attractive to many managers is the freeing up of employees to focus on higher-level activities. Just over a quarter of respondents (27%) expect automation to create opportunities for professional growth, and a similar number (26%) expect it to free up time for more human interaction. Another 37% believe automation will serve to increase employee engagement. However, only 17% say increased employee engagement has been an important benefit of automation so far; just 18% (see Figure 4) say the same about freeing up employees to take on higher-level roles.

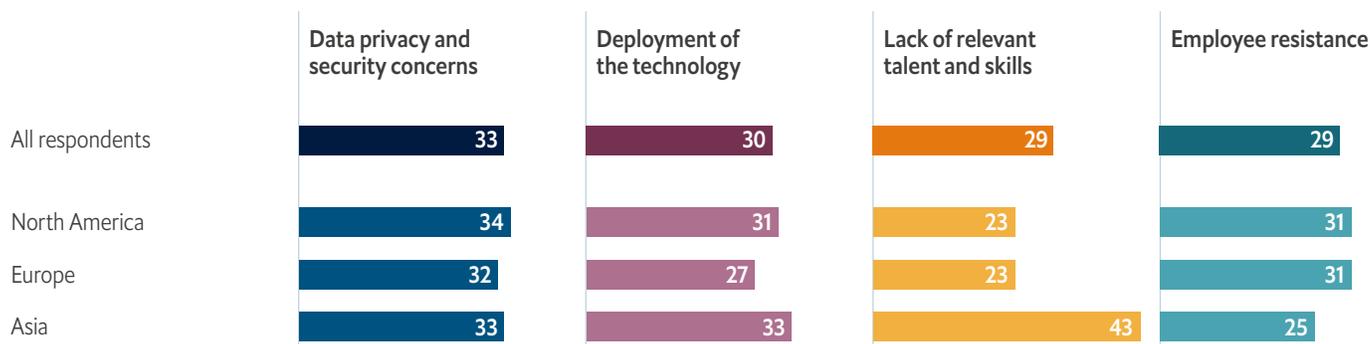
Meeting such expectations will help organisations see the kind of benefits that Mr Likens says his firm is seeing: “We’ve been able to take manual processes dealing with contracts, invoices and other documentation off employees’ plates and allow them to focus on making judgments,” he says.

Automation’s hurdles

What holds organisations back when implementing the automation of processes? The paramount challenge cited by respondents is data privacy and security concerns, which is especially strongly emphasised by public sector and healthcare executives. Technology-specific issues also figure prominently, but nearly as important are human factors: an absence of relevant skills and employee resistance. The former is felt acutely in Asia (especially Japan) and, in terms of industries, energy. European organisations struggle more with employee resistance to automation, as do those in the healthcare sector.

Figure 5: The most difficult challenges faced in automating business processes

(top responses, out of 13 possible choices)



Source: The Economist Intelligence Unit

The extent of the human-related challenges helps explain why 42% of the survey respondents believe providing education and reskilling opportunities is among the most important practices they can employ to smooth the implementation of automation.

Businesses everywhere can do a much better job of educating their workforce about the implications of automation, says Ms Veloso. The arrival of AI in the workplace, she adds, makes this particularly imperative.

Where those ahead of the curve stand out

Just over half (51%) of survey respondents' organisations may be considered "ahead of the curve" in automation, making extensive use of such technologies (see Figure 1). Dubbed here "leaders", their characteristics differ from those making moderate or limited use of automation ("laggards") in some telling ways.

- **Automation breadth.** The gap between the two groups is magnified when looking at individual functions and processes. It is the widest in IT operations, in which 59% of leaders, compared with 27% of the laggards, have automated more than half of processes. Looking at all processes as a whole, 45% of leaders have automated to this extent, versus 20% of laggards.
- **Top-line benefits.** The cited gains from automation thus far—including increased productivity, reduced human error and greater consistency of processes and output—are broadly similar across both groups, with one notable exception: a third of leaders report increased revenue as a result, compared with a fifth of laggards. This is probably related to the larger share of leaders who say that automation has led to enhanced customer experience (30% vs 24%).
- **The human factor.** A lack of relevant skills is slightly less of a problem for leaders, and both leaders and laggards struggle to a similar extent with employee resistance to automation. However, a larger share of the advanced group (45% vs 39%) emphasise the importance of providing education and reskilling opportunities as a means of lessening resistance. Leaders also have somewhat higher expectations (30% vs 24%) that automation will free up employee time for human interaction.
- **Optimism about the future.** Respondents in the leader group are much more positive than laggards about the financial gains they anticipate from automation. Nearly half of leaders expect profitability (47%) and revenue (45%) to improve significantly, compared with little over a fifth of laggards (22% and 20% respectively). Leader optimism also extends to a higher plane: 49% firmly believe automation "will enable humans to live happier, stress-free lives", a sentiment shared by 30% of the laggards.

Chapter 3: The age of AI approaches

AI and machine learning add a new dimension to automation technologies, namely that of intelligence. Such capabilities are evident today, in limited fashion, in, for example, customer service chatbots that reply to caller or user queries and determine the next steps that need to be taken to progress a transaction. “Robo-advisers” do something similar in the financial industry—automated bots that make recommendations to investors about their portfolio. In addition, algorithms powered by machine learning drive sophisticated fraud detection programmes in the security, retail and financial industries.

The adoption of AI-based automation technologies, however, is so far “exceedingly slow”, according to Byron Reese, CEO and publisher of Gigaom, a technology news website. Nonetheless, this pace is likely to accelerate given the large majority of respondent organisations that consider the deployment of AI capabilities a high priority (see “Instruments of automation” in section one). That portends a future in which, as Ms Veloso and Mr Likens pointed out earlier, automation technologies will be able to do more than execute processes quickly and accurately—they will be able to make decisions and take actions.

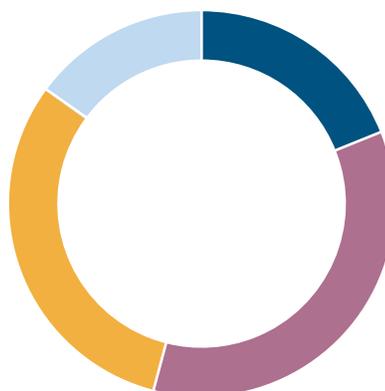
What have workers to fear?

Even as the use of AI expands, automation is unlikely to lead to the large-scale displacement of human roles in the workforce in the foreseeable future. A 2017 analysis by McKinsey suggested that while almost all roles will be affected by automation, the vast majority of them would see less than a third of tasks automated. According to the authors, “This means that most workers—from welders to mortgage brokers to CEOs—will work alongside rapidly evolving machines.” Less than a fifth of the survey respondents are convinced that “automation will displace humans in the workforce”, although a considerably larger number are unsure (Figure 6). Nearly half, meanwhile, strongly believe that automation is most effective when it complements humans, not replaces them (Figure 7).

To what extent do you agree or disagree that “automation will displace humans in the workforce”?

(% of respondents)

Strongly agree	19
Somewhat agree	35
Somewhat disagree	31
Strongly disagree	15



1. <https://www.mckinsey.com/featured-insights/future-of-work/ai-automation-and-the-future-of-work-ten-things-to-solve-for>

Figure 7: Views on the impact of automation

(% of respondents who “strongly agree”)

Automation is most effective when it complements humans, not replaces them



Automation will change the skills and requirements the workforce needs



More recent reports indicate that the deployment of automation technologies, including those based on AI, is often accompanied by the hiring of additional staff. This may involve roles in managing the data or maintaining the software, for example. Meredith Whittaker, co-founder of the AI Now Institute, part of New York University, argues that automated systems evident today in food service and other retail settings often require human labour on the back end to update and maintain them. Rather than displacement, her concern is that such labour will not be compensated adequately.

This leads back to the question of what the adoption of advanced technologies such as AI will mean for the quality of work and employees’ workplace experiences. A frequently voiced concern is that employers will use AI to monitor worker performance and micromanage their activities. (Examples of such monitoring can be found in different industries today.) Ms Whittaker sees this potentially leading to increased worker exploitation.

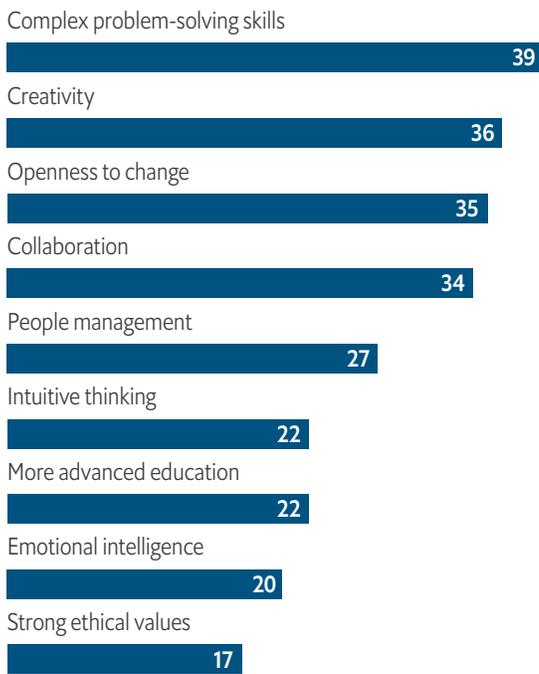
Other experts believe that AI-based automation has a greater potential to liberate and empower workers than to bind or displace them. Mr Reese believes this depends as much on employees’ motivations to change their work lives as on their employers’ use of new systems. Individuals, he says, need to ask themselves, “What drudgery do I engage in that I can use technology to destroy? What new opportunities can technology give me that I didn’t have before? Where can I buy back my own time?” If people do that, he believes, “they’re not going to get left behind.”

The majority of survey respondents are certain that automation will drive a change in the skillsets that employees will need in the future. The types of skills that respondents believe will be most in need revolve around problem-solving, creativity and collaboration (Figure 8). Intriguingly, openness to change is also high on their list—an attribute that may prove the most important of all, given the consensus among the experts we interviewed that it is too early to foresee the new roles that AI is likely to create.

2. See, for example: <https://www.theguardian.com/technology/2019/apr/07/uk-businesses-using-artificial-intelligence-to-monitor-staff-activity>; <https://www.raconteur.net/technology/ai-workplace-surveillance>; and <https://www.newscientist.com/article/219734-ai-tracks-your-every-move-and-tells-your-boss-if-youre-slacking/>

Figure 8: Given automation, what are the characteristics and skills believed to be most needed for the future workforce?

(% of respondents)



Source: The Economist Intelligence Unit

Conclusion

The research results paint a broadly positive picture of the impact that automation is having on organisations. The operational benefits are clearly visible to business leaders, and there are expectations that it will soon begin generating top-line gains as well. At the same time, there are many unknowns about the future of automation. How far will automated programmes be allowed to make business decisions, and how far up the management chain will that go? How will employee creativity and innovation be encouraged when work is shaped by intelligent technologies of great precision and power? How can the privacy of employees and their data be adequately secured? What type of safeguards need to be put in place to ensure the actions of automated systems do not lead to financial—or worse, human—calamity?

As the age of intelligent automation dawns, business leaders' responses to these questions will do much to determine whether the fruits of automation will be limited to higher productivity and efficiency, or if they have a more profound influence on business models and organisations' ability to change. But the stakes could be even higher than that, as most of our surveyed executives believe to one degree or another that automation will accelerate human achievement and that people will be happier and stress-free as a result. There is reason to be optimistic, but the unknowns demand attention.



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