Cognizant

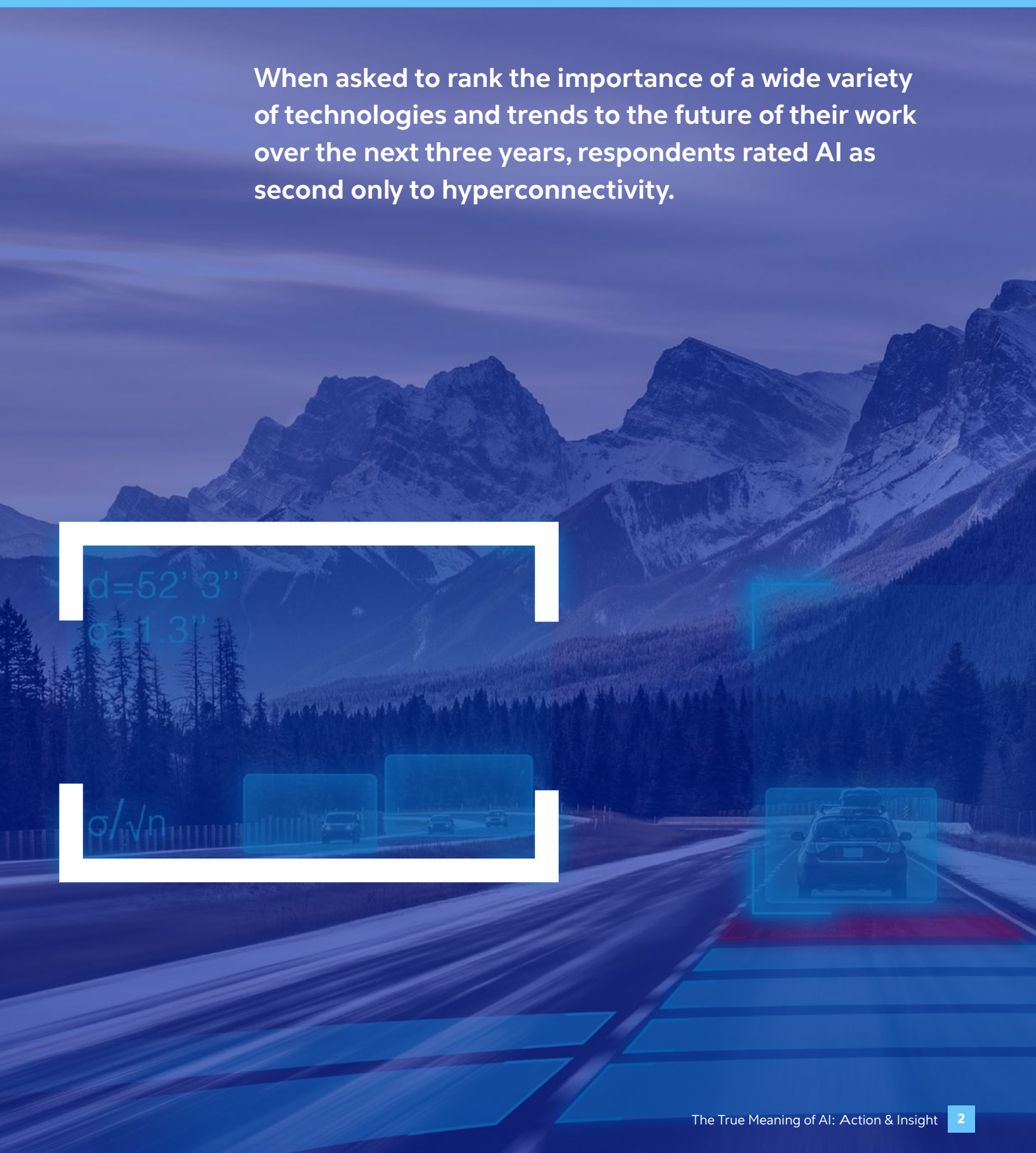
The True Meaning of AI: Action & Insight

The Work Ahead is a research series providing insight and guidance on how organizations are evolving to the next stage of their digital journey. In this report, we explore how C-level executives around the world are using artificial intelligence to power business success, and provide guidance on using this powerful technology to ensure a successful future for the future of work.

THE WORK AHEAD

Executive Summary

When asked to rank the importance of a wide variety of technologies and trends to the future of their work over the next three years, respondents rated AI as second only to hyperconnectivity.



Science fiction has conditioned us to think of artificial intelligence (AI) as an anthropomorphic super-being, intent on wiping out our jobs (or, gulp, us). But a post-Singularity future with super AI-based "Terminators" running amok is a mirage.[1] AI is, more accurately, a tool – an incredibly powerful tool – with the potential to take organizations and individuals to new thresholds of performance in whatever activity they're engaged.

Because AI has diffused into so many aspects of our lives and work so seamlessly, it is easy – as the proverbial frogs in boiling water – to overlook how significant it will be for the rest of our working lives.

In our new Work Ahead research series, however, executives appear to grasp that something big is going on. When asked to rank the importance of a wide variety of technologies and trends to the future of their work over the next three years, respondents rated AI as second only to hyperconnectivity. And, as a consequence, a very large portion of businesses – 70% – are implementing and trialing AI in some form or other, within their businesses right now. (See methodology, page 23, for full details on the Work Ahead research series.)

While AI ultimately offers incredible utility, its benefits can be challenging to achieve, and ROI doesn't happen overnight. To make it a game-changer and generate value, businesses must have the right data, strategy, applications, skills and use cases, and they must focus on real business objectives and problems to solve. Other hurdles include managing risks and ethics, and embedding AI into day-to-day workflows so people can work together with these new tools, intimately, iteratively and inextricably. All of these challenges are non-trivial. In sum, they present the work ahead.

Five key themes have emerged from our research and analysis:

1 **AI is central to the future of work.** AI is now accepted as an essential tool for modern enterprises, with respondents naming AI as a top driver for the future of work. The future of business will be based on AI-driven systems that continuously model, simulate and recommend the "next best action." Cognitive technologies are also coming into their own to deal with the mountains of data that process work generates. AI will be deployed to strip out costs, speed decision cycles and open up new horizons for innovation and disruption.

2 **Realism and recognition now surround what AI can do.** AI is arguably the most difficult of the digital technologies to master, but it's also the most rewarding and – according to our recent study – the most indicative of digital maturity.[2] While the percentage of respondents citing AI as impacting the future of work declined this year vs. in 2016, we believe this is because of businesses' more measured, nuanced approach to AI technologies. The more that companies absorb AI into their business processes, the less they see it as something magical, and more as a new means to an end.

3 **It's the data, stupid.** AI is playing a critical role in enabling businesses to churn through data at "beyond-human" scales and levels of precision. Preparing data for AI-driven analysis is a task increasingly being taken on by intelligent systems. Currently, 17% of the work involved with sifting large data sets is done by machines vs. humans, and this is forecast to rise to 25% by 2023, according to our study. The ratio between the volumes of work performed by humans as opposed to machines continues to turn in favor of machines.

4 **AI changes work, process by process.** A substantive majority of companies (70%) have piloted or implemented AI across a growing range of activities; in areas such as fraud detection and supplier management, AI is becoming a common approach. Respondents augmenting their business processes with AI expect to realize 11% increases in operational efficiency this year and 17% by 2023.

5 **Businesses that focus on AI ethics tend to also have a greater sense of purpose.** Those organizations that emphasize ethics in the use of AI also prioritize ethical approaches to managing their workforce post-COVID. These businesses are also more attuned to workforce safety, pay and conditions, and more likely to provide higher rewards for "gig" based work. A focus on AI ethics indicates an organization operating with purpose.

AI is now core curriculum

The more that companies absorb AI into their business processes, the less they see it as anything out of the ordinary. It becomes, instead, the primary means to strip out cost, speed decisions and open entirely new competitive vistas.

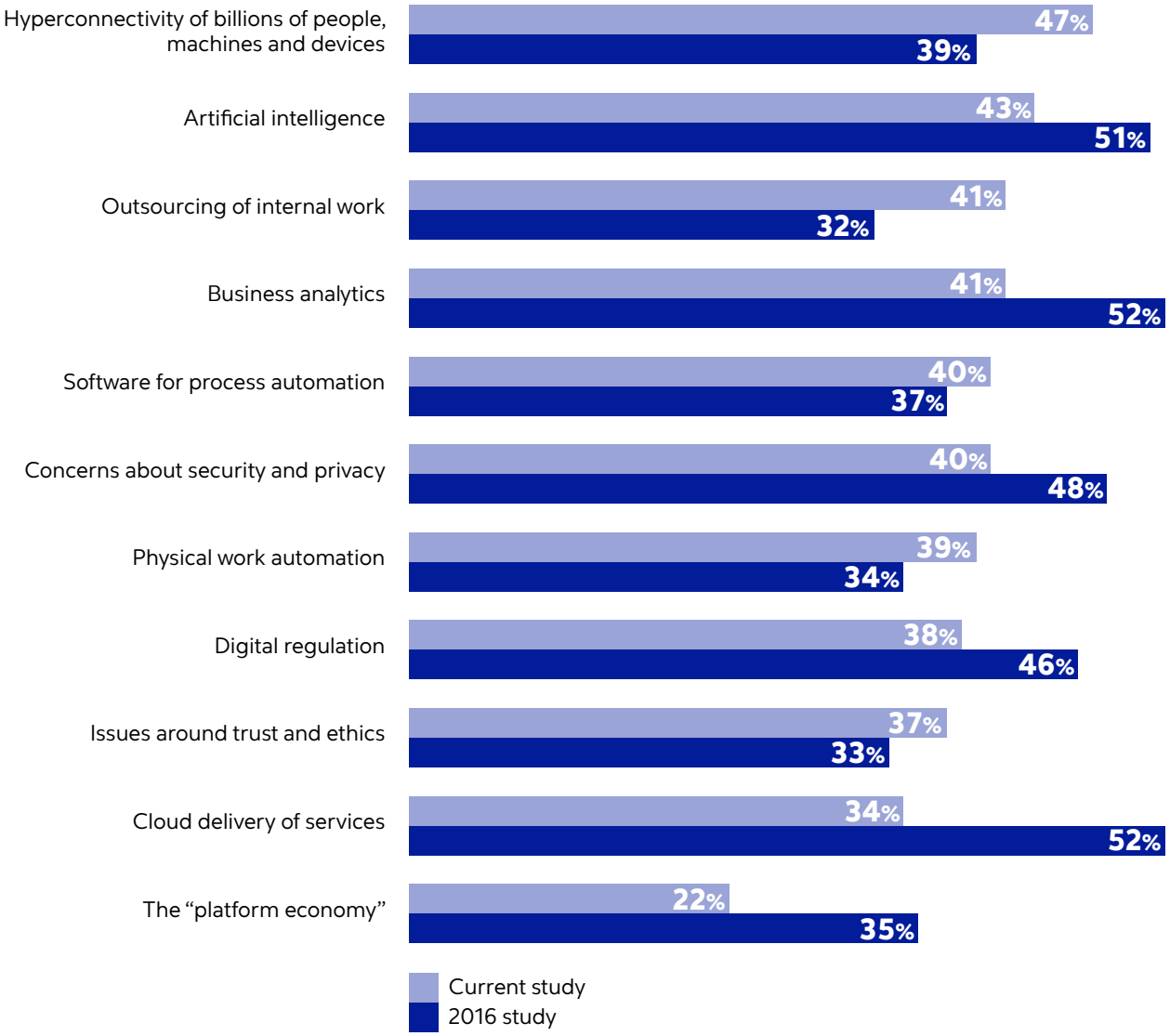
When we asked executives to name which forces would have the strongest impact on their organizations' work by 2023, AI comes in just behind the hyperconnectivity of billions of people, machines and devices.

In 2016, a slightly higher percent of respondents (51%) cited AI as having a strong impact than in our current study (43%) (see Figure 1).

Have the last several years dulled the "automagical" shine of AI that gleamed from scores of TED Talks from not-so-long-ago? Perhaps, but we believe the change in sentiment is more indicative of businesses' realization that AI is not a "magic wand" but more akin to a "Hemi" engine: an extremely powerful component of a machine that in the hands of amateurs is nothing more than an inert lump of metal but in skilled hands, can transform a car into a race winner.

AI takes a leading role

Respondents were asked to rate the impact of the following forces on work by 2023.
(Percent of respondents saying high impact)



Response base: 4,000 (current study); 2,000 (2016 study)
Source: Cognizant Center for the Future of Work
Figure 1

The more that companies absorb AI into their business processes – in the way that Amazon, Netflix, Microsoft and a whole host of other leading companies have done – the less they see it as anything out of the ordinary. It becomes, instead, the primary means to strip out cost, speed decisions and open entirely new competitive vistas.

Rather than seeing AI as something done in a secret lab by an elevated brain trust, more companies are turning to the technology to do very practical things – things that otherwise would take forever to do (or just wouldn't get done). This includes activities like accelerating underwriting processes, reducing fraud risk or increasing patient adherence to a medication regime. AI is now seen as a set of technologies that do the heavy lifting for organizations to meaningfully consume – and act on – vast volumes of continuously growing and always changing data. It's a way for us to work and see meaning at a scale that's bigger than ourselves.

Those who rate business analytics as a key driver for the future of work (41% in our study) are likely to get a further boost from applying AI technologies, as will those who cite process automation (40%); after all, why simply "automate" processes when you can optimize them and glean deeper meaning at the same time using AI?

Realizing AI-driven outcomes like these will remain a core curriculum as we reconstruct more modern businesses post-COVID, and attempt to "build back better." (See Quick Take for how we define AI in this study.)

Quick Take

No killer robots in sight

Because many businesses have different views of what AI actually is, our study offered a definitional range that encompasses the business uses of AI, including machine learning (ML) and cognitive/deep learning (e.g., predictive maintenance, recommendation engines). We've also found it helpful to categorize AI into three subsets:

- **Narrow AI** (ANI), aka "applied AI" or "weak AI," focuses around a particular task like navigating traffic, reviewing medical charts or optimizing stock trading. DeepMind's AlphaGo, which thrashed professional Go master Lee Sedol, also falls into this category.[3]

- **General AI** (AGI), aka "strong AI," is the use of machine intelligence that matches human abilities to learn entire processes, such as every task involved with walking into a kitchen to brew a cup of coffee. While such processes are simple enough for most humans to do even in an unfamiliar kitchen, machines have yet to reach this level of sophistication in learning (but the cutting-edge capabilities of GPT-3 appear to come close to AGI).[4]

- **Super AI** is the theoretical outcome of AGI, with unlimited computing power. This is the AI that some worry would quickly overtake human capability and reach levels of intelligence we can't even comprehend.

While General AI and Super AI continue to tantalize imaginations, ANI is the type of AI leading to most of the technological and business breakthroughs today and what we describe in this study. Our references to AI in this report focus on that subset of the technology, and align with Cognizant's Evolutionary AI™ approach to improve decision-making and drive impactful business outcomes.[5]

Data mastery: beyond human scale

In our study, it's clear businesses recognize that handling today's data volumes cannot be done by human workers alone and that intelligent machines will perform a greater portion of this task.

Many aspects of data management – from organizing and preparing it for AI analytics, to using it for insights – are increasingly beyond human capability.

As Figure 2 shows, the ratio between the volume of work performed by humans as opposed to machines continues to turn in favor of machines, particularly when it comes to data organization, complex decision support and rules-based decision making.

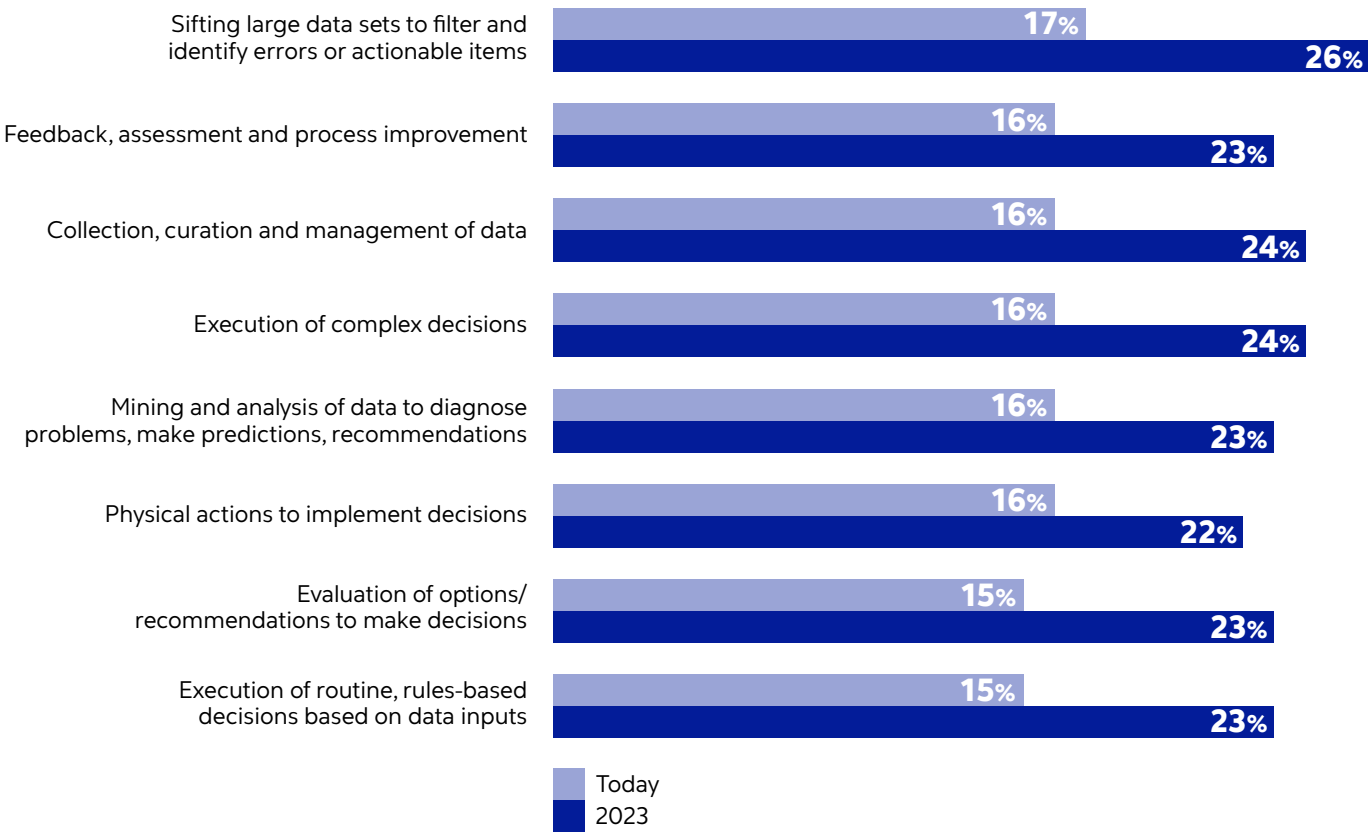
Consider that today, the main types of data integrated into AI applications are Internet of Things (IoT), customer and internal data. In many cases, this is simply because of the sheer volume of accessible data generated by sensors and customer interactions. But other forms of data are where the most extraordinary insights often lie, particularly when multiple forms of data are combined.

This means getting past the reports and spreadsheets and bringing in data that's not always structured and formatted and not always owned by the business itself, including publicly available drone and camera images or social media sentiment, as well as geolocation and psychographic data. It also means combining this data in new ways, such as taking video from street cameras and merging it with traffic data and local tweets to ascertain the business revenue of a particular geography or even what people are buying in that area.

Imagine pulling insights from millions of customer interactions with geolocation or psychographic data and making accurate, ongoing predictions regarding consumer needs and desires.

More work pivots to machines as process data explodes

Respondents were asked to what extent the following activities are executed by machines vs. employees, now and in 2023. (Percent of work that is or will be conducted by machines)



Response base: 4,000
Source: Cognizant Center for the Future of Work
Figure 2

What if you could add human insights into the results (warmth, empathy, creativity), with the ability to craft engaging, insight-driven customer journeys that work at scale?

Retailers, for example, could create immersive product catalogs with a "virtual try before you buy" feature; educators could offer personalized and effective learning paths for any subject; doctors could spot opioid addiction or a patient's withdrawal from the physical world. The possibilities for work are endless. This shift is not science fiction; it is happening now, and is generating achievable outcomes across a host of processes and industries.

Data really is the new oil

The key question is whether your business and current technology infrastructure can handle this deluge of data. Volumes will only increase, especially with a second wave of IoT solutions coming online, and the advent of 5G set to transform these solutions with greater bandwidth and lower latency. IoT sensors embedded into products would enable better user experiences, or give process owners the ability to monitor assets virtually, continually adjusting them for peak performance and applying data insights from third-party sources. Is your workforce ready for the advent of these new technologies? How will you cope with the deluge of data? This is why the use of machines is on the rise.

In our study, it's clear businesses recognize that handling today's data volumes cannot be done by human workers alone. Businesses need help organizing their data more effectively, using machine learning software targeted at databases to cleanse and organize data so it can be of business value. According to respondents, machines will perform a greater portion of this task, from 17% of this work today to 26% by 2023.

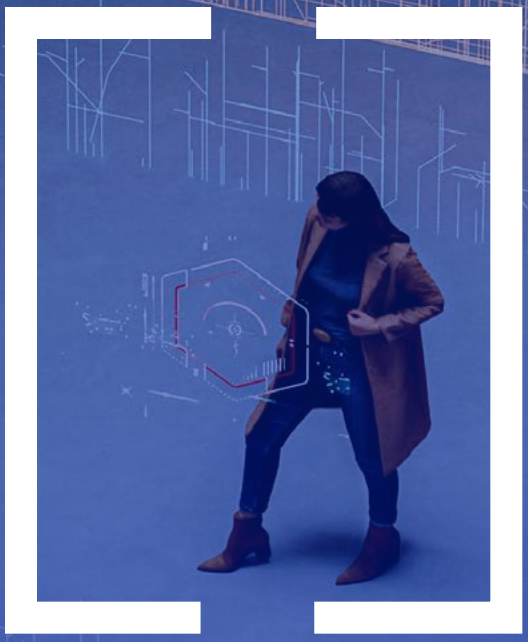
The second and third areas where the transition toward machines is set to accelerate are both encompassed by the function of decision support. "Execution of complex decisions" and "execution of routine, rules-based decisions" are both areas in which respondents expect to see a significant transition toward machines in the next three years (from 16% to 24% and from 15% to 23%, respectively). Executives are increasingly turning to AI to process large data sets (just as most stock trading is now commonly undertaken by machines, complex decision making will be done more quickly and effectively by machines). As this shift occurs, businesses will need to more fully consider the best ways for machines and human workers to partner together.

26%
by 2023

Machines will perform a greater portion of data management tasks, from 17% of this work today to 26% by 2023.

Forging a modern business, process by process

Our respondents are bullish on unlocking new operational efficiency thresholds with AI. While they're already realizing an 11% increase in operational efficiency today, they expect that to increase to 17% by 2023.



We asked respondents to identify the business processes in their organization where technology has had a material impact on augmenting (i.e., improving) process outputs, and then to say which technology tools were used.

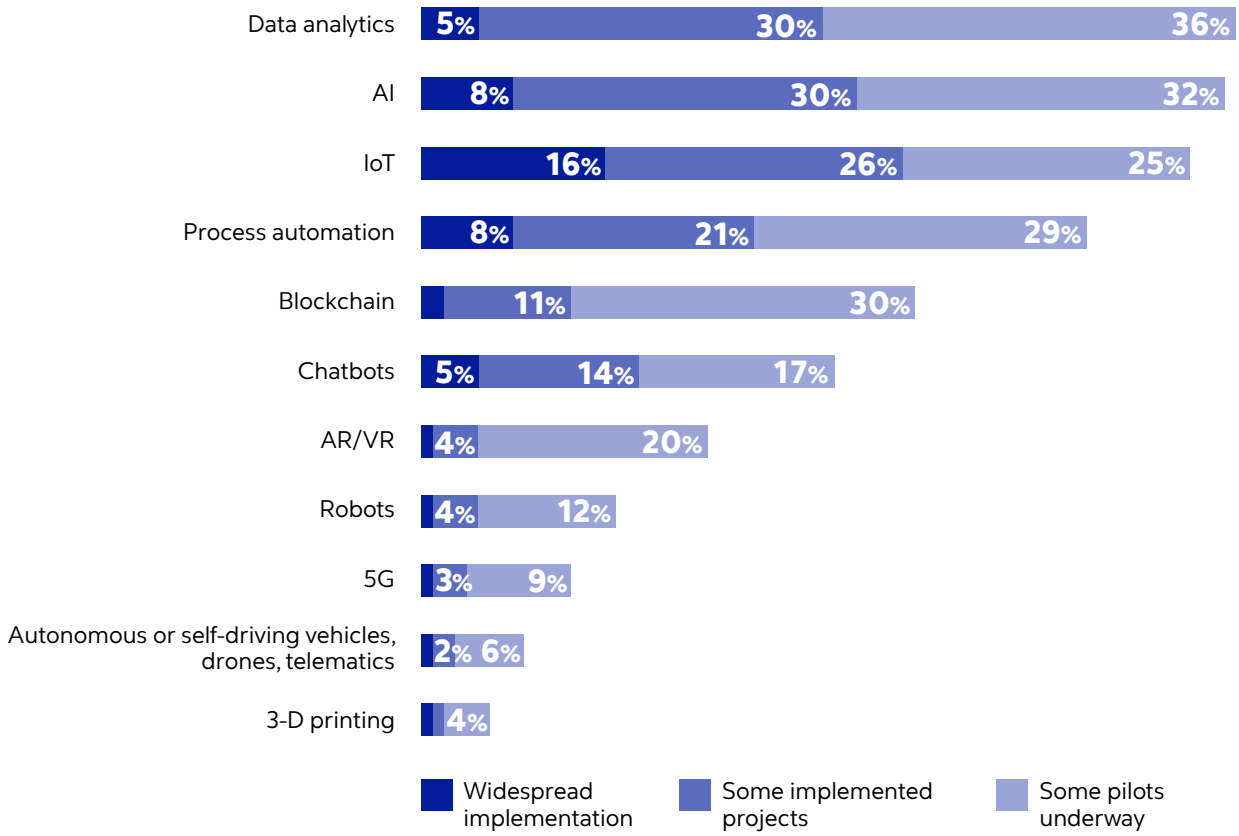
As can be seen in Figure 3, AI has been implemented to some degree by almost three-quarters of study respondents, with 8% reporting widespread implementation, 30% some degree of implementation, and another 32% with pilots underway.

The focus on IoT, analytics, blockchain and chatbots reveals the integral role AI will play in the future of process work as a tool to handle ever more detail. For example, IoT will trigger more data-oriented technology investments as intelligent sensors generate growing amounts of data and are used to control physical systems. This will create a "flywheel" effect, with an explosion of data needing to be organized and sifted for meaning at scale.

While 5G is still at an early stage of adoption – only 9% of respondents have a 5G pilot underway – over time the "mesh of machines" created by IoT and 5G will serve as the foundation for new levels of functionality and possibility that require AI to handle the data. Future employees will be able to pull insights from millions of customer interactions in the physical and virtual worlds, and use machine learning and AI to make ongoing and accurate predictions concerning consumer needs and desires.

AI is the mechanism to handle the explosion of process data

Respondents were asked about the progress made in using each technology to augment business processes.
(Percent of respondents naming each implementation phase)



Response base: 4,000
Source: Cognizant Center for the Future of Work
Figure 3

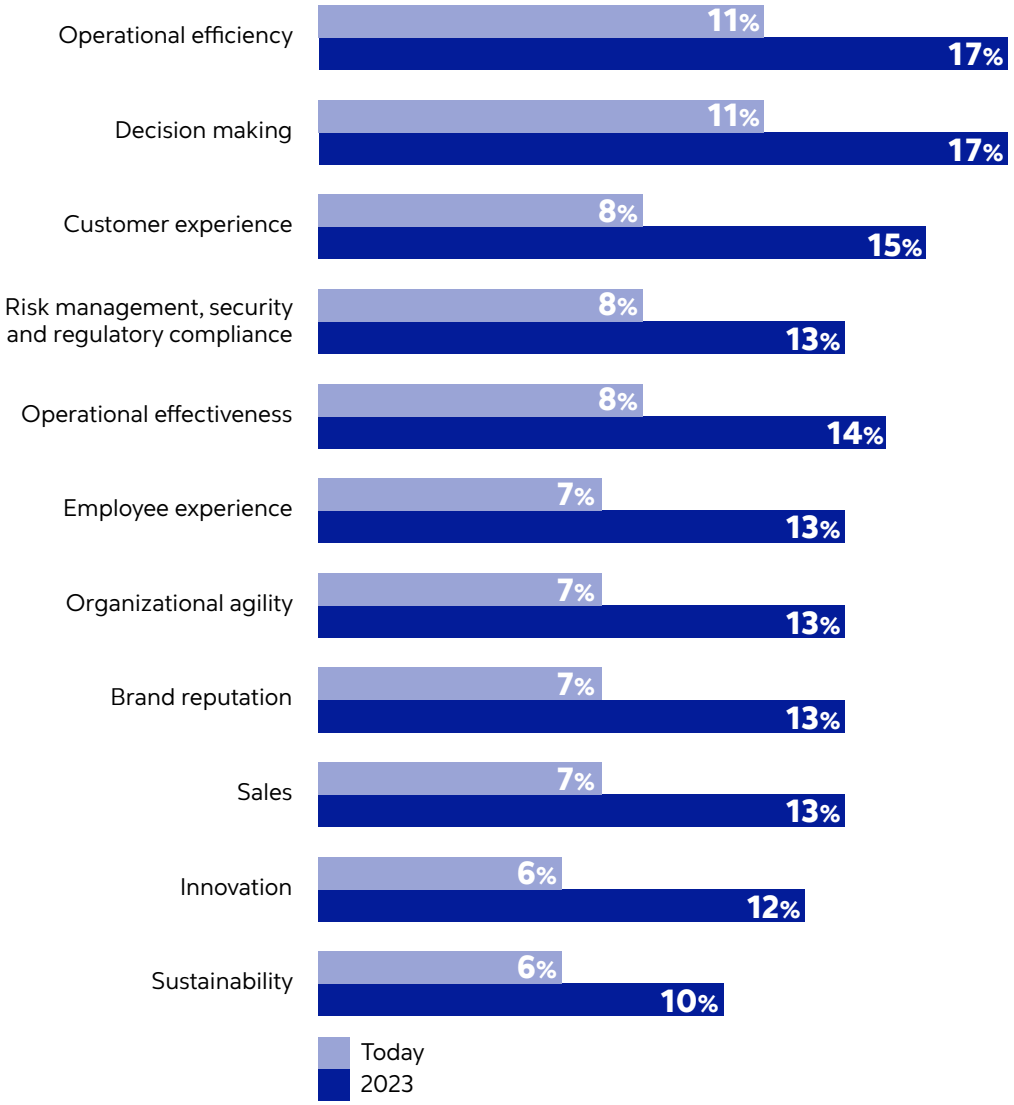
Outcomes move beyond cost and efficiency

When AI is applied to a specific business process, the underlying knowledge assets within that process have the potential to become smarter and be used (and reused) in productive ways. Our respondents are bullish on unlocking new operational efficiency thresholds with AI (see Figure 4). While they're already realizing an 11% increase in operational efficiency today, they expect that to increase to 17% by 2023.

Imagine what this speed and efficiency could mean in your own business context. What if an insurer could process claims 10 times faster than its competitors? Or if a bank could evaluate and approve a loan while the customer was still admiring the car in the showroom? By injecting AI into back-, middle- and front-office processes, companies can accelerate their operational speed and their ability to derive real-time insight into all aspects of their operations in material ways.

Top AI benefits: efficiency, decision making, customer experience

Respondents were asked about the progress they expect to make in the following areas with the application of AI.
(Mean percent increase today and in 2023)



Response base: 4,000
Source: Cognizant Center for the Future of Work
Figure 4

Respondents are also betting on AI to improve decision-making by 17% during the next three years by leveraging it for fast and intelligent insights that create new business value. To stay ahead of the curve, businesses should set a short-term target (the next 12 months) in which they aim to match their decision-making speed to that of anticipated growth in data volumes.

Our respondents are also changing the basis of competition from the outside, using AI to rewire customer-focused processes and materially improve customer experience levels by 2023. To get there, they are looking to eliminate friction points such as long wait times on service calls, mortgage loan applications, medical records management and travel planning. Cognitive computing-based customer service will soon become a make-or-break factor for succeeding in a fast-paced, competitive business environment. By processing in real-time the content of phone calls made to a call center, as well as the caller's underlying emotions through natural language processing and sentiment analysis, cognitive systems can guide chatbots and agents to de-escalate tense situations, resulting in higher customer retention, lower agent turnover and the insights to create a better customer experience.

Ultimately, our analysis shows businesses achieving a wide variety of business goals using AI, including stronger risk and security compliance and employee engagement. More mature AI adopters are achieving even more growth-oriented benefits, such as greater organizational agility, brand enhancement, innovation and sales.

To reap the benefits of AI, businesses need to build new workflows that enable predictable, rote and repetitive activities to be done by machines, while humans specialize in applying judgment, creativity and empathy.

Your five-year plan: building workflows that match smart people with smart machines

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The executives interviewed for this report recognize this need and what it means for their workforce. "We especially need skilled people who are capable of running automated systems. We will be hiring much more such talent in the future," said a CEO from a consumer goods company in Europe. A U.S. healthcare COO remarked that "the coming five years will see an increase in demand for AI, ethics and data governance, and data science in multiple divisions across our business units."

The growth in demand for such roles requires the workforce to increase its range of skills to make themselves relevant to where the market is clearly going. Big data specialists, process automation experts, security analysts, human-machine interaction designers, robotics engineers and machine learning experts will all be highly valued for the foreseeable future.

How well organizations blend and extend the strengths of their people with the capabilities of intelligent machines will determine their digital maturity and their success in fundamentally changing – and improving – how work gets done. Organizations will need to rethink their workforce resourcing model by applying AI to specific processes, separating out tasks and activities from within jobs as they are currently configured, and parsing them anew between people and machines.

The result will likely mean more gig work and micro-outsourcing of tasks as work becomes more specialized. Success for many organizations will depend on how they blend and extend the strengths of people with the capabilities of machines. Management will need to be focused on explaining this objective in a way that takes people along on the journey; preparing the workforce for the profound changes in how they work is an important element of living up to the mantra of being an organization of purpose, and of being clearly regarded in talent markets as an employer of choice. (For more on this topic, see Quick Take, page 15).

Quick Take

How to match people with machines

Succeeding with AI requires an acute focus on the relationship between humans and machines, how the two will collaborate, and how the current workforce and the business will adapt to AI. We offer a framework to help organizations build workflows to match smart people with smart machines by aligning five elements (5Ts) – tasks, teams, talent, technology and trust – to transition into the new machine age successfully. At the heart of this framework are business processes that need restructuring and reengineering to support human-machine collaboration:

- **Tasks: deconstruct jobs into tasks.** Companies will need to identify which tasks within any given job are best performed by humans vs. machines to achieve an optimal balance of human-machine collaboration. In most cases, portions of a job will be impacted or replaced by a bot, while other portions will be untouched or even enhanced.

- **Talent: fuse human and technical skills.** People skills will need to be tweaked for optimal human-machine collaboration. Workers will need to think in terms of the systems, tools and processes required to make the best use of AI-driven insights and capabilities.

- **Technology: IT matters more than ever.** Whether your organization is recreating a business process from scratch or injecting AI into front-, middle- or back-office processes, success will depend on how well the IT infrastructure is integrated with AI systems. The IT infrastructure needs to become agile, responsive, flexible, secure, scalable and simple to manage the transition.

- **Teams: small, flexible and fluid.** We will witness a shift from larger hierarchical team structures to smaller teams in the future. These changes will allow individuals and teams to become more fluid and flexible across roles and functions. Businesses will require new roles, such as human-machine teaming managers, to identify tasks, processes, systems and experiences to be upgraded by newly available technologies, as well as imagine new approaches, skills, interactions and constructs.

- **Trust: instilling trust in machines.** From unexpected or biased results to dangerous errors, we now face the moral dilemma of determining who's responsible for any wrongdoing by an AI-driven machine. Businesses will need to increase transparency into AI mechanisms and decisions.

(For more on this topic, see our full report "Humans + Intelligent Machines: Mastering the Future of Work Economy in Asia Pacific."[6]

Why AI ethics matter

Organizations that prioritize AI ethics positively outscore those that don't on every single marker of employee well-being in our study, from employee safety to pay.

As AI is used to generate more powerful business outcomes, the responsibility grows to meet ever-higher standards in its use, particularly regarding accountability, the potential for bias and permitted data use.

As has been frequently noted, one downside of machine learning systems is that they can entrench existing bias in decision-making systems.[7] Progress with these tools requires trust from both customers and employees that the right course of action is being taken.

In our analysis, organizations that prioritize AI ethics positively outscore those that don't on every single marker of employee well-being in our study, from employee safety to pay. We identified a "leader" cut of respondents, representing 14% of the respondent base, who believe that both AI and issues around trust and ethics will have a strong impact on the world of work over the next three years (for the full methodology, see page 23). We found that these leaders are the most likely to treat their workforce better and see employees not as a mere labor resource but for the value they bring to the organization (see Figure 5 and 6, next page).

When asked to predict how the pandemic would impact their business and workforce over time, these leaders pointed to employee safety and job recognition as top factors. This cohort also expects to prioritize workforce safety (62% vs. 56% for non-leaders), and to value and pay their front-line workers more (64% vs. 57%). Over the medium term, COVID will force enterprises with an ethical mission to ask more strategic questions about undertaking fundamental aspects of these goals; in doing so, they will move further ahead in their competitive battles.

The notions of "business purpose" and the ethical use of AI, it should be noted, are frequently subject to critique from those who believe many organizations simply pay "lip service" to these ideas while doing very little to act on any other objective than improving the bottom line. This criticism notwithstanding, businesses do need to take purpose and ethics more seriously than ever before for one primary reason: the next generation of talent (the fabled digital natives) demands it.

To appeal to younger generations of workers, businesses will need to make issues like diversity, inclusion, stakeholders, the environment, etc., central to their strategy. While it would be easy for leaders accustomed to prioritizing shareholder needs over those of employees to be cynical about this change, it would also be a serious mistake. The new agenda at the heart of the future of work requires businesses to step forward and lead a generation that wants change. AI talent – perhaps the most valuable talent on earth – will increasingly choose organizations that live up to ideals that are no longer idealistic but are the new standard operating procedure.

57%
of AI ethics leaders will increase supply chain resilience

vs.

49%
of all other respondents

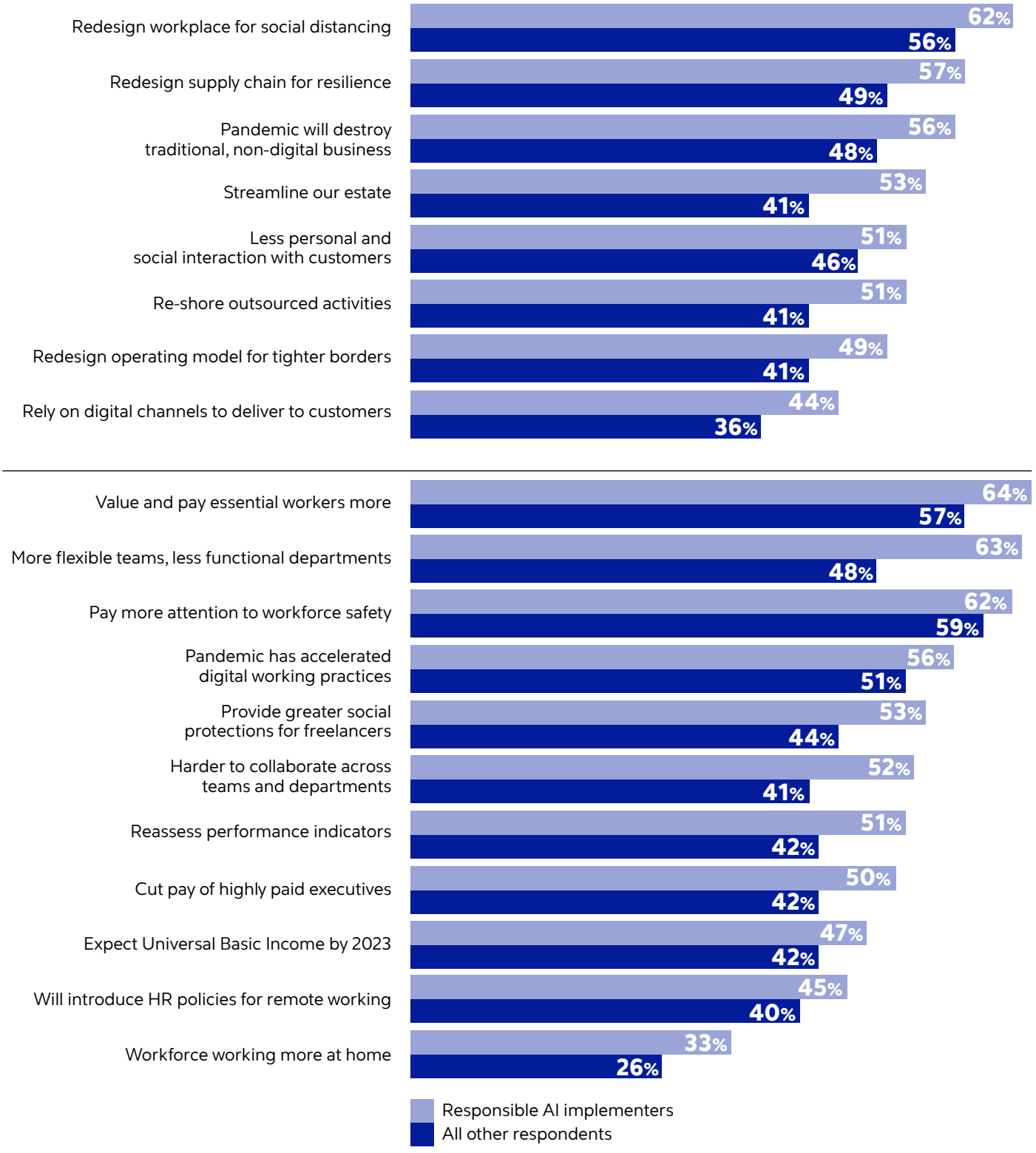
64%
of AI ethics leaders will increase pay for essential workers

vs.

57%
of all other respondents

Organizations that ethically deploy AI score higher on all aspects of workplace and workforce strategy measures

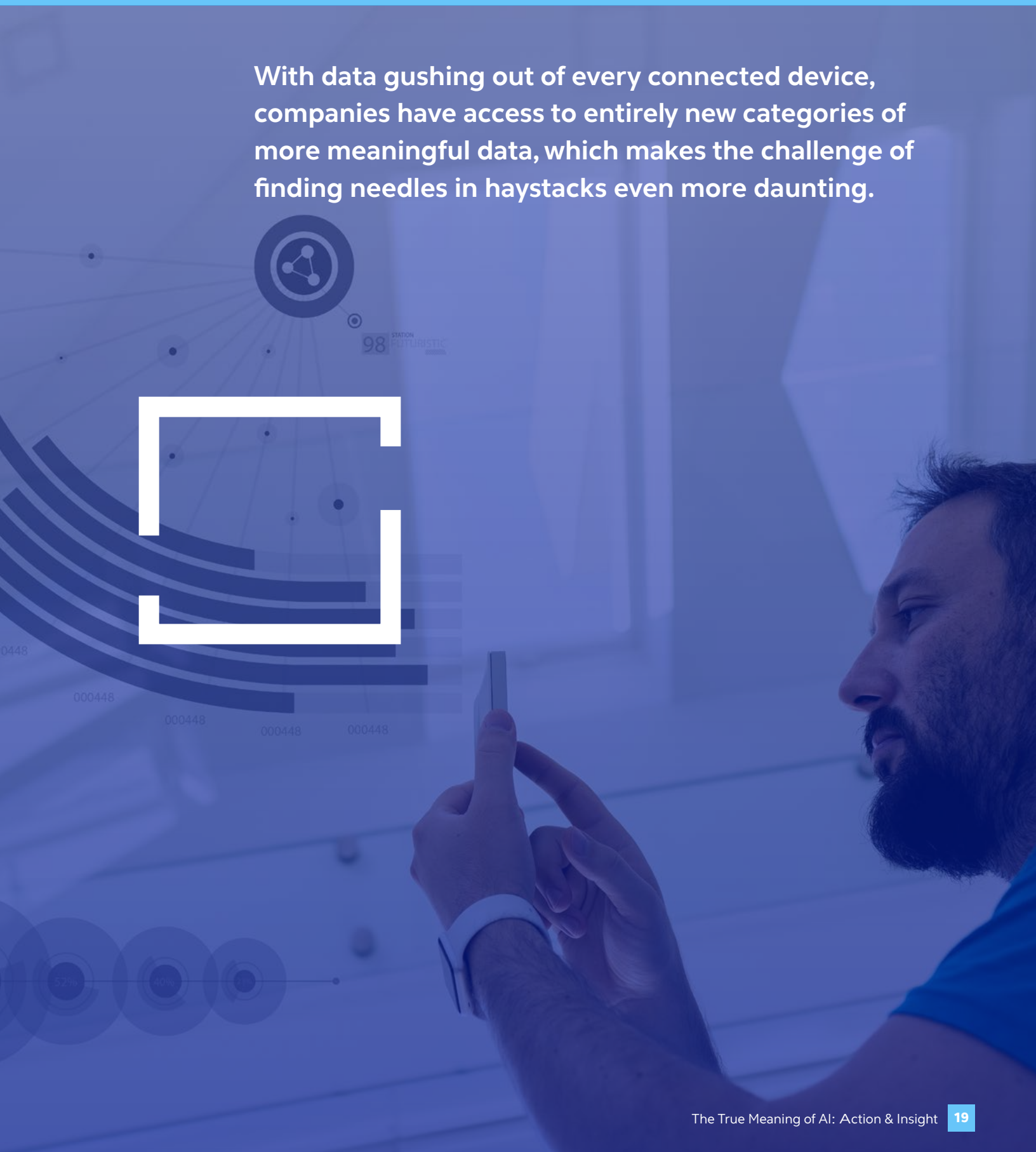
Respondents were asked whether they agree with the following statements about the likely impact of the pandemic on the business and workforce. (Percent of respondents who said they agree or strongly agree)



Response base: 4,000 total respondents; 575 "responsible AI implementers"
Source: Cognizant Center for the Future of Work
Figures 5 and 6

The future of work pivots on AI

With data gushing out of every connected device, companies have access to entirely new categories of more meaningful data, which makes the challenge of finding needles in haystacks even more daunting.



In the years since the term "digital business" first emerged, so has our understanding of digital maturity. In the first waves of digitization, it was enough to have a data warehouse or two, or even a data lake. Now, with data gushing out of every connected device, companies have access to entirely new categories of more meaningful data – unstructured data, IoT data, images, social data – which makes the challenge of finding needles in haystacks even more daunting.

The wild success of Snowflake's recent IPO is evidence enough, if it were needed, that solving this challenge can be hugely profitable.[8]

To address this issue, AI leaders **in our recent study on the ROI of AI** are spending on advanced AI technologies, such as machine learning, deep learning, computer vision and natural language processing.[9] In contrast, non-leaders are more focused on basic AI technologies, such as data management, digital assistants and robotic process automation. Deep learning is proving incredibly valuable as AI adoption expands, as it provides businesses with the ability to find meaning in diverse sets of unstructured data. But among all the AI-related technologies currently being developed, natural language processing stands out as having perhaps the highest potential.[10]

Over the last few years, the advances in voice recognition have been profound, whether to capture different accents and languages or to build capabilities into more devices. The most recent example of this is Generative Pre-trained Transformer 3 (GPT-3), released from the non-profit OpenAI research laboratory, established by Elon Musk. GPT-3 is described as an autoregressive language model that uses deep learning to produce human-like text. It has been trained on billons of words of text and, over time, has figured out the underlying rules of language and how to use them. The model generates written text so human-like that it has led to speculation on the impact of integrating it with agent coaching and real-time scripting software from companies such as **ASAAP** and then further integrating the result with the latest-gen "**digital human**" from UneeQ.[11]

When a photo-realistic digital human can talk to a customer in the customer's dialect and language, and look at them with the color eyes that they prefer (pre-selected during sign-up for the service) and solve the customer's issue quickly and painlessly, then an entirely new threshold of performance will have been reached. Systems that can learn and become smarter through the collective intelligence of the network in the way that Tesla cars are all upgraded at once and Waze collects real-time data from all of its users to inform all of its users is a future that may appear science fiction, but it's fast becoming science fact.

Deep learning is proving incredibly valuable as AI adoption expands, as it provides businesses with the ability to find meaning in diverse sets of unstructured data. But among all the AI-related technologies currently being developed, natural language processing stands out as having perhaps the highest potential.

Recommendations

From the factory floor to the back office to the boardroom, many of the tasks that people undertake today would be done better through the application of AI and other systems of intelligence.

In reviewing the AI-specific data from our Work Ahead series, it becomes clear that organizations face a pressing need to rethink the systems, processes and skills required to compete in markets that are more competitive than ever.

From the factory floor to the back office to the boardroom, many of the tasks that people undertake today would be done better through the application of AI and other systems of intelligence. In order to leverage AI in your work ahead, the following steps are important to consider and act on:

Check your progress with AI by checking the growth of data. To stay ahead of the curve, businesses should set a target for the next 12 months to match their decision-making speed to that of anticipated growth in data volumes. For instance, if you expect a 30% annual growth in data over the next 12 months, then the organization's speed of making insights and applying AI needs to accelerate by 30% during the same period. Anything less will impact the speed of doing business in this fast-changing world.

Get your data right, and make it richer. Ensuring your data is in good shape isn't enough; businesses also need to bring in richer sets and types of data, such as psychographic, geospatial and real-time data – all of which have the potential to drive higher AI-centric performance. Managing this data and making it useful for interrogation and leverage by AI systems is an important step on the road to digital maturity. Without this unglamorous hard work, a lot of data will remain noise and never reveal the signal buried within it.

Solve the human side of the equation. AI is not just about technology – in fact, it is more importantly about people. Critical to leveraging the possibilities of AI is hiring talent that can understand the technology *and* business needs *and* create solutions, not just build models. Organizations should deeply focus on HR plans (hiring and retention) that prioritize securing the next generation of talent; without it, it will be virtually impossible to keep pace in markets that are being disrupted at light speed.

Be ready to kick off your own skills renaissance. Every business now needs big data specialists, process automation experts, security analysts, human-machine interaction designers, robotics engineers and machine-learning experts. As a result, these skills aren't easy to acquire. In addition to having sophisticated hiring and retention plans (see above), organizations need to work harder to leverage the talent they already have. A root-and-branch reform of upskilling and internal career progression is an important element of the multi-factor HR strategy necessary to succeed at this foundational task.

Adopt a culture of collaboration and learning. Organizations need to spread the mantra of data and AI across every aspect of their operations – not just keep them caged within the IT department. This "spreading of the gospel" can start by establishing data tribes with squads of data stewards, data engineers and data modelers swarming around a specific challenge or customer touchpoint. Executives across functions – not just in IT – should institute a digital culture in which every employee is eager to use and apply these new data services within their roles. Rotating IT staff and non-IT staff between functions – IT and non IT – is an important tactic that can easily be deployed.

Construct new workflows to reach new performance thresholds. Organizations should start by reshaping the jobs of today into **the jobs of the future** by establishing the trust needed to make human/machine teaming a reality.[12] The trick is preparing your workforce for these profound changes in how they work. Without this trust, many individuals and groups will see new machines as a threat to their job security rather than a protector of it.

Methodology

Cognizant commissioned Oxford Economics to design and conduct a study of 4,000 C-suite and senior executives. The survey was conducted between June 2020 and August 2020 via computer-assisted telephone interviewing (CATI). Approximately one-third of the questions were identical to those asked in the 2016 Work Ahead study, allowing us to compare responses and track shifting attitudes toward technology and the future of work.

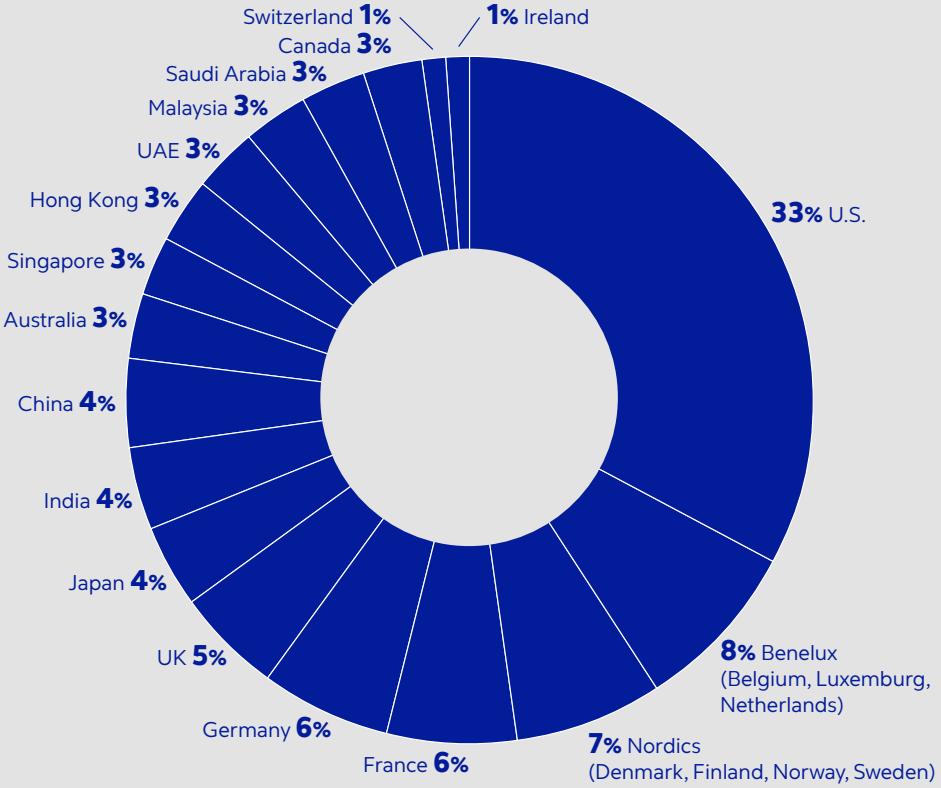
Respondents are from the U.S., Canada, UK, Ireland, France, Germany, Switzerland, Benelux (Belgium, Luxemburg, Netherlands), Nordics (Denmark, Finland, Norway, Sweden), Singapore, Australia, Malaysia, Japan, China, Hong Kong, India, Saudi Arabia and UAE. They represent 14 industries, evenly distributed across banking, consumer goods, education, healthcare (including both payers and providers), information services, insurance, life sciences, manufacturing, media and entertainment, oil and gas, retail, transportation and logistics, travel and hospitality, and utilities.

All respondents come from organizations with over $250 million in revenue; one-third are from organizations with between $250 million and $499 million in revenue, one-third from organizations with between $500 million and $999 million in revenue, and one-third with $1 billion or more in revenue.

The AI ethical leader cut is a group of respondents who believe that both AI and issues around trust and ethics will have a strong impact on the world of work by 2023. Through our data analysis, 575 respondents were identified as part of this cut, which represents 14% of the 4,000 respondents. The group consists of respondents from various markets, industries and company sizes.

In addition to the quantitative survey, Oxford Economics also conducted 30 in-depth interviews with executives, spread across the countries and industries surveyed. Interviewees exhibited a track record of using emerging technology to augment business processes. The conversations covered the major themes in this report, providing real-life case studies on the challenges faced by businesses and the actions they are taking, at a time when the coronavirus pandemic was spreading around the world and companies were formulating their strategic responses. The resulting insights offer a variety of perspectives on the changing future of work.

Respondents by geography



(Percentages may not equal 100% due to rounding)

Respondents by role

- **13%** Vice President
- **13%** Chief Operating Officer
- **13%** Director reporting to senior executive
- **13%** Senior Vice President
- **12%** President
- **12%** Chief Executive Officer
- **12%** Chief Financial Officer
- **12%** Other C-suite Officer

About the authors

Ben Pring
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Ben Pring is the Head of Thought Leadership at Cognizant, and co-founded and leads Cognizant's Center for the Future of Work. He is a co-author of the best-selling and award-winning books *What To Do When Machines Do Everything* (2017) and *Code Halos; How the Digital Lives of People, Things, and Organizations are Changing the Rules of Business* (2014). His latest book, *Monster: Taming the Machines that Rule Our Lives, Jobs, and Future*, will be out in March 2021.

Ben sits on the advisory board of the Labor and Work Life program at Harvard Law School. In 2018, he was a Bilderberg Meeting participant.

Ben joined Cognizant in 2011 from Gartner, where he spent 15 years researching and advising on areas such as cloud computing and global sourcing. In 2007, he won Gartner's prestigious Thought Leader Award. Prior to Gartner, Ben worked for a number of consulting companies, including Coopers and Lybrand.

Ben's expertise in helping clients see around corners, think the unthinkable and calculate the compound annual growth rate of unintended consequences has made him an internationally recognized authority on leading-edge technology and its intersection with business and society. His work has been featured in *The Wall Street Journal, Financial Times, The London Times, Forbes, Fortune, MIT Technology Review, The Daily Telegraph, Quartz, Inc., Axios, The Australian* and *The Economic Times.*

Based near Boston since 2000, Ben graduated with a degree in philosophy from Manchester University in the UK, where he grew up.

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Endnotes

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