

CREATING INDIA'S FUTURE WORKFORCE.

Transforming the labour force for the era of intelligent technologies—to drive innovation and growth, as well as efficiency.

● #FutureWorkforce ●

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THE ERA OF INTELLIGENT MACHINES

As in other parts of the world, in India, business leaders recognize that the future of their business is tied to how well they can use intelligent technologies. In a recent Accenture survey, 69 percent of Indian business leaders agreed that adopting intelligent technologies will be critical to their organization's ability to differentiate in the market; 41 percent believe intelligent technologies will underpin every innovation they implement in the next three years.¹

We can see artificial intelligence (AI) at work across the Indian economy, helping companies serve customers in new ways, raising efficiency, and tapping fresh sources of growth. India's healthcare providers are using AI in diagnostics and improving patient experience with AI-powered solutions. Manipal Hospitals, headquartered in Bengaluru, is using IBM Watson for Oncology, a cognitive-computing platform, to help physicians come up with personalized cancer therapies.² Columbia Asia Hospitals in Bengaluru uses algorithms developed by Bangalore-based Cardiotrack to predict and diagnose cardiac diseases, disorders, and ailments.³

In the apparel business, AI is helping companies stay ahead of fashion trends. Myntra, the online fashion retailer, for example, uses AI to process fashion data to predict trends and automatically generate designs, without human intervention.⁴ The company's designers now focus on ensuring that the right data is fed to machines and reviewing designs created by AI.

Accenture in India has developed a digital personal assistant, or chatbot, named DiPA to improve the experience of employees, who had to work through a maze of websites and services to find human resources-related information. AI helped simplify the HR experience and made it more modern and digital—an HR experience suited for an employee base dominated by Generation Y and Z workers. Whether an employee is in the office or on the go, DiPA is available 24/7 in India. It has become a digital personal advisor for new hires, providing relevant information as they acclimate to Accenture.

These are all examples of what Accenture calls 'applied intelligence'—using AI, machine learning, and other intelligent technologies to give employees superhuman powers to solve complex challenges, develop new products and services, create better customer/employee experiences, and break into new markets. The machines do the heavy cognitive lifting, while employees spend more time on creative activities and working in agile teams to tackle problems that the machines can't handle on their own. The result is a business that is smarter, faster, and more innovative.

A FUTURE OF PROMISE

As companies invest in AI systems and other intelligent technologies, they are finding that the greatest benefits do not come from simply automating what a human worker does. Rather, companies are finding that when humans and smart machines collaborate, both perform better. AI can help elevate human talent, and human supervision makes AI systems more accurate and effective. AI can empower workers, both by giving them new analytical tools and by taking over routine tasks so employees have time for higher-value work, such as helping develop a new

product or a better customer experience. This way, AI adds to both top-line and bottom-line results.

According to our research, AI has the potential to add nearly \$1 trillion per year, or 15 percent of current gross value added, to India's economy in 2035.⁵ AI is a new factor of production that can augment labor productivity and enable innovation, while driving growth in at least three important ways:



Enable intelligent automation

Use machine intelligence to automate complex, physical world tasks that require adaptability and agility—driving autonomous vehicles, for example.



Empower the workforce

Complement and enhance the skills and abilities of workforces.



Drive innovation

The insights that AI systems produce can lead to innovations and act as a catalyst for industry transformation. For example, Google Maps has helped make ride-hailing services like Uber and Ola possible, transforming transportation and providing new jobs.

THE FUTURE WORKFORCE STUDY

The fundamental question of this research is: Are businesses ready to make the most of AI—will they be able to implement human-machine collaboration on a large scale?

To find out, Accenture Research interviewed more than 1,200 CEOs and top executives whose companies are using AI. Of these, 100 were from Indian corporations. We also surveyed more than 14,000 workers of all ages and representing all skill levels, including workers whose jobs now require them to use AI systems. Of the 14,000 workers, 1,170 were from India. The survey respondents represent 12 industries and 11 economies.

AMONG THE FINDINGS

- More than one-half (59 percent) of executives in India say they plan to use AI to automate tasks to a large extent or a very large extent in the next three years.
- The vast majority (84 percent) of executives in India say they intend to use AI to enhance worker capabilities.
- They expect that collaboration between their workers and AI systems will create new sources of value, in addition to improving efficiency.

These numbers paint a positive picture, but business leaders in India are struggling to match this commitment to using AI with the actions needed to transform the workforce for the age of intelligent technologies. The most important missing ingredient is investment in

training. Half of Indian business leaders in our survey say that the skills shortage is a key workforce challenge. Yet few companies are making big investments in the training that would produce the needed skills.

This weak commitment to training limits the ability of Indian companies to get the most out of their investments in AI. Only 20 percent of executives in the survey said they think their workforce is ready for AI adoption, yet none plan to increase investment significantly in reskilling programs. And only 13 percent cite lack of employee motivation as a key barrier to retraining their workforce.

In fact, employers in India underestimate the willingness of workers to acquire the relevant skills to use AI. In our employee survey, we found that 87 percent of workers believe AI will have a positive impact on their work, while only 2 percent believe it will create challenges. And 66 percent of workers consider it very important to develop skills to work with intelligent machines.

Like their counterparts in other countries, workers in India are impatient to embrace AI: 93 percent of the workers say that it will be important/very important to learn new skills to work with intelligent technologies in the next three to five years. Also, 87 percent of workers believe intelligent technologies will create opportunities in their work, and 95 percent of workers think AI will help them to do their job more efficiently.

THREE KEY ACTIONS FOR BUSINESS LEADERS

Indian business leaders have an opportunity to tap their employees' desire to learn the skills to work with AI and other intelligent technologies.

OUR RESEARCH POINTS TO THREE KEY ACTIONS



Reimagine work to better understand how machines and people can collaborate.



Teach people to work with intelligent machines.



Prepare the organization for human-machine collaboration.



1. REIMAGINE WORK FOR THE AGE OF AI

A great deal of the talk about intelligent technologies has focused on automation—how AI and robots would take jobs from humans. Our research shows that the important impact is how AI will change jobs—augmenting human capabilities, offloading repetitious work, and making time for employees to do higher value-added work. More than half of the executives in India we surveyed (56 percent) said that traditional job descriptions will become obsolete as machines take on routine tasks and as workers take on more creative, project-based work. In addition, the implementation of AI will create new jobs, including positions for workers who “train” AI systems. Indeed, two-thirds of executives say that between reconfigured jobs and new AI-related positions, they expect that the net effect of introducing intelligent technologies will be able to increase employment.

THE EVOLUTION OF ROLES: RECONFIGURED ROLES AND NEW ONES

Even now, companies are redesigning work around AI. In our survey, 22 percent of leaders report that they've redesigned jobs to a large extent in their organizations. More than 60 percent of senior executives said that the proportion of roles requiring people to collaborate with AI will rise in the next three years.

For example, in its call centers, India's ICICI Bank has created iPal, an intelligent chatbot that can answer routine customer queries. Many issues can be resolved by the chatbot, providing rapid resolution and a better customer experience. This frees up capacity of agents, who can then focus on more complex and sensitive issues where the deft touch of a skilled human can make all the difference. The iPal system handles about 1 million queries/chats per month via the bank website or mobile app and resolves nearly 90 percent of queries, the bank says. In addition to offering basic facts and handling simple transactions, the chatbot helps customers discover new features, potentially expanding the customer relationship.⁶

The introduction of AI systems creates demand for workers to work with them. The truth about AI is that, for all its amazing powers, it is highly dependent on human intervention to function properly. Think of the space where humans and machines collaborate as the “missing middle” in current organizations. It’s “missing” because almost no one talks about it, and only a few companies are working to fill this crucial gap. In the missing middle, humans work with intelligent machines and each factor in the human-machine equation is better for it: machines augment human talent, providing employees with superhuman capabilities (such as the ability to process and analyze copious amounts of data from myriad sources in real time), while humans provide the knowledge, judgment, and oversight to optimize the AI system. Figure 1 shows how work is transformed and how workers are elevated.

Figure 1:

The evolution of work and the elevation of workers.



Source: Accenture Future Workforce Ethnographic Study 2017

We identify three new categories of jobs needed to implement AI successfully: **trainers, explainers, and sustainers.**⁷ Trainers help computers “learn” tasks by carefully supplying inputs. For example, an AI system can be trained to recognize faces by being shown enough pictures of faces to develop rules for identifying specific individuals. However, without a human selecting the images and supervising how the system creates rules, a facial-recognition system can develop biases that make it unreliable. Explainers interpret the results of algorithms, making clear how the system came up with its results and thereby building confidence in AI-powered processes. Sustainers ensure that intelligent systems stay true to their original goals without crossing ethical lines or reinforcing bias. For example, an ethics compliance manager would want to make sure that an AI-powered credit-approval system was not inadvertently starting to discriminate against customers based on race or gender.

1. Determine skill needs and job requirements

Nearly half (49 percent) of Indian employers in our survey say that getting human-machine collaboration right is critical to achieving their goals. Yet few organizations have adopted a systematic approach for unlocking the value that lies at the intersection of people and intelligent machines.⁸ To do this, employers need to define the skills that are needed, reconfigure jobs or create new ones, and map employee skills to new and reconfigured jobs.

Assess tasks and skills, not jobs.

To structure jobs that involve collaboration between workers and AI systems, employers should start with an understanding of what tasks will be required and then determine which ones are best performed by humans and which can be handled by machines. TAL Manufacturing Solutions, a subsidiary of Tata Motors, for example, has introduced the TAL Brabo welding robot on its assembly lines. Welding is a complex and dangerous task, which is associated with both injuries and health hazards from exposure to fumes and noise. This robot complements human workforces by taking over dull, dangerous and monotonous tasks, while workers are reassigned to safer and more valuable ones.⁹

Allocating tasks between machines and robots is often an ongoing process. Some companies find that they need to correct their initial allocations of work to machines because the AI system headed off in an unforeseen direction. At a Chinese auto company, a vehicle technician told us about how an AI system that analyzed massive amounts of customer data to help design cars with the right features wound up suggesting configurations that would be almost impossible to build. The company had to readjust roles so that people could train the AI to make more useful recommendations.

2. Reconfigure old jobs and create new ones

When jobs are reconfigured to accommodate AI, employee energies can be focused on higher-value activities. For example, when routine tasks in an operations job are handed off to the AI system, the employee can focus on insights rather than process. A mono-skilled employee has time to become multi-skilled, and generalists can become specialists, etc. (Figure 2).

Figure 2

Reconfigured jobs are more strategic.

One of the greatest benefits of job reconfiguration: Employees take on higher-value work, giving them a chance to be more strategic and do more satisfying work.



Source: Accenture Research Future Workforce Ethnographic Study 2017

Titan Company, an Indian maker of watches, jewelry, sunglasses, prescription eyewear, and other consumer goods, has started to use AI-based product design. This gives product managers and product engineers a powerful tool to turn out designs based on the latest consumer preference data and generate hundreds of variations with just a click. This is a collaborative activity between machines, designers, and engineers who are experts in machine learning. This makes designers multi-skilled as they now work with intelligent machines and while they focus on the creative design aspects, the machines analyze huge datasets. In a fast-changing competitive market, AI-led product design can be of huge help to companies like Titan, enabling its design studios to innovate faster and shorten time to market.¹⁰

Entirely new roles are needed, too—both the trainers, explainers, and sustainers that are needed to make AI systems function smoothly and new roles for specialists whose work depends on output from AI systems. To work with AI-based systems, for example, a financial trader will need to know all about the market and about how to use AI-based models. “They’ll need experience as a trader and be strong in computers,” a trader at a Japanese investment bank told us. “They’ll need to understand that deep learning works but that the data can’t be perfect without a knowledge of trading.”¹¹

As AI is employed in more consumer-facing applications, such as the chatbot that can answer customer-service questions, workers who are skilled at AI training will be needed to give the machines an appropriate “persona.” Personality trainers will help develop the appropriate tone, humor, and level of empathy needed for different situations. A healthcare AI agent must have a different personality than an AI-based agent taking a grocery order. Microsoft used a team that included a poet, a novelist and a playwright to develop a personality for its Cortana digital assistant, which fits with the company’s brand.¹²

3. Map skills to new and reconfigured roles

Once a company has a full list of required tasks, skills and newly defined roles, it can map needed skills against the skills present in the workforce. Where there are skill gaps, companies must decide whether they can quickly train current employees or must find new talent. In our research, we have found that some companies are addressing skills gaps with contract workers in the short term. Others have managed to align the skills of their existing workforce to the new requirements. One Indian telecom company analyzed changes in workflows to redefine roles when intelligent technologies were added. “We then redesigned certain jobs, for example in customer support and logistics support, and provided training to our employees to operate these technologies in an efficient manner,” says the company’s chief digital officer.¹³



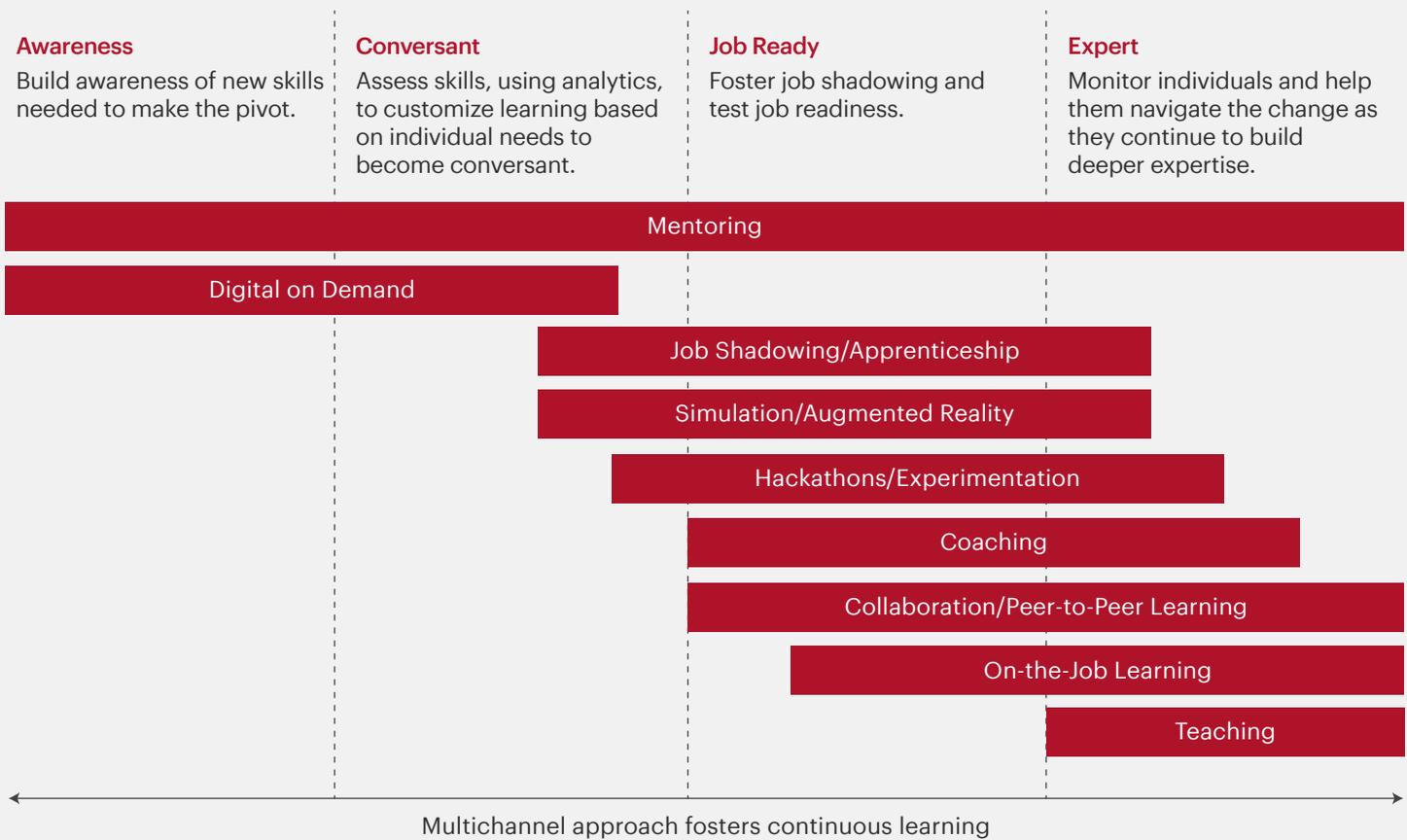
2. TEACH PEOPLE TO WORK WITH INTELLIGENT MACHINES

To fill the new and reconfigured jobs of the intelligent enterprise, companies will need new approaches to training. “New skilling” programs must be rapid, flexible, tailored, and large-scale to maximize the value humans and machines can create together.

For starters, companies will need to invest more in training. Even though almost half of business leaders in our survey identify skills shortage as a key challenge, none say their organization plans to increase investment in training programs significantly in the next three years. About two-thirds plan to increase investments in training slightly in the next three years and the rest will keep training budgets flat.

Companies can do more with whatever training budgets they choose if they are willing to innovate. At Accenture, we have developed a “new skilling” framework that maps a progression of skill—from awareness to expert—and relies on a suite of innovative learning methods grounded in neuroscience research (Figure 3). This has enabled the company to deliver training on a massive scale. Over 160,000 employees have become conversant in new IT skills, and more than 100,000 have become “job ready” in less than two years.¹⁴

Figure 3. Accenture Learning Framework
Learning Framework: New Skilling at Accenture



HOW TO SCALE UP “NEW SKILLING”

We identify three steps to expand the reach of skills programs:

1. Prioritize skills for development

Selecting the appropriate skills training will depend on the type of AI technology being used, the size of the organization, the sector, and existing skills. Technical skills may be less important than skills that are needed for new collaborative ways of working (e.g., agile methods). In our survey, executives in India rank the following as the top five most important skills for the next three years (in descending order): resource management, leadership, communication, innovation, and judgment/decision making.¹⁵

For employees working directly with AI, essential skills will include judgment to intervene effectively when machines come up with inappropriate or incongruous answers. Employees will also need to be trained to interrogate AI systems to gain the most significant and actionable insights. This requires knowing how systems categorize information and understanding the parameters of their algorithms.

Employees will also need to know how to train machines. This will require schooling in responsible AI, ensuring that data and systems are managed to be fair, transparent and accountable. Responsible AI encompasses regulatory imperatives, ethical behavior of people and machines, and responsible business practices.

2. Tailor training to account for employees of different skill levels and motivation

Employees have different starting points when they enter training and, therefore, training should fit both the skills and motivations of every employee.

We asked employees how confident they are in their skills and abilities for working with intelligent technologies. Almost all respondents—96 percent—saw themselves as “very confident/somewhat confident.” Most seem highly motivated, too: 87 percent expect AI to have a positive impact on their work.

While these numbers may suggest that workers are overestimating their capabilities, they show an encouraging enthusiasm for collaborating with AI systems. Training programs should be designed to build on that enthusiasm, while ensuring that employees truly have the skills to warrant their ingoing confidence.

3. Use digital technologies

Digital learning methods using virtual reality and augmented reality can provide realistic simulations to help employees quickly master new tasks. The same technologies can help reinforce proper on-the-job procedures—by monitoring how employees execute tasks and coaching them to do it the best way. Thyssenkrupp, for example, equips its elevator technicians with a system called Hololens, a holographic computer and head-mounted display that lets them consult with a remote expert when they confront a difficult or unusual situation.¹⁶

Digital technology can also be used to build excitement for learning. Accenture uses social media to share information about training and connect employees with experts. The corporate intranet hosts 3,000 Pinterest-like digital learning boards that are curated by approximately 900 experts. This gives all 442,000 employees access to courses in more than 300 content categories, ranging from the latest technical topics, such as blockchain, to “softer” skills, such as coaching. Employees have completed more than 42 million learning activities, 29 million of which were completed in the past year alone.



3. PREPARE THE ORGANIZATION FOR HUMAN-MACHINE COLLABORATION

To implement AI effectively and to foster the human-machine collaboration that will lead to the best results, companies not only need to address the skills challenge. They must also make organizational changes, including redeploying talent, organizing for agility, and adapting leadership to the needs of the intelligent enterprise. They need to create organizations with the mindset, acumen, speed, and flexibility to seize transformational opportunities. This means ensuring that the workforce can adapt to new customer needs, that organizational processes and resources can flex as needed, and that leadership is ready to champion a new culture.

1. Redeploy the workforce

With the help of intelligent technologies, companies are becoming far more customer-focused. In many businesses, companies now compete on customer experience using AI and data analytics. This not only requires retraining (and hiring) employees to collaborate with intelligent machines, it also means putting them in positions where they can

advance the company’s mission with customers. Employees whose routine tasks are handled by smart machines can be put into positions where they can support this new form of competition.

2. Organize for agility

The rise of the smart machines gives companies an opportunity to organize in new, agile ways. Instead of working in fixed assignments and managed in the old command-and-control style, employees can move from one multidisciplinary team to another, working with a new group every few weeks or months to tackle a specific problem, rather than repeat the same old process. The rise of the intelligent enterprise “will accelerate the shift from an assembly-line approach to a more fluid ‘assemblage’ of teams and technology, capable of higher levels of creativity and innovation,” note Paul Daugherty and Jim Wilson (Accenture’s chief technology and innovation officer and a managing director of Accenture Research) in their new book *Human + Machine: Reimagining Work in the age of AI*.¹⁷

As people do less repetitive work and participate in a series of project teams, they must also be given more autonomy and decision-making power. Organizations, therefore, should redesign processes and organizational structures to enable the fluid assembly and disassembly of project teams. And the organization must be receptive to the creativity this will unleash: “We don’t only undertake initiatives based on market research. We also crowdsource ideas internally where our people get a chance to bring innovation to the organization by using their creativity,” says the chief digital officer of an Indian telecom company.¹⁸

3. Rethink leadership

The agile, intelligent enterprise, driven by the collaboration of creative employees and powerful machines, requires a new type of leadership. To unleash the best of intelligent technology and the best of human ingenuity, leaders will need to relearn their jobs, too. As hierarchies collapse and cross-functional teams assemble and disassemble, leaders will become co-creators and collaborators with their people. Supported by data and analytics, more decision-making will be pushed down toward the front line. The department store floor walker who receives real-time data from a tablet can be empowered to change displays or shift personnel around the store. Ultimately, leadership isn’t restricted to a level in a hierarchy. The agile, intelligent enterprise needs leaders at all levels.

BUILD A STRONGER TALENT PIPELINE FROM SCHOOLS

The job changes required for the successful use of AI shine a spotlight on the large and growing skill gaps in India and around the world. Businesses complain about the shortage of qualified talent to fill jobs. But new entrants into the labor force have trouble finding work. This skills mismatch will only grow as advances in technology raise demand for technical and higher-level skills. It will be largely up to employers to narrow the skills gap. In addition to “new skilling” efforts to upgrade the skills of employees, companies should redouble efforts to address the skills gap at the source—in the education system. Companies should also collaborate with industry groups that are working with the education system and on their own to improve the talent pipeline.

On paper, India would seem to be building a solid pipeline of high-skill workers that can fill positions in the intelligent enterprise. In 2016, 2.6 million university students in India graduated with degrees in STEM (science, technology, engineering and mathematics) disciplines.¹⁹ But practical proficiency levels limits employability of many graduates, according to recent studies. Even vocational training programs are producing workers with inadequate skills. And many programs graduate students with skills that quickly become irrelevant. These students start from behind and may never catch up.

ARE YOU READY?

Artificial intelligence is redefining the nature of value creation at unprecedented speed and scale. It is reshaping core business processes and has the potential to transform customer experiences and establish entirely new business models. Companies in the future will achieve sustained growth by using AI to create better outcomes for customers and for wider communities.

Yet most businesses today are still focused on using intelligent technologies only to improve efficiency. What's needed is an urgent shift in approach. To capture the most fruitful opportunities, companies must learn human-machine collaboration and reorganize work to get the best from both employees and intelligent machines.

It's time for business leaders to reimagine the work their people do in partnership with AI. To get going, answer the tough, uncomfortable questions about your company's readiness to compete:

1. From 'Workforce' Planning to 'Work' Planning

Do we have a clear understanding today of how work in our organization will be reconfigured by intelligent machines, starting in 2018? Which of our core activities will be automated, which will see human-machine collaboration elevate our workers, and which will remain the preserve of workers only? What will this mean for our operating model? Are we prepared for the enormous changes ahead as the nature of work is reimaged?

Companies must step up their engagement with the education system and government agencies to bring changes in the academic agenda at the source—and not just in engineering programs. This includes universities, community colleges, and institutions that offer nondegree programs. NITI Aayog, the policy think tank of the Indian Government has suggested several measures to improve outcomes of the public education system, such as introducing an independent, sample-based outcome measurement system, and supporting state-level improvement through a School Education Quality Index (SEQI).²⁰

Collaborative efforts by companies in various industries will be critical. Employers should work together to define common skill requirements and actively communicate them to local educational institutions. NASSCOM, the trade association of the Indian IT business process management industry, has launched Future Skills, an online platform that offers courses in emerging technologies. It has an ambitious goal to train 2 million seasoned IT professionals and 2 million younger workers and recent graduates. Courses cover artificial intelligence, virtual reality, robotic process automation, Internet of Things, big data analytics, 3D printing, cloud computing and social and mobile apps.²¹

2. 'New Skilling' the Future Workforce

Do we have a clear view today of the knowledge, skills, and mindsets required to work with intelligent machines in a way that creates real value? Where do our people stand now? Is “new skilling” part of our leadership development, learning, and recruitment programs?

3. Positioning for the Full Value of AI

Do we have a clear understanding of how AI will be disruptive, both within our business model and in creating new business models, products, services, and customer experiences? What new jobs will be needed in our organization? Are we organized to take advantage of both the top-line and bottom-line opportunities as human-machine collaboration reshapes how we work and the nature of competition?

These are some of the defining questions that will separate winners and losers in an era of intelligent machines. Not in three years, or five years. Now.

About the Research

This research was built on four proprietary research initiatives.

A worker survey of 14,078 workers across skill levels and generations.

A business leader survey of 1,201 C-level executives.

Both surveys covered 11 countries (Australia, Brazil, China, France, Germany, India, Italy, Japan, Spain, UK and USA) and the following industry sectors: Automotive, Consumer Goods & Services, Health & Life Sciences, Infrastructure & Transportation, Energy, Media & Entertainment, Software & Platforms, Banking (Retail & Investment), Insurance, Retail, Telecommunications, Utilities.

The worker survey had 1,170 workers from India and the business leader survey had 100 C-level executives from India.

In-depth interviews with 48 C-level executives from a range of industries in Brazil, China, France, Germany, India, Japan, UK and USA.

Ethnographic interviews involving 30 in-depth qualitative in-work interviews with individuals who have been significantly impacted by the integration of new AI technologies into their workplace. Interviews covered Brazil, China, Germany, India, Japan, UK and USA and eight industry sectors.

Notes

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