

Fast forward: Relevant skills for a buoyant Indian economy

January 2019

pwc

Skilling Youth
Enriching Livelihoods

FICCI

Message from FICCI



We are witnessing a fundamental transformation in the way we work. Two distinct advantages available to India are low labour cost and a rich talent pool, which augment and empower the country's global competitiveness as a knowledge-based society. Education and training are both strategic necessities that will deliver employment-enhancing skills, in turn increasing productivity and accelerating the future economic growth of the country. India has been a front-runner in various avenues, and the government has established myriad pathways to increase the employability of the learner under the national policy on skills.

The current skill ecosystem needs to be re-engineered to cater to the evolving growth story and demands of Industry 4.0. Industries are focusing on new age technologies such as artificial intelligence, robotics, bionics, the Internet of Things, 3D printing and biotechnology, which build on and amplify one another. We as a society should have a clear view of what the future, driven by megatrends and our own actions, will look like. In addition, we need to think about society's pivotal role in pushing for educational reforms and bringing about a radical transformation in the mind-set of the youth through proactive interventions, erasing any social stigma that may be attached to vocational training programmes.

This report is grounded in the belief that individuals should understand the big picture, how technology is evolving and what the megatrends could mean for the 'world of work'. Individuals should plan for an automated world and acquire the right skills that go beyond mere technical competence. Emotional intelligence, learning agility, creativity, relationship building and leadership will be much in demand in the times to come to keep pace with the disruption impacting all spheres of our lives.

Industries which are part of the Fourth Industrial Revolution recognise the need to develop a holistic strategy. Organisations need to build a workforce that understands the culture and dynamics of the company and the product. As the workforce embraces the change and focuses on acquiring relevant skills for the future, it will lead to an increase in both efficiency and productivity.

It's clear that automation will result in a massive reclassification and rebalancing of work. Those workers who perform tasks that cannot be automated will be highly valued, and that means creativity, innovation, imagination and design skills will figure high up on the employer's priority agenda.



Raman Kumar Sharma
Co-Chairman
FICCI - Rajasthan State Council





Message from PwC



We live in a connected world and global shifts impact us both positively and adversely depending on how equipped we are to face them. The way we live and do business is being altered by five megatrends—rapid urbanisation, climate change and resource scarcity, shift in global economic power, demographic and social change, and technological breakthroughs. Of these, technological breakthroughs, especially digital technologies, have an immediate and widespread impact on the business and future workforce. In essence, that is changing business models and also the way work is done in an organisation.

When it comes to business models, digital technology has led to the integration of vertical and horizontal value chains. While vertical integration connotes integration of processes and functions within the organisation, horizontal integration has blurred the boundaries between suppliers, internal operations and customers.

In a connected global economy, we cannot ignore these changes. Digital platforms are already changing the way we hire taxis, travel, shop, access entertainment and many other routine activities. Along with these business models, there have been drastic changes to the workforce that supports these business models.

One of the positive impacts on our workforce is the gradual shift from an informal labour market to formal, structured organisations. This is fuelling the need for acquiring formal skills and training. The pace of change is also pushing individual workers towards lifelong learning.

These trends call for a drastic revamping of the current skill ecosystem to cater to the evolving growth story and demands of Industry 4.0. Advancements in the field of genetics, artificial intelligence, robotics, nanotechnology, 3D printing and biotechnology may promise future prosperity and create new jobs, but they would also pose challenges for a vast majority who would find their jobs becoming redundant or changing so much that their skills become irrelevant.

We believe that basic Science, Technology, Engineering and Mathematics (STEM) skills would become imperative for any job in any sphere and would serve us in good stead in every part of our lives. Along with STEM skills, analytical thinking and innovation, learning ability, leadership skills, critical thinking, creativity, relationship building and collaboration, and cognitive abilities will be required for the future workforce to thrive and sustain itself. As data would become the new fuel driving the economy, the ability to acquire, manage and analyse data would become a key skill in the future.

Policymakers, regulators and industries have to collectively invest in the development of new agile learners by improving education and training systems, as well as updating the labour policies to match the realities of the Fourth Industrial Revolution.

We hope you find this knowledge paper useful and we look forward to your feedback.



Ashok Varma
Partner and Leader, Social Sector Advisory
PwC India



Table of contents

Executive summary 5

The growing Indian economy 6

Skills for the Future 16

Key takeaways 21

Acknowledgements 23

1 Executive summary

The Indian growth story is a remarkable one. India is predicted to be the second largest economy by 2050, and is expected to sustain its existing position as the fastest growing large economy in the world.[1] The industry and service sectors are the major growth engines driving this economic growth. Initiatives such as Digital India, Make in India and Start-up India are further accelerating the growth of these two sectors, with increasing investment over the past few years. The demographic dividend, if exploited well, would transform India into the largest source of global human capital. The strong policy push under the Skill India programme and reforms in labour laws are gradually altering our workforce from an untrained informal workforce to a trained formal workforce.

A series of global megatrends such as rapid urbanisation, demographic shifts, shift in global economic power, political shifts and technology are influencing the way business is run. Technology (automation, artificial intelligence [AI], among other components of Industry 4.0), in particular, is transforming the workplace, nature of work and skill requirements. Amongst these emerging technologies, the Internet of things (IoT) and AI have recently seen large investments cutting across various industry sectors in India. On the other hand, investments in advanced technologies such as augmented reality (AR), virtual reality (VR) and robotics have been slow when compared with the global scenario. However, in a globally connected economy, businesses in India cannot wish away these changes and would have to adopt these technologies in a big way in the near future.

There will be a significant reduction in the number of rule- and routine-based jobs due to increased human-machine interaction and the availability of adaptive and intelligent technology. The interplay of megatrends, particularly the impact of emerging digital technologies on businesses and the economy, is forcing organisations and the workforce to adapt to the ever-changing environment. Based on these megatrends and with technological disruptions as the key focus, we have devised a skills framework to understand the future skill requirements.

The 'Skills for the Future' framework indicates that cognitive skills such as critical thinking, emotional intelligence and empathy, management and leadership, relationship building and collaboration, cognitive flexibility and creativity will be central across all industries—at both the horizontal and vertical levels (though in varying degrees) and over and above the skills related to emerging technologies. These new skill sets will not replace the existing skill demand; rather, they will be required in addition to the existing ones, often augmenting the acquired vocational skills.

To fully realise its demographic dividend, India needs to view Industry 4.0 as an opportunity for growth and renewal, equipping the youth with requisite skill sets. This is also applicable to the state of Rajasthan, given that 55%[2] of the state's economy is driven by the manufacturing and service sectors and 55% of the state's population is below 25 years of age.[3] This calls for strengthening the state's skilling ecosystem to not just impart relevant training to new entrants into the labour force, but also equip the existing workforce with the skills needed to manage technology disruptions in whichever occupation they choose, and most importantly, innovate.



1 https://www.pwc.com/gx/en/issues/economy/the-world-in-2050.html
2 Directorate of Economics and Statistics, Rajasthan
3 Census 2011

2 The growing Indian economy

The growth story

In its seventh decade of independence, India is on the path of accelerated economic growth with the potential to become the second largest economy in the world by 2050.[4] Categorised as an emerging economy, in the past year, India's gross domestic product (GDP) stood at USD 2.597 trillion,[5] with an annual growth rate of 6.7% (in 2017–18). Investment in manufacturing and consumer spending have been identified as the key growth drivers. Further, PwC predicts that India has the potential to create a USD 10 trillion economy if it accelerates its compounded annual growth rate (CAGR) to 9% over the next 20 years.[6]

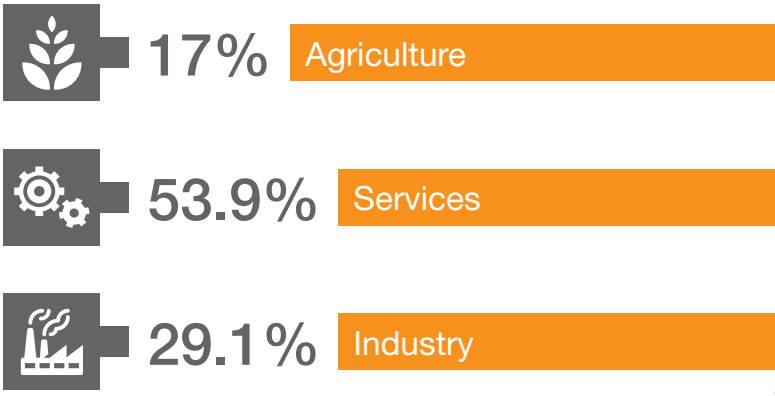
The country is undertaking several reforms to its Foreign Direct Investment (FDI) policy, thus putting India on an accelerated growth path. Despite the global decline in FDI in 2018, India attracted USD 22 billion of FDI inflows in the first half of the year.[7] Further, according to PwC's 21st CEO Survey, India has emerged as the fifth most attractive market for investments, with immense optimism from CEOs over its global economic growth prospects.[8]

With a share of more than half the total gross value added (GVA),[9] India's economy is largely driven by the service sector. It has become a major exporter of information technology (IT), business process outsourcing (BPO) and software service, contributing USD 154 billion in revenue.[10] The sector is considered as the backbone of the country's economic growth in terms of attracting significant foreign investment flows, contributing to exports and providing large-scale employment to the country's huge workforce. The service sector has seen key reform initiatives such as digitisation, e-visas, Start-up India and infrastructure upgrading. In addition, trade facilitation agreements (TFA) are a priority to remove trade barriers to services.

Growing at a CAGR of 4.34% from 2012 to 2018,[11] manufacturing is one of the fastest growing sectors of the Indian economy. Propelled by initiatives such as Make in India, Ease of Doing Business, the new electronics policy, implementation of the Goods and Services Tax (GST), development of industrial corridors, smart cities to advance domestic demand, the manufacturing sector has the potential to reach USD one trillion by 2025.[12]

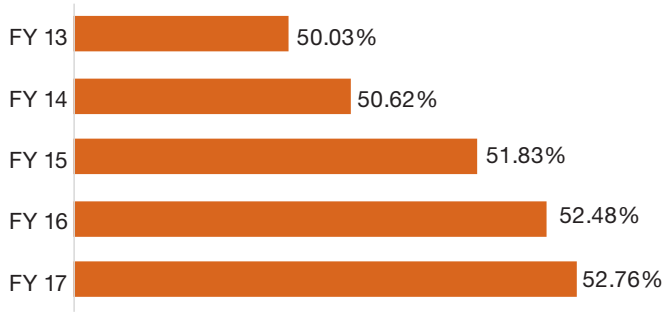
Agriculture, the primary source of livelihood for 58% of the country's population, currently stands at USD 274.23 billion.[13] The sector is expected to pick up pace with rising investments in infrastructure and provision of 100% FDI in food products, e-commerce and marketing.[14]

Sector-wise contribution to GVA (2017–18)



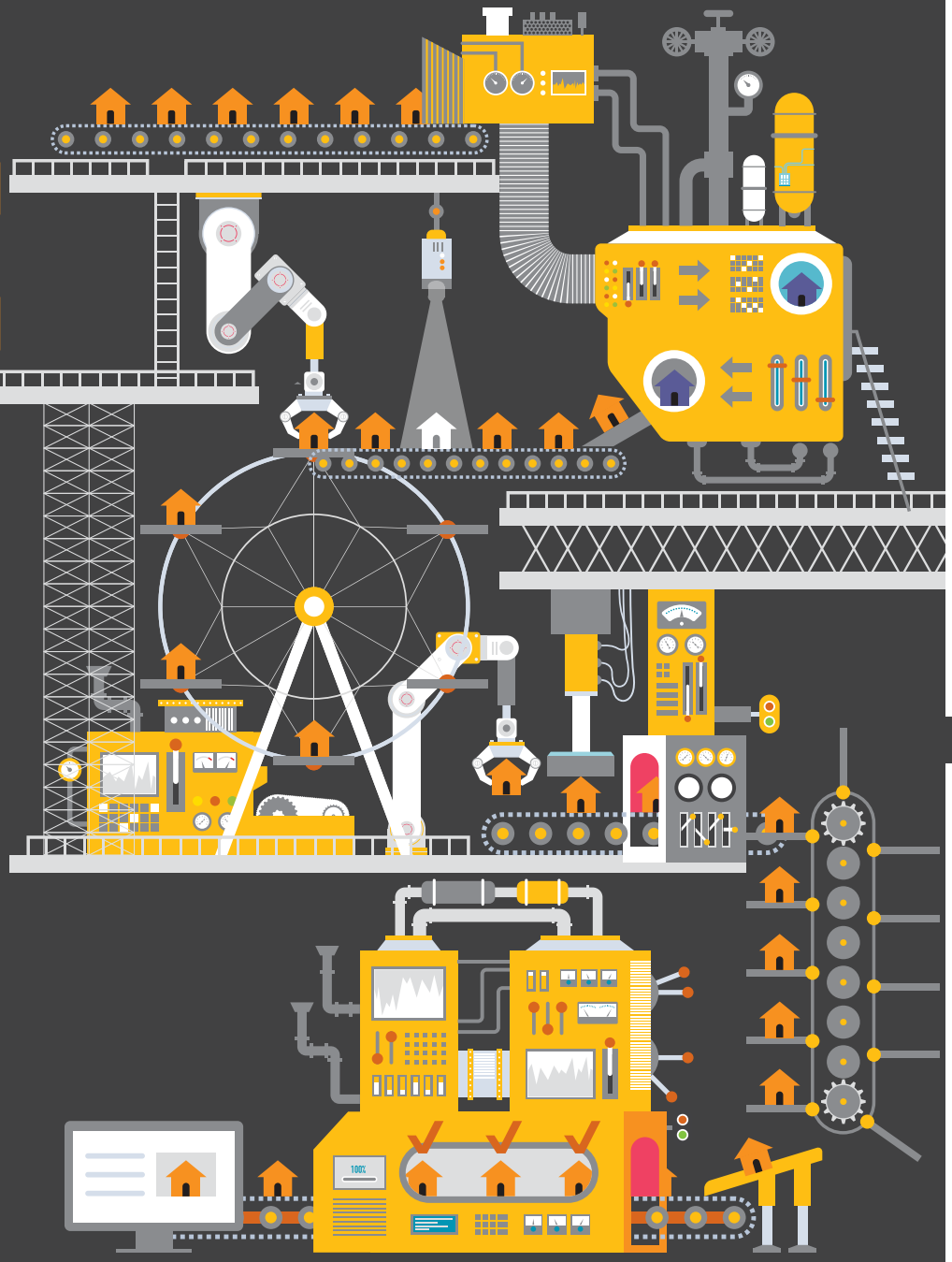
India as a service-driven economy

Service GVA as a percentage of total GVA



However, considering its demographic dividend, increasing integration with the global economy and potential for economic growth, India needs to improve and speed up its current socioeconomic initiatives to create shared prosperity for its 1.3 billion citizens. As a step towards this, PwC has introduced the Nagarik Platform[15] to provide gainful employment to the youth in smaller districts, where a majority of Indians reside.

4 PwC, 'The World in 2050' (https://www.pwc.com/gx/en/issues/economy/the-world-in-2050.html)
5 IBEF
6 https://www.pwc.in/future-of-india.html
7 United Nations Conference on Trade and Development (UNCTAD)
8 https://www.pwc.com/gx/en/ceo-agenda/ceosurvey/2019/gx
9 Gross value added (GVA) is at current prices.
10 https://www.nasscom.in/press/it-bpm-industry-india-sustaining-growth-and-investing-future
11 Ministry of Statistics and Program Implementation
12 Ministry of Commerce, 'Vision of a new India - USD 5 trillion economy'
13 IBEF
14 IBEF
15 https://www.pwc.in/research-insights/2018/nagarik.html



India's manufacturing sector

- Huge domestic market due to the rapidly rising middle class and overall population
- Cumulative FDI inflows reached USD 76.82 billion during April 2000–June 2018
- Make in India aims to increase the sector's contribution to 25% of the GDP and create 100 million new jobs by 2022
- GST is expected to make India a common market with a GDP of USD 2.5 trillion, attracting heavy investments

India's service sector

- Rising income and a young population are key drivers leading to a large talent pool for the sector
- Received most FDI inflows between 2000–18, totalling USD 68.62 billion
- Export hub for software services; 55% share in global sourcing market in 2017
- 'Services Exports from India Scheme' rewards service export

Key megatrends shaping the Indian economy[16]

Further, complex megatrends are reshaping the Indian economy and along with it, the nature of work: economic shifts that are redistributing power, wealth, competition and opportunity around the globe, technological disruptions, political shifts, demographic dividend and resource scarcity that are affecting every sector.

Technological breakthroughs

CEOs around the world view technological advancements (artificial intelligence, automation, robotics, Internet of things, augmented and virtual reality, drones, etc.) as the most significant megatrend transforming their business, the labour market and the economy in the coming years.

Rapid urbanisation

With an increasing number of Indians migrating from rural areas to cities for employment opportunities, the resulting urbanisation is expected to drive the nation's economic growth. Cities will become centres of future investment and job creation. Further, with the expansion of city boundaries and creation of new urban centres, India's urban population is projected to soar to 650 million in 2034.

Demographic dividend

India has a huge demographic dividend, with nearly 65% of its population younger than 35 years of age. As other growing economies confront a rapidly greying population, India's young population could fulfil the demand for skilled workers worldwide. However, India risks squandering this opportunity if it does not create quality employment opportunities and skill at scale.

Resource and environment sustainability

Indian companies have now started talking actively about the transition to a low-carbon economy, taking a keen interest in alternative sources of energy. This will lead to the emergence of new types of jobs in this industry. New engineering processes, product design and waste management, and re-use of resources will need to be created to deal with these needs.

Shift in global economic power

By 2050, global economic growth is expected to be driven largely by E7 economies of Brazil, China, India, Indonesia, Mexico, Russia and Turkey. This kind of global economic power shift to emerging markets is one of the most relevant and pronounced megatrends for India that will impact business opportunities, economic growth and jobs.

Political shifts

A political shift has economically large impacts on local private sector growth and economic output. Therefore, political stability and positive policies such as 100% FDI will enable India to achieve growth and development at a decent rate.

These trends are expected to shape the future of businesses into four 'Worlds of Work',[17] leading to the evolution of innovation, community, social responsibility and purely profit-driven businesses. Each World of Work will demand a unique proportion of technical and generic[18] skill sets.

15 https://www.pwc.in/research-insights/2018/nagarik.html
The project offers a set of eight transformative solutions, with market and technology access as the focus point.

16 PwC's 'Future of India: The Winning Leap; World Population Prospects; The 2012 Revision, UNDESA; PwC UK, Megatrends; PwC Article: The theme of the World in 2050; World Bank- Can Political Stability Hurt Economic Growth

17 https://www.pwc.com/gx/en/services/people-organisation/publications/workforce-of-the-future.html

18 These include skills such as cognitive thinking, emotional intelligence and communication.



Technology is disrupting work across the economy

Categorised by digital and automation disruptions, Industry 4.0 is a critical megatrend affecting not just India, but economies worldwide.

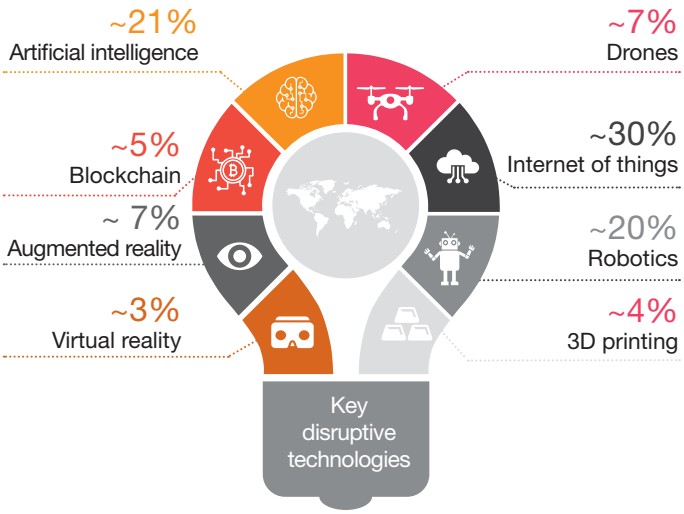
In India, eight disruptive technologies are disrupting businesses. Key technologies such as artificial intelligence (AI) based chat bots (to address consumer grievances), a cloud environment (for working collaboratively and efficiently with clients), social and mobile (to conveniently connect with end clients) have already made headway.

Advanced technologies such as augmented reality (AR), virtual reality (VR) and the Internet of things (IoT) are slowly seeing wider implementation, and are revolutionising service delivery and consumer experience. According to a PwC report, 47% of surveyed industry professionals believe that jobs within their sectors will be automated in the near future with the highest probability of automation perceived in the manufacturing (38%) and banking, financial services and insurance (BFSI) (31%) sectors.[19]

The manufacturing sector in the country has been more actively adopting digital and automation technologies, with the first smart (IoT-driven) factory being set up in Bengaluru. However, service sector companies, largely human capital driven, are slowly catching up and adopting technologies to transform internal administration and service delivery.

The BFSI sector[20] in India is pioneering the use of Blockchain with the establishment of a new Blockchain and Fintech unit in the Reserve Bank of India.[21] These advancements are bound to impact the requirements for technical skills in the future. Major IT-business process management (BPM) companies are also investing in modern digital infrastructure and rethinking business models.

To what extent do organisations/companies in India see technology disrupting their work and processes?



Source: PwC's Digital IQ Survey 2017

India's massive IT spending of USD 87 billion in 2018 was largely driven by digital business transformation initiatives from both private and public organisations.[22]

Similarly, manufacturing companies in India have also enhanced investment in innovation and emerging new technologies. As per the PwC's India Manufacturing Barometer 2019, 58% of the respondent companies have increased technology integration in R&D, innovation and processes.[23]

We believe that the technological disruptions driven by Industry 4.0 will transform the Indian economy in the following ways:

Digitisation and integration of vertical and horizontal value chains:

- Digitises and integrates processes vertically across the entire organisation—from product development, internal business services, logistics and service
- Horizontal integration stretches beyond the internal operations from suppliers to customers and all key value chain partners

Digitisation of product and service offerings:

- Digitisation of products includes the expansion of existing products by adding smart sensors or communication devices that can be used with data analytics tools, as well as the creation of new digitised products

Digital business models and customer access:

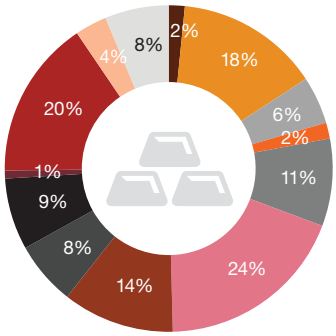
- Leading industrial companies also expand their offering by providing disruptive digital solutions such as complete, data-driven services and integrated platform solutions

Source: PwC analysis; PwC's Digital IQ Survey 2017

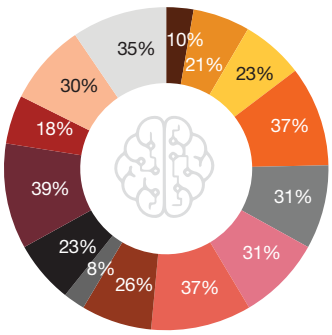
19 https://www.pwc.in/research-insights/2018/how-ai-is-reshaping-jobs-in-india.html
20 Talent demand story in BFSI Space, Sept 2018 (https://blog.bfsi.manipalglobal.com/the-talent-demand-story-in-bfsi-space/)
21 https://economictimes.indiatimes.com/markets/stocks/news/new-rbi-unit-to-track-blockchain-and-ai/articleshow/65557685.cms
22 Gartner press release, 14 November 2018 (https://www.gartner.com/en/newsroom/press-releases/2017-11-14-gartner-says-it-spending-in-india-will-reach-87-billion-in-2018)
23 https://www.pwc.in/research-insights/2019/india-manufacturing-barometer-2019.html

How are various industries in India investing in technology?

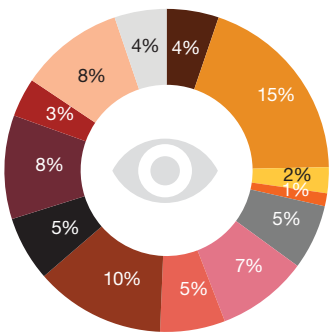
3D printing



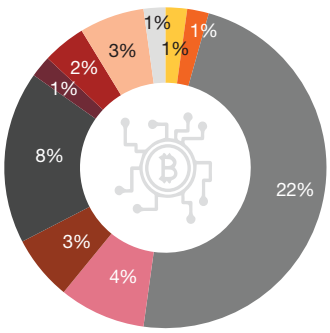
Artificial intelligence



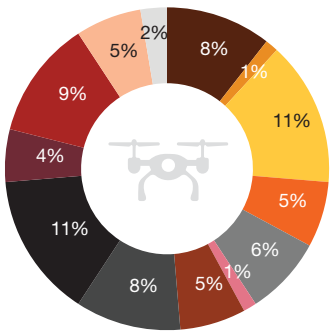
Augmented reality



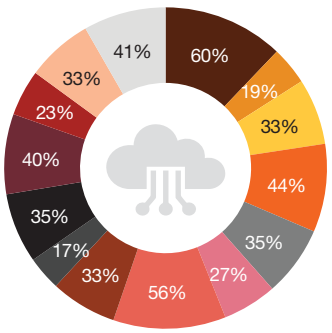
Blockchain



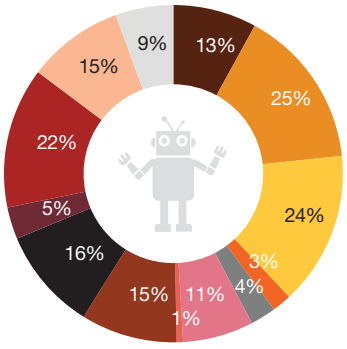
Drones



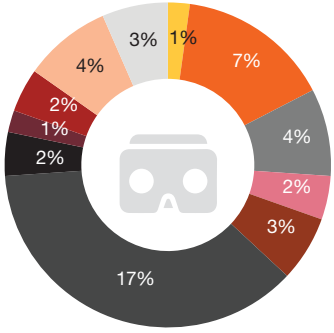
Internet of things



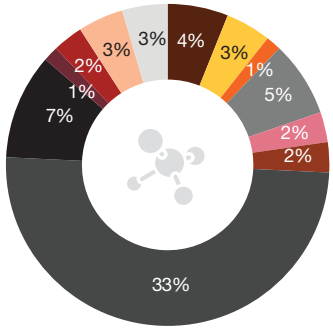
Robotics



Virtual reality



Other



Legend

- Agribusiness
- Automotive
- Energy and mining
- Entertainment and communication
- Financial services
- Pharma and healthcare
- Hospitality and leisure
- Manufacturing
- Other
- Power and utilities
- Public sector
- Construction
- Retail and consumer
- Technology services

Source: PwC's Digital IQ Survey 2017



Based on the figure above, it is clear that the two key technologies—AI and IoT—are attracting the highest amount of investment from industry across sectors. This is in line with industry's view on the extent of the impact of emerging technologies on their work and processes.[24]

While these technologies are already revolutionising the Indian economy and the workplace, it is important to gauge their impact on the 'labour intensive' Indian economy in a realistic manner. With rising unemployment having become not just a national but also a global concern, it becomes imperative to ensure timely corrective measures based on the skill requirements to face changes brought in by industry 4.0. These measures are extremely critical to equip the workforce, particularly the youth, with the skills of the future. Further, skills tailored to the needs of industry-specific emerging technologies will be of utmost importance, since technology advancements are expected to have different effects on different industries.

> "With robots attaining a greater degree of sensitivity in their touch capabilities, they will be able to take over many assembly and movement-dependent activities on the future manufacturing floor. Artificial intelligence is the driving force behind a new era of mechanisation where processes are being modernised to make production decisions smarter and real time. Therefore, manufacturers can leave the mundane, unsafe and routine tasks to automation and free themselves up to pursue new ideas and new ways of thinking and making that are beyond the realm of machines."
>
> - Sanjeev Chandra Paliwal, General Manager, Bosch

24 PwC's Digital IQ Survey 2017

Employability-driven skill development is the key for leveraging India's demographic potential

In light of the fast-paced evolving economy and changing nature of work due to technological breakthroughs, it is critical for the country to capitalise on its demographic advantage of nearly 65% of the population in the age group of 15–59 years[25] and equip them with employable skills, thus stimulating a sustainable development process and transition into a formal economy.

However, as compared to 60–90% of the workforce in developed economies,[26] only 10.8%[27] of the total Indian workforce has undergone any kind of skill training (2.2% with formal training and 8.6% with informal training). Recognising the gap and with the objective of ensuring advanced skill levels among the working age population, India is nurturing a holistic skill development ecosystem in a way that ensures larger participation from various stakeholders. However, some key challenges still remain to be addressed.



Limited training capacity and inadequate scale: The current efforts are not sufficient to adequately respond to the larger skilling mandate, and this requires a new-approach to skilling, through optimisation of investments and leveraging existing state-of-the art operational facilities and expert resources/industry practitioners.



Mismatch between demand supply: 4.5 million youth are expected to enter the job market each year with only 2% undergoing vocational training; therefore, there is a massive gap between demand and supply.



Inadequate industry interface: This is one of the major issues facing the vocational training system in India. Therefore, a new path needs to be outlined that will more effectively engage industry in the design and delivery of vocational training across the country.



Shortage of quality trainers: Although 3.5 million training personnel graduate from public institutions every year, there is a shortage of high-quality trainers. There is also lack of focus on professional development of trainers with a clear career path. Therefore, ramping up the quality of trainers through regular training, interactions with the industry and use of new technologies will be critical.



Need for pragmatic implementation of a Comprehensive Quality Assurance Framework assuring 'One Quality' and due industry acknowledgement: Skilling in India currently happens in a dispersed manner. While the National Skill Qualification Framework and National Quality Assurance Fframework are solutions, their outreach is limited. Therefore, ramping up efforts to ensure greater adoption of these solutions by training partners and the industry is critical to demonstrate One Quality across the nation.



Need for a robust approach for capturing market intelligence and monitoring: Data is critical for ensuring quality and that the skilling interventions are in alignment with industry needs. Therefore, there is need of a consolidated monitoring framework, market intelligence and labour market approach.



Lack of an integrated education and skilling approach: The education (school and higher) and skilling ecosystem in India tend to exist in silos. While efforts such as the Bachelors of Vocation are welcome, their adoption is currently low. Therefore, alignment of these two systems is critical to ensure that trained manpower in this country has the requisite qualifications and possess employable skills.



Need for making the youth aspire to skill: Skilling is often viewed as the last resort meant for those who have not been successful in the formal academic system. Further, low salaries at the entry level and lack of employers' endorsements make it undesirable. This necessitates a conscious endeavour to integrate and duly incorporate 'employability skills' and/or '21st century employability skills' into the core vocational skilling interventions.



Skill gap between the informal and formal sectors: Vocational training for the 95% of the population in the formal sector remains abysmally low. Therefore, facilitating this transition is the need of the hour to ensure adequate manpower for the growing needs of the formal sector.



Challenge of reskilling: Considering the impact of megatrends on businesses, job roles are bound to evolve, thus posing the challenge of reskilling at scale. Reskilling needs government support to serve as a safety net for those with jobs at risk of redundancy.

Source: PwC analysis

The above challenges are uniform across the length and breadth of the country, except in a few pockets where best practices by industry and training providers have resulted in significant strides in quality training. It is therefore important for the concerned stakeholders to come together and resolve the challenges of the skill ecosystem in order to achieve the aim of the Skill India Policy—namely skilling with speed, scale and quality and making the workforce ready for future technologies.

25 Sample Registration Survey of India statistical report 2015 (http://www.censusindia.gov.in/)
26 Planning Commission report (2008) (http://planningcommission.nic.in/reports)
27 NSSO, 2011-12 (68th round), report on Status of Education and Vocational Training in India

A case in point

Rajasthan, the seventh most populated state in India, is home to 6% of the country's total population. The state has an agricultural economy and is among the largest mineral-producing states in the country. The state's gross state domestic product (GSDP) (USD 129 billion in 2017–18) expanded at a CAGR (in INR) of 11.60% over 2011–12 to 2017–18. The state has attracted FDI equity inflows worth USD 1.67 billion between April 2000 and June 2018 in cement, mining and minerals, auto and auto components, textiles, IT and ITeS, and other sectors.

Industry: Over 70% of Rajasthan's industrial output comes from four regions (Jaipur, Bhilwara, Udaipur and Ganganagar). As of 2017, a total of 37,714 industrial units existed in Rajasthan. Moreover, the state is the leading producer of cement grade limestone in India with production reaching 67.03 million tons during 2017–18.

Service: IT and ITeS, tourism, hospitality and banking services are important components of the service sector. To further expand the scope of services, the Rajasthan State Industrial Development and Investment Corporation (RIICO) developed state-of-the-art IT parks at Jaipur, Kota, Udaipur and Jodhpur, and is also planning to develop a similar one in Bhiwadi.

The Rajasthan Investment Promotion Scheme 2014, single window approval mechanism, subsidies in electricity, among other measures, aim to promote investments in these sectors; however, the status of employment is weak. With 55% of the population aged below 25 years, the state is afflicted with rising unemployment, which increased from 3.2% in 2012 to 7.7% in 2018.

The problem of unemployment is further compounded by issues such as quality of trainers, inadequate industry interface, and non-alignment of education and skilling ecosystems. These are largely in line with the ecosystem challenges experienced in the country.

To tackle this growing problem and further leverage its young population (nearly 55% of the state population in the state is aged below 25 years), Rajasthan has seen continuously scaling up the education infrastructure right from schools to the higher and vocational education levels. As per recent estimates, Rajasthan has the fourth highest number of colleges in the country with 33 colleges per lakh population.

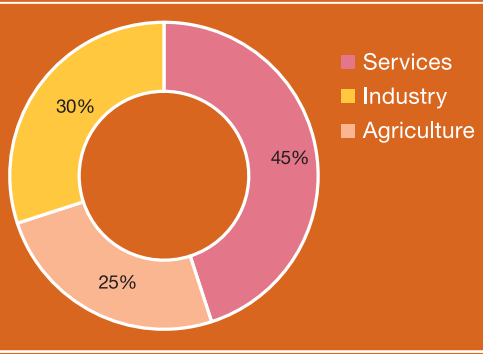
$129 bn
GSDP. Current price (2017-18)

11% GSDP growth rate - YoY (2017-18)

$1,545
per capital income - current price (2017-18)

$1.6 bn
FDI inflow (2000-18)

Sector-wise contribution to state GDP (2017-18) at current prices



105,741 schools

2,957 colleges

1,933 ITIs

148 Polytechnics

Source: Directorate of Economics and Statistics, Rajasthan; Report on General and Social Sector of Rajasthan published by Controller and Auditor General (CAG) of India 2017; Rajasthan the land of promise: Investment Brochure 2015; MSME-Development Institute Jaipur; FDI Fact Sheet (August 2018); Budget at a glance 2017-18: DES, Department of Planning, Rajasthan; AISHE report 2017-18; DTE Rajasthan; Directorate of Training: Government of Rajasthan; Census 2011

Recognising the dire need to bridge the gap between demand and supply of skilled manpower and improve employment prospects, Rajasthan became the first state in the country to launch a skill mission with the creation of the Rajasthan Mission on Livelihoods (RMoL) in 2004. To further scale up the training programmes, RMoL was restructured as the Rajasthan Skill and Livelihoods Development Corporation (RSLDC) in 2009 and currently all skilling initiatives in the state are being executed through it.

Major skilling schemes in Rajasthan

Employment Linked Skill Training Programme (ELSTP)

- Launched in 2012 with the key objective of linking skill training with employment. Target beneficiaries under the programme include urban and rural unemployed youth.

Regular Skill Training Programme (RSTP)

- Launched in 2005 and revised in 2014–15 with a key focus on imparting skill training for self-employment and productivity enhancement, women, jail inmates, juvenile home inmates and persons with special abilities.

Further, as per the 2012 National Skill Development Corporation (NSDC) Skill Gap report on Rajasthan, projections show that there will be a deficit of skilled and semi-skilled workers, whereas the availability of unskilled workers will be more than the requirement, creating a surplus of over one crore in the state by the year 2022.

323,000 Skilled workforce

2,004,000 Semi-skilled workforce

983,000 Unskilled workforce

Rajasthan has also become a pioneer in the country in setting up skill universities—Rajasthan ILD Skills University (RISU) and Bhartiya Skill Development University (BSDU) — with the objecting of improving quality of skilling in the state.

"Skill development and promoting appropriate livelihood strategies has been a key priority area for us. We, being the pioneers in introducing the state skill development ecosystem in the country, are constantly working hard to driving placement-linked skills training for the state's youth. Adopting smart manufacturing, analytics and IoT will give a new lease of life to industrialisation in India. Apart from policy implementation hurdles, one major bottleneck is the lack of skilled labour or fear of job losses owing to robotics and automation. A smart strategy to counter this is to upskill workers and millennials in these fields and create more jobs."

- Dr. Ajay Kaushik, General Manager, Rajasthan Skill and Livelihoods Development Corporation (RSLDC)

Source: IBEF, RajRas, Rajasthan State Portal; District wise skill gap study for the state of Rajasthan (2012-17, 2017-22): NSDC; Skill Rajasthan 2017 report



3 Skills for the Future

The interplay of megatrends, particularly the impact of technological disruptions on businesses and the Indian economy, are changing the nature of work and workplaces. These momentous changes pose enormous organisational, talent and human resource challenges. Moreover, a majority of the roles, skills and job titles of tomorrow are still unknown to us today. Therefore, it is becoming increasingly evident that 'generic skills' such as analytical thinking, collaboration, emotional quotient and cognitive ability will be critical for every job role.

> "So what should we tell our children? That to stay ahead, you need to focus on your ability to continuously adapt, engage with others in that process, and most importantly retain your core sense of identity and values. For students, it's not just about acquiring knowledge, but about how to learn. For the rest of us, we should remember that intellectual complacency is not our friend and that learning – not just new things but new ways of thinking – is a life-long endeavour."
>
> **Blair Sheppard**
> Global Leader, Strategy and Leadership Development, PwC



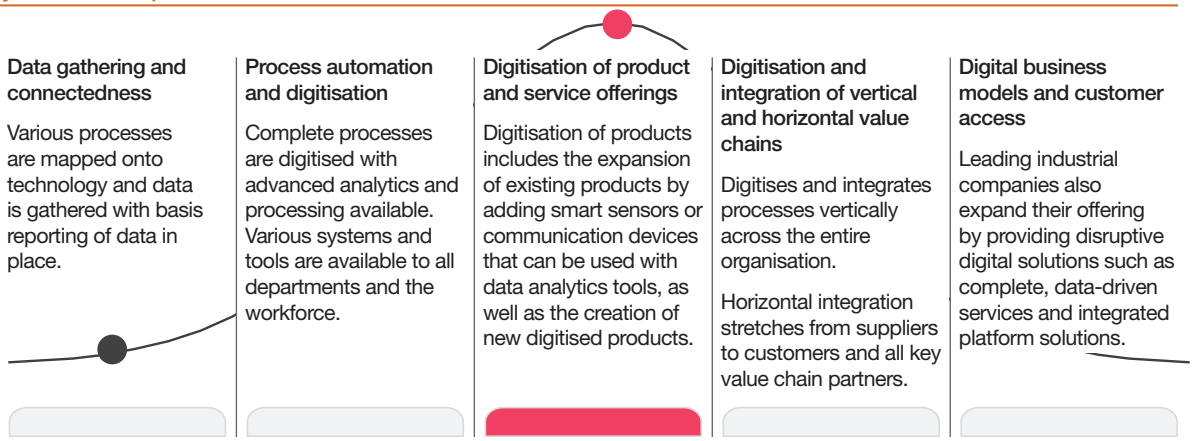
Changing skill requirements

With the evolution of Industry 4.0, the tasks to be carried out are becoming more demanding, in both technological and organisational terms. Interdisciplinary competencies are growing in importance. It is also believed that nearly 58% of the core skills required to perform a job will remain the same, suggesting that about two-fifths of the skills that are considered insignificant in today's scenario will be of importance by 2022.[28] This shift in skill requirements could be attributed to the wave of Industry 4.0 transforming current job profiles.

Further, automation has begun disrupting job futures around the world and Industry 4.0 technologies are expected to lead to a carve-out of labour markets in many industrialised economies, as many routine and rule-based jobs are being automated. India too has high automation potential but the impact of Industry 4.0 within manufacturing and service sectors will be felt in niches since the country lags behind many of the developed economies in terms of technology adoption,[29] a fact that could be attributed to the country's income level, wage rates, demographics and industry structure. Since India has different labour dynamics relative to a developed country, the automation of the workforce will be gradual.

As per a PwC survey with employers in the manufacturing and service sectors, technology-related skills would be in demand in the near future across all industries. Additionally, generic skills such as cognitive ability, integrated thinking, critical thinking, emotional intelligence and empathy, management and leadership, relationship building and collaboration, cognitive flexibility, creativity and social intelligence will also be required over and above technical skills.

Sub-sector wise analysis of skill requirements



Data acquisition and processes mapping	Process automation and data aggregation	Product and service digitisation	Industry and cross-industry integration	Ecosystems
• Agriculture • Mining and energy • Construction and infra • Logistics	• Manufacturing • Healthcare	• Retail and FMCG • Education • BPO/shared services • Banking	• Insurance and financial services • Automotive • Consumer durables	• Fintech • Media and telecom

Physical and manual skills	●	◕	◐	◐	◐
Technology skills	◐	◕	◕	◕	●
Data entry and input skills	●	◕	◐	◔	◔
Basic cognitive/ analysis skills	◔	◐	●	●	◕
High cognitive skills	◔	◔	◔	◕	●
Social intelligence	◔	◔	◔	◐	●
Integrated thinking	◔	◔	◐	●	●

Source: PwC's Digital IQ Survey 2017

Thus, while technical skills will remain the indispensable foundation for a strong career, in order to ensure career progression and longevity, these technical capabilities will need to be supplemented by social/ generic skills. This combination will enable an individual to work in different occupation settings and conditions, and will go a long way in sustaining the employability of Indian youth.

28 World Economic Forum Report 2018 on Future of Jobs (https://www.weforum.org/reports/the-future-of-jobs-report-2018)
29 World Bank Development Report 2016: Digital Dividends (http://www.worldbank.org/en/publication/wdr2016)

IT-BPM

- Skills pertaining to big data, cloud computing and cyber security are already in high demand among employers.
- Further, jobs such as back-end developers, machine learning (ML) engineers, big data developers and full stack engineers will be in demand in the next 3 years, especially for candidates trained for specific roles and with good soft skills and trainability.
- However, traditional job roles like customer relationship management (both voice and non-voice) and data entry operators will continue to dominate in tier 2 and 3 cities.

Banking and financial services

- Professionals with niche skills in emerging areas like analytics, cloud, big data, cyber security and IoT will be significant game changers.
- In view of automation of operational and back office roles, digitally-savvy problem solvers will witness growth opportunities.
- Jobs such as data scientists, cloud software engineers, cyber security analysts, AI and ML developers will be in great demand.

Telecom, media and entertainment

- Skills in technologies such as 4D, VR, 3D printing, drones, AI, big data and cloud computing will be critical for the these industries.
- Data analysts, 3D developers, network engineers, AI and ML developers, and blockchain developers will witness great demand.

Education, healthcare and retail

- These are human-centric industries that will experience limited changes to job roles. Interpersonal skills will remain in demand in view of intense customer-facing interactions required across these sectors along with operational knowledge of computers.
- Skills in AI, IoT, AR and robotics will be critical at hospitals and retail stores.

Manufacturing

- With the shift in manufacturing activities from electrified to automated to digitalised, new skills around big data analytics, cyber security, robotics, IoT, mechatronics, AR and blockchain will be in utmost demand among employers.
- Robot coordinators, automation engineers, industrial data scientists, IoT solution architects and controls system engineers will be in great demand.

Source: PwC's 'Inclusion 2.0: Leveraging technology disruptions to realise India's digital economy'; PwC's 'Flying high: Drones to drive jobs in the construction sector'; World Economic Forum; World Bank blogs; FICCI; PwC analysis

‘Skills for the Future’ framework

With the penetration of technology in the Indian market, particularly Industry 4.0 technologies, employees have started sharing space with intelligent machines. In view of this, certain activities and work processes are likely to be impacted, particularly those that involve rule- and routine-based tasks. To generate jobs and improve socioeconomic growth, digital skills have become a compulsory component of all the sectors of the economy. Technology-related skills/competencies would be in great demand across all sectors.

The manufacturing sector is expected to go through a gradual overhaul. In the case of the service sector, which largely relies on ‘affective labour’, interpersonal, emotional and social skills will continue to be demanded by employers over and above job-specific skills.

Given the changing skills landscape and talent demand due to technology disruptions, we have developed a ‘Skills for the Future’ framework. This framework depicts an interplay of megatrends shaping the future of work and technologies with the greatest impact, triggering new ways of working and the demand for a plethora of new skills across industries.

It is expected that these new skill sets will be required in addition to the skills that are considered important in the existing scenario. Broadly, these skills will be required by almost all industries; however, the degree of demand for these skills will vary based on the type of industry and job family.

Megatrends shaping India

- Technological breakthroughs
- Rapid urbanisation
- Demographic shifts
- Resource and environment sustainability
- Shifts in global economic power
- Political shifts





These emerging skills are discussed in greater detail below.



Technical skills

- These core skills are abilities or knowledge required to perform specific tasks. They are practical in nature and are often regarded as the most important for jobs in the manufacturing and service sectors. These type of skills can be measured and evaluated and can be mastered only through training and experience. However, technical skills vary based upon the type of job one is performing and are often referred to as job-specific skills.



Relationship building and collaboration

- This skill set is all about teamwork, communication and client/service orientation. These skills are required for establishing and maintaining productive and positive working relationships. It involves the ability to work with different types of people, being aware of their strengths and weaknesses, and strong communication skills. Further, this skill set involves leaving a positive impact on end clients and anticipating their future needs.



Management and leadership skills

- This skill set is composed of skills pertaining to people management and negotiation and is required to achieve organisational goals. These skills are required particularly among managers and team leaders, as they are expected to manage and motivate their team members and respond to their needs, thereby maximising their productivity. Moreover, for individuals to move up the career ladder, it is vital for them to know how to negotiate with team members, clients and mangers.



Emotional intelligence and empathy

- This type of skill is considered to be intangible and it involves individuals monitoring their own and others' feelings, i.e. tuning into the gamut of human emotions, correctly distinguishing between emotions and thus guiding one's thinking and actions. It further measures a person's ability to adapt and adjust his/her behaviour based on the mood of a colleague, or even his or her own feelings. Empathy refers to awareness of others' feelings, needs and concerns.



Critical thinking

- It refers to one's ability to logically process information and produce usable results. It involves use of logic and reasoning to investigate an issue or problem, think about various solutions to the problem, and weigh up the pros and cons of various approaches to arrive at a solution. It entails effective problem-solving skills along with self-corrective thinking to arrive at a judgement.



Cognitive flexibility and creativity

- Cognitive flexibility is the mental ability of an individual to able to switch between thinking about two different concepts, and at the same time think about multiple concepts. Creativity, on the other hand, is expected to become a key desired skill in the future. It is about one's ability to connect the dots with seemingly disparate information, and throw all the ideas together to present something new.

Sources: 'Future of Jobs 2018': World Economic Forum; 'Changing nature of Work': World Bank; PwC analysis

4 Key takeaways

The technology-driven world of today and tomorrow is replete with both opportunities and challenges. Platforms that connect suppliers with consumers in innovative ways, robots equipped to do human work, cars that drive themselves and algorithms that respond to customer inquiries are indicators of powerful new forms of automation. However, even as technology is set to further enhance productivity and improve human lives, there is a growing concern that it will substitute the human workforce.

The potential impact of automation on jobs will vary across occupations and sectors. Physical or manual activities performed in predictable environments (e.g. operating machinery) and data collection and data processing are more susceptible to automation. As a result, large amounts of labour may be displaced in, for instance, accounting and back-office transaction processing. However, automation will have less impact on jobs where machines are still catching up with humans. Workers of the future will spend more time on activities such as managing people, applying expertise, and communicating with others, thus transcending organisational boundaries and evolving occupations. The skills and competencies required will also shift, demanding more social and emotional skills and more advanced cognitive capabilities, such as logical reasoning and creativity.

The above scenario will play out across India, including Rajasthan, since 55% of the state's rapidly growing economy is based on manufacturing and services. Further, the state, like the rest of India, has the advantage of a young population, but needs to develop relevant skills in view of the emerging technologies and occupational landscape. This is essential in order to resolve the growing issue of unemployment in the state. The state's nodal skill development agency, RSLDC, has undertaken several initiatives to impart skill training to the youth; however, the interventions do not take into account the future of jobs and skills. The existing initiatives, emulating what is happening across India, focus on short-term training to provide employment-linked 'specific skills', say those of customer executives (retail) or data scientists. They do not focus on the holistic development of an individual, preparing him/her for technology disruptions. Further, there is also a need for RSLDC and similar other agencies across the country to start planning for upskilling and reskilling of the workforce already employed in existing industry establishments. The existing workforce will be most vulnerable to job loss if not equipped with the higher order skills required to perform under a changed scenario.

In addition, from the perspective of the central and state governments, it is important to recognise that the platform economy has taken centre stage in disruptions, the interaction between humans and machines is evolving, and the economy is becoming more data driven. These changes will have a profound impact on industry and manpower requirements, and call for a change in our approach to manpower development in the country, not just limited to the realm of vocational education.

Our 'Skills for the Future' framework advocates the need to impart training in critical thinking, relationship building and collaboration, enhancing emotional intelligence and empathy, management and leadership, and cognitive flexibility and creativity, over and above the vocational skills needed to perform a job. Skill augmentation would thus be relevant across industries. Further, it is worthwhile to focus on Science, Technology, Engineering and Mathematics (STEM) education as well, to help students make the leap from users of technology to innovators. While the generic/soft skills outlined in our 'Skills for the Future' framework will enable the existing workforce and new entrants to brave the onslaught of technology disruptions, STEM education at the school level will drive innovation and spur creativity, which will go a long way in building a strong foundation for the future workforce.

> "With the onset of a rapid transition to the cyber age, the youth will have to be not just literate but also 'digitally literate'. Skilling should be made an aspirational right since the elementary level to orient young minds towards employable skills. Big data analytics, artificial intelligence, the Internet of things and machine learning will be the key skilling areas for the future. There is no need for us to worry about our careers since automation may lead to some job redundancy but new jobs around these future technologies will also arise. Re-skilling, upskilling and niche skilling will define the future of the Indian workforce. Industry 4.0 is also driving demand for human-centric skills, and striking the right balance between technical and soft skills is the need of the hour."
>
> - Dr. Lalit K Panwar, Vice Chancellor, RISU

About FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialisation, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of the industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

Please see www.ficci.in for further details

Atul Sharma
Head, FICCI Rajasthan State Council
E: atul.sharma@ficci.com

About PwC

At PwC, our purpose is to build trust in society and solve important problems. We're a network of firms in 158 countries with over 250,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.com.

In India, PwC has offices in these cities: Ahmedabad, Bengaluru, Chennai, Delhi NCR, Hyderabad, Kolkata, Mumbai and Pune. For more information about PwC India's service offerings, visit www.pwc.in

PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see www.pwc.com/structure for further details.

© 2019 PwC. All rights reserved

Please see www.pwc.in for further details.

Ashok Varma
Partner and Leader, Social Sector Advisory
E: ashok.varma@pwc.com

Acknowledgements

We extend our thanks to Dr. K. L. Jain (Honorary Secretary General, Rajasthan Chamber of Commerce and Industry), Ms. Shipra Bhutani (Managing Director, Capacita Connect), Dr. Lalit K Panwar (Vice Chancellor, Rajasthan ILD Skills University), Mr. Sanjeev Chandra Paliwal (General Manager, Bosch), Dr. Ajay Kaushik (General Manager, Rajasthan Skill and Livelihoods Development Corporation) for their inputs and support towards this knowledge paper.

Contributors:

From PwC

Ashish Tyagi, Associate Director

Tapish Mehta, Associate Director

Harsh Nagpal, Manager

Bano Fatima, Senior Consultant

Garima Singhal, Consultant

Editorial team

Vishnupriya Sengupta

Dion D'Souza

Design team

Pallavi Dhingra



This document does not constitute professional advice. The information in this document has been obtained or derived from sources believed by PricewaterhouseCoopers Private Limited (PwCPL) to be reliable but PwCPL does not represent that this information is accurate or complete. Any opinions or estimates contained in this document represent the judgment of PwCPL at this time and are subject to change without notice. Readers of this publication are advised to seek their own professional advice before taking any course of action or decision, for which they are entirely responsible, based on the contents of this publication. PwCPL neither accepts or assumes any responsibility or liability to any reader of this publication in respect of the information contained within it or for any decisions readers may take or decide not to or fail to take.

© 2019 PricewaterhouseCoopers Private Limited. All rights reserved. In this document, "PwC" refers to PricewaterhouseCoopers Private Limited (a limited liability company in India having Corporate Identity Number or CIN : U74140WB1983PTC036093), which is a member firm of PricewaterhouseCoopers International Limited (PwCIL), each member firm of which is a separate legal entity.

PD/January 2019-16003