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Next-Gen Skills for a Global Workforce:

Enabling Youth and Empowering Economy

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ABBREVIATIONS/ GLOSSARY

Abbreviation	Full form
AI	Artificial Intelligence
AICTE	All India Council for Technical Education
API	Application Programming Interface
BPO	Business Process Outsourcing
CAGR	Compound Annual Growth Rate
CoE	Centres of Excellence
CT	Computed Tomography
DGT	Directorate General of Training
DPI	Digital Public Infrastructure
EHR	Electronic Health Record
EU	European Union
EV	Electric Vehicle
FICCI	Federation of Indian Chambers of Commerce and Industry
FTA	Free Trade Agreement
FY	Financial Year
GCC	Global Capability Centres
GDP	Gross Domestic Product
GDPR	General Data Protection Regulations
GenAI	Generative AI
GI	Geographical Indications
GIS	Geographic Information System
GPT	Generative Pre-trained Transformer
GPU	Graphics Processing Unit
GVA	Gross Value Added
HEI	Higher Education Institution
ICT	Information and Communications Technology
IIT	Indian Institute of Technology
ILO	International Labour Organisation
IoT	Internet of Things
IP	Intellectual Property
ISO	International Organisation for Standardization
IT	Information Technology
ITeS	Information Technology Enabled Services
ITI	Industrial Training Institute

Abbreviation	Full form
IT	Information Technology
ITeS	Information Technology Enabled Services
ITI	Industrial Training Institute
MEA	Ministry of External Affairs
MeitY	Ministry of Electronics and Information Technology
ML	Machine Learning
MoE	Ministry of Education
MoRD	Ministry of Rural Development
MoSJE	Ministry of Social Justice and Empowerment
MRI	Magnetic Resonance Imaging
MSDE	Ministry of Skill Development and Entrepreneurship
MSME	Micro, Small and Medium Enterprises
NAPS	National Apprenticeship Promotion Scheme
NASSCOM	National Association of Software and Service Companies
NATS	National Apprenticeship Training Scheme
NCERT	National Council of Educational Research and Training
NCVET	National Council for Vocational Education and Training
NEP	National Education Policy
NIELIT	National Institute of Electronics and Information Technology
NLP	Natural Language Processing
NOS	National Occupational Standards
NSDC	National Skill Development Corporation
OECD	Organisation for Economic Co-operation and Development
ONDC	Open Network for Digital Commerce
PET	Positron Emission Tomography
PhD	Doctor of Philosophy
PLFS	Periodic Labour Force Survey
PLI	Production Linked Incentives
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
QP	Qualification Pack
R&D	Research and Development
SIDH	Skill India Digital Platform
SSC	Sector Skill Council
SSDM	State Skill Development Mission
STEM	Science, Technology and Medicine
TPE	Total Persons Engaged
U.S.	United States
UAE	United Arab Emirates
U.K.	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPI	Unified Payments Interface
USD	United States Dollar

FOREWORD BY FICCI



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Catalysed by rapid advancements in Artificial Intelligence (AI) and emerging technologies, the global economy is on the cusp of a tectonic shift. The very fabric of employment, productivity, and skills is being rewoven at an unprecedented pace. For India, this is not just a wake-up call—it is a moment of strategic opportunity. The World Economic Forum Report 2025 highlights that over 85 million jobs may be displaced by a shift in the division of labour between humans and machines, but 97 million new roles could emerge—underscoring a future of net-positive job growth, if we act with foresight. AI-related roles—such as data analysts, machine learning specialists, and digital transformation experts—are rapidly climbing the list of most in-demand jobs, while routine roles face significant disruption.

India stands uniquely positioned. With the world's largest youth population, a robust Digital Public Infrastructure (DPI), and a thriving innovation ecosystem, we are well-placed to lead the global skilling revolution. However, this promise can only be realised through bold, inclusive, and forward-looking policy and action. India is expected to face a shortfall of over 1 million AI-skilled professionals by 2027, even as global AI job postings have surged by 21 percent annually since 2019, with wages rising 11 percent each year. As highlighted in this report, strategic interventions are imperative to harness this demand—both for our domestic growth and to position India as the global epicenter of digitally skilled talent.

This report arrives at a critical juncture as it thoughtfully outlines the disruptive nature of AI on workforce structures and provides an actionable roadmap to enable India's transition to an AI-integrated economy. From sector-specific skill frameworks and ITI modernization to ethical AI adoption and global talent mobility, it maps the contours of this transformation in depth and offers actionable recommendations across governance, education, reskilling, and global talent mobility. It also highlights the importance of building an AI-literate workforce, reimagining Industrial Training Institutes (ITIs), fostering ethical AI standards, and localizing skilling efforts to bridge regional disparities.

At FICCI, we believe the future of work must be human-centric, inclusive, and digitally empowered. We are committed to fostering public-private partnerships that deliver scalable skilling, unlock youth potential, and integrate ethical AI into India's growth story. We anticipate that the in-depth analysis done for this report will serve as a guide for industry leaders, policymakers, educators, and the global community in shaping a resilient and future-proof Indian workforce.

FOREWORD BY KPMG IN INDIA



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By 2030, the global economy could not only face a shortage of skilled workers[1] –it may require a fundamentally reimagined workforce equipped to thrive in an Artificial Intelligence (AI) driven world. According to the World Economic Forum's Future of Jobs Report 2025, nearly 50 percent of all employees globally will need reskilling, and AI-related roles will dominate emerging job categories.

India stands at a critical inflection point. With the largest youth population and a rapidly growing digital ecosystem, it is uniquely positioned to lead this transformation. But seizing this opportunity requires a bold redesign of our skilling ecosystem grounded in agility, inclusion, and global relevance.

This report assesses India's preparedness for this shift. It maps sector-level AI impacts, highlights systemic gaps in vocational and higher education, and offers a clear roadmap of seven strategic interventions from modernizing ITIs and building AI skilling hubs to expanding global talent mobility.

Crucially, this transformation must be inclusive. Women, rural youth, informal workers, and mid-career professionals must not be left behind in the AI economy.

India has the scale, talent, and digital infrastructure to lead–not follow–the global workforce transformation. We hope this report supports leaders across government, industry, and academia to act decisively and shape an inclusive, future-ready AI workforce.

[1]Future of Work: The Global Talent Crunch, Korn Ferry, Michael Franzino, Alan Guarino, Jean-Marc Laouchez, May 2018.

SECTION: EXECUTIVE SUMMARY

India stands at a pivotal juncture in its economic and technological evolution. As the global economy transitions from Industry 4.0 to Industry 5.0 marked by innovation and automation the need to equip workforce with next generation skills has never been more urgent. This Thought Leadership (TL) offers a strategic roadmap for India to harness the potential of its demographic dividend, digital infrastructure and policy momentum to become a global leader in the AI-driven economy. It has been prepared through a combination of extensive secondary research and primary interviews with industry experts, ensuring both data-driven insights and practical perspectives.

Understanding the shift: From automation to intelligent systems

Unlike traditional automation, which replaces repetitive manual tasks, Artificial Intelligence (AI) enables intelligent, adaptive systems to make decisions, learn from data, and evolve with minimal human input. The scope of transformation is far wider, impacting decision-making, predictive analytics, design, diagnostics, logistics, and human-machine interfaces across every major sector. This report focuses on AI-driven transformation, recognising that India's current stage of industrial maturity requires foundational interventions at both ends.

Building on this foundation this report explores how AI is reshaping the global labour market and how the transformation manifests in three ways: automation of routine tasks, augmentation of human capabilities and redefinition of job roles. Globally, AI is projected to grow to a USD 4.8 trillion economy by 2033[2], and in India, the AI associated disruption is especially pronounced in sectors such as IT, finance, healthcare, and at entry-level jobs. Women and informal workers are expected to be disproportionately affected, highlighting the need for inclusive skilling strategies.

Global trends and India's AI readiness

A study of global trends and geopolitical shifts highlights that the United States and China dominate private AI investments, while countries like Switzerland, Turkey and India are emerging leaders in public sector AI funding. Further, the national AI strategies vary with U.S. focusing on generative platforms, China on robotics and semiconductors, EU on ethical AI and India adopting soft law and regulatory sandboxes to balance innovation and control.

India's economic structure and employment landscape

Delving deeper into India's economic structure and employment landscape, it is noted that India's economy is service-oriented with a rise in self-employment and gig economy reflecting changing aspirations and impact of digital platforms. However, informality remains a challenge with 90 percent of the workers in the unorganised sectors[3], facing precarious conditions and limited social protection. The evolving Digital Public Infrastructure helps fill gaps in financial inclusion, enterprise formalisation and skill development.

[2]AI market projected to hit USD 4.8 trillion by 2033, emerging as dominant frontier technology, United Nations Conference on Trade and Development (UNCTAD), Accessed June 19, 2025.

[3]Labour and Employment Statistics, Ministry of Statistics and Programme Implementation, Government of India, accessed July 10th, 2025.

Technological and sectoral transformation

The technologies and sectoral transformation are aligned with the vision document of Viksit Bharat 2047, which hinges on sectoral transformation of five priority sectors – Advanced Manufacturing and Automation; IT and Semiconductors; Green Economy; Agritech and Food Systems and Healthcare and Life Sciences. The level and the impact of AI varies across each of the sectors depending on the nature of the role.

Role of skilling, governance, and talent mobility

Increased role of Skilling, Governance, and Talent Mobility has been observed with the rising AI talent gap across geographies. Globally, countries, such as US, Germany and U.K. are also grappling with talent shortages and liberalising visa regimes to attract skilled professionals. India's strength lies in its large STEM graduate pool, Global Capability Centres, and initiatives such as IndiaAI mission and FutureSkills PRIME. However, challenges, such as only 26.1 percent[4] of youth accessing formal vocational training, gender disparities and regional digital divides complicate the skilling landscape.

Key recommendations

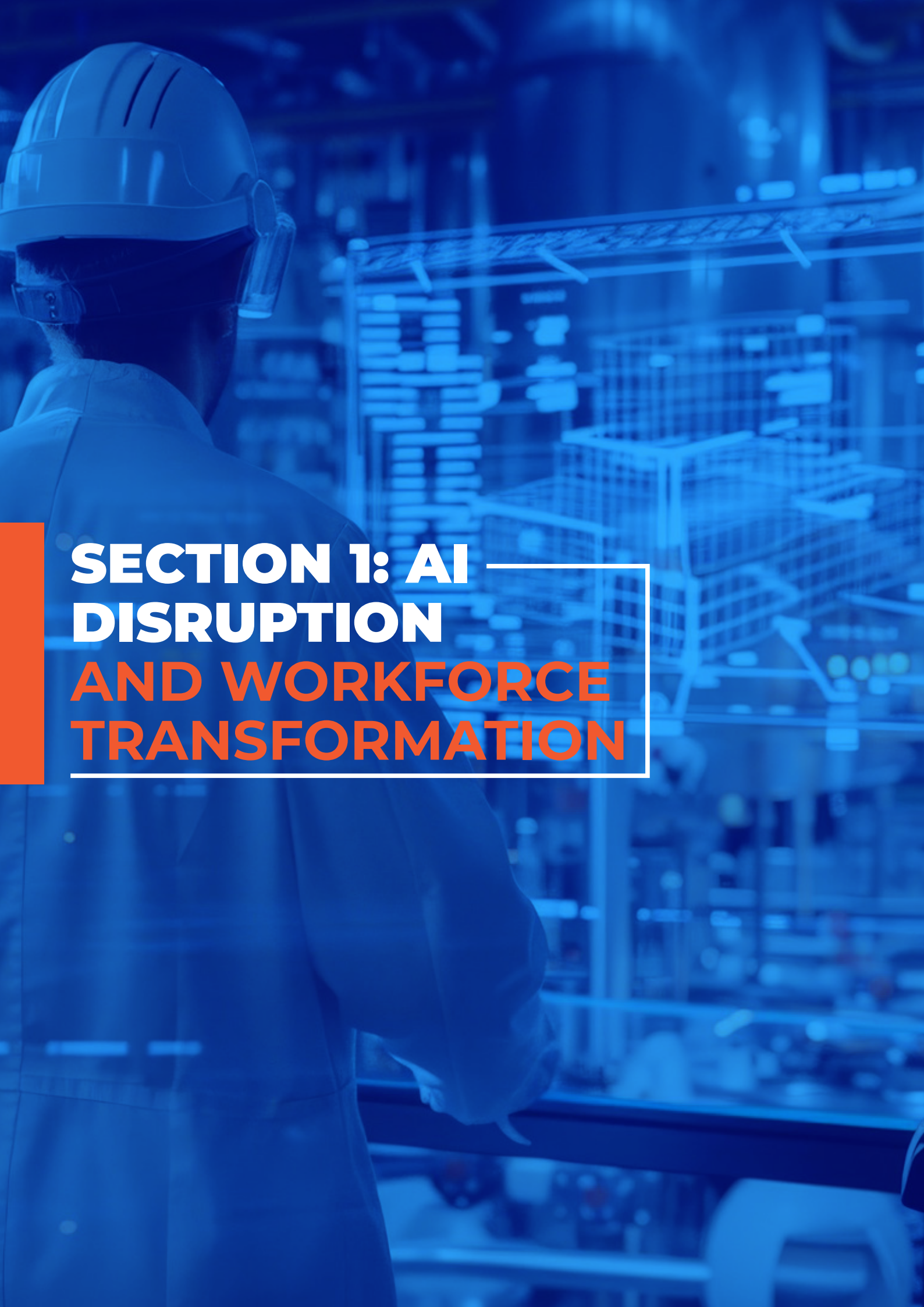
To address the issue of AI at hand, the report outlines six strategic recommendations –

- Tailored Sector-Specific AI Skilling Frameworks – Develop sectoral skilling roadmaps co-created with industry, academia, and government. Align job roles and training modules with sectoral AI maturity, tech stack, and workforce profile.
- Modernise ITIs for AI Readiness – Modernise curricula to include AI machine interface training and create mobility pathways to higher education.
- Accelerated Skilling via Public-Private Investment – Launch stackable credential programmes, make AI mandatory part of course and create co-funded skilling initiatives.
- Localised AI Skilling Hubs in Tier 2/3 Cities – Establish training centres in Tier 2 and Tier 3 cities with regional language modules and industry partnerships, deploy blended learning models.
- Building a Globally Competitive AI Workforce: Soft Skills and Strategic Mobility- Embed emotional intelligence, ethics, and interdisciplinary learning into AI skilling programmes, while mapping global demand, aligning certifications with international standards, and negotiating talent mobility tracks in trade agreements and global forums to position India as a strategic exporter of AI talent.
- Ethical AI Adoption and Inclusive Transition – Develop India-specific ethical standards and ensure representation of marginalised groups in skilling pipelines.

Conclusion

India's demographic advantage, digital infrastructure and entrepreneurial spirit positions, it uniquely to lead the global AI transformation. However, this potential can be optimally realised through inclusive, adaptive and ethically grounded workforce strategies. By embedding AI fluency and ethical awareness across its skilling ecosystem, India can transform disruption into opportunity and emerge as a global thought leader in the AI economy.

[4]Periodic Labour Force Survey (PLFS), Ministry of Statistics and Programme Implementation, Government of India, 2024.



SECTION 1: AI DISRUPTION AND WORKFORCE TRANSFORMATION

The global labour market is undergoing a seismic shift—driven not by traditional economic cycles but by rapid advancements in Artificial Intelligence (AI). A key inflection point in this transformation is the emergence of Generative AI (GenAI), an evolution within the broader AI landscape. GenAI extends AI's capabilities from automating routine, data-intensive tasks to enabling content creation, ideation, design, and decision support. As part of the Fourth Industrial Revolution, this advancement signals a deeper integration of AI into cognitive and creative domains of work.

From automation to augmentation: The expanding role of AI

This progression from earlier forms of AI to more generative and adaptive capabilities marks a fundamental shift in the nature of work. The implications go far beyond productivity gains they challenge the relevance of traditional job roles, reorder skills hierarchies, and redefine human-machine collaboration. What sets this moment apart is the scale, speed, and cognitive reach of the disruption.

Rather than displacing all jobs uniformly, AI is transforming how tasks within jobs are performed, resulting in three broad outcomes:

- **Automation:** Tasks are fully performed by machine (e.g. data entry automation).
- **Augmentation:** Human workers use AI tools to perform work efficiently and enhance productivity (e.g. use of diagnostic tool in healthcare).
- **Redefinition:** Entire roles are reimagined or replaced with new AI-native workflows (e.g.- fraud detection).

This task level disruption means that occupation/jobs are undergoing partial transformation while other face risk of being obsolete. The future of work lies not in resisting this change, but in actively shaping how AI is integrated across domains unlocking new models of productivity, creativity, and value creation.

AI market landscape: Global growth, projections and impact on economy

Artificial Intelligence (AI) is rapidly emerging as a powerful economic force, transforming industries, driving innovation, and generating substantial revenues across the global. A United Nation Trade and Development (UNCTAD) report projects the global AI market will grow from USD 189 billion in 2023 to USD 4.8 trillion by 2033, a 25-fold increase in a decade's time[5]. Its share of the global frontier technology market is expected to rise from 7 percent to 29 percent[6], making AI the dominant sector force. In addition, since the release of ChatGPT in November 2022, investment flows into AI have increased nearly eightfolds[7].

As the AI sector continues to grow, its impact on the workforce varies significantly across economic groups, affecting 60 percent of jobs in advanced economies, 40 percent in emerging economies, and 26 percent in low-income economies[8]. Though workforce exposure to AI is high in advanced economies, these countries are also better positioned to harness its benefits compared to emerging markets. As per UNCTAD[9], 27 percent of jobs in advanced economies could be enhanced by AI, boosting productivity and complementing human skills.

[5]AI market projected to hit USD 4.8 trillion by 2033, emerging as dominant frontier technology, United Nations Conference on Trade and Development (UNCTAD), Accessed June 19, 2025.

[6]Ibid

[7]Future of Jobs Report 2025, World Economic Forum, 2025.

[8]Ibid

[9]AI market projected to hit USD 4.8 trillion by 2033, emerging as dominant frontier technology, United Nations Conference on Trade and Development (UNCTAD), Accessed June 19, 2025

AI and job disruption: Varying risks and opportunities across occupations

[10]While we examine the disruptions AI is causing across tasks, occupations, and industries it is imperative to recognise that its impact is far from uniform - varying significantly across sectors, age groups, gender, education levels, and skill sets. The International Labour Organisation estimates that nearly 75 million jobs globally are at complete risk of automation due to AI[11].

Global labour market transformation projection : 2025-2030

Fastest-Growing Job Roles

- **Driven by technological advancements:** Big Data Specialists, FinTech Engineers, AI and Machine Learning Specialists, Software Developers.
- **Security-related roles:** Security Management Specialists, Information Security Analysts.
- **Green transition roles:** Autonomous and Electric Vehicle Specialists, Environmental Engineers Renewable Energy Engineers.

Fastest-Declining Job Roles

- **Clerical roles:** Cashiers, Ticket Clerks, Administrative Assistants, Executive Secretaries, Printing Workers Accountants.
- **Driven by digital access,** AI, Information Processing Technologies, and Robotics.

Largest Net Growth Job Roles

- Farmworkers, Delivery Drivers, Building Construction Workers, Salespersons, Food Processing Workers.
- **Care jobs:** Nursing Professionals, Social Workers, Personal Care Aides.
- **Education roles:** University and Higher Education Teachers, Secondary Education Teachers
- **Technology roles:** Software Developers, General and Operations Managers, Project Managers.

By 2030, macrotrends will create 170 million new jobs (14% of current employment) and displace 92 million jobs (8%), resulting in a net growth of 78 million jobs (7%).

*Source- Future of Jobs Report 2025

Figure 1: Global Labour Market Transformation Projection

Jobs most at risk of disruption are those involving routine and repetitive language tasks, while roles requiring significant personal interaction or physical movement are expected to be least affected. The occupations with the highest potential for automation include Credit Authorisers, Checkers, and Clerks (81 percent of work time could be automated), Management Analysts (70 percent), Telemarketers (68 percent), Statistical Assistants (61 percent), and Tellers (60 percent). On the other hand, jobs with the greatest potential for augmentation, focusing on mathematical and scientific analysis include, Insurance Underwriters (100 percent of work time potentially augmented), Bioengineers and Biomedical Engineers (84 percent), Mathematicians (80 percent), and Editors (72 percent). Meanwhile, roles with lower potential for either automation or augmentation are expected to remain largely unchanged, such as Educational Guidance and Career Counsellors and Advisers (84 percent of time spent on low-exposure tasks), Clergy (84 percent), Paralegals and Legal Assistants (83 percent), and Home Health Aides (75 percent)[12].

[10]The Future of Jobs Report 2025, World Economic Forum, January 2025.

[11]Minimizing the negative effects of AI-induced technological unemployment, International Labour Organization, 2025.

[12]World Economic Forum. (2023). Jobs of tomorrow: Large language models and jobs (p. 7). World Economic Forum.

The intersection of automation, productivity, and job growth

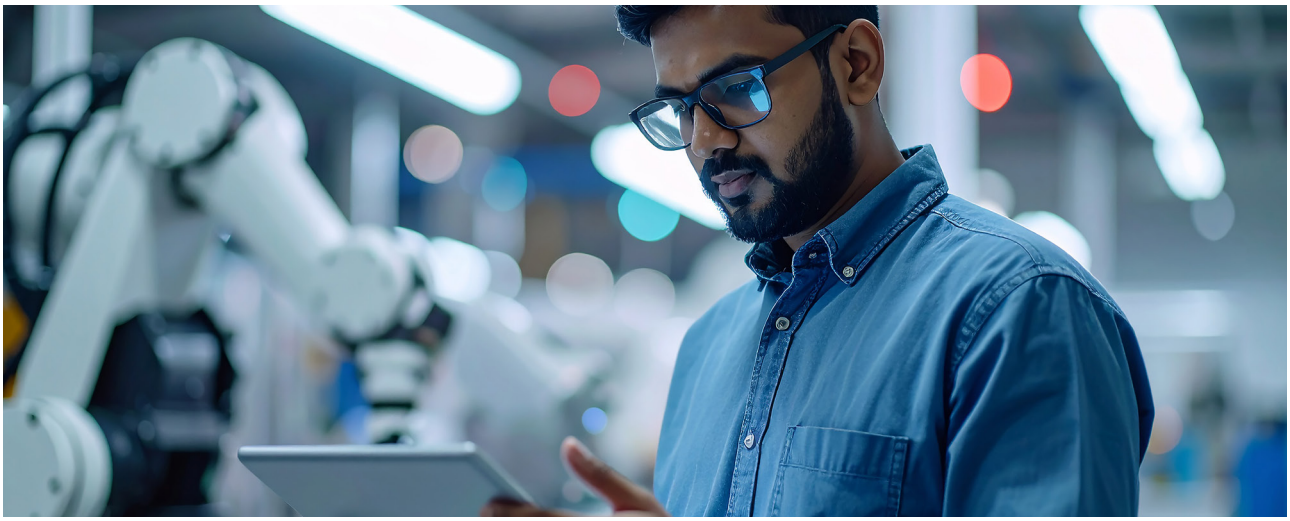
However, multiple studies indicate a positive overall correlation between AI-enabled automation and sector-level employment, as the share of high-skill workers within these sectors continues to rise with change in technology and upskilling. A study by Bessen (2018)[13] examined the effects of automated manufacturing on the U.S. textiles, steel, and automotive industries. The study found that automation-driven productivity gains contributed to strong job growth and increased worker earnings over nearly four decades before eventually leveling off. Similar trends were observed in developing countries, where the integration of robotic and human labour helped slow the rate of unemployment growth over time. Another study by a leading Business School in 2023[14] found that nearly 80 percent of U.K. firms adopting AI, robotics, or automation reported a positive net impact on jobs and skills. These findings resonate with perspectives shared by industry leaders interviewed for this paper, including one of India's leading corporate houses, which emphasised that in the Indian context, automation combined with AI is expected to augment productivity and support the workforce, rather than replace it.

India: Opportunity and impact of AI

In India there is growing uncertainty about the impact of AI and displacement of jobs. This is amplified by two interlinked factors, a young work force entering job markets with limited formal skilling and high concentration of workers in repetitive, entry level service vulnerable to automation. As per Future of Jobs Report 2025, 38 percent of workers' core skills are expected to change in India.

Protracted labour displacement poses a significant risk for a labour-abundant nation like India. The core issue lies in the sheer scale of employment demand India's economy is predominantly service-oriented, with a large portion of the Information Technology (IT) sector engaged in low value-added tasks. These roles are particularly vulnerable to automation, as companies may opt to replace human labour with technology to reduce operational costs.

In India, approximately 26 percent[15] of the workforce is engaged in high-exposure occupations, with women disproportionately represented in entry-level jobs and service roles that are highly automatable. At a global level also women remain significantly more exposed to automation risks compared to men. In high-income countries, jobs most vulnerable to automation account for .6 percent of female employment, whereas only 3.5 percent of male employment falls within this high-risk category, highlighting a substantial gender disparity in workforce automation exposure[16].



[13]Automation and Jobs: When Technology Boosts Employment

[14]AI adoption widespread and having positive impact on jobs, Warwick Business School, 2025.

[15]Cazzaniga, M., Jaumotte, F., Li, L., Melina, G., Panton, A. J., Pizzinelli, C., Rockall, E. J., & Tavares, M. M. (2024). Gen-AI: Artificial intelligence and the future of work (IMF Staff Discussion Note No. 2024/001). International Monetary Fund.

[16]Gen-AI: Artificial Intelligence and the Future of Work (IMF Staff Discussion Note No. 2024/001), Cazzaniga, M. et al., International Monetary Fund, 2024.

Table 1- AI-driven disruption of employment across Indian sectors source – Economic survey 2023-2024

Sectors	Job Roles Impacted	Nature of Disruption	AI Technologies Involved	Emerging Job Roles – Illustrative
 IT and Outsourcing	Customer Support, Junior Coders, Data Entry	High job loss due to automation	Chatbots, NLP, code generation tools	• AI/ML Engineers • Prompt Engineers • AI Ethics Specialists • Automation Architects
 Finance	Credit Analysts, Risk Modelers	Routine tasks automated, fewer entry-level roles	AI underwriting, fraud detection	• AI Risk Analysts • Fintech Product Managers • Fraud Detection Analysts • Data Scientists
 Healthcare	Radiologists, Diagnostics, Surgical Assistants	Augmentation and partial replacement	AI imaging, robotic surgery	• AI Imaging Specialists • Health Data Analysts • Robotic Surgery Technicians • Virtual Health Assistants
 Education	Grading Assistants, Tutors	Personalised learning and automated assessments	Adaptive learning platforms	• EdTech Developers • Learning Experience Designers • AI Curriculum Specialists
 Legal	Junior Associates, Paralegals	Research and risk analysis automated	Legal AI tools, predictive analysis	• Legal Tech Analysts • AI Compliance Officers • Predictive Legal Strategists
 Customer Service	Call Centre Agents	High automation risk	Virtual assistants, voice bots	• Conversational AI Designers • Bot Trainers • Customer Experience Analysts
 Manufacturing	Assembly Line Workers	Limited disruption due to cost of automation	Industrial robotics	• Smart Factory Engineers • AI Maintenance Technicians • Industrial Data Analysts
 Retail & Logistics	Inventory Managers, Delivery Coordinators	Augmented decision-making	AI in supply chain and demand forecasting	• AI Supply Chain Analysts • Inventory Optimization Specialists • Demand Forecasting Experts

In India, jobs that are at risk of automation and displacement are in congruence with global trends. As shown in the table above, sectors, such as IT, finance, healthcare, education, and legal services are experiencing substantial disruption, particularly in roles involving routine cognitive tasks. But at the same time, it is also leading to creation of jobs, which required new and updated skills. In the Indian context, AI is increasingly deployed to automate functions like credit underwriting, diagnostics, customer support, and legal research, reshaping traditional workflows. This parallel between domestic and international shifts reinforces the urgent need for proactive reskilling strategies that prepare workers for hybrid roles and emerging career pathways. While disruption is real and ongoing, India is also uniquely positioned to lead a responsible and inclusive transition. It has:

- A rapidly expanding digital public infrastructure (DPI) stack
- Policy momentum under initiative like FutureSkills Prime, IndiaAI Mission, and CoEs in Emerging Techs
- A growing domestic market for GenAI adoption in healthcare, education and governance.

As India navigates this delicate balance between risk and opportunity, it must do so with a clear understanding of the global forces at play because the future of AI and labour is being shaped not in isolation, but within a rapidly shifting international landscape.





SECTION 2: GLOBAL TRENDS AND GEOPOLITICAL SHIFTS SHAPING AI AND LABOUR

The evolution of artificial intelligence (AI) over the past decade has been marked not only by technological breakthroughs but also by profound geopolitical and labour market transformations. It is rapidly becoming a defining axis of global competition, with countries investing heavily through both public and private channels to secure technological leadership and strategic advantage.

Global AI investment landscape: Strategic priorities and emerging leaders

The United States and China are the dominant players in this space, with the U.S. contributing over 109 billion dollars in private AI investment in 2024 alone, more than twelve times China's 9.29 billion dollars[17]. Together, these two countries accounted for 40 percent of global AI R&D output in 2022, supported by over 100 firms[18]. However, when alternative metrics are considered, the investment landscape reveals a more interesting picture. For instance, based on the average value of public AI contracts between 2013 and 2023, Switzerland and Turkey emerge as top contributors, with mean investments of 3.05 million dollars and 2.81 million dollars respectively well ahead of the U.S. and China[19]. India also stands out, contributing USD 11.29 billion in cumulative public investment over the same period surpassing several developed economies, such as France, South Korea, and the UAE[20].

Data shows global AI investment has been concentrated in three primary areas: Infrastructure and governance (37.3 billion), data management and processing (16.6 billion), and healthcare and agriculture (11 billion)[21]. Other sectors of strategic interest include fintech, semiconductor technology, and cybersecurity[22]. National investment patterns reflect distinct strategic priorities: The United States is at the forefront of advanced AI platform development; China is concentrating on robotics and semiconductor innovation; while the European Union and India are directing resources toward socially impactful applications of AI in sectors, such as healthcare, education, and agriculture[23].

These differentiated approaches underscore the diverse strategic imperatives shaping AI investment globally, as countries seek to align technological innovation with broader economic and societal goals.



[17]Stanford Institute for Human-Centered Artificial Intelligence. Artificial Intelligence Index Report 2025. Stanford University, 2025, 252.

[18]Stanford University Human-Centered Artificial Intelligence. AI Index Report 2025: Chapter 1 – Research and Development. Stanford University, 2025.

[19]Artificial Intelligence Index Report 2025. Stanford University, 2025, 355

[20]Ibid

[21]Artificial Intelligence Index Report 2025. Stanford University, 2025

[22]Artificial Intelligence Index Report 2025. Stanford University, 2025

[23]Artificial Intelligence Index Report 2025. Stanford University, 2025

Competing visions: National AI strategies and global power plays

China has explicitly pursued AI leadership as a national goal. Its 2017 New Generation AI Plan aims to make China the global AI leader by 2030[24]. By 2020, China's central and local governments were investing heavily in AI research, education, and infrastructure. Major cities like Beijing, Shanghai, and Shenzhen launched[25] multi-billion-dollar AI innovation funds to attract companies and talent. This top-down support rapidly boosted China's AI output[26], with domestic firms developing advanced applications ranging from facial recognition to language models.

The United States entered the 2020s with strong AI foundations, built on decades of research and innovation[27]. U.S. firms pioneered breakthroughs from early neural networks to GPT models, leading to dominant products[28] like Open AI's ChatGPT and GPT-4. The U.S. controls critical parts of the AI value chain top labs, software frameworks, and semiconductor design. Public policy has reinforced this edge: The 2022 CHIPS and Science Act[29] allocated USD 52 billion for domestic semiconductor manufacturing and AI chip development in the country. By 2024, U.S. AI startups attracted USD 131.5 billion[30] in private funding (up 52 percent from 2023), with cumulative private investment reaching USD 471 billion compared to ~USD 119 billion in China and USD 28 billion in the U.K.[31].

Other nations are also asserting their AI ambitions. The UAE's G42 fund announced USD 10 billion for global AI investments in 2023[32] and is building an AI campus and chip-design centres, supported by a U.S. collaboration agreement[33]. Saudi Arabia launched its National Strategy for Data and AI in 2020[34] and, in 2025 has partnered with leading chip company to build "AI factories".[35] It is also training youth in AI[36] and offering visas to attract global talent.

At the same time, Japan and South Korea are leveraging their tech giants for AI chip development, robotics, and language models. Japanese conglomerates have also become major global investors in AI startups[37]. Singapore, with its 2019 National AI Strategy (updated in 2023)[38], is positioning itself as Southeast Asia's AI innovation hub.



[24]Why China's AI breakthroughs should come as no surprise, World Economic Forum, June 2025.

[25]Industries in the Intelligent Age White Paper Series: China's Path to AI-Powered Industry Transformation, World Economic Forum, January 2025.

[26]China's National AI Strategy, Ministry of Foreign Affairs of the People's Republic of China, July 2025

[27]Artificial Intelligence: Objective or Tool in the 21st-Century Higher Education Strategy and Leadership?, Lucien Bollaert, Ghent University, Education Sciences, June 2025

[28]Ibid

[29]What The CHIPS and Science Act Means for AI, Stanford HAI, August 2022

[30]Economy | The 2025 AI Index Report, Stanford Institute for Human-Centered Artificial Intelligence (HAI), Stanford University, 2025.

[31]Visualizing Global AI Investment by Country, Visual Capitalist, Marcus Lu, April 2025.

[32]Mubadala-backed AI firm G42 sets up USD 10bn tech fund, AGBI, August 2022

[33]Ibid

[34]Saudi Arabia, National Data and AI Strategy (2020), Organisation for Economic Co-operation and Development (OECD), December 2021.

[35]Saudi Arabia and NVIDIA to Build AI Factories to Power Next Wave of Intelligence for the Age of Reasoning, NVIDIA Newsroom, May 2025.

[36]SDAIA, Education and Human Resources Ministries Urge Citizens to Enroll in AI Training Program, Saudi Data and Artificial Intelligence Authority (SDAIA), Kingdom of Saudi Arabia, 2025.

[37]NVIDIA and SoftBank Corp. Accelerate Japan's Journey to Global AI Powerhouse, NVIDIA Newsroom, November 2024.

[38]Singapore's National AI Strategy: AI for the public good, for Singapore and the world, Singapore Economic Development Board (EDB), 2023.

National AI strategies: Diverging paths, common goals

As nations race to establish AI leadership, their investments and innovation strategies are reshaping global power dynamics. But this surge in ambition has also intensified concerns around unchecked development, ethical misuse, and societal disruption. From Hollywood strikes over AI's impact on creative jobs to resistance by studios like Japan's Studio Ghibli, public pushback reflects growing unease about AI's reach and governance. These developments highlight a critical gap: While AI capabilities accelerate, policy and regulatory frameworks must keep pace to ensure responsible, inclusive, and sustainable growth. In response, countries are not only drafting national regulations but also participating in multilateral efforts, such as the Bletchley Declaration, the Hiroshima AI Process, and the OECD AI Principles[39].

Below is a table highlighting the different governance models and the number of different AI regulations in different regions around the world:

Table 2-AI Governance Models by Country

Governance Model/Tool	Description	Countries Using This Approach
Industry Self-Governance	Voluntary, industry-led oversight with minimal regulation	United Kingdom
Soft Law	Non-binding principles, ethics, frameworks guiding AI use	India, Chile, Canada, Australia, Estonia, Singapore, Japan
Technical Standards	Use of safety, fairness, and explainability standards (often ISO or national)	European Union, China, Singapore
Regulatory Sandboxes	Testbeds allowing AI systems under relaxed rules	India, Brazil, Colombia, United Kingdom, European Union, Singapore
Horizontal AI Law	Cross-sector binding legislation for AI governance	European Union, Brazil (proposed)
Updating Existing Laws	Applying data protection, competition, or consumer laws to AI	United Kingdom, Brazil, United States, Italy
Sector-Specific Laws	Domain-focused regulation (e.g., finance, health, public safety)	Nigeria, United Arab Emirates, United Kingdom, European Union, China

Source[40]

[39]International Association of Privacy Professionals. Global AI Law and Policy Tracker. IAPP, 2025,

[40]KPMG Analysis

China is advancing its own AI regulatory framework, with a proposed comprehensive law focused on ethical development, labour rights, and data usage. This builds on earlier steps such as the Interim Measures for Generative AI Services[41]. In contrast, the European Union emphasises ethical AI aligned with European values. The European Union, meanwhile, has emphasised ethical AI aligned with its foundational values. Its 2021 draft AI Act introduced a risk-based regulatory approach, banning practices like social scoring and imposing strict requirements on high-risk AI[42]. In 2024, the EU enacted the world's one of the first AI law.

The European Union has taken a leadership role with the EU AI Act, which applies a risk-based approach to AI deployment and is backed by a dedicated AI Office for policy enforcement[43]. Alongside China, the EU is also contributing to global AI governance through initiatives like the G20 AI Principles and UNESCO's ethical guidelines[44], signaling a shared recognition of the need for international coordination in regulating AI's impact.

India and the UAE are advancing distinct national AI strategies aligned with their development goals. India, through NITI Aayog's #AIforAll vision[45], focuses on inclusive, scalable AI solutions for emerging economies and has engaged in global forums like the 2023 U.K. AI Summit, while aligning with international ethical standards. The UAE, meanwhile, has institutionalized AI governance through the world's first Ministry of AI and bodies like the Council for AI and Blockchain[46]. Its national strategy emphasises culturally relevant, privacy-conscious, and ethically guided AI use, as reflected in its recent generative AI guidelines.

A central challenge in AI regulation is balancing innovation with oversight. The EU's stringent compliance model seen in frameworks like the General Data Protection Regulations (GDPR) has raised barriers for smaller firms, potentially slowing innovation[47]. In contrast, the U.S. and China have adopted more flexible regulatory approaches, allowing their AI sectors to scale rapidly[48]. This divergence is reflected in the dominance of U.S. AI firms and significantly higher compensation for American tech talent compared to their European counterparts. These contrasts highlight the need for adaptive, innovation-friendly regulation that still upholds ethical and security standards. India, meanwhile, is taking a cautious yet proactive approach emphasising responsible AI use, while signaling its intent to develop a light-touch regulatory framework that supports growth and safeguards societal interests.

AI as economic catalyst: India's opportunity and the global talent race

One clear consequence of emergence of AI is the rising global AI competition for talent. Skilled AI researchers and engineers are in short supply, and many countries are now easing visa rules and launching initiatives to attract AI labour force. Economically, India stands to gain by harnessing AI for its own growth and by exporting IT-enabled AI services. Indian IT firms are already integrating AI into outsourcing services e.g. using AI tools to boost efficiency in software development, customer support, etc., which could bolster India's IT industry and keep it globally competitive. At the same time, global tech firms are expanding their AI R&D presence in India, establishing research centres in cities like Bengaluru and Hyderabad to tap into the country's vast AI talent pool[49].

[41]Chinese Academy of Social Sciences. Artificial Intelligence Law of the People's Republic of China (Draft for Suggestions from Scholars). Translated by Concordia AI, edited by Kwan Yee Ng and Jason Zhou. DigiChina, Stanford University, August 2023, 2. https://digichina.stanford.edu/work/translation-artificial-intelligence-law-model-law-v-1-0-expert-suggestion-draft-aug-2023/

[42]AI Dilemma: Regulation in China, EU & US – Comparative Analysis, Pernot-Leplay.com, November 2024.

[43]International Association of Privacy Professionals, Global AI Law and Policy Tracker 12

[44]International Association of Privacy Professionals, Global AI Law and Policy Tracker, 12

[45]NITI Aayog. National Strategy for Artificial Intelligence: #AIforAll Discussion Paper. Government of India, June 2018. Accessed June 18, 2025

[46]International Association of Privacy Professionals, Global AI Law and Policy Tracker, 24

[47]Sarah Kreps. "The Global AI Race: Will US Innovation Lead or Lag?" Brookings Institution

[48]Ibid

[49]Microsoft Research. "Microsoft Research India." Microsoft accessed July 18, 2025.



SECTION 3: INDIA'S ECONOMIC STRUCTURE AND EMPLOYMENT LANDSCAPE

India's demographic strength-one of the youngest populations-globally offers a powerful foundation for AI-led economic transformation. However, the key to harnessing this potential lies in aligning its workforce with the evolving demands of an AI-integrated economy.

The services sector, contributing 54.7 percent to Gross Value Added (GVA) as per the Economic Survey 2024–25, has seen the earliest and most visible integration of AI particularly in IT, financial services, and BPO. Meanwhile, industry, which accounts for 27.6 percent of GVA[50], is experiencing a resurgence in areas like electronics and precision manufacturing, driven by automation, AI adoption, and government-backed initiatives, such as PLI. Notably, electronics manufacturing employment rose by nearly 50 percent compared to pre-pandemic levels, pointing to AI as a possible enabler of new high-skill jobs. Agriculture, contributing 17.7 percent[51], remains less AI-intensive, yet offers untapped potential through precision farming and agri-tech innovations. Labour market trends also reflect broader shifts. Between 2017–18 and 2023–24:[52]

- Self-employment increased by 6.2 percent, signalling a rise in entrepreneurial ventures–many of which now involve AI-enabled services and platforms.
- Regular salaried work declined marginally, while casual labour fell by over 5 percent, highlighting the push toward more structured, tech-enabled work formats.
- Female participation in agriculture rose, while more men moved toward construction and services, sectors, where AI-driven tools and automation are beginning to reshape work patterns.

India's emergence as the third-largest startup ecosystem, with over 30,000 tech-focused startups[53], demonstrates how technology is already playing a catalytic role in job creation, particularly for skilled talent in digital and innovation-driven sectors. As India navigates its employment transition, the challenge is clear: to embed AI not just in top-tier innovation, but across sectors and skills bridging gaps in formalisation, access, and adaptability.

Navigating informality: India's labour market in the age of tech and gig work

As India embraces AI-led growth, the realities of its labour market, dominated by informality and evolving gig work models highlight the complex interplay between technological progress and employment structures. Technological advancement has led to job loss as well as job creation. One such example is that of gig workers who are identified as a "person who performs, works, or participates in a work arrangement and earns from such activities outside of a traditional employer-employee relationship"[54]. In India, around 90 percent of the workforce is part of unorganised sector and a significant contributor to the economy of the most populous nation[55]. As per National Accounts Statistics, the informal sector contributed about 45 percent to the total GDP of the economy in FY 2022-23[56].

As per the report publish by Niti Ayog 'India's Booming Gig and Platform Economy' in 2022 the number of gig workers and platform workers in the country was 7.7 million in 2020-21, including women. This number is expected to rise to 23.5 million by 2029-30[57] comprising 6.7 percent of non-agricultural workforce and 4.1 percent of total livelihoods. There are 47 percent medium skilled gig workers, 22 percent high-skilled gig workers, and 31 percent low skilled gig workers[58].

Dominance of informal sector along with rapidly growing gig workers is precisely the reason it is important to navigate India's labour market with the advent of AI with caution, planning and strategic interventions. While digital platforms have revolutionised ride-hailing and food delivery services offering flexibility and new income opportunities, but often do lack social protections with only 10 percent of the gig workers accessing health insurance. India's gig economy continues to expand, driven by platformisation and remote work[59].

[50]Economic Survey 2024-2025, Ministry of Finance

[51]Electronics Manufacturing and AI Employment Trends, Ministry of Electronics and Information Technology (MeitY), Government of India,

[52]PLFS Report 2023-2024

[53]From AI to Tier 3 Growth: India's Startups Accelerate,

[54]India code: Code on Social Security, 2020. (n.d.). India Code

[55]Unorganised sector in India – statistics & facts, Statista, Manya Rathore, June 18, 2024.

[56]Press Release, Press Information Bureau, Government of India, July 2025.

[57]Press Release, Press Information Bureau, Government of India, July 2025.

[58]Niti Ayog Report - India ` s Booming Gig and Platform Economy'

[59]Economic Survey. 2025. Government of India. Chapter 13

The challenges posed by platformisation and remote work underscore the urgent need for social inclusion in the digital economy. Addressing them would require gender-sensitive policies, accessible communication systems, and expanded social security measures tailored to the needs of gig and platform workers[60]. To truly harness the potential of the digital and AI-driven economy, these inclusion efforts must be complemented by strong investments in education and workforce skilling. Preparing workers for evolving job roles, while ensuring adequate safety nets will be key to enabling a just and equitable tech transition.

Bridging the digital divide for inclusive AI skilling

As India accelerates toward an AI-enabled future, uneven digital readiness risks deepening regional and social divides. A uniform AI skilling model cannot succeed in a country as diverse as India. Regional disparities in digital infrastructure and access directly impact the ability of people especially in Tier 2 and 3 cities and rural areas to benefit from AI-driven opportunities.

The NITI Aayog Innovation Index 2021 illustrates these divides starkly: Innovation leaders like Karnataka, Telangana, and Haryana score significantly higher due to stronger internet penetration, a thriving tech ecosystem, and higher ICT exports. In contrast, states like Bihar, Odisha, and Chhattisgarh lag behind, constrained by weaker digital infrastructure and limited innovation pipelines.

This divide is also reflected in access to digital tools 65 percent of urban workers use digital platforms[61] compared to just 25 percent in rural areas, even though 70 percent of India's workforce resides in rural India[62]. These structural gaps pose a serious hurdle for equitable AI skilling, potentially concentrating benefits in already-advanced regions, while leaving others behind.

To ensure that the AI revolution does not mirror existing inequities, policy must prioritise digital infrastructure, localised skilling initiatives, and targeted support for under connected regions.

Rebalancing for an AI ready workforce

India's demographic edge, digital infrastructure, and startup ecosystem create strong foundations for an AI-driven future. Yet, challenges like informality, sectoral imbalance, and digital divides persist. To stay ahead, policies must focus on skilling, education, and infrastructure, especially in underserved regions.

A forward-looking, inclusive approach is key, not just to create jobs, but to build resilient, tech-enabled livelihoods. This will be central to realising Viksit Bharat, where AI can power growth in emerging sunrise sectors.



[60]Niti Ayog report

[61]PLFS 2024.

[62]Ibid



SECTION 4: TECHNOLOGIES AND SECTORS BEING TRANSFORMED IN VIKSIT BHARAT

India aspires to become a USD 30 trillion economy by 2047, powered by innovation, technology, and inclusive growth. Achieving this vision requires transformative change not just in sectoral output, but in how each sector adapts to and leverages emerging technologies to drive productivity and employment in a tech-led era.

While the previous section outlined India's economic structure, this section explores how technologies like AI, green tech, manufacturing, and digital infrastructure are reshaping productivity, workforce models, and sectoral growth. The pace and depth of this transformation, however, are far from uniform. Insights from industry experts reveal that automation and AI adoption vary significantly across sectors. For instance, healthcare is seeing accelerated integration of AI from diagnostics to administrative optimisation, whereas in solar manufacturing, automation is underway, but AI remains underutilised. These divergences reflect broader patterns influenced by geography, capital intensity, regulatory maturity, and digital and skill readiness.

Five sectors are covered in this section to maintain analytical depth, while aligning with priority areas as defined in vision of Viksit Bharat. These sectors represent the highest potential for technology led transformation employment impact and global competitiveness. It does not aim for exhaustive coverage, but rather identifies the emerging directions and actionable insights across priority sectors aligned to India's development ambitions.

Tech-driven transformation in advanced manufacturing

The India Industrial Automation Market size is estimated at USD 17.28 billion in 2025, and is expected to reach USD 33.64 billion by 2030, at a CAGR of 14.26 percent during the forecast period (2025-2030)[63]. This transformation is backed by government initiatives, such as Make in India, favorable FDI policies, as well as digital transformation. Indian manufacturers are investing significantly in technology modernisation, allocating 35 percent of their operating budgets to technology implementation, substantially higher than the global average of 23 percent. This increased focus on technological advancement is driving the adoption of sophisticated automation solutions, including robotics, artificial intelligence, and machine learning applications across manufacturing processes, leading to enhanced operational efficiency and productivity[64].

Uneven but rapid adoption of technology in the sector signals a shift from traditional hand-on skills to that of more sophisticated requirement, such as robotics, data analysis and machine learning.

Below are some of the job roles wherein AI adoption is catalysing a shift from traditional roles to high-skill tech roles in manufacturing sector:

Table 3-Traditional and emerging roles in the workplace

Traditional roles	Emerging roles
Machine Operators	Robotic Technicians
Assembly Line Workers	AI System Integrators
Quality Inspectors	Data Analysts and ML Engineers

[63]India Industrial Automation Market Size & Share Analysis – Growth Trends & Forecasts (2025–2030), Mordor Intelligence, July 2025.
[64]Ibid

IT-ITES and semiconductor industry: Catalysts of India's tech-driven growth

In the IT and ITeS sector, GenAI is expected to automate 20–45 percent of software development functions, including coding, debugging, and testing[65]. Leading firms are investing in proprietary AI platforms. Internal AI assistants and smart automation tools are being developed across the industry, with some reporting up to 90 percent improvement in data accuracy and a 60 percent reduction in manual effort highlighting the operational efficiency AI can unlock[66].

The semiconductor industry, which was valued at USD 38 billion in 2023, is projected to reach USD 109 billion by 2030, is also driven in part by AI enabled innovation and automation. In India's 1.25 lakh chip design engineers, who represent 19 percent of the global talent pool[67], are increasingly leveraging AI for design optimisation[68], data engineering[69], and digital twin simulations[70].

The evolving nature of semiconductor roles now demands proficiency in AI-powered supply chain analytics, cybersecurity for IP protection, and system-on-chip integration. The country's semiconductor workforce currently includes approximately 220,000 professionals, with plans to add 1 million new jobs by 2026[71]. Within the sector, continuous upskilling, cross-disciplinary integration, and collaborative development with generative AI systems are emerging as foundational capabilities for professionals navigating advanced digital manufacturing ecosystems.

Table 4-Impacts of AI on productivity in different sectors

Sectors	Productivity gain	Key usage
BPO/Call Centre Management	80%	AI chatbots, sentiment analysis
Software Development	61%	Code generation, debugging
Content Development and Distribution	45%	Copywriting, localisation
Customer Service	44%	Multilingual support
Sales and Marketing	41%	Campaign optimisation

However, this technological shift is also reshaping workforce dynamics, particularly across different role levels. While junior roles are most susceptible to automation due to their repetitive nature, mid-level and senior professionals are increasingly expected to evolve into strategic and oversight positions, guiding AI integration and governance.

[65]Navigating the Complexity of Generative AI Adoption in Software Engineering | ACM Transactions on Software Engineering and Methodology, June 2024

[66]Generative AI Poised to Unlock USD 621 Billion in Productive Capacity for India, Federation of Indian Chambers of Commerce & Industry (FICCI), June 2023.

[67]Government Spending on Semiconductor R&D Crosses ₹2859 Crore in Last Decade, Press Information Bureau, Ministry of Electronics & IT, Government of India, December 4, 2024.

[68]How AI in semiconductor manufacturing is transforming chip design, Infosys Knowledge Institute, June 2025

[69]How AI in semiconductor manufacturing is transforming chip design, Infosys Knowledge Institute, June 2025

[70]Simulation on Digital Twin: Role of Artificial Intelligence and Emergence of Industrial Metaverse, IEEE Conference Publication, June 2024

[71]India's Semiconductor Future Through Skilling and Inclusion, India Today, Raja Manickam, May 2025.

Table 5-Level of impact that AI and automation have had on different roles In the workplace		
Role level	**Impact**	**Impact level**
Junior roles	• High automation potential for repetitive tasks (e.g., data entry, basic coding) • Time savings of 8-10 hours/week on augmentable tasks • Entry level coders and analysts will see job evolution	High
Mid-level roles	• Shift towards AI oversight, prompt engineering and orchestration • Roles like project managers and analysts will evolve into AI trainers and data interpreters	Medium to high
Senior Roles	• Strategic leadership in AI governance, ethics, and integration • C-suite expected to lead AI transformation roadmaps	Medium

Greening India's future: Clean energy and mobility innovations

Building on its transformative role in high-tech sectors, AI is also emerging as a cornerstone of India's transition to a sustainable and resilient green economy. With 90 percent of the nation's current energy mix still dependent on fossil fuels[72], AI is being strategically deployed to enhance the accuracy of demand forecasting, supply chain coordination, and dynamic pricing mechanisms. These capabilities are particularly critical for optimising the integration of renewable energy sources—such as solar and wind—into the national grid, enabling more efficient and reliable energy distribution.

Equally significant is AI's role in managing decentralised, renewable-intensive energy infrastructure. As Asia's share of global primary energy consumption surged from 28.8 percent in 1991 to 53.5 percent in 2021, India faces mounting pressure to modernise its energy systems. AI facilitates real-time grid optimisation, advanced energy storage management, and predictive decision-making, allowing for responsive load balancing and intelligent energy dispatch. These innovations reduce dependence on conventional forecasting models and support the broader goals of energy security and sustainability.

In the mobility sector, AI particularly Generative AI (GenAI) is reshaping the automotive industry. By 2030, AI is projected to deliver productivity gains of 30–32 percent, across areas like customer engagement, production and assembly, automation and predictive maintenance, etc[73]. As the sector shifts from product-centric to service-oriented models, automakers are increasingly leveraging AI to streamline development cycles, enhance operational sustainability, and personalise mobility solutions. These shifts are not only redefining value chains but also aligning the industry with India's broader climate and innovation objectives.

Following are the workforce implications of this transition:

Table 6-Skilling and upskilling priorities matched to emerging roles	
Emerging roles	**Reskilling priorities**
Digital grid analysts to manage AI-based forecasting and load balancing	AI literacy for technicians in smart grid and predictive syvs
EV fleet data engineers to optimise routing, charging and diagnostics	Cross-functional training blending electrical engineering with AI fluency
AI-integrated Safety Engineers to oversee compliance and risk systems	Public-private apprenticeship
Carbon Trading Analysts to model emissions and manage credits	Programmes aligned with India's Skill Development Mission

[72]Integrating AI: The Superpower in India's Energy Transition Toolkit, KPMG India, October 2024.

[73]Artificial Intelligence (AI) set to reshape 38 million jobs in India by 2030, boost productivity, IBEF, June 2025

Smart farming and sustainable food systems

Extending AI's role in sustainability, India's agriculture sector which employs nearly 46.1 percent of the national workforce[74] is undergoing a rapid transformation through AI-powered innovation. The domestic Artificial Intelligence in Agriculture market is projected to grow from USD 1.7 billion in 2023 to USD 4.7 billion by 2028, reflecting a compound annual growth rate of 23.1 percent[75]. Technologies, such as machine learning, computer vision, and predictive analytics are being deployed across the agricultural value chain to enhance productivity, resilience, and resource efficiency.

AI is already demonstrating measurable impact in yield optimisation. In Andhra Pradesh, a pilot initiative delivered tailored crop advisories to 175 farmers, resulting in yield increases of up to 30 percent per hectare[76]. Beyond productivity, AI is also advancing climate risk mitigation. Predictive models are being used to forecast rainfall variability, glacial melt, and coastal vulnerability, integrating satellite and ground-level data to support climate-resilient farming systems and bolster government preparedness against environmental shocks.

Water efficiency remains a critical concern, with 90 percent of India's groundwater allocated to irrigation[77]. AI-enabled smart irrigation systems, supported by initiatives, such as Per Drop More Crop under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and the Digital Agriculture Mission, are optimising water usage through IoT sensors and dynamic weather-linked scheduling. These interventions are not only improving input efficiency but also aligning agricultural practices with India's broader goals for sustainable food systems and climate adaptation.

Following is the expected the workforce implications and emerging roles:

Table 7-Job roles and associated skills

Role level	Description	Skills required
Field Advisor/ Digital Agronomist	Translates AI-generated crop advisories into actionable insights for farmers	Agronomy, digital extension platforms, local language fluency, AI tool interpretation
Agri-Robotics Technicians	Operates and maintains AI-powered drones and autonomous farm machinery	Mechatronics, drone piloting, robotics servicing, AI-computer vision basics
AI-Enabled Crop Planning Advisor	Supports crop selection and sowing decisions using AI models based on soil, weather and market data	Data analysis, agronomic modeling, GIS< ML-based decision tools
Smart Irrigation Engineer	Design AI-integrated irrigation systems for water-efficient farming	IoT systems, hydrological modeling, AI-based scheduling, control systems
Agri-Climate Risk Analyst	Uses AI to model local climate trends and advise resilient farming practices	Climate modelling, statistical computing, geospatial analytics
Digital Farm Extension Officer	Delivers AI-powered, location-specific advisories to smallholder farmers via mobile platforms	Extension methodologies, mobile app navigation, NLP and chatbot familiarity
Post-Harvest AI Logistic Coordinator	Applies AI to plan storage, transportation, and cold chain efficiency to reduce food loss	Supply chain analytics, AI route optimization, agri-logistics, sensor tech
Agri-Data Steward	Curates and manages agri-data repositories used for training AI systems and building data infrastructures	Data governance, metadata standards, open API use, cloud-based dataset management

[74]PLFS report 2023-24

[75]India's AI-Driven Agricultural Growth: The Future of Indian Agriculture, IndiaAI, Dr. Nivash Jeevanandam, December 18, 2024.

[76]Intelligent Inputs: Revolutionising Agriculture, Naman Agrawal and Himanshu Agrawal, NITI Aayog, Government of India, September 2021

[77]Design and Study of Smart Irrigation System Using Photovoltaic Cells Based Smart IoT System and Weather Prediction System for Energy and Water Conservation in India, Dushyant Raj Chaudhary et al., National Institute of Electronics and Information Technology (NIELIT), Aurangabad, 2025.

Reimagining healthcare and life sciences in the AI era

India's healthcare sector is also undergoing a rapid digital transformation, with the health tech market projected to reach USD 35.8 billion by 2030[78]. Digital health services alone are projected to more than double—from USD 12.2 billion in 2023 to USD 25.6 billion by 2027[79] driven by advances in medical devices, diagnostics, and AI-powered platforms.

Among the earliest adopters is radiology, a data-intensive domain where AI is accelerating image interpretation and disease detection[80]. The Ni-kshay program[81], for instance, utilises AI to screen chest X-rays for tuberculosis, significantly reducing time to diagnosis[82]. Similarly, research at demonstrates that AI-based radiomics are enhancing early detection of cancers through CT, MRI, and PET imaging, improving diagnostic accuracy and clinical outcomes[83].

Another frontier is digital pathology, where AI is helping address a critical resource gap India has only 5,500 MD pathologists serving over 300,000 laboratories[84]. AI-supported diagnostic platforms are emerging to fill this void, particularly in rural and underserved regions, enabling scalable and timely diagnostics. Beyond clinical applications, AI is also streamlining administrative processes, such as Electronic Health Record (EHR) management, replacing manual data entry and facilitating health system integration.

Together, these developments signal a shift toward precision medicine, data-driven public health, and inclusive healthcare delivery, positioning AI as a strategic lever in India's broader health and innovation agenda. Following are the Workforce implications:

Table 8-Emerging job roles and associated skills

Role level	Description	Skills required
Radiologists and Pathologists	Shift to AI-assisted diagnostics and decision support systems	AI tool Interpretation, Model validation
Diagnostic Assistants	Transition to AI tool operation, data annotation and quality control	Operating diagnostic AI platforms
Lab Technicians	Automation of repetitive tasks and sample processing	AI supported lab equipment usage
Health Record Clerks	Decline in manual data entry, automation through Electronic Health Record systems	HER platform navigation, data validation
Health Data Managers	Oversight of large-scale health informatics and AI-driven analytics	Data governance, cybersecurity
Nurses and ASHAs	Use of AI-enabled remote monitoring and diagnostics	Knowledge of using AI-based health apps
Insurance underwriters	Risk profiling automated via AI	Fluency in multilingual AI tool fluency

India's key sectoral landscape is undergoing a deep technological transformation. As AI and automation reshaped workflows, redefine value chain, and alter productivity benchmarks, the demand for a digitally capable, adaptive, and future people forces become non-negotiable. From sunrise sectors like clean energy and electronic to traditional domains like agriculture and logistic the speed and scale of change are unprecedented. But this transformation is only as effective as the talent that drives it. The next frontier, therefore, lies in preparing India's workforce to just not respond to this disruption but to lead it.

[78]Technology Will Play Pivotal Role in Addressing Gaps in India's Healthcare Sector, B Capital, November 2023

[79]AI Adoption in Indian Healthcare Sector Will Create Almost 3 Million Jobs by 2028, IndiaAI, February 2024.

[80]Achieving Greater Connectivity in Radiology Through Digitization and AI, GE HealthCare India, March 2023.

[81]Ni-kshay" combines two Sanskrit words—Ni (end) and Kshay (tuberculosis)—symbolizing India's goal to eliminate TB by 2025.

[82]India's 100-Day TB Elimination Campaign: A Decisive Step Towards Ending Tuberculosis, Press Information Bureau, Government of India, December 2024

[83]Artificial Intelligence Enabled Radiomics for Quantitative Imaging Biomarkers and Prediction Model Development in Radiology: Improving Early Cancer Diagnosis Through Technology, India Science, Technology & Innovation Portal, Dr. Syrpailyne Wankhar (AIIMS Bhopal), 2023–2026.

[84]Ibid



SECTION 5: SKILLING, GOVERNANCE AND TALENT MOBILITY

As AI moves from niche innovation to widespread deployment across industries, the key question is no longer whether it will transform work, but how prepared we are for that transformation. For India, this shift unfolds at a moment of unique convergence: the world's largest youth population, a rapidly digitising economy, and growing global demand for AI-skilled talent. It calls for a rethinking of how we skill, how we govern, and how we globally position India's workforce in the age of intelligent machines.

Global demand and shortage for skilled workforce in AI

There is an increasing demand globally for skilled workforce in AI specifically in sectors that are automating and are at the forefront of adopting AI. AI-related job postings have increased by 21 percent every year since 2019, and compensation for AI roles has risen by 11 percent annually during the same period[85]. Yet this demand far outpaces supply. By 2027, AI job openings in India are projected to exceed the available talent pool by 1.5 to 2 times[86]. This is both an opportunity and a challenge, for reskilling and upskilling.

Globally it is estimated[87] in:

- United States: By 2027, up to half of all AI-related job openings in the U.S. may remain vacant. Research estimates that demand could surge past 1.3 million roles in the next two years, whereas available talent may fall short at under 645,000 suggesting the reskilling need for as many as 700,000 American workers.
- Germany: The country may face one of the most severe talent shortages in AI, with approximately 70 percent of positions potentially going unfilled by 2027. Although demand is expected to reach between 190,000 and 219,000 jobs, the local talent pool stands at only 62,000 professionals, highlighting a critical reskilling imperative.
- United Kingdom: By 2027, the U.K. could experience a talent deficit exceeding 50 percent in the AI domain. The available AI workforce is estimated at 105,000, while demand could climb to 255,000 roles, underlining a substantial shortfall.
- Australia: A shortage of over 60,000 AI experts is projected by 2027. With workforce availability at around 84,000 professionals and anticipated demand reaching up to 146,000 roles, strategic reskilling initiatives are vital.

India, with its abundant young and skilled workforce, has the potential to fill significant portions of these labour gaps, especially in high-demand areas, such as healthcare, technology, engineering, and green energy. Additionally, India has been a consistent source of global migration and constitutes the world's largest diaspora meaning a large part of skilled workforce requirement globally is met by India.



[85] Widening Talent Gap Threatens Executives' AI Ambitions, Bain & Company, Sarah Elk, March 2025.

[86] Ibid

[87] AI: The Ambitions Are Bold, but the Talent Is Scarce, Bain & Company, February 2025

Global opportunities for talent mobility

Increasing demand and lack of skilled workforce in AI and allied sector has prompted countries to compete for skilled professionals.

- The UK, Germany, Singapore, UAE, Canada, and the U.S. have introduced targeted visa pathways (e.g., Tech.Pass, Golden Visa, AI Action Plans, Blue Card) aimed at attracting skilled AI professionals.
- These reforms are being accompanied by AI Centres of Excellence, digital skills accelerators, and public-private skilling partnerships.

Importantly, demographic trends in advanced economies are accelerating this shift:

- Japan, South Korea, and many EU countries are experiencing population ageing and shrinking labour forces.
- 2050, more than 40 percent of Japan's population[88] and nearly a third of the EU's[89] will be above 60 years old, creating long-term talent shortages, and would impact AI-enabled sectors like robotics, diagnostics, and smart infrastructure.

India has a strategic edge here: a young, scalable, and tech-savvy workforce, which can be matched with global needs through a focus on international certifications, globally aligned credentials, and cross-border employability.

To capitalise on this, India must:

- Expand international collaborations on skills recognition
- Align domestic skilling standards with global frameworks
- Facilitate skill mobility agreements with major destination countries
- Promote bilateral partnerships in emerging areas, such as AI governance, digital trust, and talent flow management

AI labour market is now global, mobile and highly dynamic and countries need to either create or attract talent to mitigate risk of falling behind in economic competitiveness. India's success in preparing its workforce for the AI era must be seen in the context of a globally competitive talent race. The focus must now expand beyond training, to include international certifications, industry aligned credentials and global awareness, ensuring that Indian talent is not only skilled but also has a global demand and recognition.

Skilling India for the AI era

The Government of India's vision of 'AI for All', driven by policy commitment to democratise technology, reflects the nation's ambition to embed artificial intelligence into every facet of economic and social development.

[88]2023 Population Projection Press Release, Ministry of Health, Labour and Welfare (Japan), April 21, 2023.

[89]European Commission Report – The Impact of Demographic Change in a Changing Environment

- Recognised globally as a leading hub of AI capability, India ranks among the top four countries in Stanford University's Global AI Vibrancy Index and holds the largest global share 24 percent of AI-related projects on GitHub[90].
- Anchoring this momentum is the IndiaAI Mission, a strategic framework launched in March 2024 with seven foundational pillars to promote innovation, skilling, research, and a safe, inclusive AI ecosystem.
- Under this mission, initiatives like the IndiaAI Innovation Centre have spurred the development of domestic foundation models aligned with India's unique needs, while the Digital India Bhashini platform expands vernacular accessibility through advanced language technologies across 22 Indian languages.

Government collaborations with academia and industry, such as the Srijan Centre for Generative AI at IIT Jodhpur and the YuvAI skilling initiative with AICTE are building future-ready talent and open-source innovation.

- Complementing these are nation-wide programmes like FutureSkills PRIME, CERT-In's AI-driven cybersecurity upskilling, and the Visvesvaraya PhD Scheme, all designed to nurture an inclusive pipeline of skilled professionals.
- Notably, in alignment with the National Education Policy (NEP) 2020, AI education is being introduced from as early as Class 6, with a structured curriculum that includes AI literacy, coding, and ethics to prepare students for the digital future.

By embracing both opportunity and responsibility, India is positioning itself not only as a global AI leader but as a steward of safe and equitable technological advancement.

Challenges and the road ahead

National level challenges in creating AI equipped workforce

AI is poised to reshape India's labour market, with projections indicating an impact on 38 million jobs by 2030. At the same time, it is expected to drive productivity gains of 2.61 percent in the organised sector and 2.82 percent in the unorganised sector, underscoring its cross-cutting relevance. As per the Future of Jobs Report 2025, skill gaps are the primary barrier to business transformation (63 percent of employers).

Despite India's demographic and institutional advantages, several structural challenges persist:

- Vocational training penetration remains low: Only 26.1 percent of youth and 34.7 percent[91] of the working-age population access formal skilling.
- Industrial Training Institutes (ITIs), although over 15,000[92] in number, often lack updated curricula, especially in emerging domains, such as AI, robotics, and automation.
    - Many ITIs are yet to integrate digital or AI literacy, limiting their ability to provide entry-level job readiness for modern manufacturing, logistics, and service sectors.
    - Strengthening and upgrading ITI particularly in Tier 2 and 3 regions can become a critical enabler of inclusive skilling and employment pipelines.

[90]Government of India Expands AI-Driven Skilling -Press Release, Press Information Bureau, Government of India, July 2025.

[91]Annual Report: Periodic Labour Force Survey (PLFS) 2023–2024, Ministry of Statistics and Programme Implementation, Government of India, September 2024.

[92]Press Release, Press Information Bureau, Government of India, July 2025.

- Gender disparities in access to training further widen the skill gap.
- The half-life of skills is now less than five years and as low as 2.5 years in some tech domains rendering many qualifications quickly obsolete[93].
- With 90 percent of India's workforce in informal employment, delivering structured, future-proof skilling at scale remains a massive logistical challenge.

These realities highlight the need for accelerated, industry-aligned, and inclusive skilling models that can not only bridge existing gaps but also anticipate the skill sets of tomorrow's workforces.

Challenges for global mobility of talent

India has several natural advantages when it comes to creating strong workforce of skilled AI. There are 2 million STEM students, who graduate every year annually, the largest in the world after China. It is home to over 1700[94] Global Capability Centres (GCC) of which many focuses on AI, data analytics and R&D. According to a report[95], GCCs in India are now responsible for USD 76 billion in direct output and employ over 2.1 million people. They play a pivotal role in areas like product design, AI development, and advanced analytics, and are expected to exceed 2,400 in number by 2030[96]. In India, AI job opportunities may surpass 2.3 million by 2027. With the talent pool projected to grow to about 1.2 million professionals, the country may need to upskill or reskill over 1 million individuals to bridge the gap.

However, this edge comes with critical gaps. In China for example AI research and output has surpassed that of the U.S., UK and EU combined. India risk falling behind unless it rapidly scales it ecosystem[97]. U.S. on the other hand continues to attract the world best AI professional supported by sustained investment, top rank Universities and robust ecosystem for startup and research as highlighted in previous sections. According to QS World Ranking 2025, five of the top ten institution in AI and data science are based in the U.S., consolidating its global lead in AI education and research. In contrast India needs to take lead at all levels starting from basic AI based education at school level to researchers and expert in higher education.

This duality of immense opportunity and urgent preparedness underscores India's strategic edge but also exposes critical skilling gaps. India's higher education must work in tandem with industry and skill development institutions. While the country has the potential to become a global powerhouse for AI-driven talent and innovation, this potential can only be realised through targeted, scalable, and inclusive skill development initiatives. The next phase of India's workforce strategy must therefore focus on equipping its people not only with technical proficiency, but also with the adaptability, creativity, and critical thinking that AI-era jobs demand.

Bridging todays gaps, anticipating tomorrow's needs

As India and the World navigate the AI powered transformation of work, equipping the workforce with right skills, governance framework and global mobility pathway is no longer optional, it is essential. While this section presents and integrated view of the current skilling and talent ecosystem it may not capture all future trajectories or disruptions, which are ongoing and evolving.

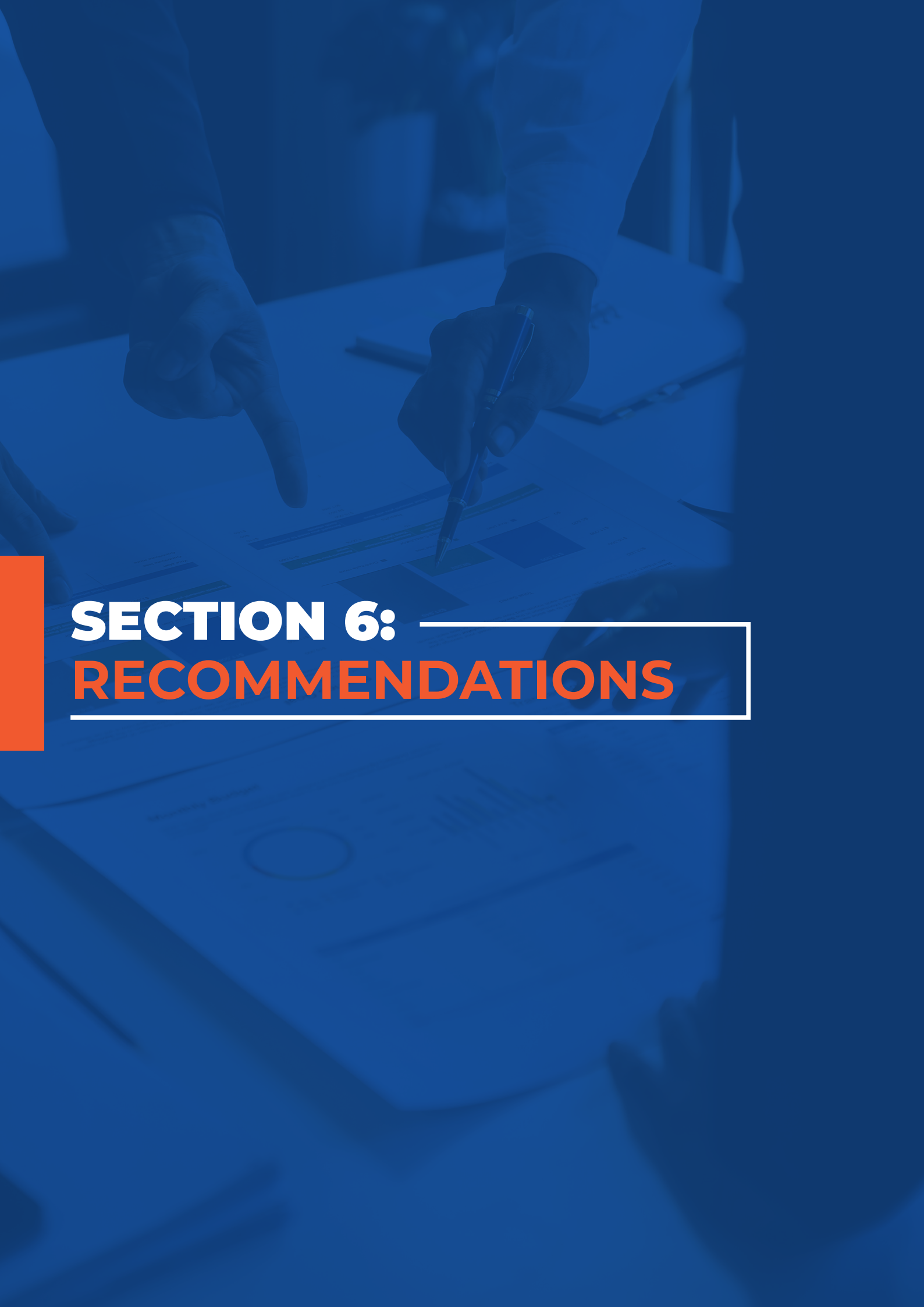
[93]AI Puts the Squeeze on the Shrinking Half-Life of Skills, Forbes, Joe McKendrick, April 30, 2024.

[94]Press Release, Press Information Bureau, Government of India, July 2025.

[95]GCC 3.0: Positioning India as the Global R&D Hub – A Strategic Trend Analysis, NASSCOM, July 2025.

[96]India's AI Talent and Job Market Outlook, NASSCOM and BCG, 2025.

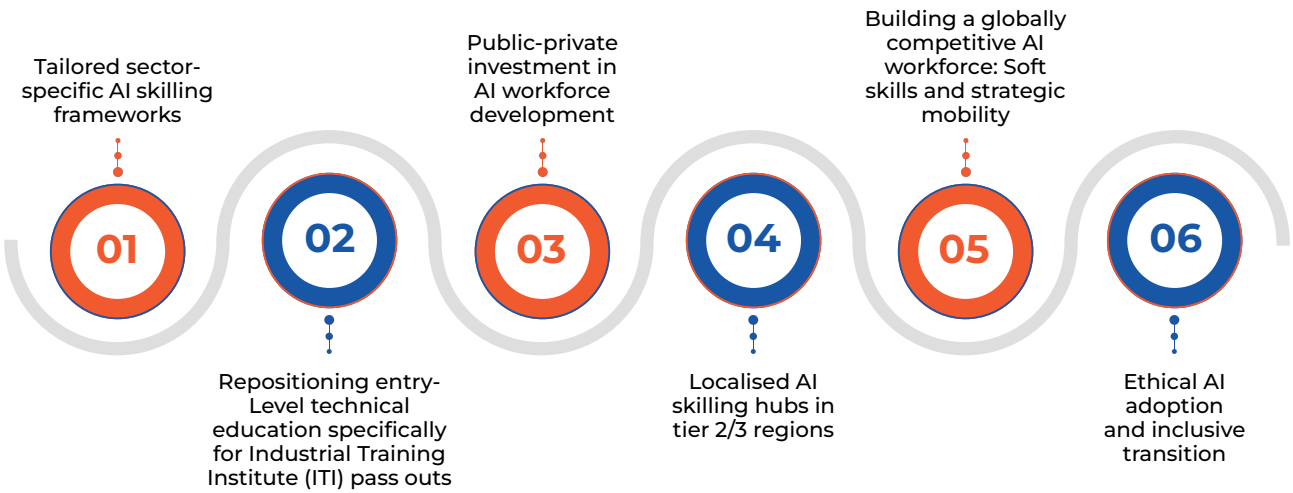
[97]China Produces More AI Research Than US, UK, and EU Combined, Elsevier, April 2024.



SECTION 6:
RECOMMENDATIONS

The global transition from Industry 4.0 to Industry 5.0 marks a paradigm shifts from automation-driven efficiency to human-centric, sustainable innovation. While Industry 4.0 focused on robotics, IoT, and cyber-physical systems, Industry 5.0 emphasises co-creation between humans and intelligent machines, inclusive innovation, and resilience. This evolution demands not just digital fluency but also emotional intelligence, ethics, and adaptability across the workforce. This next phase reimagines the workforce not just as factor in production but as co-pilot in intelligence driven systems. As the pace of AI adoption accelerates, workforce transformation is longer optional, it is fundamental to economic competitiveness. The following key recommendations have emerged from extensive secondary data analysis and in-depth interviews with industry experts.

Key recommendations



Tailored sector-specific AI skilling frameworks

Why it matters: AI's impact is not uniform across sectors. To ensure workforce readiness and minimise displacement, AI skilling must align with each sector's technological maturity, job profiles, and priority use cases. For example, healthcare needs training in data governance and diagnostic AI; manufacturing demands skills in predictive maintenance and robotics; agriculture calls for precision farming and AI-driven yield optimisation.

Industry insights show uneven AI adoption: While healthcare and IT services are leveraging AI for R&D and analytics, some manufacturing units (e.g. solar panel assembly lines) still rely on basic automation with few AI use cases. Indeed, certain service industries like BPO have achieved up to 80 percent productivity gains through AI chatbots, whereas traditional sectors lag far behind. This highlights that a one-size-fits-all approach is ineffective – sector-specific skilling frameworks are essential to meet unique industry needs and to capture sectoral opportunities without leaving lagging sectors behind.

Industry insights also reveal uneven AI adoption: While healthcare is actively leveraging AI for R&D and manufacturing, solar panel manufacturing units remain focused on automation and have yet to explore AI use cases. This highlights that a one-size-fits-all AI solution is ineffective sector-specific inputs and frameworks are essential to address unique industry needs.

Action:
Develop sectoral skilling roadmaps co-created with industry, academia, and government. These should align job roles and training modules with sectoral AI maturity, tech stack, and workforce profile.

Key implementing agencies:

- MSDE– Coordinate national sectoral skilling roadmaps and funding support
- SSC- Lead curriculum design validation tailored to sectoral AI applications

- NCVET– Align AI content with certification standards and QPs/NOS
- AICTE/UGC- Integrate AI modules into technical and higher educational framework
- Industry Chambers (FICCI and others) supply industry specific AI use case study and ensure industry alignment

Priority – High

Repositioning entry-Level technical education specifically for Industrial Training Institute (ITI) pass outs

Why it matters: India's vast network of over 15,000 ITIs[98] produces millions of entry-level technicians, but many programmes lag in emerging technologies like AI, robotics, and automation. This gap leaves graduates underprepared for modern roles in manufacturing and logistics, where AI-driven machinery demands higher technical proficiency. Industry experts note a growing trend of ITI-trained workers being replaced by diploma holders and engineers, not due to basic knowledge gaps but due to lack of training in AI-machine interfaces. Upgrading ITI curricula with contextual, tech-focused modules is critical not just to prevent obsolescence, but to create inclusive pathways into the formal AI-powered workforce, especially in smaller towns. Fast-growing sectors like electronics manufacturing have seen a 50 percent jump in employment[99] with AI adoption, but these new jobs increasingly favor more skilled candidates unless ITIs modernise quickly.

Action:

- Modernise ITI curriculum with AI-augmented operations, basic coding, and human-machine collaboration modules
- Introduce short-term AI-readiness bridging courses for existing ITI students
- Incentivise industries to retain ITI workforce by co-investing in AI upskilling
- Create pathways for transfer from ITI to polytechnic to engineering colleges

Key Implementing Agencies:

- DGT– Lead modernisation of ITI curriculum and implement AI-ready modules
- NCVET– Approve revised training standards and certification aligned with AI competencies
- State Skill Development Mission (SSDMs): Roll out short term AI bridge courses and promote mobility pathways
- AICTE/Technical Universities– Develop transfer framework from ITI to polytechnic and engineering institution

Priority – High

Public-private investment in AI workforce development

Why it matters: To fully harness India's demographic dividend in the age of AI, strategic public-private investment in workforce development is not just beneficial-it is essential. Industry experts report that fresh engineering graduates often require six to nine months (≈1000 hours) of additional training to become productive in roles, due to limited hands-on exposure during college. It's no surprise, then, that while 88 percent of Indian enterprises Recognise AI's transformative potential, only 3 percent feel they have a sufficiently skilled workforce to implement it. This talent deficit calls for accelerated skilling programmes to skill as well upskill both new and existing workers at scale. Public-private co-investment is crucial here: The scale of training needed (millions of workers) and the fast-evolving nature of AI tech require pooling resources and expertise. By partnering with industry, the government can ensure curriculum relevance and employment outcomes, while industry can benefit from government support in expanding training infrastructure.

[98]Annual Report, Ministry of Skill Development and Entrepreneurship (MSDE), Government of India, 2024.

[99]GCCs in India: Economic Impact and Growth Projections, Zinnov and NASSCOM, 2025.

Action:

- Launch stackable credential-based reskilling programmes through NSDC and Sector Skill Councils
- Make AI mandatory part of course curriculum at every level
- Create institutionalised network and partnership with industry
- Create co-funded skilling programmes where industry funds curriculum design and placement guarantee, while government subsidizes delivery via Skill India Digital Platform
- Expand the 'earn while you learn' model for AI roles in logistics, automotive, and services

Key Implementing Agencies:

- National Skill Development Corporation (NSDC)- Lead the design and implementation of stackable credential-based AI skilling programme
- SSC- Develop sector specific AI curriculum
- MSDE- Enable nationwide rollout and fund sharing mechanism for AI skilling
- Skill India Digital Platform (SIDH)- Anchor delivery of hybrid and co-funded learning modules along with conducting awareness campaign

Priority - High

Localised AI skilling hubs in tier 2/3 regions

Why it matters: India's AI revolution must be inclusive; it cannot be confined to big-city tech centres or elite institutions. Tier-2 and Tier-3 cities, which are home to a large share of India's youth, often lack the infrastructure and exposure needed for AI skill development.

Already, we see stark contrasts: About 65 percent of urban workers use digital platforms, compared to just 25 percent in rural areas, even though 70 percent of the workforce lives in rural India. This disparity in digital access and skills can translate into inequality in the AI era. Experts we interviewed underscored that "talent exists across India, but infrastructure and exposure don't." In other words, many rural youths have the aptitude and interest but lack local avenues to acquire AI skills in a context and language they understand. Training that is grounded in local context (including vernacular languages) is crucial to ensure these populations can participate in and benefit from AI-driven growth. By establishing localised AI skilling hubs, we can empower regional talent, spur local innovation (e.g. AI solutions for agriculture, local languages, small businesses), and mitigate the risk of AI exacerbating regional inequalities. Equitable workforce development is not just a social imperative but an economic one – India cannot afford to leave half the country behind in the journey to an AI-powered economy.

Action:

- Establish AI Skilling and Application Labs in regional education and skilling institutions, co-located in industrial clusters or state-run training centres to provide hands-on learning with real-world datasets and use cases
- Design regional language enabled AI modules to improve accessibility and ensure cultural relevance, especially for rural learners
- Partner with local industries to co-develop short-term deployment-focused programmes and contextual use-case projects
- Deploy blended learning models (digital + mentor-led) to maximise reach without compromising quality

Key Implementing Agencies:

- MSDE– Coordinate national rollout of AI skilling hubs and ensure policy alignment with regional skilling goals
- SSDMs- Identify local clusters, implement training centres, and align programme with state specific economic priorities
- AICTE/UGC- Ensure integration of AI modules in affiliated regional technical institutions and promote regional based curriculum design

Priority – High

Building a globally competitive AI workforce: Soft skills and strategic mobility

Why it matters: India aspires to be a global AI talent hub, leveraging its ~2 million annual STEM graduates and ranking among the top 4 globally in AI talent vibrancy. However, to fully capitalise on this potential, India must produce well-rounded professionals equipped not only with technical expertise but also with the human-centric skills and global readiness demanded by Industry 5.0.

As AI automates routine tasks, the premium shifts to creativity, complex problem-solving, ethical reasoning, emotional intelligence, and teamwork. Our analysis shows that the half-life of technical skills is now less than five years (and as low as ~2.5 years for some tech domains), making continuous learning and interdisciplinary adaptability essential for long-term employability. Industry experts emphasise the need for AI professionals who can apply their skills across domains–such as blending computer vision with agricultural science to develop smart farming solutions–and collaborate effectively in multicultural environments.

Simultaneously, AI talent is becoming a strategic global asset. Countries like Canada, Germany, the UK, Singapore, UAE, Australia, and the U.S. are liberalising visa regimes and launching tech talent programmes to address acute shortages. For example, Germany may fill only 30 percent of its AI vacancies by 2027. This presents a major opportunity for India to evolve from a tech talent source into a strategic exporter of AI professionals–mapping global demand, aligning training to international standards, and enabling smoother mobility. Without a proactive strategy, India risks brain drain and missing the global AI moment.

Action:

- Embed soft skills and emotional intelligence into all AI skilling modules, with measurable outcomes
- Foster cross-disciplinary programmes that blend AI with healthcare, agriculture, sustainability, and design
- Map global demand and future trends for AI, data science, cybersecurity, and digital infrastructure roles using real-time labour analytics
- Develop globally aligned AI skilling modules, including cross-cultural readiness, digital credentialing, and regulatory understanding of data/AI use abroad
- Create AI Skill Passports or interoperable credentials to showcase Indian graduates' competencies across jurisdictions, aligned with OECD and UNESCO frameworks
- Negotiate talent mobility tracks in FTAs, bilateral labour pacts, and global forums (e.g., G20, ILO) for AI and digital governance roles
- Streamline emigration policies to support faster, safer, and skill-aligned outmigration of AI professionals

Key Implementing Agencies:

- AICTE/MSDE- Shift from checklist-based inclusion to outcome-based frameworks for soft skills and interdisciplinary integration. Incentivise institutes demonstrating applied capabilities (e.g., capstone projects blending AI with public health)
- Ministry of Education (MoE)- Drive faculty development and interdisciplinary research incentives across HEIs, especially state universities
- Universities and HEIs- Establish interdisciplinary innovation labs and minor degree programmes (e.g., AI + Social Work)
- Ministry of External Affairs (MEA)- Lead diplomatic tracks for skill recognition and mobility agreements
- NSDC International and MeitY- Map demand and align international skilling programmes
- Ministry of Skill Development and Entrepreneurship (MSDE)- Integrate global mobility modules in domestic training
- Ministry of Labour and Employment- Oversee regulatory frameworks for outbound talent

Industry chambers (NASSCOM, FICCI) Facilitate employer linkages and real-time market mapping

Priority - High

Ethical AI adoption and inclusive transition

Why it matters: As organisations rush to adopt AI, there is a risk that technology advancement could outpace our social safeguards. The bigger challenge, however, is ensuring that AI-driven transformation does not deepen existing inequalities - be they digital, gender-based, or regional. If AI adoption focuses narrowly on tech and profit, it may sideline considerations of accessibility and fairness. India's own experience with digital infrastructure (e.g. UPI for payments, Aadhaar, DigiLocker) shows that inclusive design can empower hundreds of millions; we need to carry the same ethos of openness, accessibility, and trust into the AI era.

Conversely, a purely tech-centric approach could worsen divides - for instance, automating processes without retraining staff could displace workers, or deploying AI in English could exclude non-English speakers. Moreover, neglecting responsible AI practices (like transparency, explainability, privacy, and safety) can have dire consequences: Biased algorithms could discriminate against marginalised groups, or opaque AI in critical areas (healthcare, welfare decisions) could erode public trust. In a country as diverse as India, ethical AI use is not a luxury, it's a necessity to prevent "algorithmic divide" alongside the digital divide. There is also a need for a forward-looking policy framework to govern AI and automation impacts - much like other regions (EU, etc.) are doing - tailored to India's context of large-scale public deployments and diverse user base.

Action:

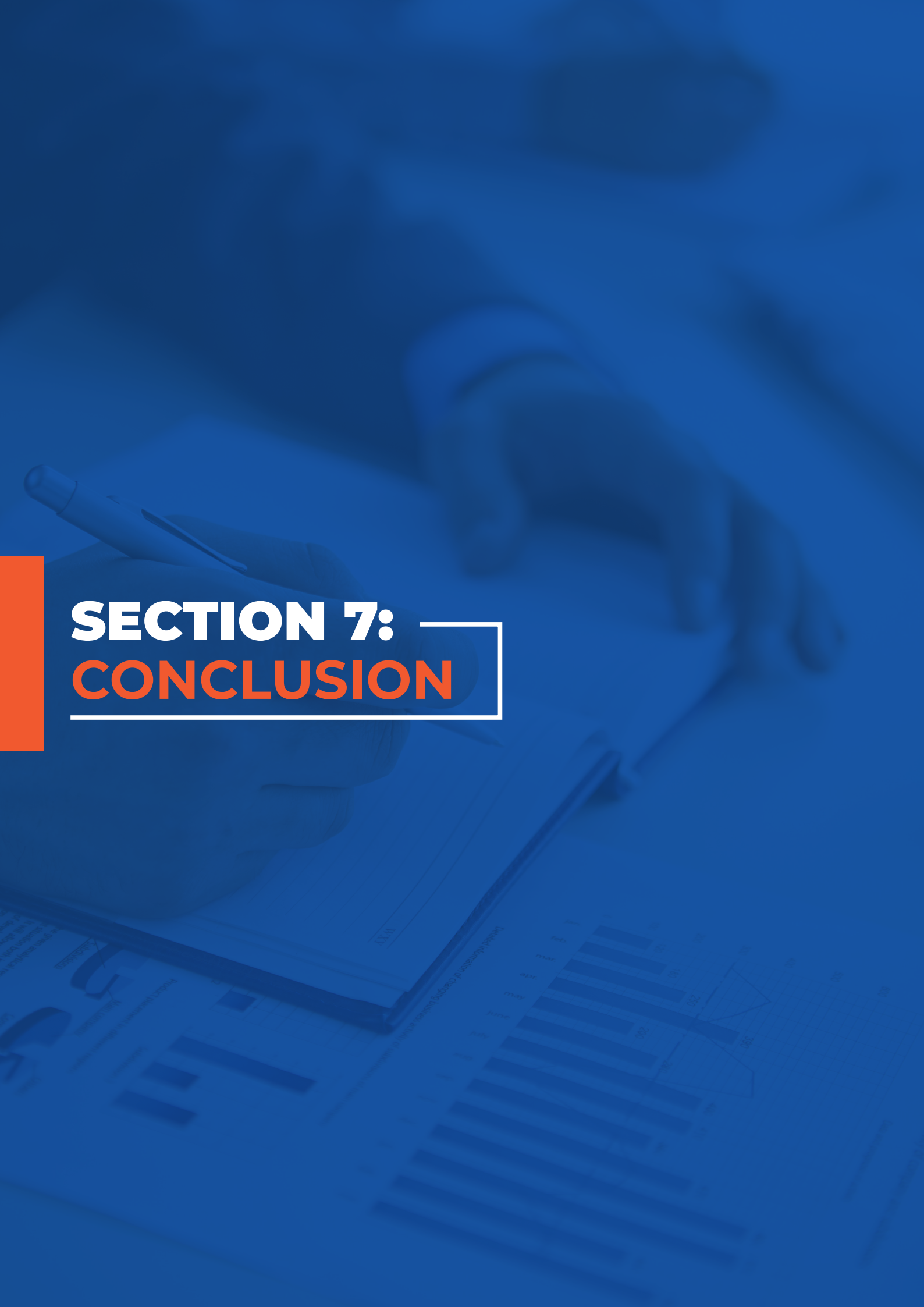
- Develop India-specific ethical AI standards, aligned with constitutional values and modelled after global best practices, such as the EU's AI Act and UNESCO's AI ethics framework. These should guide both AI usage and AI skilling curriculum
- Mandate ethical literacy and data responsibility modules in all AI skilling and digital literacy programmes especially for public sector deployments and DPI-linked applications
- Ensure representation of women, rural, and informal workers in AI skilling pipelines through targeted outreach, financial support, and community-led training models
- Promote use of AI in local languages and contexts, ensuring accessibility across India's diverse population particularly for low-literacy and non-English-speaking users
- Institutionalise grievance redressal and audit mechanisms in AI systems used for governance, welfare delivery, and education to safeguard citizen rights

Key Implementing Agencies:

- MeitY- Lead development of India specific ethical AI standards and coordinate inter-ministerial framework for safe and inclusive AI deployment
- MSDE– Embed ethical AI, data responsibility and grievance redress modules into all public skilling programmes, especially those linked to Digital Public Infrastructure
- NCERT and AICTE- Integrate ethics and literacy in schools and higher education curricula to build early awareness of safety and accountability
- Ministry of Social Justice and Empowerment (MoSJE) and Ministry of Rural Development (MoRD)- Ensure representations of rural, informal and marginalised workers in AI skilling pipelines through inclusive delivery models and outreach.

Priority – High





SECTION 7: CONCLUSION

India stands at a defining moment in its economic and technological journey. As the world accelerates towards Industry 5.0 a future that demands not only smart machines but also smart, ethical, and agile humans our demographic dividend can become our greatest asset or our most urgent liability.

This report highlights that while India's current stage of automation is still evolving, this very lag offers a rare opportunity: the ability to shape our workforce from the ground up for a future-ready, AI-integrated economy. Rather than retrofitting skills in response to disruption, India can proactively embed AI fluency, ethical awareness, and adaptability into every rung of its skilling ladder from ITIs to engineering colleges, from school curricula to MSME clusters.

Moving forward, India must embrace a multi-layered strategy: one that blends digital infrastructure with human investment, leverages public-private innovation, and builds in ethical safeguards from the start. The window of opportunity is narrow, but the possibilities are immense. A skilled, ethically grounded, and context-aware AI workforce can be India's true competitive edge in the global economy. Now is the time to act.

Interviewees and acknowledgement

The team is grateful to all who actively participated in this study and the information they provided. First and foremost, we would like to thank industry leaders/experts who made time to not only give us in – depth interviews but also shared their invaluable and rich experience. Without such enthusiastic and holistic contributions from all participants, the study would not have achieved its goals.

Industry Experts	FICCI	KPMG in India
Mr. Bijay Sahoo Group President- Strategic HR, Chairmans Office Reliance Industries Limited	**Dr. Rajesh Pankaj** Director and Head – Education Skills	**Mr. Narayanan Ramaswamy** National Leader - Education and Skill Development, Government and Public Services, KPMG in India
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Established in 1927, Federation of Indian Chambers of Commerce and Industry is the largest and oldest apex business organization in India. A non-government, not-for-profit organization, FICCI is the voice of India's business and industry. FICCI has direct membership of over 3000 corporate, including SMEs and MNCs, as well as public sectors and more than 500 chambers of commerce and business associations, and an indirect membership of companies from regional chambers of commerce. FICCI espouses the shared vision of Indian businesses and speaks directly and indirectly for over 250,000 business units. FICCI maintains the lead as the proactive business solution provider through research, interactions at the highest political level and global networking.

FICCI works closely with the government on policy issues, enhancing efficiency, competitiveness and expanding business opportunities for industry through a range of specialized services and global linkages. It also provides a platform for sector specific consensus building and networking. FICCI has a national network with 20 states. Partnerships with 77 countries across the world carry forward our initiatives in inclusive development, which encompass health, education, livelihood, governance and skill development.

FICCI serves as the first port of call for Indian industry and the international business community. Our presence is in regions such as Africa, Arab, Israel, Asia Pacific, East Asia, Europe, Latin America, the Caribbean, North America, South Asia, etc. FICCI is also involved with diaspora engagement, forum of parliamentarians, Commonwealth of Independent States (CIS), multilateral, international policy, and strategy.

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