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Ideate · Innovate · Impact

Harnessing AI: Pioneering change for an empowered tomorrow

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Foreword by PwC

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As AI continues to advance, its impact on industries and businesses remains wide ranging. Today, companies are faced with concerns not only around business model reinvention but also with respect to how AI can be adopted in the best possible manner.

In this paper, we present insights than can help businesses prepare for an impactful future. We start with understanding AI's economic influence, followed by how it is transforming markets. Next, we address the necessity of building frameworks around ethical, secure and responsible AI to harness the growth of AI adoption. Additionally, we present certain collaborative models and recommendations to highlight the benefits of partnerships. We also emphasise the importance of having a skilled workforce.

We hope this report helps the larger community with their AI transformation aspirations.

Message from PwC

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In today's rapidly evolving world, leaders must skilfully navigate both the opportunities that AI offers and the responsibilities it entails. This paper presents a comprehensive outlook and insights to understand the impact of AI and harness its potential.

As we highlight in this report, it is important to understand AI's economic impact in India and across the world. To do so, we've explored different models to bring out the benefits of AI adoption from partnerships. We've also addressed the concerns surrounding new-age technologies and the ethical ramifications of what goes into building and incorporating them through certain frameworks.

With this report, we hope to assist the community of solvers, decision makers, educators and innovators working towards building a competitive advantage in the evolving AI landscape.

Foreword by ASSOCHAM

Manish Singhal
Secretary General
ASSOCHAM

AI is reshaping the global economy on an unprecedented scale. Generative AI alone is projected to add considerable value for the future.

For India, the opportunity presented by AI is immense with sectors such as healthcare, retail, education, financial services and IT-enabled business services accounting for nearly 69% of this growth. This highlights India's strong potential to harness AI across multiple high-impact industries.

At ASSOCHAM, we believe India's AI journey must be anchored in responsible and inclusive adoption. By partnering with PwC and through our dedicated AI Taskforce, this report offers a comprehensive roadmap to unlock AI's potential ethically and effectively.

As one of India's leading industry bodies, ASSOCHAM presents this report as a strategic contribution towards advancing responsible AI adoption. It aims to catalyse informed dialogue among policymakers, guide ethical and competitive innovation within the business community, and support the development of governance frameworks that balance progress with accountability.

This report also reflects ASSOCHAM's broader commitment to global collaboration and inclusive growth. By fostering partnerships across industry, government and civil society, we aim to position India as a trusted leader in the global AI ecosystem – where technology serves not just economic goals, but also societal well-being.

This report is the joint effort of ASSOCHAM's AI Taskforce and PwC India. I extend my sincere gratitude to our partners at PwC and the members of the ASSOCHAM AI Taskforce, whose experience and insights have been invaluable to this effort. We hope this report will inspire actionable steps and deeper collaboration across all sectors as we move towards a shared AI-powered future.

Message from ASSOCHAM

Sandip Patel
Chair, ASSOCHAM National Taskforce on
Artificial Intelligence

AI is no longer a distant frontier – it is a defining force of our present and a transformative driver of our future. From revolutionising business models to reshaping citizen services, AI holds the potential to unlock inclusive growth, national competitiveness and societal progress at scale.

India stands at the cusp of this transformation. We are home to one of the world's most dynamic digital ecosystems – powered by a skilled workforce, bold policy interventions and a thriving entrepreneurial landscape. The opportunity before us is immense to harness AI not only for productivity and innovation but to solve some of our most complex challenges, from healthcare access and agricultural sustainability to education equity and urban development.

Realising this vision demands more than technology alone. It calls for a shared national effort where **industry, government, enterprises, startups** and **academia** come together to build an AI ecosystem that is:

- **practical** – focused on real-world outcomes and scalable impact
- **responsible** – rooted in transparency, fairness, and trust
- **embeddable** – seamlessly integrated into core operations and public systems.

This ASSOCHAM–PwC report reflects the urgency and opportunity of this moment. It offers actionable insights for all stakeholders – from policymakers shaping digital infrastructure to enterprises driving innovation on the ground.

ASSOCHAM's AI Taskforce is committed to accelerate this journey by enabling dialogue, partnerships and responsible deployment of AI across all sectors. We envision a future where AI strengthens India's position as a global innovation hub – while delivering tangible value to every citizen, business and community.

The path forward is not without its challenges. However, with shared intent and inclusive collaboration, we can ensure that the promise of AI becomes a transformative force for national development and human progress.

01

Economic impact and adoption of AI

In recent years, the advent of transformers, large language models (LLMs) and generative AI (GenAI) has played an increasingly important role in boosting productivity and economic growth. Worldwide competition has been fierce with global leaders – the US and Asia – emerging with multiple LLMs, vastly improving efficiencies in business processes across industries. Whether analysing large datasets in less time, ideating to create new products and services or assessing markets to make key strategic decisions – AI has already made an impact.

However, every disruption comes with challenges. Economists warn that the current trend of rapid adoption could lead to the creation of super firms – hubs of wealth and knowledge – which may have detrimental effects on the wider economy. Plus, job displacements and shifts in skill requirements will become significant if not tackled in time. The shifts in knowledge, wealth and jobs might lead to an imbalance and reduce wages, which in turn will limit the spending power of consumers, thereby causing an economic slowdown.

1.1

Economic impact of AI: An overview of the global vs India landscape

Recent market research studies have estimated that the addition of GenAI alone has the potential to add trillion of dollars annually to the global economy – an amount which is comparable with the gross domestic product (GDP) of any large country. Additionally, recent studies have projected that broadly, AI could contribute up to USD 15.7 trillion[1] to global GDP by 2030. In India alone, opportunities involving AI are enormous. AI has driven steep upward trends across various indicators – ranging from its projected contribution of USD 15.7 trillion to global GDP by 2030,[2] to the tens of billions of devices it has powered since 2020 and its expanding user base. Between October 2022 and April 2025, the number of ChatGPT users went up to 800 million, and the platform made more than USD 4 billion in revenue, making it one of the biggest success stories of the technology sector.[3]

However, despite the potential, India's AI spend is only approximately 1.5% of the global AI spend.[4] To be a leader in the space, this needs to be improved considerably. Although recent trends such as the AI Mission (2024)[5] – which allocates approximately INR 10,0000 crore over a five-year planned period to build shared AI infrastructure (approx. 18,000 GPUs) – and data resources suggest that India is rapidly moving ahead to close the gap, strong government initiatives, investor sentiments and mass digitisation efforts are needed to continue to fuel growth. In addition to the government's efforts, private organisations are also stepping up to further India's position in the global AI landscape. NASSCOM AI Adoption Index 2024 notes that Indian companies are increasingly integrating AI. Most of the organisations today fall in the category of enthusiasts willing to experiment and pick up relevant skillsets or people who are still adopting AI. Large players in manufacturing, media, telecom and healthcare have moved the needle to the 'expert' stage.

In short, global AI impact is running into multi-trillion dollars, and India is an integral part of this journey following a similar trajectory by leveraging a young IT workforce, booming startup scene and recent policy initiatives.

1 https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

2 https://www.orfonline.org/research/a-i-the-world-and-india-present-trends-and-future-directions

3 Ibid.

4 https://nasscom.in/knowledge-center/publications/ai-adoption-index-20-tracking-indias-sectoral-progress-ai-adoption

5 https://pib.gov.in/PressReleasePage.aspx?PRID=2012375

1.2

Changes in the overall markets and economic value projections

The global AI market is expanding at a breakneck pace. The predicted compound annual growth rate (CAGR) stands at 26.6%.[6] This reflects AI adoption across software, cloud services, hardware and analytics. In venture capital (VC) funds, inflows are funding new data centres, chip production and startup growth. FY 2024-25 saw a record USD 100+ billion in global VC investment in AI companies (which is nearly an 80% jump from 2023).[7] The capital market is rapidly repricing technology. Leading tech firms' valuations have soared due to AI breakthroughs, and new specialised AI companies are emerging. This market growth also seems to indicate large productive gains.

6 https://www.statista.com/outlook/tmo/artificial-intelligence/worldwide

7 https://news.crunchbase.com/venture/global-funding-data-analysis-ai-eoy-2024/#:~:text=Breakout%20year%20for%20AI,-One%20thing%20was&text=Funding%20to%20AI%2Drelated%20companies,global%20funding%20year%20of%202021

1.2.1 Global perspective

Present

AI is fundamentally transforming market dynamics by automating processes, facilitating predictive analytics and creating entirely new product categories. Companies that use AI exhibit significantly higher profit margins compared to their industry counterparts, while startups that are native to AI attract considerable VC funding. On the other hand, traditional industries are experiencing disruptions as AI diminishes barriers to entry and empowers more agile competitors.

Consumer behaviour is also shifting considerably as an increasing number of individuals rely on AI-driven recommendations and anticipate personalised experiences. Competition is increasingly focused on algorithmic advantages rather than conventional differentiators – prompting companies to invest heavily in AI capabilities.

Market consolidation is taking place around firms that possess superior data assets and the ability to deploy AI effectively. The competitive landscape now showcases rapid cycles of innovation, with AI significantly shortening product development timelines – compelling even established companies to embrace more experimental strategies to remain relevant.

Emerging

AI-driven products and services are witnessing significant growth, resulting in a considerable global market. Platform business models are prevalent, with leading AI platforms capturing substantial market value through network effects and advantages in data accumulation. These platforms increasingly operate as innovation ecosystems, where third-party developers contribute applications while the platforms maintain control over data and distribution.

At the same time, data has transformed into a strategic asset that drives competitive advantage, with most executives prioritising data strategy. Companies are transitioning from product-centric to data-centric business models, focusing on monetising insights rather than just their offerings.

Cross-industry partnerships are emerging to integrate complementary data assets, while concerns regarding data monopolies are intensifying. AI-as-a-service models are making access more democratic, with subscription-based AI solutions expanding rapidly, allowing smaller entities to utilise capabilities that were once exclusive to technology giants.

Future

Economic forecasts indicate that AI will significantly contribute to the global GDP by 2030, driven by both enhancements in productivity and effects on consumption. Corporate earnings in sectors heavily reliant on AI are expected to outpace those in traditional industries in the coming decade. By 2030, the consumer surplus generated from products and services enhanced by AI could amount to trillions of dollars annually – mainly due to reduced costs, time savings and improved quality.

Economists anticipate that AI could facilitate substantial productivity growth, potentially mitigating the productivity stagnation observed since the early 2000s.

We appear to be approaching an economic turning point – akin to past revolutions in general-purpose technologies such as steam power, electricity and computers – which had similar transformative effects on economic frameworks.

Nevertheless, the distribution of economic value is likely to be highly uneven, with early and effective adopters reaping disproportionate rewards, which may further intensify inequality among companies, sectors and nations.

1.2.2 India perspective

Present

AI is reshaping the market landscape in India, as numerous large enterprises are now adopting AI strategies. The e-commerce sector has experienced significant growth, fuelled by AI-driven recommendation systems and inventory management optimisation.

Digital payments facilitated by AI-secured platforms are witnessing rapid increases in adoption. In the healthcare sector, AI diagnostics are catering to millions of patients each year, while the agricultural sector is benefiting from substantial yield enhancements through AI-optimised farming methods.

The IT services industry has shifted its focus towards AI services, demonstrating robust growth. Transportation systems in major urban areas have alleviated congestion through AI-integrated routing solutions.

The banking sector has automated a considerable number of operations using AI, leading to significant cost reductions. Consumer adoption of AI assistants has surged to hundreds of millions of users, and educational technology platforms are using AI to tailor learning experiences for students across the nation.

Emerging

Indian enterprises are progressively utilising AI to address conventional limitations across sectors. Manufacturing productivity has been enhanced through AI-driven predictive maintenance and quality assurance. In the retail sector, inventory expenses have been reduced by employing AI demand forecasting. Customer service departments are managing a greater volume of inquiries at a reduced cost due to AI assistants. Small enterprises that have embraced AI platforms are exhibiting higher growth rates compared to their counterparts.

In the agricultural sector, AI soil analysis and crop recommendation systems have led to increased incomes for farmers in the regions where they are implemented. Healthcarer providers leveraging AI diagnostic technologies are able to process patients quickly and provide more accurate diagnoses. The government's digital initiatives have incorporated AI to enhance the efficiency of service delivery.

Organisations that adopt AI-enabled process automation report significant reductions in operational costs, while also achieving quicker time-to-market for new products and services.

Future

Economic analyses indicate that AI has the potential to significantly enhance India's GDP by 2035, which could lead to an increase in annual economic growth rates. The manufacturing sector may experience considerable value addition through operations optimised by AI, while the healthcare sector could achieve notable advancements through more accurate diagnoses and treatments. Agriculture, which employs a substantial segment of India's workforce, is likely to witness significant productivity improvements. The services sector is expected to secure a considerable share of the economic advantages brought by AI, driven by improved productivity and enhanced global competitiveness.

Projections for the labour market suggest that numerous new positions will arise in relation to the implementation and management of AI – although traditional jobs may be subject to automation. India's demographic advantage presents unique opportunities during this transition, characterised by a youthful population that is becoming increasingly proficient in digital skills. For a successful economic transformation, it will be essential to coordinate investments in digital infrastructure, skill enhancement and regulatory frameworks that are specifically designed to suit India's distinct market conditions.

1.3

Sectoral penetration of AI

AI adoption varies widely by industry. Globally, financial services and technology sectors lead in AI usage because of abundant data and clear returns on investment (RoIs). Energy, manufacturing and industrials have lagged due to legacy systems and regulations. Many global banks alone stand to gain hundreds of billions from AI. Emerging industries such as healthcare and education are also ramping up AI applications (in diagnostics and personalised learning, respectively) – albeit from a lower baseline.

In India, sectoral trends suggest that banking, financial services and insurance (BFSI) is a leader in AI adoption (68% of banks/financial firms using AI in FY24-25), followed by the technology/IT sector (60–65%).[8] Furthermore, pharma and healthcare companies have had a 52% adoption rate, and fast-moving consumer goods (FMCG)/retail about 43%. By contrast, manufacturing and automotive firms reported only ~28% adoption, and infrastructure/transport only ~21%. The media and entertainment sector has had the lowest uptake i.e. ~11%.

Table 1 highlights these numbers, reflecting each sector's maturity and focus – service sectors with digital business models are already ahead of the curve, while labour-intensive or regulated sectors are moving more slowly. Indian enterprises typically pursue AI for cost and efficiency gains – this is cemented by the fact that 'optimising operations' is cited as a top driver for AI projects.[9] In many mature Indian firms, AI use is still focused on automating processes – such as fraud detection in banking or predictive maintenance in telecom sectors.

Table 1. Sector-wise AI penetration (global vs India)

Sector	Global AI adoption	India AI adoption
Financial services	Very high (35% of firms are AI leaders)	68% of firms
Technology	Very high (~46% of firms are AI leaders)	60–65% of firms
Healthcare and pharma	Moderate (growing AI R&D and diagnostics)	52% of firms
Retail and consumer	Moderate (AI in analytics and logistics)	43% of firms
Manufacturing	Low (industrial AI still emerging)	28% of firms
Infrastructure and transport	Low (initial pilots in logistics/energy)	~21% of firms
Media and entertainment	Low (limited to recommendation engines)	~11% of firms

Sources: The Fearless Future: 2025 Global AI Jobs Barometer, PwC; 2025 AI Business Predictions, PwC

These penetration patterns highlight where AI's economic impact is the strongest. Finance and technology sectors take the lead in this aspect, driving gains in productivity and customer service. Sectors like manufacturing and transport, although slower, are beginning to experiment with the same to gauge adoption advantages (e.g. quality inspection using AI, intelligent traffic systems). There seems to be a growing consensus in the market, corroborated by Indian industry surveys which note that companies need clearer RoI metrics – many have active proofs-of-concept but hesitate to move to scaled production.

AI is already permeating data-rich sectors rapidly, indicating that imminent economic value will likely be concentrated in areas with the highest levels of adoption. Understanding these sectoral differences will be key for policymakers and leaders planning AI investments and workforce skilling.

8 https://invest.up.gov.in/wp-content/uploads/2024/05/AI-adoption_130524.pdf

9 https://community.nasscom.in/communities/data-science-ai-community/top-applications-artificial-intelligence-business

02

Ethical, responsible and secure AI

Apart from focusing on advancing technologies to build a competitive advantage, it is also essential to ensure that these technologies respect human rights and are not misused. This is where ethical AI and responsible AI (RAI) come in. While ethical AI ensures fairness, transparency and privacy, RAI involves governance and accountability. Furthermore, secure AI stresses on the importance of including security and data protection into AI.

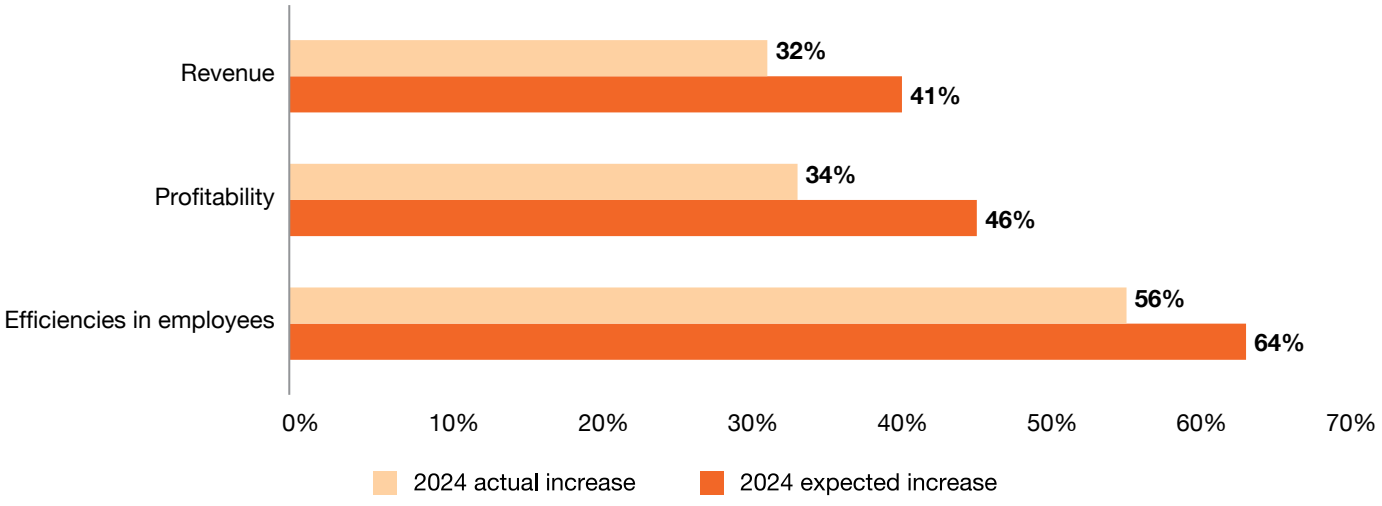
Together, these three pillars – ethical, responsible and secure AI – serve as the essential foundation for building trustworthy AI.

Due to increasing reliance on AI for decision making, the importance of trustworthy AI is growing as well. About 86% of Indian CEOs expect AI to reshape business in the next five years.[10] However, there also exists a trust gap, with only about one-third of the global CEOs reporting a high confidence in AI's reliability and just 10% of Indian executives feeling truly confident for the same. Such gaps underline why ethics and security are crucial and reflect the need for responsible, explainable AI which can add significant value – without amplifying biases or inequities.

Moreover, global trends echo this narrative. With the advent of GenAI, 70% of executives believe it will significantly change how businesses create and capture value.[11]

CEO predictions about the impact of GenAI in 2024-25 turned out to be slightly optimistic.

Figure 1. To what extent did GenAI increase or decrease the following in your company in the last 12 months? (showing only % who answered, 'Increase significantly,' 'Increase moderately' and 'Increase slightly')



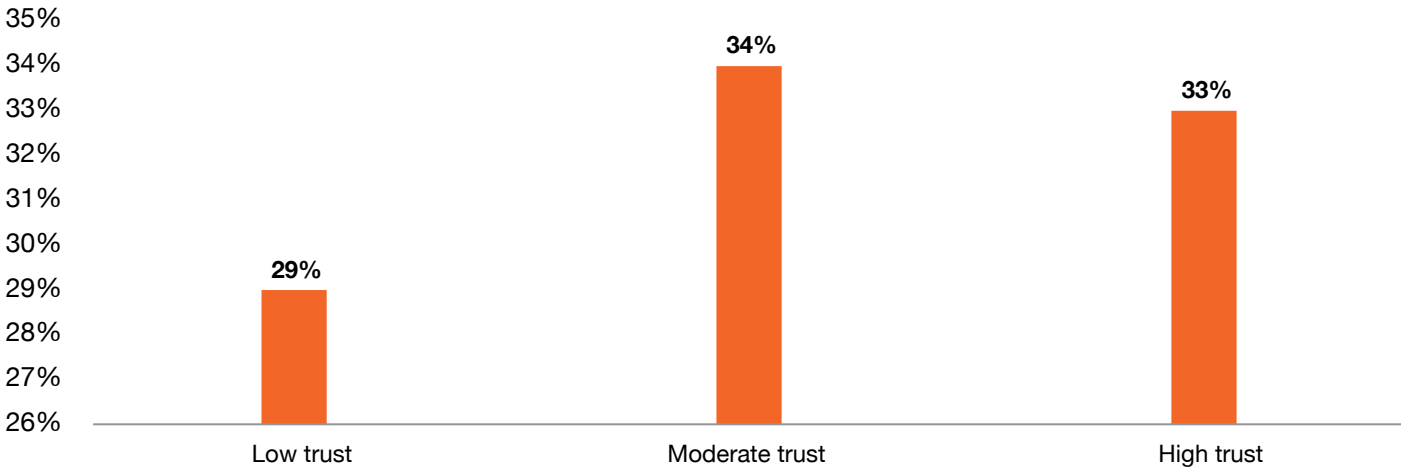
Source: PwC's 27th and 28th Annual Global CEO Surveys

10 https://www.pwc.com/gx/en/ceo-survey/2025/28th-ceo-survey.pdf

11 https://www.pwc.com/gx/en/issues/c-suite-insights/nextgen.html#:~:text=NextGen%20show%20remarkable%20alignment%20with,creates%2C%20delivers%20and%20captures%20value

Yet widespread concerns remain, as 92% of the leaders see security vulnerability as a primary obstacle and 89% cite regulatory uncertainty as a barrier to AI adoption.[12] Nearly a third report a low degree of personal trust in having AI embedded into key processes.

Figure 2. To what extent do you personally trust having AI (including GenAI) embedded into key processes in your company?



Note: Low trust is the sum of 'Not at all or to a very limited extent' and 'To a limited extent'; moderate trust is 'To a moderate extent'; high trust is the sum of 'To a large extent' and 'To a very large extent'.

Source: PwC's 28th Annual Global CEO Survey

In response to these concerns, policymakers worldwide are issuing ethical guidelines. The OECD **AI Principles** explicitly promote 'innovative and trustworthy AI that respects human rights and democratic values'.[13] The **EU AI Act (2024)** imposes transparency and risk requirements on AI systems, especially generative models.[14] Furthermore, NITI Aayog's **Responsible AI for All** initiative articulates national ethics principles – including safety, equality, privacy, transparency and accountability – grounded in the Indian legal context.[15]

Building AI that is ethical, responsible and secure is both urgent and difficult. Industry leaders need to balance this opportunity with caution. However, only a small fraction is fully prepared for the attendant risks – for instance, 53% of India executives and 36% of global executives have admitted the lack of a formal approach for identifying AI risks, with a mere 33% of Indian executives feeling confident about complying with the emerging AI regulations.[16]

12 https://www.pwc.com/gx/en/issues/c-suite-insights/nextgen.html#:~:text=NextGen%20show%20remarkable%20alignment%20with,creates%2C%20delivers%20and%20captures%20value

13 https://oecd.ai/en/ai-principles#:~:text=The%20OECD%20AI%20Principles%20promote,stand%20the%20test%20of%20time

14 https://www.pwc.in/industries/technology-media-and-telecommunications/trusted-ai-ethics-and-responsible-ai-in-generative-systems.html#:~:text=The%20importance%20of%20transparency%20and,Before%20many%20of%20the

15 https://www.niti.gov.in/sites/default/files/2022-11/Ai_for_All_2022_02112022_0.pdf

16 https://www.pwc.in/consulting/technology/data-and-analytics/with-ai-s-great-power-comes-great-responsibility.html

2.1

Key challenges in AI adoption

With the evolution of AI, organisations have encountered a myriad of challenges related to its adoption, which span across ethical, technical, regulatory and cultural concerns. Some of these have been outlined in Table 2.

Table 2. Challenges in AI adoption

Challenge	Issues
Data privacy and security	• Security vulnerabilities – such as cyber intrusions, data leaks and adversarial attacks – have been highlighted by many Indian executives as the primary AI obstacle.
Algorithmic bias and fairness	• India's cultural diversity amplifies the risks associated with AI implementation as tackling bias of any sort would require data diversity and rigorous fairness testing. • AI models generally inherit biases in training data, leading to discriminatory outcomes. For example, facial recognition can misidentify women and minorities. Hiring algorithms may favour male candidates.
Explainability and transparency	• As tools and technologies emerge, AI is increasingly becoming a 'black box' which makes it harder to explain AI decisions to stakeholders. About 58% of Indian executives have outlined 'lack of understanding of how AI arrives at a decision' as a roadblock. • Without explainability, organisations struggle to justify automated decisions (e.g. credit denials), thereby undermining trust of their stakeholders.
Regulatory and governance	• Nearly 89% of Indian leaders see regulatory uncertainty as a challenge and 67% of Indian companies have admitted to being unsure about AI compliance obligations. • The Digital Personal Data Protection Act, 2023, and forthcoming AI policy have further added compliance complexity.
Workforce and cultural readiness	• About 35% of executives in India cited insufficient AI knowledge as a barrier. Only one-third of the CEOs said they will integrate AI into their workforce or skills strategies. • Workforce readiness with GenAI has become even more challenging as employees are concerned about bias or misuse. Furthermore, scepticism about the future requires training, cross-functional teamwork and change management.

Challenge	Issues
Technical integration and robustness	• Legacy systems and data silos hamper AI adoption. About 50% of the leaders have highlighted this as a roadblock as they grapple to integrate AI within their existing systems. • Although AI models should be designed to be secure and private, it is difficult to ensure model robustness and security. Poor data quality or insufficient volume can also undermine model performance.
Trust and accountability	• Trust is a key factor in ensuring the success of AI implementation. If an AI model behaves unpredictably, user confidence will diminish. Therefore, companies must demonstrate accountability through validation and audit trials. Without clear responsibility, errors or biases will be difficult to monitor. • Currently, only about 10% of Indian executives trust AI completely.

Sources: With AI's great power comes great responsibility, PwC; PwC's Responsible AI – AI you can trust, PwC

2.2

Frameworks for trustworthy AI

To overcome the challenges mentioned above, there are certain principles around which frameworks can be built and adopted by organisations.

Such frameworks may include a comprehensive open-source toolkit that includes metrics and algorithms to detect and mitigate bias in machine learning models. These frameworks focus on fairness and transparency in AI applications.

With a robust RAI framework, companies can embed ethical and security considerations from strategy through execution, building trust in AI solutions. This will result in higher **AI adoption** and confidence.[17]

- **India's Responsible AI (AI for All) Principles** outline the broader principles for AI management – addressing safety and reliability, equality, inclusivity and non-discrimination, privacy and security, transparency, accountability and protection of positive human values.[18] Organisations can choose to align their AI initiatives with these principles and anticipate future regulations to operationalise them.
- **The RAI framework adopted by organisations can also help address industry-specific guidelines** published by various sectors – e.g. safety standards for industrial AI leveraged by manufacturing companies, and interpretable AI guidelines in the finance industry. Furthermore, in the banking sector, the Reserve Bank of India (RBI) has signalled upcoming norms on data localisation and AI use in banking. Organisations should thus actively monitor sectoral regulations (in sectors like finance, healthcare, defence) and ensure that their AI governance covers all domain-specific risks.

17 https://www.pwc.in/assets/pdfs/consulting/technology/data-and-analytics/with-ai-s-great-power-comes-great-responsibility.pdf#:~:text=scalable%20deployment%20of%20AI%20solutions,to%20develop%20and%20implement%20AI

18 https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf

2.3

2.3 Actionable recommendations for leaders

Distinctive and visionary leadership in this era of AI/GenAI is essential in order to propel growth in organisations. Here are some recommendations for the leadership to consider:

1. **Establish governance and accountability:** AI risks need to be owned, and appointing a cross-functional AI team for governance and accountability can prove useful. This team would perform end-to-end oversight of AI projects – from approving new use cases to monitoring deployed models. Furthermore, establishing formal policies (e.g. an AI ethics code) would mandate risk assessments before project launch.

2. **Integrate RAI frameworks early:** This would enable the systematic assessment of AI projects. For example, run a pre-deployment RAI diagnostic that checks off the five RAI dimensions (governance, bias, explainability, security, ethics). This practice would prevent issues which might become liabilities later.

3. **Strengthen data governance and privacy:** Robust data management can be enforced by companies by applying privacy-by-design principles – i.e. anonymise personal data when possible, minimise data collection and secure data stores, maintain an inventory of data assets used for AI, and ensure they comply with the local/global laws.

4. **Mitigate bias and ensure fairness:** This can be achieved using both organisational measures and technical tools. Organisational measures include assembling diverse AI teams to design and review models and encouraging domain experts to participate in model development. Technical measures include tools to leverage fairness-testing libraries to detect disparities in model outcomes for different groups.

5. **Enhance explainability and transparency:** To achieve this, companies can develop explainability standards for each AI application. For high-stakes decisions, they can use interpretable models when feasible – or apply explainable AI methods to neural nets. Furthermore, technical teams can document model logic and data lineage thoroughly which can be used to communicate clearly to stakeholders to explain how AI is used.

6. **Embed security from day one:** Security must be integrated into the AI lifecycle. This means rigorous cybersecurity for data pipelines and models. To ensure security from day one, organisations need to regularly test models against adversarial inputs and use secure development practices (code reviews, dependency checks) for AI software. A robust system can include implementation of intrusion detection on AI servers and restricting model access, and continuous monitoring of AI systems in production for unusual behaviour. Such practices will not only protect assets but also restore customers' trust in AI's integrity.

7. **Cultivate an AI-ethical culture:** Beyond rules and technology, companies must foster a culture that prizes ethical AI use. This involves training and awareness programmes – every employee (not just data scientists) should learn basic AI ethics principles and safe usage guidelines. The framework should emphasise empowering the workforce – ensuring employees know when and how to use AI tools safely.[19] By embedding ethical thinking into performance metrics and decision rights, companies make RAI everyone's responsibility.

Business leaders today must recognise the importance of building AI trustworthiness. This is fundamental to sustaining AI-driven value. By leveraging proper well-designed frameworks, organisations can systematically identify and address ethical issues and risks.

The recommendations above – from establishing leadership accountability and robust data governance, to fostering an ethical AI culture and collaborating on standards – provide the basis for a practical roadmap. In an AI-powered future, leaders who place trust at the heart of their strategy will unlock innovation while safeguarding customers, employees and society.

19 https://www.pwc.com/gx/en/issues/c-suite-insights/the-leadership-agenda/an-ai-trust-gap-may-be-holding-ceos-back.html#:~:text=2,is%20a%20key%20mandate%20of

03

Research and development and international collaboration

Breakthroughs in AI and GenAI have led to a surge in global investments in research and development (R&D) in recent years. Strategic collaboration has become essential now, as a lone company, university or country will not be able to master AI alone. Partnerships like these will help in building the capital and expertise needed for R&D and mitigating risks.

3.1

AI research frontiers and national priorities

Globally, GenAI and foundation models – enormous neural networks trained on massive datasets to perform tasks with minimal fine-tuning – are at the forefront of AI research. Additionally, universities and companies are building explainable models and fairness-checking tools. Research in RAI includes privacy-preserving methods such as federated learning, secure multi-party computation and robust safety-based models.

India's AI research output is relatively small globally and needs to grow. During 2018-23, only 1.4% of the top conference papers originated from India. India ranked 14th worldwide in AI research contributions.[20] However, significant efforts are being made to improve India's research output. The call for proposals on foundation models as part of India's 2024 'AI for India' mission drew over 187 applications by March 2025.[21] These proposals spanned LLMs and smaller domain-specific models, signalling a strong appetite to develop indigenous AI capabilities.

A key focus now would be to align the research trends with India's national goals (Table 3). India's 'AI for India 2030' initiative (a WEF–NASSCOM–government partnership) frames AI as a USD 500 billion economic opportunity – covering agriculture, healthcare, manufacturing and smart cities.[22]

20 https://economictimes.indiatimes.com/tech/artificial-intelligence/india-14th-in-ai-research-with-just-1-4-share-of-papers-study/articleshow/112554830.cms?from=mdr

21 https://timesofindia.indiatimes.com/science/indias-ai-mission-government-receives-187-proposals-for-domestic-ai-foundation-models/articleshow/119600701.cms

22 https://www.weforum.org/stories/2025/01/ai-for-india-2030-blueprint-inclusive-growth-global-leadership/#:~:text=With%20the%20potential%20to%20contribute,healthcare%2C%20urban%20planning%20and%20manufacturing

Table 3. AI research themes

Research theme	Relevance to industry/policy priorities
Foundation models/ GenAI	Innovation in digital services and media (AI assistants, content generation etc.); high-impact use cases in healthcare diagnostics, education, agriculture and climate changes etc. In India, multimodal LLMs that can translate educational materials into various languages and dialects, can boost growth and literacy.
Natural language processing (NLP)	Voice/text interfaces in Indian languages are core to Digital India's citizen services and commerce. NLP models can facilitate chatbots to boost efficiency and productivity of government helplines, administrative work etc. The government's BHASHINI mission targets a multilingual NLP development.
Computer vision and multimodal AI	AI-powered cameras and sensors can be leveraged to optimise production lines and monitor infrastructure in smart cities. AI can be a strong way to enhance urban planning and environmental monitoring. This will boost the implementation of Industry 4.0 technologies in the manufacturing sector.
Edge AI/internet-of-things	This would reduce reliance on continuous cloud connectivity and is key to solving rural connectivity gaps. Additionally, it would allow AI on low power devices for smart agriculture, remote healthcare and smart energy optimisation. The MeitY–NASSCOM CoE programme addresses these specific areas of execution.
Responsible and inclusive AI	This aligns with policies such as Digital India's emphasis on equitable access to ensure AI safety, bias removal and ethics that support inclusive growth.

Sources: PwC analysis, 2025 ; Business Today; The Global Partnership on Artificial Intelligence (GPAI)

Table 3 showcases India's innovation priorities – including urban efficiency, digital governance, farm productivity and healthcare access. These priorities are aligned with global AI research.

Examples of research work aligned with these innovation priorities are as follows:

- NLP in local languages that can boost Digital India and education
- AI-driven robotics and vision systems which boost 'Make in India' and smart manufacturing
- use of GenAI to analyse medical reports and generate treatment options, supporting National Digital Health initiatives.

Aligning R&D with national strategy as well as integrating AI into organisations' core strategy will ultimately drive value from AI investments.

3.2

International collaboration models

Some of the prominent collaboration models in the AI space include multilateral forums to bilateral pacts and industry consortia.

- **Multilateral initiatives (government-led)** focus on solving problems by involving multiple nations cooperating under one international framework – e.g. the Organisation for Economic Cooperation and Development (OECD)'s Global Partnership on AI (GPAI) and forums like G7/ G20 discussions. The GPAI brings together OECD and non-OECD countries to set AI principles and fund research projects. Benefits of this model include pooling of resources, a broader representation of the cohort and tackling global issues with widespread participation. At the 2024 GPAI Summit in New Delhi, ministers from dozens of countries 'committed to fostering trustworthy and human-centric AI through an inclusive, multi-stakeholder approach'.[23] However, some challenges remain as the need for consensus among diverse parties can slow down action and may lead to diversion from national interests.
- **Bilateral partnerships** refer to agreements between two countries. Such arrangements create a more agile and targeted system with better trust and shared strategic alignment. Let us consider the **India–UK** cooperation. This cooperation today has been strengthened via the Bilateral Science and Innovation Council. Another example is the **EU–India Trade and Technology Council** (TTC) which was launched in 2022. In 2025, this relationship was strengthened as the second ministerial meeting committed the EU AI Office and India's AI Mission, thereby deepening cooperation on **LLMs and RAI frameworks**.[24]
- In **public–private partnerships (PPPs)**, the focus is on the government, industry and academia. Herein, the benefits include accelerated commercialisation work, innovation and alignment of research with real-world needs.
- Finally, **academic and research consortia** stress upon the collaboration across universities and research institutes, fostering academic freedom and open publications which are essential for accelerated knowledge sharing.

While multilateral forums set norms, bilateral pacts help in pooling resources. Furthermore, PPPs will enable commercialisation, and a collaboration with academic institutions will fuel innovation. Therefore, a healthy AI ecosystem would use a balance of the above-mentioned models, leveraging them in an optimal manner.

23 https://gpai.ai/gpai-new-delhi-declaration-2024.pdf#:~:text=3,developed%20economies%20to%20this%20end

24 https://digital-strategy.ec.europa.eu/en/news/eu-and-india-deepen-strategic-engagement-second-trade-and-technology-council#:~:text=performance%20computing%20and%206G,for%20ethical%20and%20responsible%20AI

3.3

Recommendations for maximising collaboration

The following are some of the recommendations that can be followed by organisations and supported by the government. This will help to unlock the full potential of AI R&D partnerships:

- Foster open research and create a common knowledge base accessible to a larger community. This can be done by encouraging publication of research papers and release of open-source models/data that can be innovated or worked upon. Furthermore, publicly funded AI projects can add their results, findings and work into the open repository.
- Harmonise regulations by aligning data privacy, IP and export control rules.[25] Establishing mutual recognition of trusted models and aligning with ethical guidelines would let AI tools be used across borders more freely.
- Incentivise joint ventures with continued funding schemes for international R&D projects. Co-funding with partner countries can multiply impact on a global scale.
- Promote talent exchange by implementing scholarships and fellowships for cross-border AI research.
- Leverage standards and ethics by actively participating in international standards setting. For example, India could host or co-host AI interoperability hackathons under ISO guidelines or certify Indian AI products against global benchmarks.
- Ensure inclusive access by facilitating collaborations that bridge the digital divide. This may include shared AI infrastructure with developing nations and promoting AI use that addresses local needs (vernacular NLP, low-cost hardware, etc.).

The integration of international collaborations and R&D is essential for advancing with the next generation AI. Both governments and businesses must work together to expedite these advancements, while controlling risks using a combination of bilateral, multilateral and PPP models. Additionally, coordination with global research frontiers with a strategic national objective is important. Pragmatic technology transfer methods – such as open science, uniform IP contracts and harmonised regulations – are essential and will help to ensure that all stakeholders benefit from developments in AI.

The mandate for leaders is straightforward: Connect, cooperate and share. Active participation in the global AI ecosystem, whether through co-developing a generative model with foreign partners or contributing to an international AI safety standard, will play a key role in deciding who is at the forefront of the next wave of innovation.

25 https://gpai.ai/gpai-new-delhi-declaration-2024.pdf#:~:text=developed%20economies%20to%20this%20end%3B,Ministerial%20Declaration%2C%20where%20we%20stated

04

Education, awareness and workforce development

The evolution of AI and GenAI is not just limited to driving automation. It facilitates an increased workforce efficiency, plus an upward shift in the kind of work that the workforce is engaged in – suggesting a fundamental change in the very nature of the work across various sectors. AI-exposed sectors have witnessed a 4.8 times growth in labour productivity and 25% skills change.[26] Thus, there is a need for proactive and comprehensive measures to upskill, educate and develop the workforce for the future. This is recognised by the business leaders as well. A significant majority of CEOs (69%) anticipate that the pervasive influence of AI will necessitate the development of entirely new skill sets for a substantial portion of their employees in the next three years.[27] Hence, organisations are starting to see strategic investments mobilised into AI-related education and training programmes.

4.1

Empowering India for the AI-driven decade: Skilling for global competitiveness

The Indian workforce has demonstrated a notably higher degree of awareness for upskilling to maintain relevance and competitiveness in the evolving job market compared to their global counterparts. Nearly 62% of the Indian employees have anticipated significant change in the core skills required to do their jobs in the next five years.[28] Additionally, 69% of them have a clear understanding of the nature of these changes. Moreover, the Indian diaspora is optimistic about the potential positive impacts of AI, as 47% believe that the change will facilitate valuable new skills, and 37% foresee the creation of entirely new jobs as a direct result of AI.[29] Indian employees highlight the importance of both digital and green skills for the future. These points imply a broader understanding of the diverse skills required to align with the future job market, extending beyond the core AI competencies.

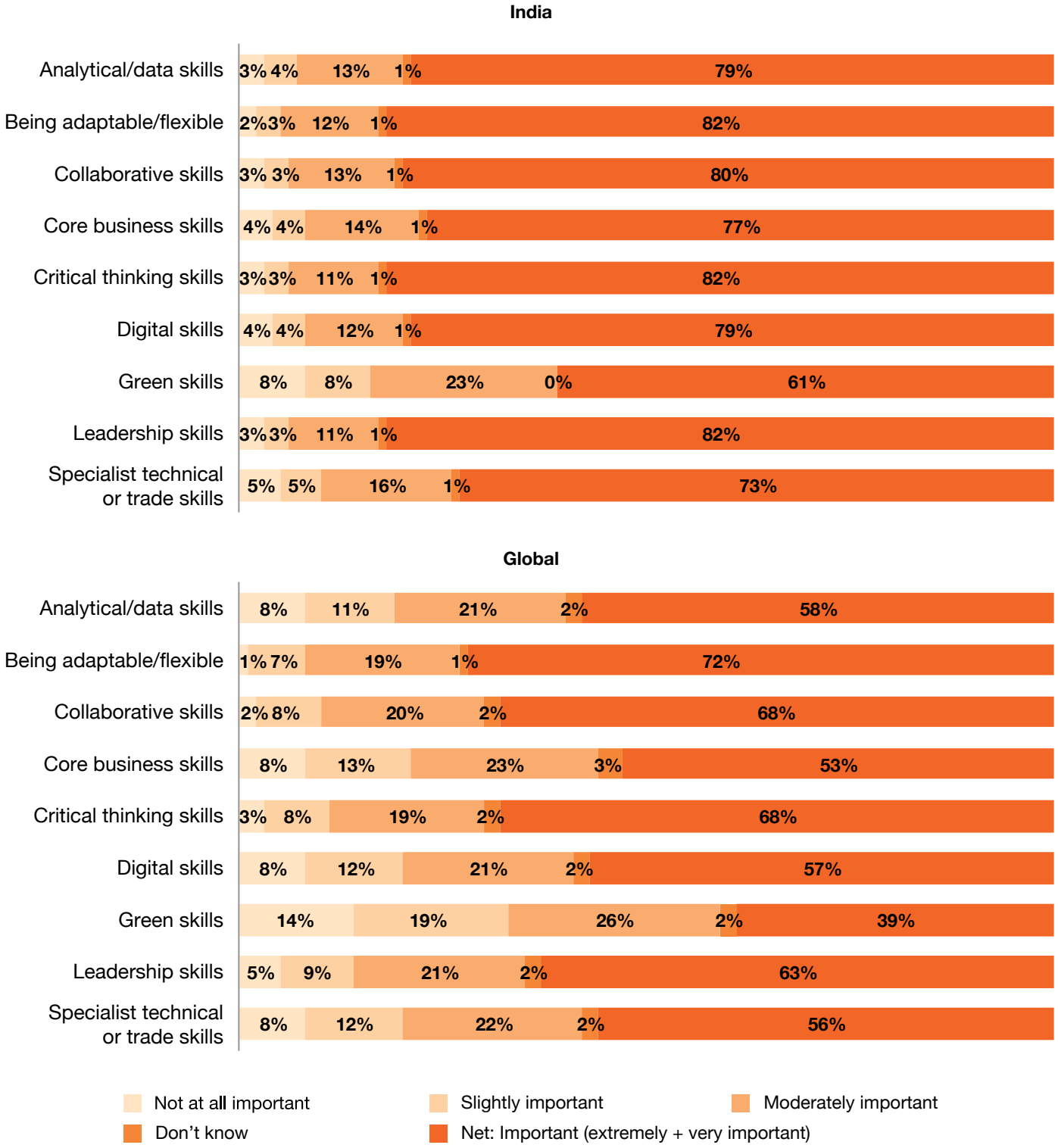
26 https://www.pwc.com/gx/en/issues/artificial-intelligence/ai-jobs-barometer.html#:~:text=AI%20is%20the%20Industrial%20

27 https://www.pwc.com/gx/en/ceo-survey/2024/download/27th-ceo-survey.pdf

28 https://www.pwc.in/india-workforce-hopes-and-fears-survey-2023.html#:~:text=62%25%20of%20India%20employees%20believe

29 Ibid.

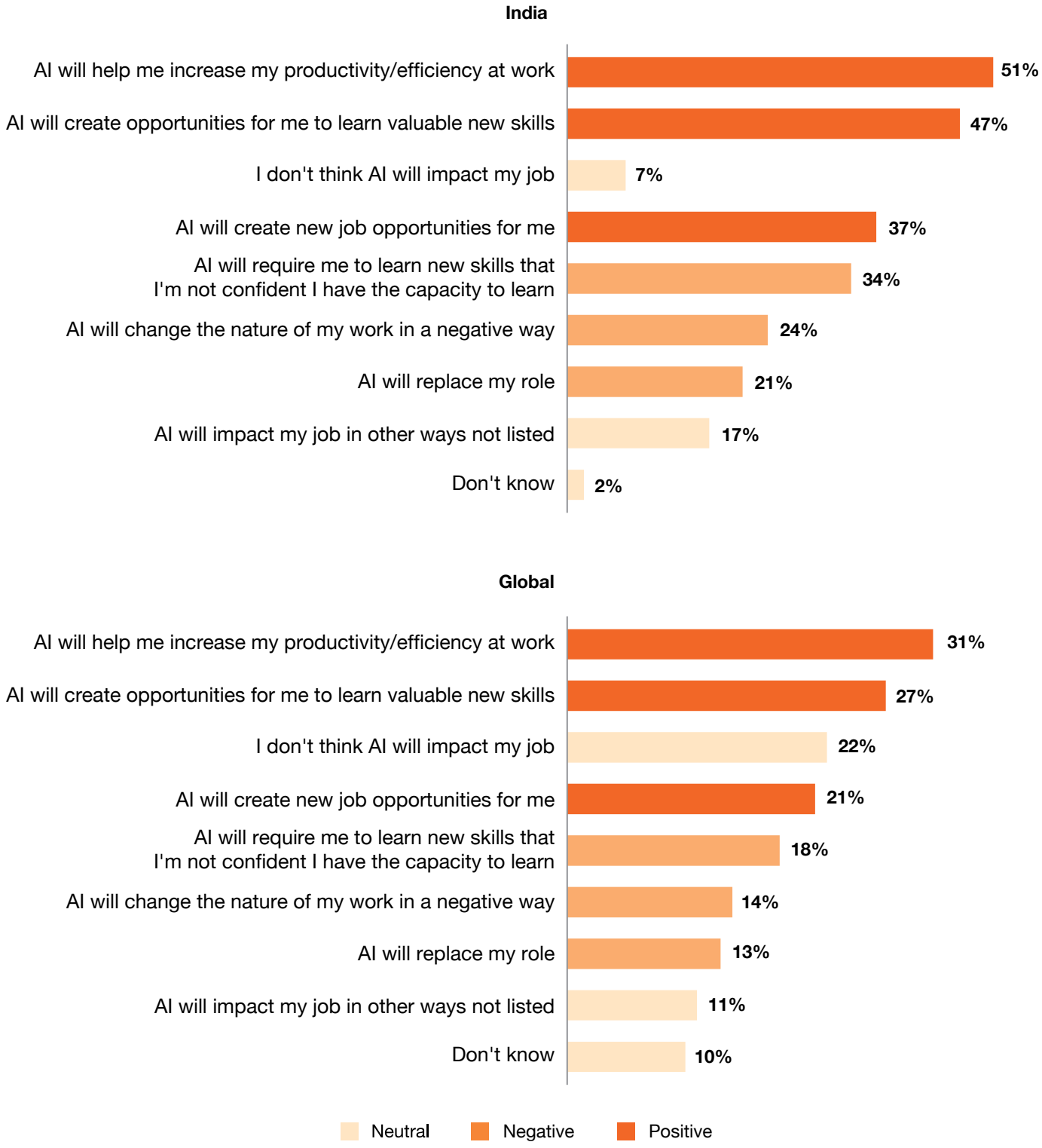
Figure 3. Digital and green skills are key in India



Note: Depicts the importance given to the above skills by employees in their career for the next five years (response shown is of India and global respondents, ranging from 'Not at all important' to 'Don't know'.). 'Net: Important' values shown combine the responses for 'Extremely important' and 'Very important'.

Source: Global Workforce Hopes and Fears Survey 2023, PwC

Figure 4. Indian workforce is cautiously optimistic for a head start in AI adoption



Note: Shows the impact AI could have on the career of the respondents in the next five years (response shown is of India and global respondents, showing 'positive', 'neutral' and 'negative' sentiments.).

Source: Global Workforce Hopes and Fears Survey 2023, PwC

To enable the nation to move forward, the Government of India has articulated a strong national vision with the 'AI for All' initiative which aligns with the goal of democratising technology and ensures the transformative benefits of AI, thus setting the stage for innovation and sustained economic growth.[30] Led by these factors, the IndiaAI mission, 2024, is a strategic initiative to establish a robust, inclusive and ethical AI ecosystem.[31] This mission is structured around seven pillars – one of which is IndiaAI Future Skills which suggests a clear vision to expand the AI talent pool by increasing the number of specialised personnel in AI. This pillar also prioritises the establishment of state-of-the-art data and AI labs in Tier 2 and Tier 3 cities throughout India, offering foundational and advanced courses in data science and AI, thus extending access to high-quality AI education beyond major urban centres.[32]

Furthermore, recognising the impact of AI, Indian academic institutions are revamping their curriculum to integrate AI and AI-related courses across a wide spectrum of disciplines. The greater goal is to produce graduates who are industry ready. To ensure that the academic training provided is closely aligned with the rapidly evolving demands of the industry, universities are actively forging strategic alliances and collaborative partnerships with leading technology corporations, prominent research institutions and dynamic startup enterprises.[33] Leading universities are also partnering with major global technology companies to offer specialised training programmes, intensive AI bootcamps and industry-recognised certification courses.[34] These initiatives significantly enhance the employability of graduates by equipping them with the specific skills and credentials that are highly valued by potential employers in the AI sector.

Despite significant efforts, reports still project a potential shortfall of over one million skilled AI professionals within the next few years, specifically by 2027.[35] This poses a considerable threat to India's ambitions to become a prominent global hub for AI talent and could hinder the effective adoption of AI technologies across various sectors of the Indian economy.

Furthermore, the projected growth in the Indian AI market is quite steep in the upcoming years. The recent introduction of GenAI only amplifies the supply-demand gap and is expected to further exacerbate the existing and potential availability of qualified AI talent.

30 https://ai-for-all.in/#/home

31 https://indiaai.gov.in/

32 https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2012355

33 https://psa.gov.in/CMS/web/sites/default/files/psa_custom_files/PSA_NOVEMBER%202024%20ISSUE_04%20DECEMBER%202024%20FINAL.pdf

34 https://bestcolleges.indiatoday.in/news-detail/universities-reshaping-education-bridging-ai-training-and-workforce-needs

35 https://ai.icai.org/articles_details.php?id=196#:~:text=However%2C%20a%20recent%20study%20by,burgeoning%20demand%20for%20AI%20expertise

4.2

Building a future-ready workforce for the next decade of AI innovation

With AI use becoming the norm, the present workforce will soon transition to a new paradigm that is led by humans and driven by intelligent AI agents. This workforce will showcase the importance of human-specific abilities, such as the capacity to mentor and supervise AI systems with insights, and collaborate with AI to promote innovation and make quick and well-informed decisions. This human–machine collaboration will also encourage critical thinking and complex problem-solving, which are higher-order cognitive skills, as well as vital interpersonal skills like creativity, flexibility, teamwork and effective communication.

To navigate this, a culture of continuous learning must be built. This would ensure that employees remain adaptable and equipped to respond to rapid changes in the AI landscape.

Organisations should also actively encourage their staff to embrace AI integration as a fundamental principle that supports long-term success of their businesses. By emphasising the value of AI competency right away, onboarding procedures for new hires can be strengthened by integrating fundamental AI knowledge and abilities.

Furthermore, in an AI-driven economy, encouraging a lifelong learning mindset and high level of workforce adaptability are essential tactics for guaranteeing long-term relevance and success. To stay competitive in a labour market that is rapidly changing due to AI, workers must continuously participate in learning initiatives. Organisations can introduce a variety of resources and incentives for employees such as financial subsidies, internal workshops, on-the-job training opportunities that let the workforce acquire and use new AI skills in practical settings. Workers must be adaptable and comfortable with change to handle inherent risks associated with ongoing technological disruptions.

Finally, company executives need to be proactive in addressing any fears their staff members may have about how AI will affect their jobs and the workplace. Clear and consistent communication explaining strategic reasons for AI adoption and highlighting the technology's function as a tool to enhance productivity and augment human capabilities can help achieve this. Building employee trust and confidence requires openly reaffirming job security and providing chances for reassignment or further training for those in positions that could be greatly impacted by AI. Additionally, creating an enabling workplace environment that encourages AI tool experimentation and acknowledges early achievements can boost confidence and allay any initial fears about this technology.

4.3

Conclusion

The emergence of AI offers a huge opportunity for both economic growth and global advancement. But to reach its full potential, education, awareness and workforce development must be strategically and cooperatively prioritised. As highlighted in this report, the effects of AI are already being felt in multiple industries and in people's daily lives. This calls for proactive adaptation and a dedication to lifelong learning. India is well-positioned to take the lead in AI applications owing to its innate technological advantages and highly intelligent and driven workforce. The government's bold initiatives, adaptability of academic institutions and growing investments by businesses in upskilling initiatives will further drive AI adoption. However, closing the impending AI skill gap and ensuring that the advantages of this technological revolution are distributed fairly to all facets of society continue to be top priorities. A skill-first strategy will help India successfully negotiate these challenges, ushering in a culture of lifelong learning and prioritising ethical and responsible AI development.

About ASSOCHAM

The Associated Chambers of Commerce & Industry of India (ASSOCHAM) is the country's oldest apex chamber. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem.

With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well-known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is driving four strategic priorities - Sustainability, Empowerment, Entrepreneurship and Digitisation. The Chamber believes that affirmative action in these areas would help drive an inclusive and sustainable socio-economic growth for the country.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

The Chamber also supports civil society through citizenship programmes, to drive inclusive development. ASSOCHAM's member network leads initiatives in various segments such as empowerment, healthcare, education and skilling, hygiene, affirmative action, road safety, livelihood, life skills, sustainability, to name a few.

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