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NITI Aayog

NITI Frontier Tech Hub

Roadmap for Job Creation in the AI Economy

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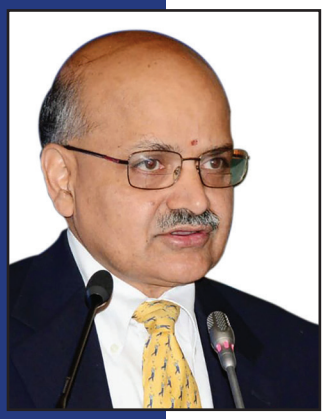
Foreword



As AI reshapes the global economy, India stands at a critical juncture: we can either be disrupted by this wave or lead it with confidence and purpose. The choices we make today will determine whether we lose jobs in India's tech sector by 2031 or create new, AI-enabled opportunities for our youth.

India's strength lies in its people. With over 9 million technology and customer experience professionals, and the world's largest pool of young digital talent, we have both the scale and the ambition to become the AI workforce capital of the world. But scale alone is not enough. What we need is urgency, vision, and national coordination.

This is why the recommendation to establish an India AI Talent Mission, in this report is both timely and essential. By embedding AI fluency across our education system, creating a massive national reskilling engine, and becoming a magnet for global AI talent, we can turn today's disruption into tomorrow's opportunity.

BVR Subrahmanyam
CEO, NITI Aayog

Foreword

AI is rewriting the rules of the job market—faster than any policy, curriculum, or company can keep up. The question is no longer *if* jobs will be impacted, but *how* we respond.

By 2031, India's technology sector stands at a crossroads: we could lose 1.5 million jobs or create up to 4 million new opportunities. The difference lies in the choices we make today.

To help navigate this pivotal moment, NITI Aayog's Frontier Tech Hub has developed a comprehensive roadmap using a Work-Worker-Workforce lens—showing how India can convert disruption into opportunity and become the AI workforce capital of the world.

I am deeply grateful to BCG and NASSCOM for their partnership in developing this report, and to the Expert Council for their invaluable guidance in shaping the analysis and recommendations.

Ms Debjani Ghosh,
Distinguished Fellow, NITI Aayog

Executive Summary

Cut to the chase: AI (whether Generative or Agentic or any other form) is ubiquitous. The prevalent rhetoric is that many jobs will be lost. The less prevalent, yet material, counterargument is that jobs will not be lost but will be replaced by people who know how to use AI, and many new, previously unheard-of jobs will get created.

Which way would the future unfold for jobs in India's powerhouse IT services (euphemism for the development and maintenance of applications, infrastructure and other forms of technology) and BPO sectors (operations including finance and accounting, customer service, payroll, and others), which are especially exposed to AI risks?

In a business-as-usual case, there will be a downside. In this worst-case scenario, the headcount in the tech services sector could go down from 7.5 to 8 million in 2023 to 6 million by 2031. Similarly, the headcount in the CX sector could go down from 2 to 2.5 million in 2023 to 1.8 million.

And yet, as this action plan highlights, if India acts strategically, tech sector jobs in the country could increase rather than decrease. The total number of jobs in the tech and Customer Service sectors could swell to 10 million and 3.1 million, respectively.

The action plan arrives at this view after examining the mechanics of the AI disruption that is already unfolding in the tech sector. Employing a 3W work-worker-workforce framework, the action plan outlines the differential impact of AI across sub-parts of tech sector roles, the evolution of job profiles, and the transformation of organizational structures.

Three existing factors exacerbate the AI risk: high job displacement risk, gaps in India's computer science education, and a shortfall in AI talent in the country.

But AI will create upward tailwinds in the long run, unlocking new roles, technology, and use cases. More of hyper specialization in tech will lead to job creation of three kinds: Enterprise AI Skills, Frontier AI Skills and AI for AI skills. The most commonplace 'enterprise roles' being created are AI prompt engineers, AI architects and AIOps engineers. In addition, given the truly horizontal nature of AI impacting multiple industries with many use cases intersecting other technologies like Quantum, Haptic and others, these use cases are spawning a whole new set of frontier roles (for instance, Quantum ML Engineer, Neurohaptic Engineer). Finally, there are roles 'AI for AI' – advanced research scientists & AI engineers who are advancing AI itself by creating the next LLMs, SLMs and other protocols. It is important for India to capture all three kinds of job creation. This

action plan calls on the Government, academia, and industry to collaborate to capitalize on the tailwinds.

This action plan calls for the establishment of an India AI Talent Mission—a nationally coordinated, all-of-government initiative focused squarely on equipping India's workforce for the AI age. The urgency is clear: AI is advancing faster than policy, curriculum, and skilling cycles can adapt. If India does not act in time, the nation risks not only irreversible job losses in its flagship Tech Services but also broader societal disruption, economic marginalisation, and a weakening of its global competitiveness.

Today, India's efforts to address the AI skilling imperatives are spread thin across numerous ministries and agencies—each driving well-intentioned but siloed programs. What's missing is convergence. An integrated, mission-mode approach is now essential to unify these fragmented initiatives under one national banner, with clear goals, accountability, and execution. The India AI Talent Mission must act as that central anchor—bridging industry, academia, and government efforts—and ensuring they move together at the speed and scale that this transformation demands.

This mission should be anchored on three foundational pillars:

1. Embedding AI fluency across all levels of the education system, from schools to universities;
2. Building a globally attractive AI talent magnet by positioning India as a premier destination for AI skills;
3. Launching a massive AI skilling engine to reskill and upskill the current workforce at scale

In addition, it should coordinate with India AI Mission to ensure the following. These two are critical enablers for India's AI skilling strategy because they provide the open data, benchmarks, and compute infrastructure needed to turn trained talent into innovators and researchers. Without them, India risks losing skilled professionals abroad; with them, we can retain top talent, foster indigenous innovation, and secure long-term competitiveness

4. Establishing an India Open-Source AI Commons to democratise innovation
5. Operationalising a federated national compute and innovation grid to enable access to AI infrastructure

The moment of reckoning for India's tech sector is here. Only a unified, urgent, and mission-driven response can turn the looming threat of disruption into a generational opportunity for India.

This roadmap is a living document, designed to evolve as new skills, technologies, and opportunities emerge. Its purpose is to ensure that India's skilling response remains coordinated, resilient, and future-ready—positioning the nation not just to withstand disruption, but to lead in creating sustainable and inclusive opportunities in the AI economy.

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1. INTRODUCTION

Section Summary: *Artificial Intelligence is not new—it has been a century-old pursuit, punctuated by long "AI winters." What makes this era different is the convergence of three forces: massive compute power, the web as a data backbone, and unprecedented accessibility. This combination ensures that AI Gen4 is here to stay.*

The critical question now is its impact—especially on jobs. While one narrative is dystopian, predicting large-scale job losses, another sees AI as a catalyst for entirely new categories of "AI-first" jobs that are yet to be imagined.

For India, the tech services sector (IT, CX, BPM) is at the epicenter of both risk and opportunity. This action plan emphasises that the industry is not a passive spectator — it can actively shape its future. Whether India's tech services emerge as a net creator of jobs or a net loser will depend squarely on the choices and actions we take now, as laid out in the sections ahead.

A quick quiz question: what is common between "Metropolis", "Eliza", "Watson", and "AlphaGo"? The answer is "Generational AI". Metropolis (1927) was the first movie (German) that depicted an intelligent humanoid robot called Maria, the first known reference to AI; Eliza (1966) was a Gen 1 chatbot mimicking a psychotherapist; Watson (2011) in Gen 2 won Jeopardy! using curated Machine Learning; and AlphaGo (2016) demonstrated Gen 3 Deep Learning to beat the world champion at Go. **AI is a 100-year-old concept, interspersed with long "AI winters."**

However, the launch of ChatGPT 3.0 (2022) has ignited interest in AI like never before. The world has since been simultaneously gripped by excitement and anxiety. The excitement stems from sudden access to a technology that seems so human-like. That, ironically, is also the root of the anxiety. For the public at large, what started as an attempt to understand how such chatbots and code-completing tools work has quickly evolved into a deeper, worrying question about what AI will do to our lives and our jobs.

It is different this time, though. There are many reasons for it, but to state it simplistically, for the first time, we are combining massive compute power, web-scale data, a very modular transformer architecture, API and UX accessibility, and a consumer-ready integration with daily workflows (e.g. in coding, writing, and teaching). This, as opposed to earlier generations of narrow AI, clunky ML, non-interactive deep learning, and the unavailability of compute power.

AI Gen 4 is here to stay. What impact, therefore, might this have, especially on jobs?

Almost everyone has a view on this question. From those who have a general dystopian view of the AI future ("One of the biggest risks to the future of civilisation... may be more dangerous than nuclear weapons" — Elon Musk, Tesla/SpaceX CEO) to those who sense an impending doom for the SDLC (Software Development Life Cycle) industry with ("Everybody in the world now is a programmer. This is the miracle of AI" — Jensen Huang, Nvidia CEO).

On the other hand, many feel that this is a game-changer, and we just need to understand what the new game may be. According to Gilbert Houngho, Director-General of the International Labour Organisation, "Millions of jobs are going to be lost, millions of jobs are going to be created. We are not facing an employment apocalypse." Historian and thought leader Yuval Noah Harari, says: "While AI will automate many tasks, it will also lead to the emergence of new professions that we can't yet envision". Whichever side we land up with, it seems increasingly clear that **"AI won't replace people, but people who use AI will replace people who don't,"** as tech entrepreneur Andrew Ng, puts it.

India's tech services sector—strategically vital to the economy, employing 13% of the total workforce and over 30% of the white-collar talent—stands on the frontline of AI disruption.

It faces significant risks, but also unprecedented opportunities that could redefine its global competitiveness.

According to industry tracker finalroundai.com, by mid-2025, almost 78,000 tech employees had lost their jobs due to AI (that's roughly 500 people every day). IBM, Microsoft, and banks like Citigroup, JP Morgan, and Goldman Sachs have all been in the news for tech layoffs or frozen hiring plans. **IMF claimed (as per washingtonpost.com) that 25% of jobs in India have "high exposure" to AI.**

On the other hand, research at Stanford, which studied customer support teams, concluded that when human agents were given AI assistance, productivity jumped, customer satisfaction improved, as did employee retention, and no jobs were cut. Teleperformance noted that thousands of data annotators, prompt engineers, AI trainers, safety testers, and ethicists have been hired – roles unheard of before the advent of AI. **LinkedIn and Indeed reported that job listings for Gen AI developers grew by over 50% between 2022 and 2024.** In fact, Klarna reversed course and began re-hiring human agents, admitting that relying solely on chatbots led to lower quality work, and asserting that "It's critical to assure your customer that there will always be a human."

What does this mean—for the world, and for India? The answer is not definitive. Globally, however, the signals are sharpening. The World Economic Forum reports that nearly half of all companies (49%) expect AI to be a net job creator, while only 23% foresee net job losses. Its Future of Jobs 2023 study projects the creation of 69 million new roles by 2027, even as 83 million existing jobs face disruption. The precise number remains uncertain, but the direction of change is increasingly unmistakable.

For India, this action plan believes that the Indian tech services industry can be in control of its destiny. As of 2023 , the industry employs 7.5-8 million individuals. If we do not react to the situation in front of us proactively and immediately, then we risk losing 1.5 million jobs. However, if the industry, along with the Indian government and academia, can get its act right promptly, then by 2030, we can add 2 million more new jobs.

Similarly, the Customer Service (CX) sector employs 2 to 2.5 million. Non-action can take the headcount down to 1.8 million. At the same time, right actions can take this up to 3.1 million.

Whether our industry is a net employer, or a net loser of jobs depends on the actions we take, as detailed subsequently.

2. SITUATION: MECHANICS OF DISRUPTION

Section Summary: *It is easy to fall into the trap of viewing AI's impact as a simple story of automation and job loss. This fear is not new. From Printing Press to Textile automation and computerisation – every technological wave triggered anxiety about displaced workers. Yet, each of these disruptions ultimately created millions of new jobs. In order to estimate the impact of AI, we looked at changes in three interlinked dimensions — not only the "work" done, but also the "worker" and the "workforce". While areas that are routine and scalable will be the first to be disrupted in an AI world, other areas of work in the tech services sector will transform much slowly. Secondly, while AI will render many roles redundant, it will simultaneously unlock new use cases, technologies, and roles through unlocking of new budget pools, convergence of technologies and removing traditional barriers like accent. So as the roles of QA engineers and L1 Customer Support representative may get automated, they will need to reskill to move to higher skilled or newer AI-native roles. Finally, AI is triggering a change in the workforce itself. As AI boosts productivity it will lead to fewer layers, faster releases, and leaner teams.*

One is at risk of getting carried away by AI's role of automating the actual "work" done as a simple, linear impact. This is not a new fear. In the 15th century, the printing press disrupted the jobs of scribes and monks who copied manuscripts, triggering fears of obsolescence and even social unrest. Instead, the printing press gave rise to millions of new jobs for editors, writers, printers, bookbinders, paper manufacturers, teachers, and librarians. **Textile automation transformed the jobs of handweavers and artisans into roles in mass fashion, global trade, textile engineering, and the modern retail industry.** And in more recent times, one remembers labour strikes in India when computerisation was introduced —there was fear of job losses for typists, filing clerks, and mailroom workers. Instead, India has been at the forefront of the entirely new industries that have emerged around software, e-commerce, digital marketing, social media, cybersecurity, IoT, & now AI.

Hence, in order to estimate the second and third order impact of AI, **we looked at changes in three interlinked dimensions — not only the "work" done, but also the "worker" and the "workforce"** (see Fig. 1) — and their potential impact on the tech services sector.

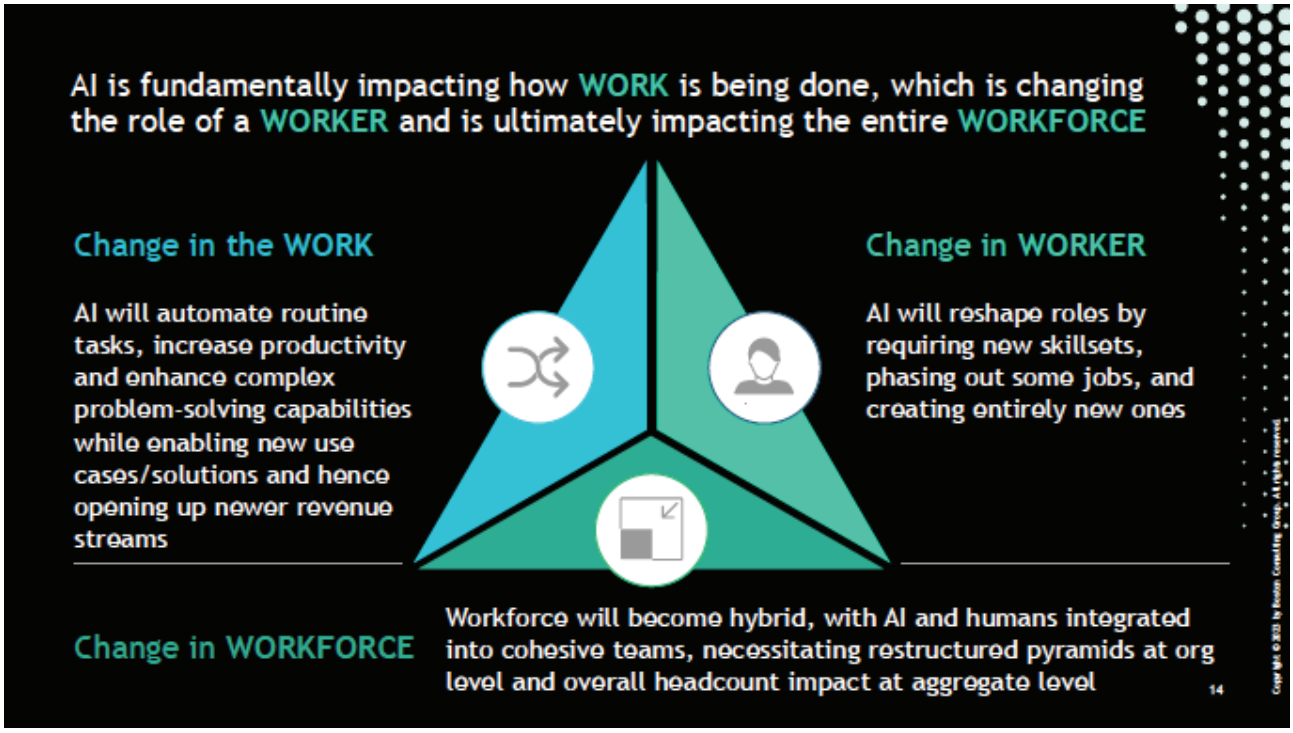

Fig. 1: The 'Work, Worker, Workforce' paradigm to assess impact of AI

Let's take work first. In the pre-generative AI era, a typical mid-sized IT services firm would have required a team of developers and quality assurance engineers [6-8 weeks of effort] to build, say, a custom dashboard application for a client. This would have involved writing boilerplate code for UI components, API design, testing, documentation, and deployment.

According to a BCG analysis based on observations of over 35 pilot accounts of clients, AI is significantly impacting many aspects of this process, including code automation, improvements, bug fixing, and documentation. The bottom line is that **AI is already transforming the software development lifecycle, unlocking an overall productivity improvement of 10-20%. This figure could be as high as 50-60% for applications that are straightforward to build**, such as the dashboard that the IT services company referred to above was building.

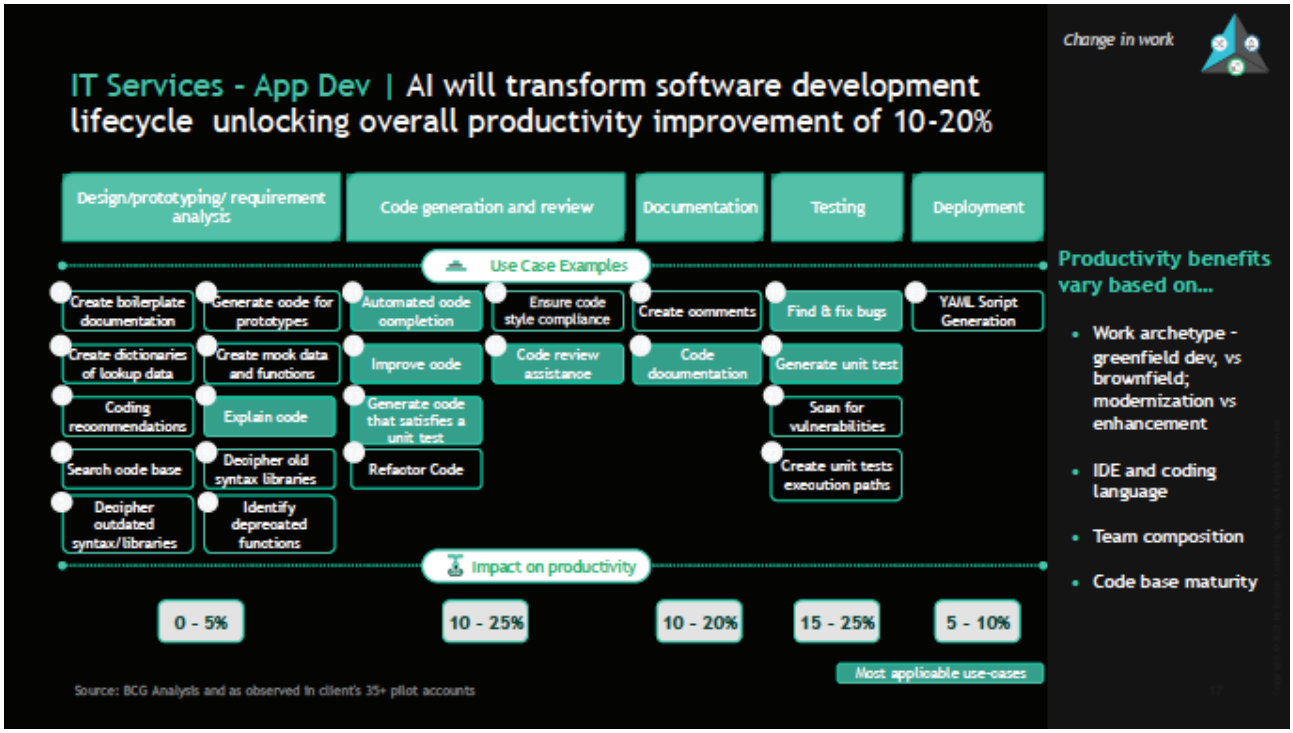

Fig. 2: Productivity improvement across SDLC using GenAI

Application development not only accounts for almost a quarter of an organisation's tech spending but also is an area that is significantly impacted by the advent of AI. Fig. 2 clearly accounts for the different Gen AI automation use cases across the Software Development Life Cycle and the productivity implications at scale. **So, while a 15-25% productivity improvement is being seen across code generation, documentation, and testing, only a 0-10% improvement is seen across the upstream and downstream parts** of the value chain in requirement gathering and deployment so far, leading to an overall potential of 10-20% as mentioned above.

Another area of work that is similarly significantly impacted by the advent of AI is customer service. An example of an e-commerce client's contact centre, which handles thousands of customer queries daily, is useful. **In the pre-AI era, L1 agents would typically respond to questions about everything from order status to returns, and from refunds to delivery tracking.** As a result, call queues would be long, and response times would be long. Rigid resolution scripts would result in a poor customer experience.

Today, AI chatbots (and soon voicebots) can handle a bulk of the first-line queries quickly and accurately. Bots can use LLMs trained on client data to offer personalised support. Sentiments can be monitored, and auto-escalations triggered appropriately. AI can help capture queries and patterns on a daily basis. Human agents, on the other hand, can get live support from AI tools.

With AI, customer support agencies will find that the whole customer service representative journey has been transformed. Each phase of this journey—receiving query, reviewing query, resolving issue/escalating query—will be touched by AI, helping the agencies increase output, decrease costs, and improve the quality of interactions (see Fig. 3). That's why, for instance, a mid-tier CX services company is actively exploring implementing Agentic AI use cases in its CX journey to drive productivity, specially in language translation, accent neutralisation, and sentiment analysis use cases.

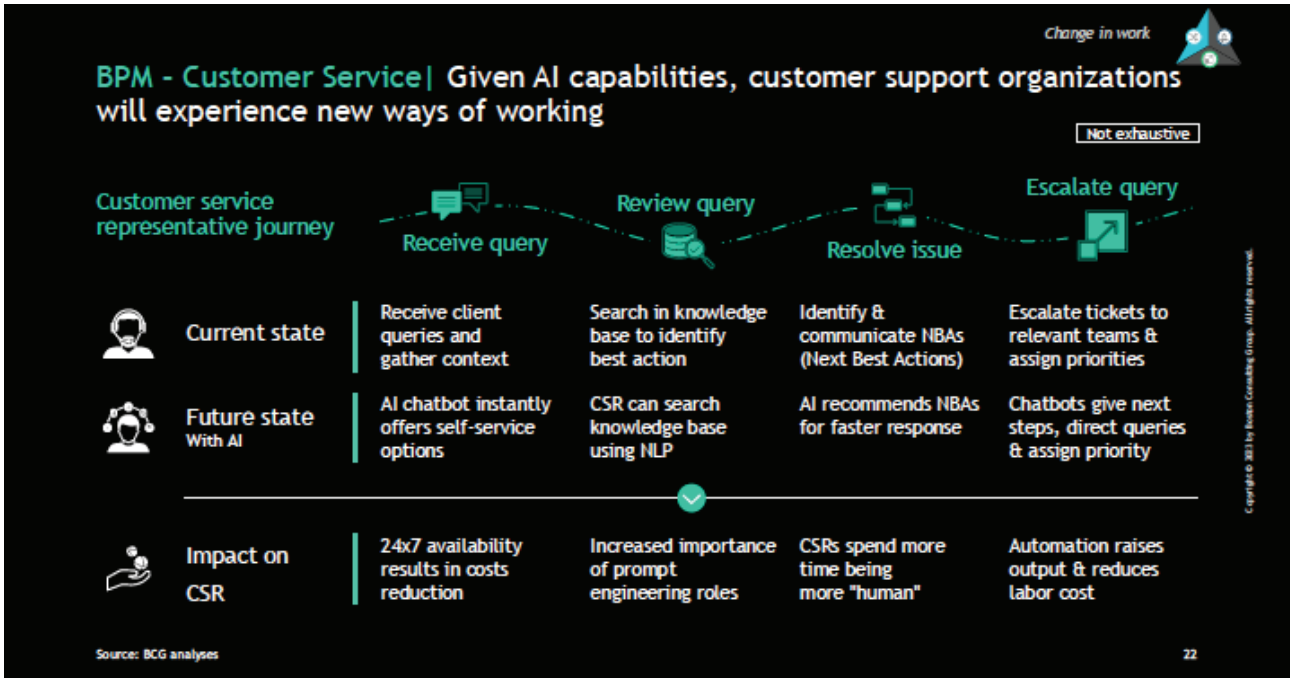

Fig. 3: Productivity improvement across the CX value chain using GenAI

On the other end of the spectrum, there are areas in the tech services sector that will be less impacted by AI, at least for the time being. Examples of such areas include infra ops and network operations (IT services). For instance, the use cases within network ops, including network troubleshooting assistant and configuration script generation aren't enough to disrupt the overall value chain. And this is why we are likely to see a sub-10% productivity impact of AI in infrastructure and network operations. In addition, there will be many areas in the middle of this spectrum that will be impacted to different degrees.

The impact of AI on work, elaborated upon above, provides us with two broad learnings. One, **AI's impact is not uniform but inevitable. While areas that are routine and scalable will be the first to be disrupted in an AI world**, other areas of work in the tech services sector will transform much slowly.

Secondly, while AI will render many roles redundant, it will simultaneously unlock new use cases, technologies, and roles.

Let us look at use cases first. **AI is helping IT services companies push into what were traditionally non-IT budgets**, an example being drug discovery. AI-driven simulation and generative tools are useful in the design of novel molecules or proteins in the pharmaceutical industry. Similarly, self-governing systems for predictive maintenance, or demand-based supply planning, especially for manufacturing companies, could be a new source of revenue.

Secondly, AI is also accelerating technology convergence, as it intersects with new frontiers such as 5G, Edge, and quantum computing. For instance, companies like Tata Elxsi and Tech Mahindra are already offering IOT + AI solutions in manufacturing and smart cities, which have started to see a tailwind. TCS and IISc have partnered on quantum computing research, and are investing in quantum-safe cryptography, intersecting with AI-driven security.

India launched the National Quantum Mission in 2023 with a budget of ₹6,000 Cr, where private players are expected to create consulting and integration jobs. A large IT services firm launched Quantum Lab in 2024, combining quantum simulation with machine learning to solve logistics optimisation problems. This team has grown seven times in just eight months.

New AI-native roles such as data centre controller and AI marketing specialists are emerging. OpenAI's GPT-3 uses over 45 TB of text+code data, and Indian startups are mirroring this with domain-specific LLMs. Firms like Yotta are building GPU-as-a-service platforms to serve Indian and global Large Language Model (LLM) firms, and is already working with IT services firms to provide backend services. India is becoming a data centre hub, driven by growing AI compute needs. Over 6500 MW of new data centre capacity has been planned across Mumbai, Hyderabad, and Chennai. Major IT firms are partnering with hyperscalers to manage and operate such data infrastructures. **Naukri's hiring outlook 2024 also suggests that demand for cloud-native AI DevOps roles is up 40% YoY.**

Thirdly, AI technologies like accent neutralisation and real-time language translation are reducing the barriers for onshore/nearshore CX needs to be served from India. This is evident from the fact that leading global CX services firms are reporting an increasing number of jobs in India, driven by the shift from onshore and nearshore locations, which has been enabled by AI. **Tools like Meta's SeamlessM4T, OpenAI's Whisper, and Sanas.ai are being integrated by Indian tech firms for real-time customer support.**

Fourthly, the Global Capability Centers (GCC) expansion in India for developing in-house AI is also creating a tailwind for AI jobs in India. About 70% of new GCCs have AI/ML as one of the top 3 talent requirements. **Walmart, Goldman Sachs, PepsiCo, Bosch, and JP Morgan have all created AI-focused CoEs in India in the last 2-3 years.**

Let us now examine AI's impact on the worker. Fig. 4 summarises this impact. **There will be roles that evolve with AI and require collaboration with AI tools to accomplish tasks. AI will also lead to a set of emerging new roles that did not exist till now but will be needed as the technology expands.** Finally, there will be a set of roles that may likely become redundant. This is because the skills that were critical for those roles are being mostly disrupted by AI. To understand this impact, it is important to unbundle roles into their many components and assess AI's impact on each.

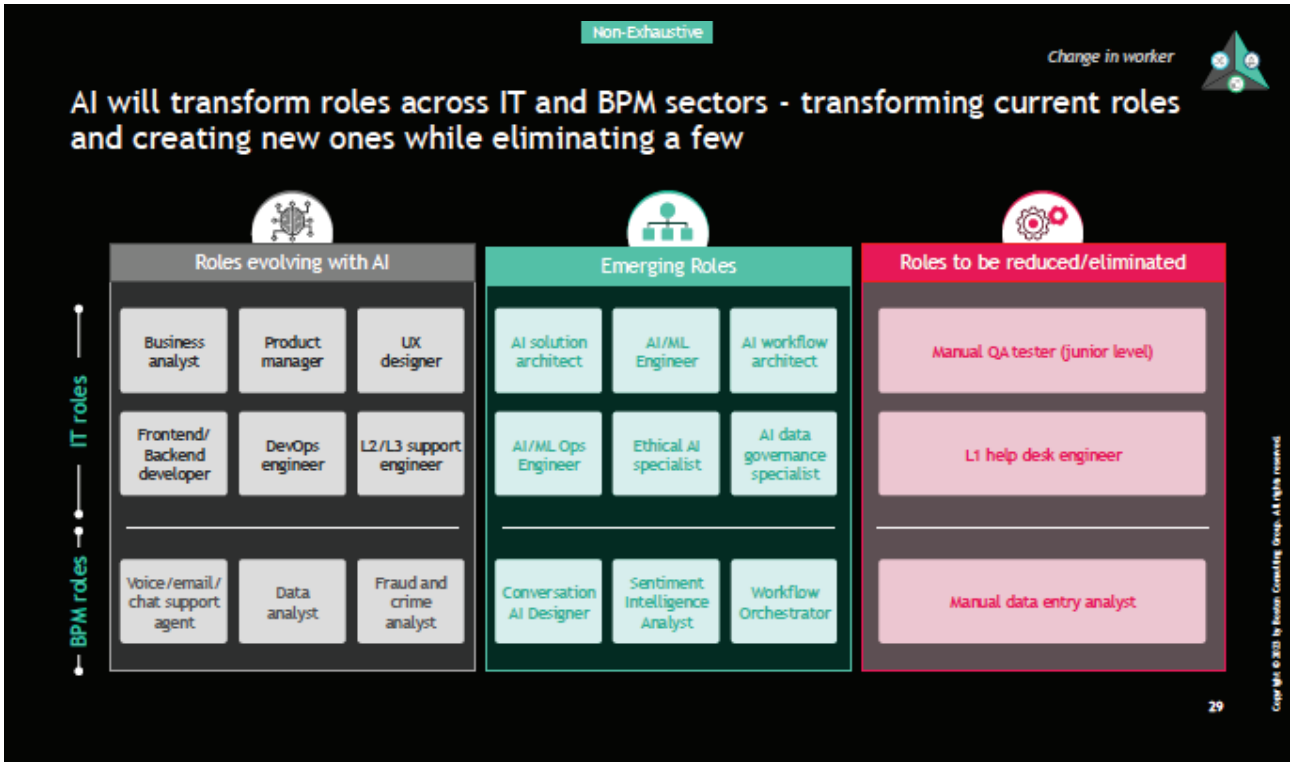

Fig. 4: Impact of AI on IT and CX roles

Pune-based Rekha is a junior QA engineer, whose core job involves designing and executing test cases, data management, and regression testing. The advent of AI has significantly disrupted her role, leading it on the path to redundancy. This is because the skill sets that were core and critical for her job role, such as designing test cases, executing test cases, test data management and even regression testing, are easily executable by AI.

But the QA engineer's role itself is more exhaustive, involving other aspects like analysing requirements, and defect reporting and tracking, all of which can be fulfilled more efficiently with support from AI. Furthermore, an aspect of the QA engineer's role that has emerged only because of AI is edge case analysis. **Rekha, being a junior QA engineer, doesn't get to deal with the more exhaustive areas of the role. Hence, a junior QA engineer's role might be deeply impacted by AI.**

Similar is the situation facing Chennai-based Aman, an L1 support agent working in the same sector. His core work revolves around ticket triage and routing, software installation and configuration, account provisioning and deprovisioning, VPN & connectivity support, file access resolution, and basic hardware troubleshooting. **None of these areas is immune to the advent of AI.** In other words, even at the current levels of development, AI can replace a human L1 support agent seamlessly.

Like in the case of the QA engineer, the support role is also exhaustive and not limited to what an L1 agent does. Aspects of this broader role involve remote desktop support and operating systems proficiency, both of which can be fulfilled more efficiently with support from AI tools. Furthermore, customer empathy and patience have emerged as an opening mainly because of AI. **Aman could still find relevance as an L2/L3 support engineer, a role that hasn't been consumed by AI but evolving with its support.**

Many tech services roles will evolve with AI, and continued relevance requires the acquisition of new skills. Take the case of a data architect, for example. The traditional skills required for such a role include enterprise data architecture design, data modelling and schema design, data integration & ETL pipelines, and data governance and compliance. In the AI world, the new skills would include AI-assisted data architecture design, integration of AI models with data systems, data governance for AI, and data pipelines for AI model training.

Similarly, **consider the role of a full-stack developer. The traditional skills required for such a role would include HTML/CSS/Javascript**, frontend frameworks, server-side languages, and database management. **In the AI-augmented world, this role now involves LLM API integrations, AI-generated content/code processing**, AI guardrails implementation, and even real-time response streaming.

There are more pronounced upsides to the AI disruption of the tech services sector as well. **AI is spawning fresh, new roles of three kinds – Enterprise skills, Frontier skills and AI for AI. An example of Enterprise roles (see Fig 4) is the role of an Ethical AI Specialist in the IT sector. The person in this role needs to ensure that AI systems are fair, transparent, accountable, and safe.** This, the person needs to ensure by auditing for bias and discrimination, defining and enforcing ethical guardrails, and ensuring regulatory compliance. This is important as AI becomes ubiquitous and has the potential to influence key decisions that impact all stakeholders of a business.

A similarly new AI-era role emerging is that of the Sentiment Intelligence Analyst, who decodes emotional and behavioral signals from customer interactions. This role assumes significance as human interactions could provide rare, vital signals in an increasingly AI-driven world. The role would require the use of AI tools to analyse emotions, identify patterns, train chatbots, and create escalation logic.

In addition, given the truly horizontal nature of AI impacting multiple industries with many use cases intersecting other technologies like Quantum, Haptic and others, these use cases are spawning a whole new set of frontier roles (for instance, Quantum ML Engineer, Neurohaptic Engineer).

Finally, there are roles 'AI for AI' – advanced research scientists & AI engineers who are advancing AI itself by creating the next LLMs, SLMs and other protocols.

Finally, AI is triggering a change in the workforce itself. This is reflected in the way AI and humans integrate into cohesive teams, necessitating **a restructuring of the organisational pyramids. Such a change is also influencing hiring. Three possibilities emerge based on how quickly and deeply AI is integrated within an organisation** (See Fig. 5)

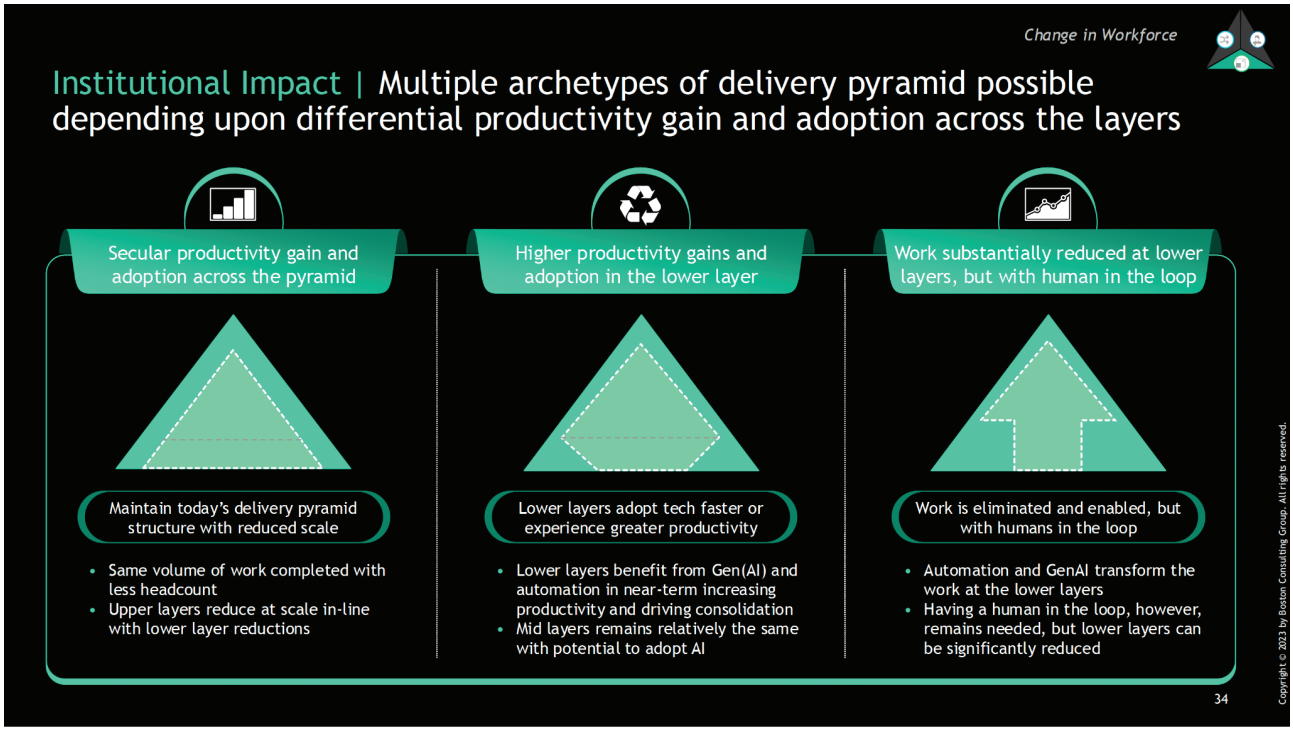

Fig. 5: Archetypes of delivery pyramids

The first possibility is of a secular productivity gain and adoption across the pyramid. The delivery structure in the tech services sector remains the same, but its scale shrinks proportionately. In effect, this means the organisation does the same amount of work but with fewer people.

The second possibility is of higher productivity gains and adoption in the lower layer of the organisational pyramid. The lower layers benefit from the use of generative AI, increasing productivity. The rest, though, remains relatively the same and will now need to manage the code that's generated using AI.

Under the third possibility, work at the lower layers is substantially reduced. But there is a human in the loop, indicating a new supervisory role, in which skills such as judgment become important.

In an IT services company, this typically translates to a shrinking of entry-level roles involving QA and support, which AI can handle adequately. It also means juniors ramp up quicker and focus on logic, leaving the basic aspects of their job to AI. The middle management roles focus less on hand-holding juniors and more on strategising. And in upper management, there are not only new roles such as AI stack architects and prompt engineers but also a greater emphasis on critical thinking rather than domain-specific skills.

In short, AI boosts productivity across the board. This means fewer layers, faster releases, and leaner teams.

3. THE COMPLICATION: A TIPPING POINT AT RISK

Section Summary: *The implications of AI for the tech services sector encompass both risks and opportunities. India is at a cross-roads, and AI's impact on the job market needs immediate attention. This urgency stems from three critical challenges: the sheer scale of the job displacement risk, fundamental shortcomings in education and skills development, and a widening gap between supply and demand for AI talent. The key question is what can India do to flip this story?*

The foregoing discussion shows that the implications of AI for the tech services sector encompass both risks and opportunities. The upside, however, is not guaranteed, and needs a bold and strategic action plan to unlock the full potential.

This urgency stems from **three critical challenges:** the sheer scale of the **job displacement** risk, fundamental **shortcomings in education** and skills development, and a widening **gap between supply and demand for AI talent**.

The first is the sheer scale of the **job displacement risk** unfolding in the sector. **According to data from the Centre of Advanced Study in India, over 60% of formal sector jobs in the country are susceptible to automation by 2030.** This is particularly so in the IT and BPO sectors. About half of the workers fear AI's impact on their jobs, according to The Economic Survey last year. Further exacerbating the challenge is the fact that those in the informal sector — and about 400 million Indians are — have little access to formal training.

The impending obsolescence poses a substantial threat to job roles like the L1 support agent and the junior QA engineer, as previously detailed. There is also an additional risk of a slowdown in hiring for roles such as entry-level software engineers. Without widespread access to effective upskilling initiatives, the continued employability of these individuals within the burgeoning AI-driven IT environment is at risk.

The second reason pertains to problems with India's talent pipeline. At the grassroots level, **India's computer science education is uneven**. It is only offered in some schools, limiting early exposure. In China and Russia, in contrast, computer science is mandatory at primary and secondary levels (see Fig. 6). **India also lags the rest of the world in AI publication citations and AI patents**, according to data published by the 2025 AI Index Report (India's share of Granted AI patents fell from 8-10% in 2010 to under 5% in 2023 — see Fig. 7).

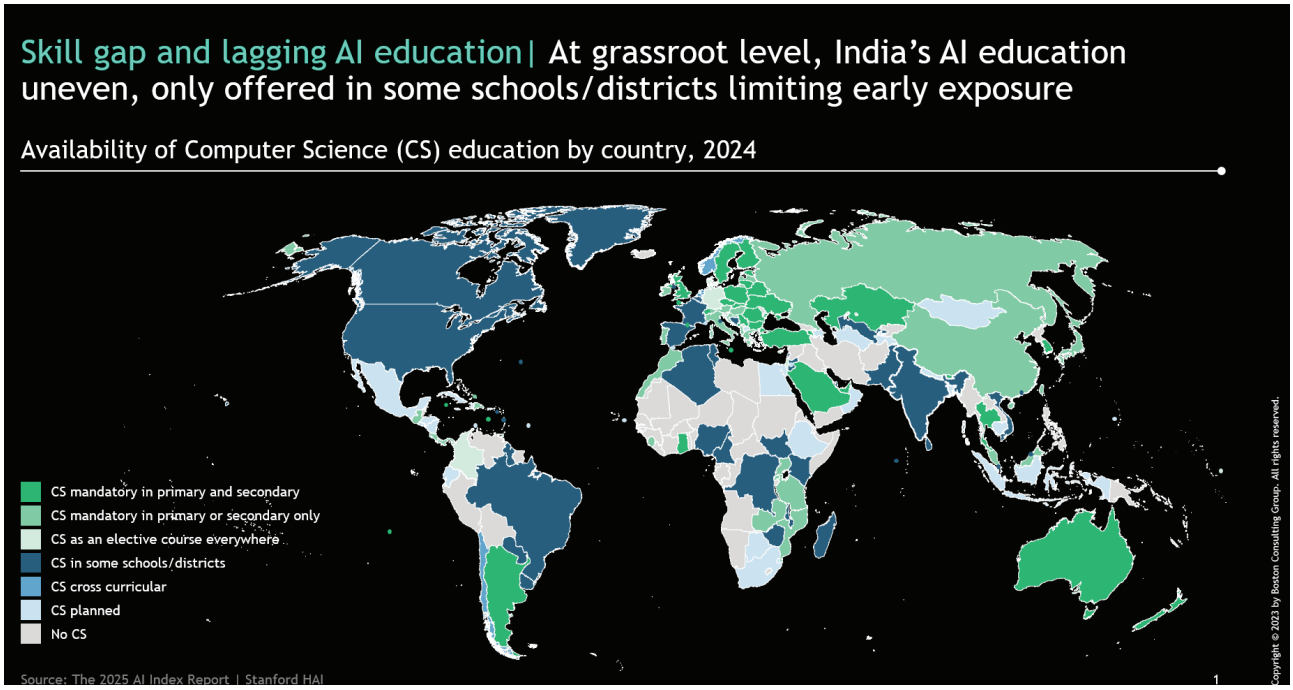

Fig. 6: Availability of computer science education by country

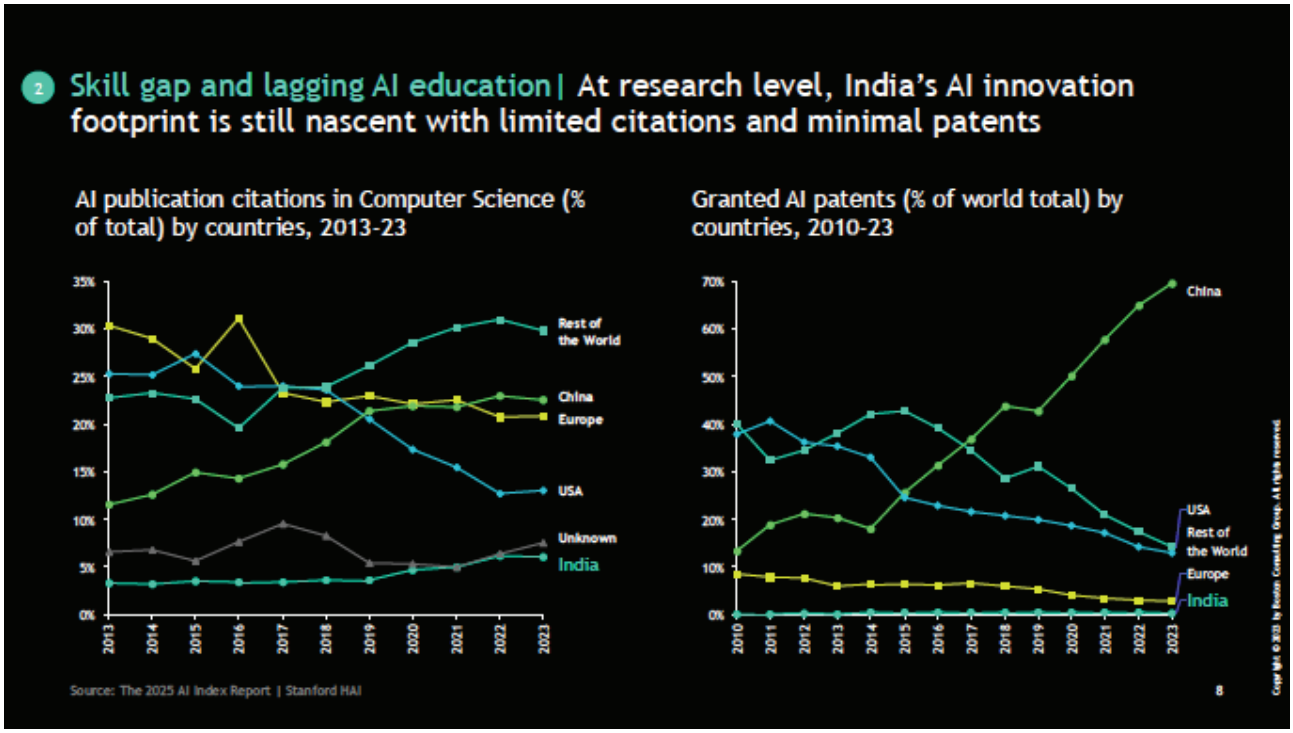

Fig. 7: India's share of AI citations and patents

Furthermore, a comparison with, for example, US STEM graduates indicates a gap in curriculum depth. US graduates are skilled in specialised research-intensive courses, while the exposure of students to core AI courses in India is limited. What this comparison reveals is that students need to develop industry-grade solutions, not just train for implementing existing solutions. There is also a need to keep the AI curriculum in India evolving with evolution in the field. While the US curriculum keeps abreast with newer AI concepts like Retrieval Augmented Generation (RAG), Model Context Protocols (MCP) and Agent to Agent (A2A) communications, the AI curriculum in India takes time to catch up.

The third reason is that there is **a critical supply-demand gap for AI talent**. **Supply for AI talent is now 50% of the current demand in India, and is expected to further lag in the next few years**, according to a NASSCOM report published last year. The Indian AI talent demand is expected to grow from 800,000-850,000 to over 1,250,000 over 2024-26, a CAGR of 25%, while existing talent is only growing at 15%.

What makes this even more challenging is the fact that **India is not among the top destinations for global AI talent, with a net negative talent migration (-1.55 per 10,000)**. This stands in stark contrast to several Asian counterparts such as Saudi Arabia, Singapore, Hong Kong, and the UAE, which have a positive net talent migration figure.

Global landscape

India has raised multiple AI-readiness initiatives, with the government spearheading the effort in policy, data, research, and investment, and the industry and academia working on skills and curriculum reforms, respectively.

India's efforts become important in the context of a big push given to AI by many governments, academic, and industrial bodies across the world.

For instance, **it was way back in 2019 that the Saudi Arabia government spelt out its AI ambition with the launch of the Saudi Data & AI Authority, which eventually promoted the**

theme 'Data is the New Oil.' The oil-backed economy has set its sights on a transformation that would make it one of the top 15 AI nations globally by 2030.

In a country of about 35 million people, over 779,000 have already been trained in AI. Not just that. **The government has established AI offices across 23 ministries, and targeted over $20 billion in investment into AI infrastructure and ecosystem**, supporting over 300 startups.

There are more examples from Asia itself. Singapore, for instance, has funded more than a 100 AI projects ($250,000 per project), trained over 200 engineers with a 95% placement rate. And the **UAE houses the world's first dedicated AI university**, and has trained over 500 AI grads from over 40 countries. Governments aren't just pushing on the policy front, but also supporting funding and the establishment of ecosystems.

China, one of the leaders in the AI race, has built two national AI labs, producing trillions of parameter models, and focused on AI R&D. **As far as academia goes, China had integrated AI into its high school curriculum as early as 2022**. It has since trained over 3,500 teachers in AI pedagogy, and has an ambitious plan to make AI literacy universal by 2030.

In the US as well, NSF-backed AI-curriculum for K-12 classes has been adopted in multiple states already.

Training, job pathways, and the establishment of centres of excellence are the **industry's** mandate. German company Bosch's centre of excellence focuses on bridging the academia-industry gap. The company has also established the Bosch Center for Artificial Intelligence, which focuses on integrating AI into its products and services. In addition, it offers an 18-month programme for building AI proficiency. It has committed to spend €2 billion over 10 years to reskill 400,000 employees.

Many prominent companies, including IBM, Microsoft, Intel, Toyota, Mastercard, among others, run projects around AI skilling and research and development.

The Indian government's flagship AI program is the Rs 10,000 crore+ IndiaAI Mission, which seeks to invest in compute, datasets, startups, and responsible AI use. And while platforms like OGD, NDAP, and IndiaAI Datasets aim to provide accessible, standardised open data for innovation, they suffer from poor standardisation, siloed design, and low awareness, especially among startups.

The establishment of AI Centres of Excellence in agriculture, health, and smart cities marks a step forward, but remains a work in progress. The much-anticipated Rs 2,000 crore India Startup Fund does not have specific criteria for AI building startups.

In academia, while the CBSE AI curriculum and Atal Tinkering Labs (ATL) AI modules have introduced AI learning in schools, the rollout has been uneven, and there is a shortage of trained teachers. The industry's initiative on skills, the Future Ready Talent programme (co-run with Microsoft), has enrolled 1.86 million undergraduates in virtual internships, though completion rates remain low.

The risk of job losses and a fragile pipeline of available talent present a grim picture of India's tech industry's immediate future. What can India do to flip the story?

4. THE RESOLUTION: HOW INDIA CAN CATCH THE AI UPSIDE

Section Summary: *Building an AI-ready workforce requires a concerted effort across government, academia, and industry—each playing a distinct and complementary role. The goal must be twofold: to develop talent capable of building AI and to equip the wider workforce to use AI effectively. Such a national collaboration can position India as the world's premier AI talent hub, shaping and advancing AI to meet global needs.*

To achieve this, we propose a unified "India AI Talent Mission" with three targeted recommendations for government and academia:

- Become a global AI talent magnet
- Build AI skilling engine for current workforce
- Embed AI in education system from school, undergraduate programs

alongside two strategic partnership initiatives to align the India Talent Mission with the India AI Mission, since these are critical enablers for India's AI skilling strategy because they provide the open data, benchmarks, and compute infrastructure needed to turn trained talent into innovators and researchers. Without them, India risks losing skilled professionals abroad; with them, we can retain top talent, foster indigenous innovation, and secure long-term competitiveness

- Establish India Open-Source AI commons
- Operationalise federated National compute & innovation grid

In the now-thriving Indian tech services sector, the reality of an AI-driven world presents both risks and opportunities. India's total tech workforce headcount in 2023 was 7.5 to 8 million (including jobs in the tech services sector as well as tech jobs in other sectors). Similarly, the CX jobs headcount was 2 to 2.5 million in 2023.

Depending on the interplay between the headwinds and tailwinds at play, this headcount can drastically reduce or increase significantly over the next 4-6 years.

Tech Workforce-

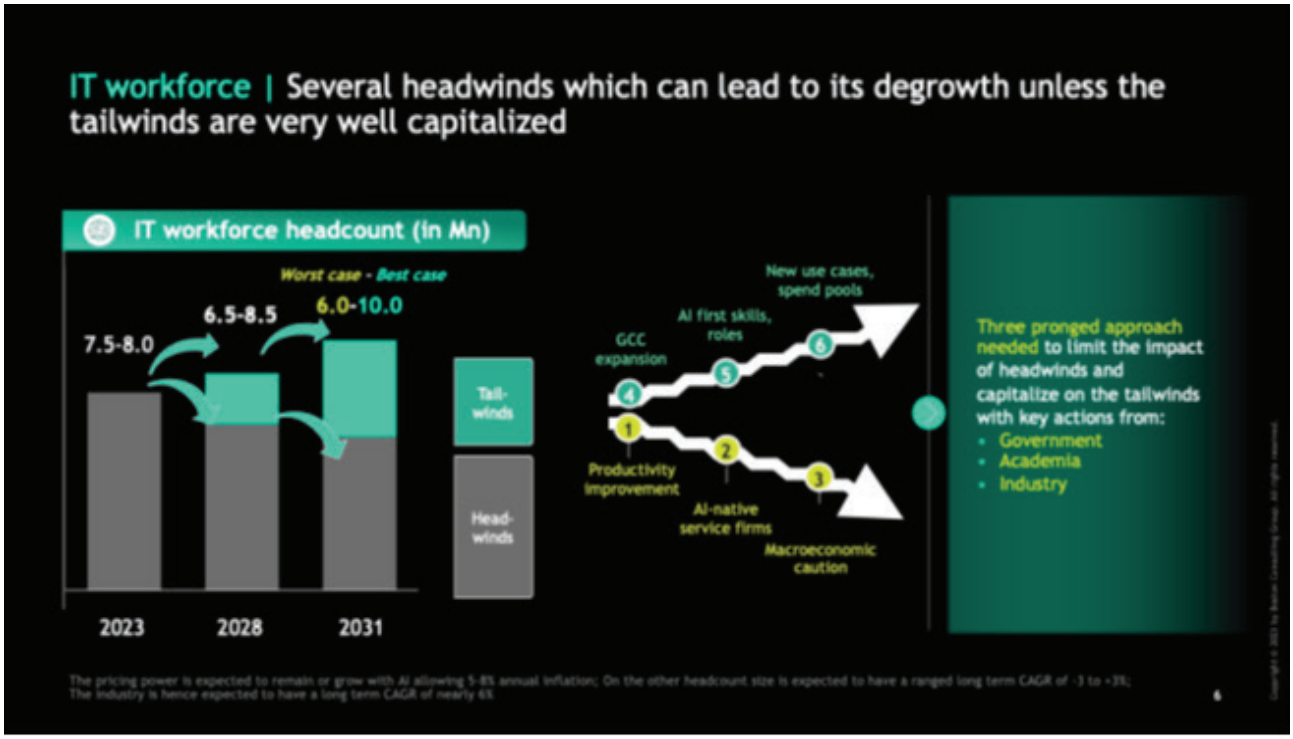

Fig. 8: Tech workforce in India with headwinds & tailwinds

As discussed earlier, **there are headwinds such as productivity improvement, competition from onshore AI-native service firms, and macroeconomic geopolitical instability**. At the same time, there are tailwinds in the form of newer spend pools and use cases, newer technologies, newer roles, and GCC expansion.

We estimate the IT Services industry to grow 3-9% annually, depending on the industry's ability to ride the tailwinds. Similarly, owing to the usage of AI and upward shifts in average skillsets within a pyramid, we expect the price-per-FTE for the industry to grow 5-8% annually over the next few years.

What this means is that the predominance of headwinds can take the total tech headcount down to 6 million by 2031. At the same time, tailwinds can take this up to 10 million. The estimates have been arrived at after extrapolating the impact to the tech workforce within other sectors as well.

Customer Service (CX) Workforce

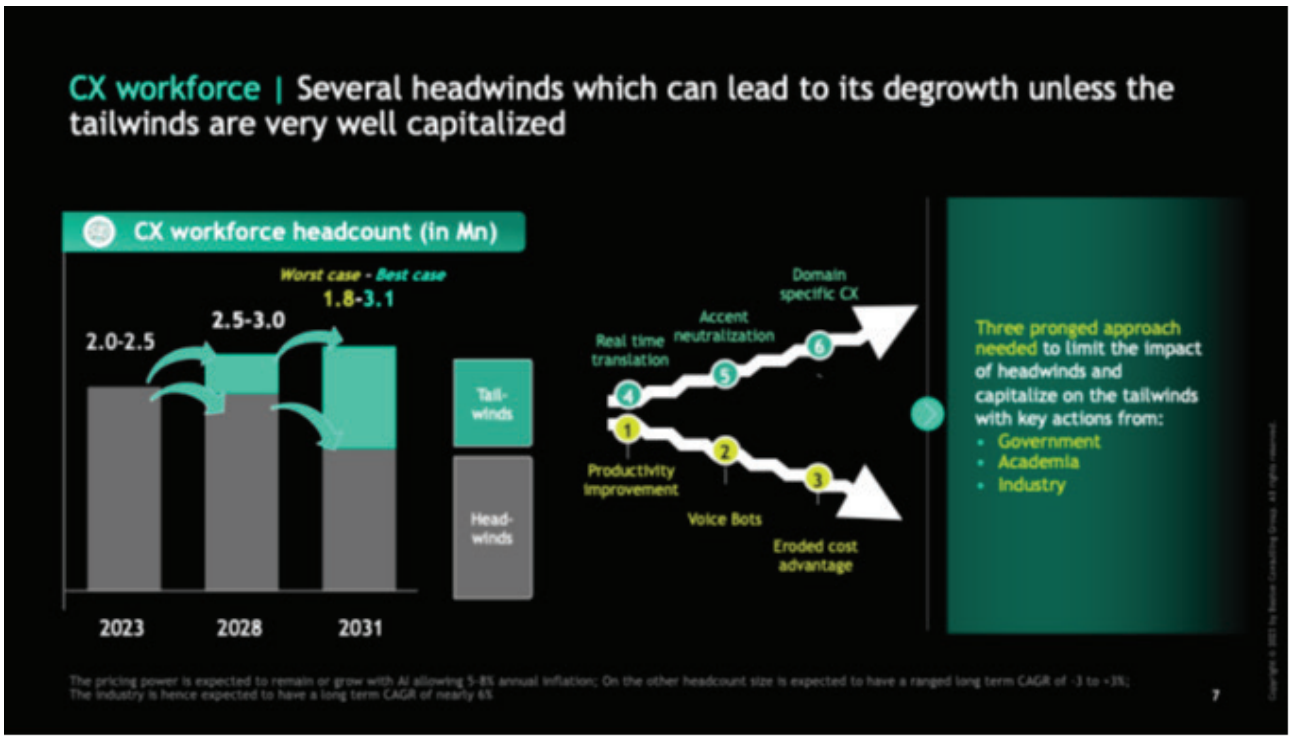

Fig. 9: CX workforce in India with headwinds & tailwinds

The headwinds here are the same: productivity improvement, competition from onshore AI native service firms (voicebots) and macro-economic geopolitical instability. At the same time, there are tailwinds in the form of real-time language translations and accent neutralisation tech that are reducing the barriers that prevent onshore and nearshore jobs from moving to India.

What this means is that the predominance of headwinds can take the headcount from 2-2.5 million down to 1.8 million by 2031. At the same time, tailwinds can take this up to 3.1 million. Again, the estimates have been arrived at after extrapolating the impact to CX workforce within other sectors as well.

The difference between the stark and the hopeful scenarios rests on whether the country is able to limit the headwinds and capitalise on the tailwinds. This action plan suggests a three-pronged approach to tilt the scales in favour of the upsides. This involves the **coming together of government, academia, and industry, with each playing a role in building an AI workforce that is skilled to 'Build AI' and to 'Use AI'.** Such a collaboration will ensure India becomes the global talent hub for AI, contributing strongly to advancing and shaping AI for global needs, while at the same time establishing itself as a trusted AI-augmented services hub that builds the world's AI backbone.

Recommendations for India

India must establish an India AI Talent Mission to unify strategy and oversight, and execute the key recommendations that follow.

There is an urgent need for such a mission, as the AI disruption is already here. Furthermore, it is evolving more rapidly than policy and educational cycles.

A delay or a business-as-usual approach will mean irreversible job losses, a shrinkage in competitiveness, and societal disruption. As discussed earlier, depending on the interplay between the headwinds and tailwinds, the headcount of the tech services sector in India can drastically reduce or increase significantly over the next 4-6 years.

Also, India's AI skilling landscape today is fragmented, with overlapping but disconnected programs run by different ministries, industry bodies, and academic institutions. Further, AI curriculum in India is not aligned to global benchmarks. An AI Talent Mission will not only ensure that the efforts are integrated but also aligned to national goals.

An AI Talent Mission will act as a **single empowered point of strategy and execution**. The setting up of the Mission will enable an **end-to-end integrated, all-of-government and forward-looking approach**, so that India can support the world with AI talent.

Proposed Vision Statement:

To position India as the global epicentre of AI talent by 2035—empowering every Indian to "Build AI" and "Use AI", and transforming the nation into the world's trusted AI workforce and innovation partner. Through an integrated, all-of-government mission, we will create a scalable, inclusive AI talent ecosystem that fuels economic growth, drives social equity, and secures India's leadership in the global AI economy.

Proposed Scope of the Mission:

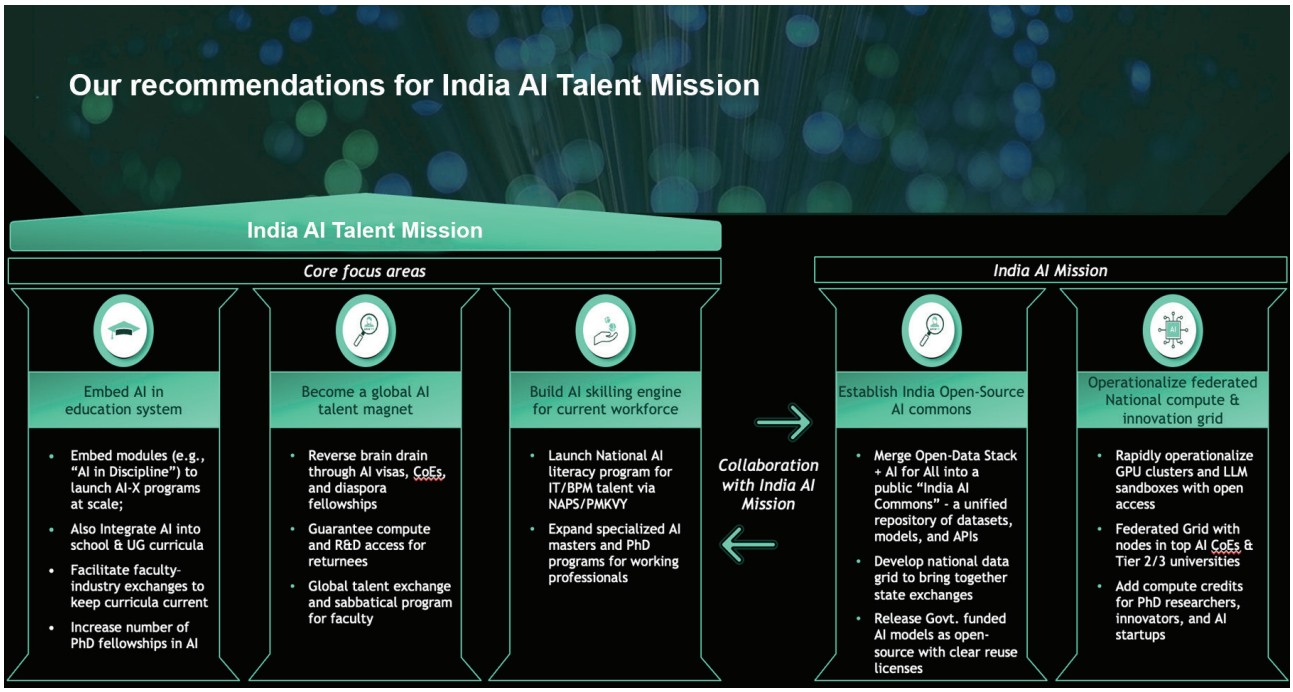

Fig 10: Scope of the India AI Talent Mission

The proposed scope of the mission constitute three key pillars –

- Embedding AI in the education system,
- Becoming a global AI talent magnet, and
- Building an AI skilling engine

For the remaining two - the AI Talent Mission should work in collaboration with the IndiaAI Mission. These pillars are critical enablers for India's AI talent strategy because they provide the open data, benchmarks, and compute infrastructure needed to turn trained talent into innovators and researchers. Without them, India risks losing skilled professionals abroad; with them, we can retain top talent, foster indigenous innovation, and secure long-term competitiveness.

- Establishing India open-source AI commons and
- Operationalising a federated national compute and innovation grid

Firstly, if India is to lead in artificial intelligence, it must build an academic pipeline for advanced research and innovation. Today, that pipeline is dry. Most AI degrees are confined to a handful of top-tier institutions, leaving the vast majority of engineering and science colleges without structured AI departments or curricula.

India produces fewer than 500 AI-related PhDs annually, lagging behind countries like China, the US, and even smaller economies. The IndiaAI PhD Fellowship, though a step in the right direction, offers only 100 fellowships per year, and pales in comparison to peers. There is also a glaring absence of interdisciplinary AI research ecosystems.

India must establish dedicated AI departments and CoEs to scale up embedding AI in different disciplines & launch AI+X programs at scale. AI should be integrated into school and under-graduate curricula. Faculty-industry exchanges must be encouraged to keep this curricula current & relevant. There should be a plan to increase AI PhD fellowships and scholarships to expand funding for AI doctoral students massively. Pushing for interdisciplinarity and incentivizing AI research careers are also much needed.

Secondly, India needs to retain talent. Nearly 44% of India's top AI researchers work abroad, encouraged by better-funded labs and clearer career paths. The research ecosystem in India is weak. **The existing return pathways, such as VAJRA and Vaibhav fellowships, lack the continuity, scale, and career security**. Many overseas researchers eager to contribute to India's AI growth face hurdles in relocation, hiring, and incentives.

Meanwhile, there are global best practices that India can draw lessons from. The US blends world-class R&D, universities, and open immigration even as it invests billions in domestic AI development. **China's Thousand Talents Plan, UK's Global Talent Visa, and Taiwan's Yushan Fellowships all offer structured packages to lure diaspora scientists.**

India now needs to respond with a clear value proposition. This should begin with the offer of attractive grants and salaries for returning AI researchers. The government should create a target list of returnee talent and directly engage with them.

To anchor their work, India must set up AI Centres of Excellence (CoEs) that offer institutional autonomy. Returnees and global hires should be given priority access to India's AI compute grid, enabling them to train large models and build solutions locally. India must also introduce a dedicated AI Talent Visa, thereby providing fast-track residency. Finally, India should offer startup relocation support.

Thirdly, **India needs a strong reskilling engine for its current** tech services **workforce which can provide flexible AI masters, doctoral programs** for the large industry workforce eager to upskill themselves and move to more complex tiers of work in their respective areas with additional qualification. Having National AI literacy programs via NAPS/PMKVY are steps in the right direction.

The three points elaborated upon above form the core focus areas of the India AI Talent Mission. There are two other areas that require deep coordination with the IndiaAI Mission.

To truly build a holistic national AI talent strategy, the India AI Talent Mission must work in close alignment with the India AI Mission on its fourth and fifth pillars—establishing an India Open-Source AI Commons and operationalising a federated national compute and innovation grid. These two pillars are foundational enablers without which the first three pillars cannot fully succeed. A frictionless research and innovation ecosystem, backed by high-quality open datasets, transparent benchmarks, and affordable compute access, will empower India's students, researchers, and startups to create globally competitive breakthroughs at home rather than moving overseas. Equally, these measures will help retain India's best AI talent by offering them world-class infrastructure and pathways to pursue advanced research domestically. Without this integration, India risks training high-quality AI talent that ultimately migrates abroad due to limited opportunities and inadequate research infrastructure. By converging talent with innovation and compute capacity, India can ensure not only a future-ready workforce, but also a thriving indigenous AI research and innovation pipeline that strengthens its long-term competitiveness.

One, India needs a central AI Commons Portal hosting datasets, models, and benchmarks. This effort must be powered by partnerships with universities and ministries to contribute public datasets at scale. To fuel adoption, contributors should be incentivised through funding and recognition. **Most importantly, India must build transparent benchmarks and validation tools to ensure trust, and comparability.**

Two, India needs to have easily accessible, high-performance compute infrastructure. Currently, India's computing resources remain fragmented, which is now being consolidated under the ambit of India AI Mission. Startups and non-academic innovators are often locked out of affordable HPC access. To ensure broad adoption, India must offer tiered access to students, startups, and researchers.

5. CONCLUSION AND NEXT STEPS

AI's disruptive ability and India's inherent gaps in education and skills mean India's powerhouse tech services sector faces the real risk of net job losses in the coming years. But that isn't the only possibility.

The sector seemingly vulnerable to AI-led disruption is also one that is best-positioned to ride the AI wave. In this scenario, India should capitalise on the tailwinds of new AI roles, technology, and use cases.

But success isn't a given. It requires decisive action by the Government on multiple fronts: Open-source AI commons, access to compute, embedding AI in education, talent retention, and reskilling workforce.

Without this, India risks losing strategic ground in the global AI economy.

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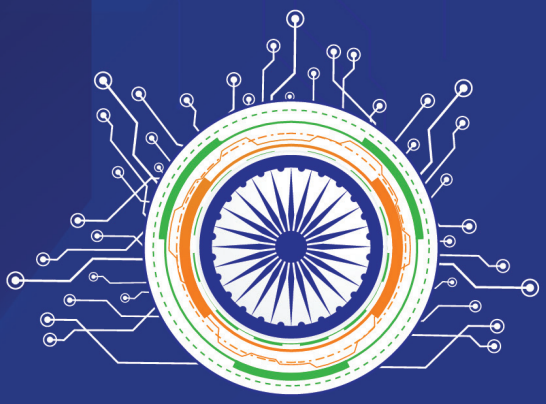

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