

Future of India's Tech Workforce and Employability

The Indian tech industry stands as a leader in innovation and job creation, propelled by extensive research, exponential investments, and the adoption of emerging technologies. The Indian tech market size (FY 2024) stands at \$254 billion and is expected to witness 3.8% YoY growth. The tech workforce in India is estimated at 5.6 million (FY 2024).

The sector is poised for exponential growth, driven by innovation, strategic investments, and a thriving entrepreneurial spirit, consolidating India's status as a global tech powerhouse. These advancements are driving growth across key sectors, including Global Capability Centers, IT Services & Products, and Non-Tech industries. New technologies like artificial intelligence (AI), cloud computing, and cybersecurity are opening up unprecedented opportunities, expanding productivity, and creating more value in everyday business operations.

While these new technologies are revolutionizing industries there is also an increase in demand for specialized talent. As AI automates processes and enhances decision-making, cloud computing improves scalability and operational efficiency, and cybersecurity becomes vital for protecting digital assets, there is a growing need for highly skilled professionals in these areas.

With the constant evolution of technology, organizations must prioritize upskilling and reskilling their workforce to stay competitive in the global market. Investing in tech talent with expertise in AI development, cloud infrastructure, and cybersecurity management is essential to navigating the complexities of the digital age and driving future innovation.

Global Capability Centers: A Growth Perspective

Global Capability Centers (GCCs) are centralized units established by multinational companies to manage specific business functions or processes, leveraging cost advantages, a skilled workforce, and favorable business environments in strategic locations worldwide. India is home to more than 1,600 Global Capability Centers. Many multinational companies are expanding their GCCs in India, with significant investments to enhance capabilities in IT, finance, research and development. These GCCs have contributed significantly to India's economy, with an estimated annual economic contribution of \$121 billion.

While most of the GCCs are located in major cities like Bengaluru, Hyderabad, Delhi NCR, Mumbai, Pune, and Chennai due to robust infrastructure and talent pools, with a

growing trend of expansion to Tier-1 and Tier-2 cities like Ahmedabad, Kolkata, and Vadodara driven by improved infrastructure and cost advantages. The expansion of GCCs in India is contributing to significant job creation, employing over 1.66 million people. GCCs are increasingly being seen as innovation hubs where new technologies and solutions are developed and tested. Partnerships with local startups and tech companies are fostering innovation and accelerating the development of new products and services.

IT Products & Services: An Overview

IT Products & Services involves the creation, production, and management of hardware, software, networks, and services that support organizations in generating, managing, optimizing, and accessing information and business processes. This segment is projected to contribute 8% to India's GDP by 2026.

India's technology sector revenue in the Research and Development sector including hardware is projected to exceed \$350 billion by 2025, reflecting an annual growth rate of 8.4%. Exports have reached \$194 billion, growing at 9.4% in reported currency terms.

Similarly in the Startups and Innovation segment, the Indian tech segment: India is set to play a critical role in driving economic growth and creating jobs. The country has seen the rise of over 92,683 startups in the past decade of which 6,386 startups are in the fintech sector.

In FY 2023, the Indian tech industry employed approximately 5.4 million individuals, marking a Y-O-Y growth of nearly 6%. The country has emerged as the second-largest source of STEM graduates globally with 2.14 million individuals.

The growth of large language models (LLMs) is advancing, improving a variety of applications in natural language processing and AI-based solutions. Cloud investment is expected to grow by 25-30% by 2030 and the adoption of cloud solutions is projected to generate 14 million jobs by 2026.

Tech in Non-Tech Sectors: An Overview

Tech in traditionally non-tech industries refers to the integration of advanced technologies within essentially non-tech sectors such as BFSI, automotive, healthcare, retail, telecom, media and entertainment, and energy. A rapid increase in investments towards implementing tech in non-tech is fueling an increase in hiring for tech roles which are set to transform these industries. The increasing adoption of AI and rise of generative AI will lead to an increase in demand for cybersecurity during the first half of 2025. 85% high-tech firms, along with over 70% of companies in telecom, media and

entertainment, BFSI, and energy sectors, have allocated over 20% of their technology budgets to digital advancements.

The BFSI sector in India is seeing rapid growth, with banks planning to allocate around 10% of their operating expenses toward technology to keep up with the surge in digital transactions and increased regulatory scrutiny from central banks. Additionally, the fintech market is projected to grow by 30% from 2022 to 2030, driven by innovations like mobile payments, digital loans, insurtech, and online investment platforms.

AI's role in the automotive industry is expected to skyrocket by 2032 as the sector undergoes technological disruption, transforming vehicles into "gadgets on wheels." This has led to a surge in demand for software developers, data scientists, cybersecurity engineers, embedded systems engineers, and product managers at major automotive companies.

Innovations in the healthcare sector have led the sector to grow from roughly \$3 billion in FY 2020 to \$7 billion in FY 2023. With over 10,000 startups, healthtech remains a hotbed of innovation in India.

The retail sector is all set to incorporate investments in AI which are expected to catapult the sector from the current \$5 billion to \$31 billion by 2028. Approximately 71% of Indian retailers are planning to adopt generative AI within the next year, with the potential to boost the sector's profitability by 20%.

In-Demand Tech Skills Across Sectors in FY 2024-25

The talent landscape of the tech sector, inclusive of GCCs, IT Services & Products, and Non-Tech, can be explored through six distinct functional areas, namely Software Development & Engineering, Cybersecurity and Network Administration, Data Management and Analytics, Project Management and User Experience, Systems Operations and Technical Support Services, and Cloud Solutions & Enterprise Applications. The salary trends indicate that GCC's offer higher compensation (12% to 20%) as compared to IT Services or Tech in Non-Tech Sectors. While the GCC's lead in the adoption of advanced skills in AI, ML, and Cybersecurity, with a high focus on Cloud related skills. The IT Products & Services sector too seeks to leverage AI, Cloud Computing, and Cybersecurity with focus on using Generative AI and automation to boost efficiency and modernize legacy architectures. Sectors such as manufacturing and BFSI from the Tech in Non-tech segment seek advanced digital skills such as data analysis and process automation for enhanced productivity and innovation.

With the growing focus on ESG, there is a rise in demand for green tech and sustainability with the adoption of technologies like cloud sustainability, decarbonization analytics, and Carbon Capture Utilization and Storage (CCUS). These innovations help companies cut carbon emissions and safely store carbon dioxide. AI has shown significant potential in this area, reducing energy consumption by up to 40% in data centers. As technology continues to evolve, acquiring green tech skills is vital for IT professionals to support sustainability efforts across industries. There is a surge in demand for Green Tech and Sustainability)

1. Software Development and Engineering

- **Rising Demand for Version Control and Automation Tools:** In software development and engineering, the increased need for Version Control Systems, Visual Studio Code, and Test Automation Frameworks is driven by the adoption of Agile and DevOps practices, which require efficient collaboration and robust development pipelines.
- **Cloud Platform Proficiency:** AWS and Microsoft Azure are highly sought-after skills, reflecting the critical role of cloud platforms in modern software engineering. These platforms offer scalable, flexible, and cost-effective solutions for managing IT infrastructure and deploying applications.
- **Importance of AI and Data Analytics:** Skills in Natural Language Processing (NLP) and Data Mining are in high demand, underscoring their significance in software development. These capabilities enable the extraction of valuable insights from data, enhancing software functionality and decision-making processes.

2. Cybersecurity and Network Administration

- **Emphasis on Intrusion Detection and Risk Assessment:** The rising demand for Intrusion Detection/Prevention Systems and Risk Assessment tools across sectors underscores the increasing need for proactive security measures. This is driven by the growing frequency and sophistication of cyber threats, necessitating robust defenses to safeguard organizational data and infrastructure.
- **Prevalence of Network Security Protocols and Tools:** Skills in Network Security Protocols, Nmap, and Metasploit are highly sought after, reflecting the critical importance of securing network communications and identifying vulnerabilities. This trend highlights the need for comprehensive network security strategies to prevent breaches and ensure data integrity.

- **Adoption of Advanced Security Technologies:** The demand for advanced security tools like Kubernetes, Hyperledger Fabric, and Blockchain Architecture in GCCs signifies a shift towards leveraging cutting-edge technologies for enhanced security. These technologies offer robust solutions for securing applications, managing distributed systems, and ensuring transparent and tamper-proof transactions.

3. Data Management and Analytics

- **Growing Demand for Data Integration and Processing Tools:** Skills in Apache Spark, Hadoop, and Kafka are increasingly sought after across sectors, reflecting the need for robust data processing and integration capabilities. These tools are essential for handling large volumes of data, ensuring efficient data management, and enabling real-time analytics.
- **Emphasis on Business Intelligence and Analytics Platforms:** Power BI, Excel, and Tableau are in high demand, highlighting the importance of business intelligence tools in extracting actionable insights from data. These platforms enable organizations to visualize data effectively, facilitating data-driven decision-making and strategic planning.
- **Proficiency in Database Management Systems:** The rising need for NoSQL, SQL, and Database Management Systems skills indicates a focus on efficient data storage and retrieval. This demand is driven by the necessity to manage diverse data types and ensure scalable, reliable database performance, crucial for supporting advanced analytics and business operations.

4. Project Management and User Experience

Increased Demand for Collaboration and Automation Tools: In the Tech in Non-Tech sector, skills in JIRA, Trello, and Automation Anywhere are highly sought after, indicating the critical role of collaboration and automation tools in streamlining project workflows, enhancing team collaboration, and automating repetitive tasks, thereby driving efficiency and productivity.

Emphasis on Web and User Interface Design: In the IT Products & Services sector, proficiency in HTML, CSS, JavaScript, and Adobe Creative Suite is in high demand, underscoring the importance of web development and user interface design skills. These competencies are essential for creating engaging, user-friendly digital experiences and ensuring seamless interaction between users and applications.

Focus on Customer Relationship Management (CRM) Systems: In GCCs, the demand for skills in Salesforce, Zoho CRM, and HubSpot CRM reflects the increasing reliance on CRM systems to manage customer interactions and data. Effective CRM usage enhances customer engagement, improves sales processes, and supports data-driven decision-making in project management and user experience initiatives.

5. Systems Operations and Technical Support Services

- **High Demand for Remote Access and Network Security Skills:** The Tech in Non-Tech sector shows a significant demand for skills in Remote Desktop Protocol (RDP), TeamViewer, and Network Security. This indicates a focus on secure remote access solutions and strong network security protocols, essential due to the rise in remote working environments and increasing cyber threats.
- **Importance of IT Service Management and Directory Tools:** The IT Products & Services sector emphasizes skills in Microsoft Active Directory, ServiceNow (ITSM), and LDAP. This reflects the necessity for efficient IT service management and robust directory services to maintain secure and well-organized IT operations, enhancing overall system management.
- **Critical Need for Virtualization and Monitoring Technologies:** In GCCs, there is a strong demand for expertise in VMware vSphere, Monitoring Systems, and ServiceNow. This highlights the importance of virtualization and comprehensive monitoring tools in ensuring the scalability, performance, and reliability of IT infrastructure, which is crucial for supporting dynamic and complex business environments.

6. Cloud Solutions and Enterprise Applications Management

- **Demand for Cloud Infrastructure and Automation Skills:** In the Tech in Non-Tech sector, skills in Infrastructure as Code (IaC), Azure, and Google Cloud SDK are highly sought after. This trend highlights the increasing reliance on cloud automation and scalable infrastructure solutions to enhance operational efficiency and agility in a variety of industries.
- **Critical Role of Cloud Security and Management Tools:** The IT Products & Services sector shows significant demand for skills in AWS, Kubernetes, and Docker. These skills are crucial for managing cloud environments, ensuring secure deployments, and orchestrating containerized applications, reflecting the sector's focus on robust cloud infrastructure management.

- **Adoption of Comprehensive Cloud Platforms:** In GCCs, there is a strong emphasis on expertise in Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform. This indicates a strategic shift towards leveraging comprehensive cloud platforms to support enterprise applications, drive digital transformation, and maintain competitive advantage through scalable and flexible cloud solutions.

The Journey Towards Upskilling

India's tech industry is set for a major shift, with projected salary hikes of 8% to 15% in 2024 for crucial positions in Artificial Intelligence, Data, Cybersecurity, and Cloud. This increase highlights the rising need for specialized expertise in these advanced fields, spurred by rapid technological progress. While the entry-level job market is stabilizing at 19%-20%, demand for experienced professionals remains high at 40%. However, a growing gap between demand and supply is forecasted, with a potential shortage of 1.4 to 1.9 million digital professionals by 2026. Currently, digital skills are expanding at five times the rate of other tech skills, accounting for 33% of the overall tech skillset—a figure expected to exceed 40% by FY 2025.

In the evolving tech landscape, upskilling and reskilling are crucial. Companies that invest in the latest training technologies see higher employee satisfaction with learning and development opportunities- Employers are prioritizing modern skill development and providing extensive learning opportunities to their workforce.

Global Capability Centers (GCCs) Employers in this space transition demand advanced expertise in areas like Generative AI, AI Chips, and Quantum Computing. With the GCC landscape still expanding and somewhat unstructured, a talent shortage is evident. To effectively close skill gaps, GCCs will need to implement detailed skill taxonomies and provide for the upskilling and reskilling of their employees.

IT Products & Services This sector is witnessing a digital transformation that is being driven by focus on AI, blockchain, and data analytics skills. Companies in this space will need to prioritize reskilling and upskilling through customized learning paths and blended learning models that mix traditional instruction with practical, digital platform-based learning opportunities.

Non-tech industries Adopting digital technologies such as Digital Twins, Autonomous UAVs, and Green Tech is essential to overcoming significant skill gaps. Green Tech, in particular, is gaining importance as industries aim for sustainability and environmental responsibility. Collaborating with educational institutions for specialized training,

fostering cooperative learning environments, and utilizing flexible, accessible training technologies are all effective strategies for addressing these needs.

The Indian tech industry is on the verge of a remarkable transformation, fueled by innovation and a strong commitment to upskilling. With a robust market projected to grow significantly in the coming years, the need for specialized talent in areas like artificial intelligence, cloud computing, and cybersecurity is more critical than ever. The proliferation of Global Capability Centers (GCCs) and the integration of technology into non-tech sectors are not only creating jobs but also redefining the skill sets required in today's workforce. As companies adapt to the rapid pace of technological change, investing in employee training and development will be essential for maintaining a competitive edge.

The journey ahead is undoubtedly challenging, but it is also filled with immense potential. As the demand for digital skills continues to outpace supply, the focus on continuous learning and adaptation will determine the future of India's tech landscape. By fostering a culture of innovation and collaboration, India can solidify its position as a global tech powerhouse.

As Albert Einstein wisely stated, "Intellectual growth should commence at birth and cease only at death." This sentiment resonates profoundly in the context of India's tech industry, emphasizing the importance of lifelong learning and continuous skill enhancement in an ever-evolving digital world.