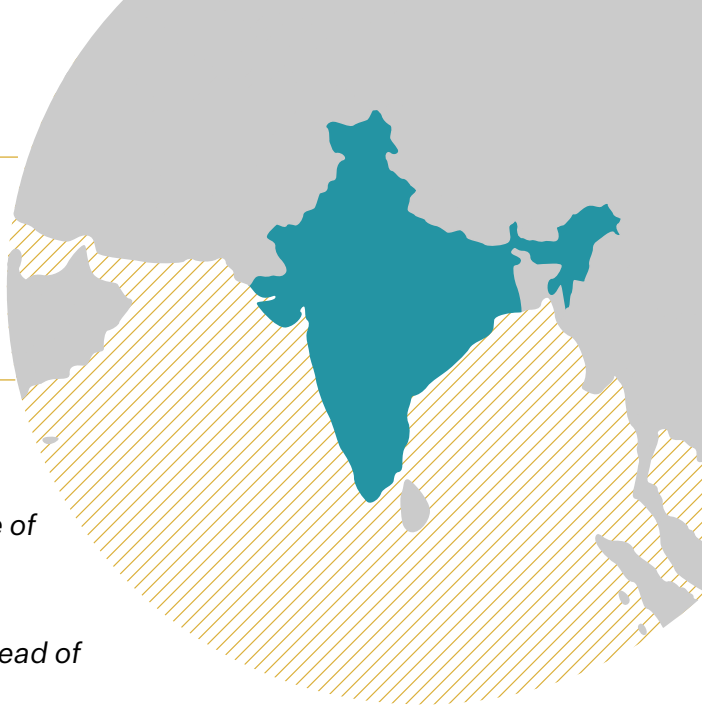
INDIA

Gaining insights into transformative technologies and their social integration



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Key takeaways:

- Development of online platforms and AI supporting software tools in India are part of its vision to become the hub for software in the Global South. Achievements in the country include the establishment of Centres of Excellence and upskilling initiatives to advance capacity for AI.
- Streamlining and coordinating the work of the newly established Centres of Excellence as well as the lack of private-public partnerships are challenges in the country which are currently being addressed.

AI is pivotal to India's strategy of harnessing transformative technologies. Driven by the Ministry of Electronics and Information Technology (MeitY), AI missions are designed to foster inclusivity, steer innovation and ensure AI's wide acceptance across diverse sectors. The aim is to yield significant societal benefits and economic growth.

First applications

A primary focus is on extending the advantages of AI to every segment of society, aligning with the broader vision of comprehensive and sustainable development (TEC, 2020). With current rapid developments in data and AI infrastructure in the country, India aims to become the hub for the Global South for software tools. A prime example of AI's societal contribution in India on the national level is the Bhasini platform, empowered by AI and other advanced technologies and dedicated to local language translation (Bhasini, no date). The National Data and Analytics Platform is another government initiative that streamlines access to governmental data in India: it offers a user-friendly environment for individuals to search, amalgamate, visualize and retrieve datasets easily (NDAP, no date). Moreover, AIRAWAT (AI Research, Analytics and Knowledge Assimilation), a specialized AI-centric cloud computing infrastructure for India, is set to debut soon (AIRAWAT, 2023).

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Establishing Centres of Excellence

MeitY is leading the AI initiatives in India. It has formed seven expert groups to focus on various aspects of AI integration, from establishing national missions to skilling the workforce and addressing cybersecurity. These committees are shaping India's AI strategy. The expert groups' recent report (Expert Group to MeitY, 2023) brought out the operational aspects of establishing the Centres of Research Excellence, which now as they are being implemented are referred to as Centres of Excellence (CoEs). The functions of CoEs may include but are not limited to foundational research, technology development, promoting innovation and entrepreneurship, and AI skill development. Institutional structures of CoEs vary from partnerships between national or local government with companies, such as the CoE for Internet of Things and AI, a partnership between MeitY and the trade association Nasscom, as well as the CoE for Data Science and AI, a partnership between the Government of Karnataka and Nasscom. Some CoEs are within universities.

Skill development initiatives

The Ministry of Skill Development and Entrepreneurship has launched a free online training programme on AI available in various Indian languages. This course is jointly developed by Skill India and GUVI (Grab Ur Vernacular Imprint), an ed-tech company incubated at the Indian Institute of Technology, Madras, and Indian Institute of Management, Ahmedabad. The private sector is also stepping up in AI skill development. For example, Infosys has launched a free AI certification training program that is available on the Infosys Springboard virtual learning platform. Intel, in partnership with the Central Board of Secondary Education under the Ministry of Education, has announced the 'AI For All' initiative to foster a fundamental understanding of AI for everyone in India. Many Indian educational institutions have meanwhile developed their own programs and certification courses in AI and machine learning. One such example is the postgraduate-level advanced certification program in Deep Learning (TalentSprint, 2024) offered by the Indian Institute of Science, Bangalore.

Strategic direction

The National Institution for Transforming India (NITI) Aayog serves as the apex public policy think tank of the Government of India. NITI Aayog published a discussion paper in 2018 titled *National Strategy for Artificial Intelligence #AIForAll* (NITI Aayog, 2018). This is a guiding document for understanding India's vision to integrate AI across all sections of society, ensuring its benefits reach everyone. The document highlights NITI Aayog's recommendations for five sectors that are envisioned to benefit the most from AI in solving societal needs: healthcare; agriculture; education; smart cities and infrastructure; and smart mobility and transportation. MeitY drives India's AI missions within these sectors.

Acknowledging that AI research in India is at a relatively early stage, NITI Aayog has put a strong emphasis on enhancing research capacity and infrastructure. The strategy involves setting up CoEs for in-depth AI research and International Centres of Transformational AI for developing practical AI applications. This dual approach aspires to bring together more collaboration among academia, industry and government. Integrating AI into society also requires addressing ethical, legal and socio-economic issues. Recognizing the need for

appropriate handling of data to ensure privacy and security, NITI Aayog recommends setting up Ethics Councils within CoEs. There is also a recommendation for creating a National AI Marketplace to democratize data access, which is essential for AI innovations.

Roles for Centres of Excellence

In acknowledgment of AI's transformative potential, the finance minister, in her 2023–2024 budget speech, emphasized the need to expand India's comprehensive AI capabilities, which led to the inception of three CoEs in premier educational institutions, adopting a hub-and-spoke model.

These CoEs are integral to the 'INDIAai' initiative, positioning the country at the forefront of global AI advancements. The critical areas identified for the CoEs to promote research and development include governance, healthcare, agriculture, manufacturing and financial technology, as a reflection of their significance in promoting inclusive socio-economic growth. The CoE initiative aims to foster an AI ecosystem, driving innovation through collaboration with industry, academic entities and startups domestically and globally. The CoEs are to lead foundational and practical AI research, targeting sector-specific challenges and aiding the commercialization of existing AI solutions. They are mandated to outline sector-specific AI strategies, identify primary challenges and recognize opportunities.

India's global position

The *AI Index Report 2023* by the Stanford Institute for Human-Centred Artificial Intelligence highlighted India's growing contribution to AI research and development, with steady growth in AI-related publications (Stanly, 2023). India is also making contributions in the global AI ecosystem and Indian tech giants are promoting open-source AI contributions to democratize the technology. India served as the chair of the Global Partnership on Artificial Intelligence, an international initiative aiming to promote the responsible development and use of AI, for 2022–2023. The Indian government has meanwhile taken various steps in developing its own roadmap for AI governance. Towards this, INDIAai organized a roundtable in February 2023 to discuss the generative AI developmental trajectory, ethics and intellectual property rights, involving experts from institutions like the Indian Institute of Science, Bangalore, the Global AI Ethics Institute and IBM Research India (INDIAai, 2023).

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