

Spool Back Tech Talent

- *By Amitabh Kant**

With a vibrant startup ecosystem and a young demographic, India has all the makings of a new, and immense, wave of technological transformation—we just need to catalyse it. If we hedge our bets correctly, these three powerhouses—artificial intelligence (AI), quantum computing, and semiconductor manufacturing—will unleash unprecedented growth and global influence.

The name of the game has changed—first, **AI** will drive enormously consequential economic, social and defence transformations. By 2030, AI is projected to contribute a staggering \$15.7 trillion to the global economy – that’s over four times the GDP of the United Kingdom in 2024. This powerful technology will cut across every sector, changing the way we live and work forever.

Second, **quantum computing** will make a paradigm shift in problem-solving capabilities, and is being plugged into processes anywhere from optimising supply chains to advancing drug discovery.

Third, advancements in **semiconductor** manufacturing are platforming digital transformations around the world. By investing in local chip design and production, India can reduce dependency on imports while becoming an integral part of the global semiconductor supply chain, supporting everything from consumer electronics to sophisticated defence equipment.

We are entering one of the most decisive phases in human history, and in order for India to establish itself as *Viksit Bharat* by 2047, it must become a product-developing nation through the championing of innovation in these three critical technologies, or risk falling behind in the global race.

There exists, within the Indian entrepreneurial ecosystem, an awareness that ideas will fuel the future. According to the 2024 Knowledge Paper by Fraunhofer Institute, India saw a record number of patent applications (90,300) filed in 2023, with over one lakh patents granted. And yet, India faces a significant challenge in effectively commercialising this intellectual property.

The paper also states that in the last decade (2014-2014), Intellectual Property Rights (IPR) payments tripled from 4.8 billion US\$ to 14.3 billion US\$, while IPR receipts only doubled from 0.7 billion to 1.5 billion. This means that India is paying approximately ten times more for IP usage than it receives. This imbalance indicates a broader difficulty in translating domestically generated knowledge and innovation, including potentially data-driven innovations, into commercially viable products and services. In short—our patents are not becoming products.

India's investment in research and development has been significantly lower than other countries. The Rs 1 lakh Crore fund for R& D , the 10,300 Crore earmarked for the IndiaAI Mission, and the established of a dedicated Fund of Fund for DeepTech in the 2025 budget indicates a concerted effort by the Government of India to advance our infrastructure capacity to drive technological innovation. But we may need a bigger push.

For its part, India does have existing schemes aimed at improving R&D in the country. The VAJRA Faculty Scheme invites overseas scientists to serve as adjunct faculty in Indian public institutions with honoraria and grants, while the GIAN initiative engages international experts for short-term courses and lectures in our higher education programmes.

These existing efforts, while valuable, are limited in their scope. Schemes like VAJRA are geared towards shorter engagements and largely remotely driven research collaborations, and GIAN's primary focus is on delivering academic content through guest lectures. Conceptualised before the transformative emergence of today's advanced technologies and the intensely competitive global environment for talent. .To propel India to the forefront of research and development and to effectively harness the potential of its diaspora, a far more ambitious and large-scale strategy is needed. India needs to think big and implement substantial programmes that can attract top-tier scientific minds for more significant and sustained engagement in R&D within the country. This requires a bold vision focused on bringing back talent to invigorate India's innovation ecosystem on a much larger scale.

We need our best minds to come home.

India needs to develop a reputation as the place to do cutting-edge research. For this, we need to create a holistic and competitive R&D environment, make strategic investments, and, crucially, create conditions alluring enough to convince Indian innovators abroad to come back.

To do this, we need a dedicated national programme singularly focused on bringing top-tier scientific talent back to India, strengthening our national capabilities in research, development, and deployment across various scientific domains. We can implement this across two distinct tracks:

Under Track 1, India should attract 250 distinguished academics from the leading 100 global universities over five years, requiring them to spend at least six months annually at an Indian host institution for a minimum of five years. They should receive a one-time research budget of up to \$1 million to establish labs or initiate projects, with optional teaching based on preference. Track 2 should aim to create 1,000 research sabbaticals for academics from the top 200 global universities, supported by a one-time \$100,000 budget and additional annual “top-ups”. Both tracks should provide competitive sustenance allowances and require active collaborations with local academics and mentorship for PhD students.

India should also embrace research in the arts by allocating 15% of its targets to non-sciences and humanities. This could include fields like design, architecture, performing arts, and digital media—specialised areas that not only enrich culture but also drive innovation, enhance problem-solving skills, and contribute to sustainable urban development. Domestically, we must also integrate Tier 2 and Tier 3 cities, from which some of the brightest minds and most innovative thinkers emerge, offering unique perspectives rooted in the economic and cultural realities of our land.

Other countries have already succeeded at this task. Amid tightening immigration policies and hostility towards ‘outsiders’ in Western countries, countries like China have made coming back a more lucrative opportunity for its researches. Through programmes like the “Youth Thousand Talents, China successfully enticed nearly 20,000 scientists of Chinese descent to return by offering substantial financial incentives and research support. According to LinkedIn’s “2024 Chinese Overseas Graduates Job Seeking Report,” 84% of Chinese students abroad also chose to return, signalling a shift with significant implications for both China and the global workforce.

In comparison, top talent continues to leave India for opportunities abroad in tech . Nearly all AI researchers have opted for careers in countries like United States, Australia and the UK. In fact, a 2023 study ¹showed that among the top scorers of the IIT entrance exams, 62% of the top 100 and 36% of the top 1,000 candidates chose to study abroad.

Indians are already making a significant impact in high-ranking positions at leading tech companies in the West. Our challenge now is to bring back these top researchers, academics, and technicians, along with the best talent from around the world, to contribute to India's story.

India is staring at a once-in-a-generation opportunity to leapfrog into the next era of its development. Our efforts must create an ecosystem that not only brings back the best of our diaspora, but also motivates and nurtures talent within the country to excel in AI, quantum computing, and semiconductor manufacturing. A dedicated national program is key, which incentivizes the sustained engagement of 250 academics from the top 100 global universities (Track 1) with India's R&D ecosystem, and also offers 1,000 sabbaticals for scholars from the top 200 universities (Track 2). When you combine these efforts with our dynamic startup movement and the Fund of Funds for Deep Tech as laid out in the budget, India can position itself at the forefront of these emerging technologies, ensuring that the technological revolution benefits all.

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¹ <https://www.sciencedirect.com/science/article/pii/S0304387823000755?via%3Dihub>