SOUTH ASIA SCAN

India's Foundational Artificial Intelligence and Large Language Model Ambitions

Amitendu Palit
Kanika Kaur

NUS National University of Singapore | ISAS Institute of South Asian Studies

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Institute of South Asian Studies
National University of Singapore
29 Heng Mui Keng Terrace
#08-06 (Block B)
Singapore 119620
Tel (65) 6516 4239
Fax (65) 6776 7505
URL www.isas.nus.edu.sg

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Executive Summary

The global race for leadership in the development of advanced artificial intelligence (AI) large language models (LLMs) is unfolding within an increasingly competitive geopolitical landscape. LLMs and other foundational AI systems are no longer considered neutral productivity tools; instead, they are seen as strategic assets shaping state capacity, economic competitiveness and geopolitical leverage. They are, therefore, important determinants of national power and on the abilities of countries to exert strategic influence.

The United States (US) and China are leading the creation of LLMs. Their advances in this regard are enhancing their techno-strategic rivalry. Their approaches to developing LLMs and adopting applied AI are marked by contrast. Along with China and the US, several other countries are actively pursuing foundational AI capacity-building strategies. The economic and strategic utility of such strategies has resonated with India as well. Given India's structural development constraints and imperatives, differing opinions have emerged on the optimal strategy that India should adopt. The varying opinions arise from contesting priorities between India's strategic ambitions and the roadblocks created by its institutional capacity constraints.

This South Asia Scan adopts a comparative approach to examine the various pathways pursued by major AI actors, including China, the US and select European states such as the United Kingdom (UK) and France, alongside regional examples like Singapore and the United Arab Emirates (UAE). Drawing on these experiences, efforts made by India to date and a close inspection of India's AI ecosystem, this paper argues in favour of a nuanced hybrid, tiered approach. India's AI strategy must strike a balance between strategic autonomy and pragmatic adaptation. By anchoring its approach in public-private partnerships, open-source collaboration and incremental capability building, India can reduce dependency risks, enhance digital sovereignty and position itself as a credible AI actor for the Global South without mirroring the capital-intensive models of existing AI hegemons.

Introduction

As global competition for leadership in AI intensifies, a handful of firms, primarily from the US and China, dominate the race due to their control and access to data, capital, talent and cutting-edge research. The US and China are locked in a race to accelerate the development and adoption of AI. Firms in these countries are rapidly developing new applications and accelerating the commercial and military adoption of AI, exemplified by companies such as Palantir, Anduril, Baidu and Da-Jiang Innovations, whose dual-use systems move swiftly from civilian markets to defence deployment.

India has also decided to build a sovereign LLM by announcing the establishment of BharatGen.[1] Notwithstanding the development, there are contrasting views on whether India should dedicate itself to developing its own foundational LLM or adapt practical applications for existing ones.

This Scan treats LLM development as a strategic question, not just a technological one. This debate unfolds at a moment of global techno-strategic flux, with the US restricting the export of graphics processing units (GPUs) to maintain its dominance. China has mobilised a whole-of-nation effort, incorporating public-private collaboration, state support and research and development (R&D) integration to build scalable domestic LLMs. Meanwhile, India stands at a strategic crossroads with no clearly defined path. It holds unique contextual advantages such as a vast data ecosystem and a thriving technology workforce, but also faces significant risks, including limited compute capacity and regulatory uncertainty. India has demonstrated that frugal innovation can disrupt global incumbents, as evidenced by the Unified Payments Interface (UPI) and the Aadhaar programme.

India has a demographic and data advantage, but a limited R&D capacity (0.6 per cent of gross domestic product (GDP), heavy dependence on GPU imports and a shallow deep technological

1 Press Information Bureau (PIB), *Dr. Jitendra Singh hails "BharatGen" as India's first sovereign multilingual and multimodal AI driven Large Language Model*, Press Release, (New Delhi: Ministry of Science & Technology, 25 November 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2194204&reg=3&lang=2.

ecosystem.[2] This vulnerability is compounded by the risk that models like DeepSeek could begin displacing low-cost service sectors, threatening to erode India's long-held information technology (IT) advantage. In light of these pressures, this Scan evaluates whether building foundational models is a strategic imperative for India or a premature ambition. It examines the cost-benefit trade-offs of domestic LLM development, the risks of overdependence on foreign models, the state of India's AI ecosystem and computing capacity. It explores a layered, middle path approach that balances strategic autonomy with pragmatic adaptation.

2 Vishwa Mohan, "India improves its R&D expenditure but lags behind many countries including China, USA and Israel", *The Times of India*, 29 November 2024, https://timesofindia.indiatimes.com/india/india-improves-its-rd-expenditure-but-lags-behind-many-countries-including-china-usa-and-israel/articleshow/115813953.cms.

Foundational Artificial Intelligence Models, Economic Transformation and Strategic Dimensions

LLMs are AI systems trained to understand and generate human-like language. By using deep learning techniques, particularly neural networks, they analyse massive amounts of text data to learn how words, phrases and sentences relate to one another.[3] LLMs can automate time-consuming tasks, such as summarising reports, generating emails or translating documents, saving hours of manual effort. By powering voice assistants and smart interfaces, they make technology more intuitive and user-friendly.

LLMs are fuelling a new wave of human-AI collaboration as they are being used to build smarter chatbots, provide better customer support, analyse large data and develop digital products. The transformative role of LLMs stretches beyond the technology sector to multiple industries. One of their most powerful transformative applications is in the healthcare industry, where they are summarising patient records, diagnosing symptoms based on documentation, powering AI chatbots responding to health enquiries and automating clinical documentation, resulting in more efficient and accessible care.[4] LLMs are also transforming customer-centric industries like retail and e-commerce through personalised customer support, product recommendations and content creation. LLM-generated content, including clear and compelling product descriptions, has a significant influence on buyer decisions.[5] Amazon, for instance, is using LLMs to personalise services, tailor product suggestions and market content and web experiences.[6] In the financial industry, LLMs are facilitating fraud detection by identifying suspicious language and behaviour patterns, streamlining internal processes and improving compliance through intelligent document handling. By scanning and summarising risk data from multiple sources, LLMs are enhancing financial institutions' capacity to counter potential threats.

3 Cole Stryker, "What are large language models (LLMs)?", *IBM Think*, 10 September 2025, https://www.ibm.com/think/topics/large-language-models.

4 "LLMs Transforming Industries: An Early 2025 Perspective", *Illumbria*, 10 March 2025, https://illumbria.com/insights/llms-transforming-industries-early-2025-perspective/.

5 "109+ B2B Ecommerce Statistics & Numbers (updated 2026)", *BusinessDasher*, 3 January 2026, https://www.businessdasher.com/importance-of-product-description/.

6 Ivy Levine, "How Amazon is using generative AI to improve product recommendations and descriptions", *Amazon News*,19 September 2024, https://www.aboutamazon.com/news/retail/amazon-generative-ai-product-search-results-and-descriptions.

Strengthening cybersecurity has become an important application for LLMs, with businesses leveraging them for better threat detection, automating incident response, real-time log analysis and intelligent security assistants that enable faster, more accurate decision-making. LLMs can analyse logs, emails and network activity to detect unusual patterns or suspicious behaviour, identifying threats before they escalate. They also strengthen security capabilities by summarising incidents, suggesting actions and drafting reports. Cybersecurity firms are integrating LLMs into their Security Operation Centres to automate threat triage, improve response accuracy and reduce analyst fatigue and response time.[7]

It is fallacious to treat LLMs as just cutting-edge computational tools, as they are becoming the foundational infrastructure for national governance. They have emerged as strategic governance assets for countries, as they significantly influence the core functions of societies and states. Their profound impact on service delivery arises from their ability to analyse large volumes of data and generate rapid insights, enabling predictive analytics for efficient delivery of public goods and services. These attributes make them digital backbones for decision-making and key strategic assets for governments.

The development, control and application of LLMs are significantly impacting the abilities of countries to not only influence their own development but also the global economy. Countries that own and shape the development and application of LLMs will have greater control over global data and will enjoy strong comparative advantages in AI-intensive use of cross-border platforms and industrial operations. Furthermore, the impact of such influence exerted by countries that own and apply LLMs will be widespread. This is due to AI's emergence as a general-purpose technology (GPT) and its profound disruption across labour markets and industrial processes, similar to those caused historically by the inventions of electricity, steam engines and the internet.[8] Countries aspiring to emerge as global powers must closely examine their capabilities to develop and

7 Xihuan Lin, Jie Zhang, Gelei Deng, Tianzhe Liu, Xiaolong Liu, Changcai Yang, Tianwei Zhang, Qing Guo and Riqing Chen, "IRCopilot: Automated Incident Response with Large Language Models", *arXiv*, 27 May 2025, https://arxiv.org/abs/2505.20945.

8 David J. Deming, Christopher Ong and Lawrence H. Summers, "Technological Disruption in the Labor Market", *National Bureau of Economic Research* (NBER), Working Paper No. 33323, (Cambridge, MA: National Bureau of Economic Research, January 2025), https://www.nber.org/system/files/working_papers/w33323/w33323.pdf.

strategically utilise LLMs for both domestic and global objectives. The global landscape is already experiencing the strategic weight of LLMs. The US, China and the European Union (EU) are actively building domestic general-purpose models, each embedding its own political values, economic goals and regulatory visions into the design of AI. In this context, developing LLMs for India is a national strategic imperative, not just an innovation challenge. Whether it chooses to develop LLMs or not will determine whether, in the distant future, it can shift from being a consumer of foreign-built general-purpose models to a service provider with the ability to adapt models to its own needs and capabilities. This would also weigh in on the idea of digital sovereignty, as the latter will depend on building models trained on domestic data capable of accommodating linguistic diversity, governance complexities and developmental priorities. This is essential for ensuring inclusive and equitable public access to AI tools. Unlike other global powers pursuing frontier R&D dominance, India can define and nurture its global strategic edge by anchoring AI in providing real-world solutions to a variety of global development issues, especially concerning the delivery of public goods in the Global South, based on learning from localised use cases. India's grassroots innovation capacities, a dynamic and robust start-up ecosystem and the demographic scale can make India a global leader in producing scale-intensive applied sovereign AI.

Global Approaches to Large Language Model Development and Regulation: Evidence from China, the United Kingdom and France

As Generative AI (GenAI) systems and LLMs become central to national strategies, countries are adopting diverse approaches to their development. This chapter reviews some of these strategies and the resultant experiences.

China

Although US businesses (for example, Google, Microsoft, Meta and OpenAI) are regarded as 'first movers' in developing LLMs, the efforts have spread beyond the Silicon Valley. In Asia, China has seen a rapid rise in GenAI applications for public consumption, with Huawei's Pangu being one of the most notable ones. China's engagement in the GenAI space is distinctive for its regulatory approach. It relies on light-touch regulation, which contrasts with the EU's much stricter approach. It emphasises on dedicated regulatory bodies and on subjecting riskier AI applications to rigorous testing and pre-market approval processes.[9] More recently, models such as DeepSeek signal China's growing capacity to develop competitive LLMs outside established technology giants.

The regulatory scope of China's initial interim measures, issued in July 2023 by ministries and departments under the State Council, applies to services that provide text, image, audio and video content.[10] The regulations seek to manage a range of risks associated with the application of GenAI, including content security, personal data protection and data security. These comprised the first legally binding instrument aimed at regulating GenAI. Further strengthening this framework, new labelling rules that came into effect on 1 September 2025 mandate the implicit labelling of all AI-generated content through metadata and explicit labelling, clearly perceptible to users, for applicable text, audio, image and video content. In addition, on

9 Mimi Zou and Lu Zhang, "Navigating China's regulatory approach to generative artificial intelligence and large language models", *Cambridge Forum on AI: Law and Governance*, Vol. 1, 2025, https://www.cambridge.org/core/journals/cambridge-forum-on-ai-law-and-governance/article/navigating-chinas-regulatory-approach-to-generative-artificial-intelligence-and-large-language-models/969B2055997BF42DE693B7A1A1B4E8BA.

10 Ibid.

25 April 2025, the State Administration for Market Regulation and the Standardisation Administration of China jointly released national standards to strengthen the security and governance of GenAI.[11]

The Chinese approach has been described as a vertical approach to AI regulation, focusing on addressing specific risks.[12] It is also considered highly reactive and adaptive, with regulatory bodies responding swiftly to abrupt and sudden changes and uncertainties.[13]

China's cyber laws and regulations aim to control a variety of risks emerging from a rapidly advancing technological landscape, while simultaneously fostering development and innovation.[14] The state-led approach to AI governance focuses on harnessing AI to increase the country's international competitiveness, economic growth and social development. This approach is tied to China's ambitions to become a global leader in AI technology, as outlined in the AI development plan launched in 2017, which aims to make China a globally dominant player in AI by 2030.[15] Becoming a global leader will entail the commercialisation of AI as well as the shaping of technical and ethical standards.

From the perspective of global strategic rivalry in advancing foundational AI, it is important to review China's policies alongside those of the US and the EU. Compared to the market-driven approach of the US and the rights-based approach of the EU, China's AI development strategy prioritises security interests and domestic social stability. When looked at specifically in the context of the EU's horizontal approach of developing broad regulatory frameworks, China's strategy is vertical, focusing on a narrower framework for specific applications and technological manifestations.[16] The EU has preferred employing its AI Act as a single piece of horizontal legislation for regulating the broad scope of AI applications. China's vertical approach enjoys the advantage of speed in introducing or amending legally binding instruments.[17] The approach of the US is far

11 CADE, "China's new regulations on AI-generated content labeling", CADE Publications, 15 March 2025, https://cadeproject.org/updates/chinas-new-regulations-on-ai-generated-content-labeling/.
12 Ibid.
13 Ibid.
14 Ibid.
15 Mimi Zou and Lu Zhang, "Navigating China's regulatory approach to generative artificial intelligence and large language models". Op. cit.
16 Ibid.
17 Ibid.

more in contrast, with respect to both the EU and China, in its market-driven, innovation-first character, relying on loose sectoral regulation and executive guidance rather than a comprehensive binding federal framework. Consequently, the development of LLMs in the US has been largely driven by private firms. The innovation-first model prioritises scale, speed and market leadership. More on the specific strategic contestation between China and the US is discussed later.

It is also noteworthy that, while state-led, China's regulatory approach to AI cannot be classified as top-down, as the shaping of AI rules has involved multiple stakeholders, including various policymakers and regulatory bodies. It may have led to the developmental objective of AI being given a relatively higher weight in policy statements enunciating the strategy, while not undermining the security objective.[18]

Strategic Rivalry with the US and its Implications for Artificial Intelligence Policy

The US-China rivalry is largely centred on advantages and gains each can secure through advances in frontier technologies and their applications. This has impacted the shaping of AI rules in China.

China's AI strategy comprises three key components: an infrastructure megaproject for computing power, a whole-of-nation approach to developing AI foundation models and forging connections with foreign innovation systems beyond the US.[19] The infrastructure megaproject was partly in response to the US' export controls on AI-relevant semiconductor technology.[20] It resulted in several initiatives to organise China's scarce computing resources more efficiently for AI model training. Through such projects, China is pursuing self-reliance in AI technology while integrating with global innovation networks where possible and advantageous. A notable initiative in this regard is the state-backed Peng Check Lab (PCL), which embodies efforts

18 Scott Singer and Matt Sheehan, *China's AI Policy at the Crossroads: Balancing Development and Control in the DeepSeek Era*, Paper, (Washington DC: Carnegie Endowment for International Peace, 17 July 2025), https://carnegieendowment.org/research/2025/07/chinas-ai-policy-in-the-deepseek-era?lang=en.

19 Rebecca Arcesati, *China's AI development model in an era of technological deglobalization*, Report, (Berlin: Mercator Institute for China Studies (MERICS), 2 May 2024, https://merics.org/en/report/chinas-ai-development-model-era-technological-deglobalization.

20 Ibid.

to bring different actors together. Established by the Guangdong provincial and Shenzhen municipal governments, PCL serves as a coordination hub that pools state funding, academic expertise and industry participation, facilitating collaboration among universities, state-owned enterprises and private technology firms to drive advanced research.

The PCL spearheads the China Computing Net (CCN), in collaboration with Huawei. The CCN, a key component of the National Integrated Computing Power Network, is designed as an interconnected grid of AI computing centres, data centre clusters and supercomputers that allocate computing power in a manner similar to a public utility.[21] Descriptions of the CCN reveal its usefulness in the context of US export controls, as it combines different kinds of chips and optimises hardware use.

The whole of the nation's approach manifests in orchestrating partnerships and pooling resources for training foundational models. By mobilising state labs and tasking leading firms with building a dedicated AI ecosystem, China aims to rally relevant actors around a nationwide mission. The approach, which has deep historical roots, emphasises on the state's key role in steering market actors to achieve breakthroughs in areas like AI. This approach, however, requires a delicate balancing of state-market relations, with the government selecting leading AI firms to build ecosystems in select areas and setting standards. This demonstrates the government acting as the ecosystem orchestrator.[22] Chinese LLM developers are receiving generous government subsidies to expand their computing resources and are also supported in other ways. For instance, the Beijing municipality promotes resource pooling among firms and labs through a partnership plan for artificial general intelligence, including open cooperation platforms for LLMs.

The complex global geopolitics around the US-China rivalry has restricted Chinese actors' access to global technology resources. The US technology giants have downsized or halted their AI R&D in

21 Ibid.
22 Ibid.

China.[23] Smaller firms based elsewhere, such as the British AI chip startup Graphcore, have had to withdraw from China due to export controls.[24] Concerns over losing access to foreign capital and global software communities will impact China's AI strategy with efforts to forge partnerships beyond the US.[25] China's AI collaboration with the EU, for example, is on the rise. The whole-of-nation approach, while pioneering the state as an ecosystem enabler, will continue to seek diversification to maximise strategic advantages.

The United Kingdom

The UK's approach to LLM development and regulation is defined by its innovation-first ethos – a strategic effort to make the UK a global leader in AI, with regulations functionally distinct from those of the EU and the US. The UK's 'middle path' approach strikes a balance between economic opportunity, public trust and global competitiveness in its AI policies.[26] The National AI Strategy of 2021 frames AI as a driver of economic growth, scientific leadership and geopolitical influence. Unlike the EU, which prioritises rights, safety and rules-based compliance, the UK emphasises market dynamism, economic utility and light regulatory mechanisms. At the same time, unlike the US strategy, which focuses heavily on market actors, the UK government has been active in shaping AI development infrastructure, regulating compute, integrating semiconductors and aligning AI with national security.[27] The UK's strategy serves as a bridging model, combining elements of both the market and the state. While leaning economically towards the US' template, it embeds state-backed safeguards, such as AI safety research, public sector audits and risk integration, into national policy.

Articulated across the domains of ecosystem development, sectoral and regional diffusion and governance architecture, the National AI Strategy has distinct short-, medium- and long-term objectives. In the

23 Annie Palmer, "Amazon closes Shanghai AI research lab in latest cost-cutting move", *CNBC*, 23 July 2025, https://www.cnbc.com/2025/07/23/amazon-closes-shanghai-ai-research-lab-in-latest-cost-cutting-move.html.

24 Ibid.

25 Ibid.

26 Emre Kazim, Denise Almeida, Nigel Kingsman, Charles Kerrigan, Adriano Koshiyama, Elizabeth Lomas and Airlie Hilliard, "Innovation and opportunity: review of the UK's national AI strategy", *Discover Artificial Intelligence*, Volume 1, article number 14, 2021, https://link.springer.com/article/10.1007/s44163-021-00014-0.

27 Ibid.

short term, efforts focus on improving data availability, cyber-physical infrastructure and AI-related skills. Medium-term priorities include a national skills agenda, enhanced visa regimes to attract talent and collaborative R&D initiatives with the US. Notably, the 'Tech Prosperity Deal' on AI, quantum computing and civil nuclear energy, agreed upon during US President Donald Trump's September 2025 visit to the UK, was paused in December 2025.[28]

Over the longer term, the goals are to bolster semiconductor supply chains, promote diversity in AI development and launch open government data initiatives. A key aspect of the national AI strategy is to stimulate the diffusion of AI technologies across low-maturity sectors to ensure the equitable distribution of benefits.[29]

A key distinction lies in the greater role of the state in developing AI capacities, as opposed to that of the US, which is spearheading innovation. Innovation efforts in the US are driven entirely by private firms. The UK prefers that the government play a more active role in areas like talent pipelines, cybersecurity, compute access and defence applications. The role of the state, though, is much less than that described earlier for China. The hybrid approach characterises the bridging model by strongly encouraging private and market-driven efforts while ensuring state-backed safeguards. This is further evident through AI standards hubs, algorithmic transparency pilots and foundational model oversight mechanisms for integrating ethical standards without hindering innovation.

The UK's specific posturing on GenAI was articulated in 2023 in the white paper, *A Pro-Innovation Approach to AI Regulation*, which examined foundational models and their regulatory implications.[30] The white paper introduced two key dimensions for risk evaluation, namely, adaptiveness and autonomy. It highlighted the potential risks associated with the use of LLMs, including the dissemination of misinformation, amplification of social biases and exacerbation of national security risks in the absence of adequate safeguards for

28 Alistair Smout, "US pauses implementation of $40 billion technology deal with Britain", *Reuters*, 15 December 2025, https://www.reuters.com/world/europe/us-suspends-technology-deal-with-uk-ft-says-2025-12-16/.
29 Ibid.
30 "AI Watch: Global regulatory tracker", *White & Case*, 25 March 2025, https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-united-kingdom.

open-source deployment.[31] The subsequently evolving regulations are shaping into a flexible, context-dependent model granting sectoral regulators discretion to mandate transparency, privacy and safety requirements tailored to specific AI use cases, such as statutory reporting obligations for LLMs trained on data beyond a certain threshold. The framework also urges regulators to allocate legal responsibility based on roles played across the AI value chain, ranging from dataset curation to model deployment.[32]

A subsequent report by the House of Lords in 2024, while supporting innovation, highlighted how the government's focus on safety from long-term speculative harms has compromised short-term market and security challenges. [33] The report drew attention to the risk of monopolisation in the LLM market and advocated greater support for startups, along with the need for transparency in training data and model usage.[34] It also called for stronger safeguards against disinformation, cyber threats and misuse of generative tools. On the sensitive issue of content copyright, the report urged the government to regulate the use of protected data by LLM developers without consent or compensation and to create laws ensuring transparency, licensing and accountability in AI training practices.[35]

Most recently, in January 2025, the government published the AI Opportunities Action Plan, outlining strategic actions to bolster the UK's AI ecosystem and reaffirming a light-touch, pro-innovation regulatory approach rather than a comprehensive statutory regime. The plan also emphasised the continued role of sectoral regulators and iterative guidance updates in shaping AI oversight.[36]

The UK's experience is an illuminating example of a global middle power exercising agency in AI governance. The emphasis on soft

31 Ibid.
32 Ibid.
33 Liam Kay-McClean, "UK 'too focused on safety' in AI and LLM policy, says Lords", *Research Live*, 2 February 2024, https://www.research-live.com/article/news/uk-too-focused-on-safety-in-ai-and-llm-policy-says-lords/id/5122203, https://www.research-live.com/article/news/uk-too-focused-on-safety-in-ai-and-llm-policy-says-lords/id/5122203#:~:text=UK%2520%E2%80%93%20The%20UK%20government's%20approach,Lords%20Communications%20and%20Digital%20Committee.
34 Ibid.
35 House of Lords Communications and Digital Committee, "Large language models and generative AI", House of Lords Paper 54, (London: House of Lords, 2 February 2024), https://publications.parliament.uk/pa/ld5804/ldselect/ldcomm/54/54.pdf.
36 Department for Science, Innovation & Technology, *AI Opportunities Action Plan*, Independent Report, (London: Department for Science, Innovation & Technology), 13 January 2025, https://www.gov.uk/government/publications/ai-opportunities-action-plan/ai-opportunities-action-plan.

regulation, compute strategy, foundational model oversight and economic opportunity offers a viable path for other middle powers. This is especially relevant for large emerging markets like India that are not global AI hegemons but are seeking to establish themselves in the global AI race through institutional capacity and agile regulation. The UK model highlights the coexistence of regulatory reach with innovation uptake and how middle powers, besides the US and China, may shape AI governance and technological advancement.

France

France has been one of Europe's most vocal champions of AI sovereignty. In the lead-up to the 2024 Paris AI Action Summit, French President Emmanuel Macron declared that one of France's strategic objectives was to secure technological sovereignty in AI.[37] The ambition reiterates past French efforts to protect national control over critical digital infrastructure, such as the push for cloud sovereignty, which imposed strict requirements on foreign-owned data centres operating within France. Since then, France, as well as the EU, has been gradually fortifying local AI capacity, including investments in model development and compute infrastructure. The EU has also announced OpenEuroLLM, a project aimed at developing open-source European AI models trained on EU-owned supercomputers.

A distinct geopolitical undertone is emerging in France's strategic approach to AI, as reflected in the EU's AI strategy. Macron has been describing AI as a geopolitical issue centred on sovereignty and strategic autonomy, thereby positioning Europe as a direct competitor of the US and China.[38] Within the geopolitical space, however, he is inclined toward deeper collaboration with the US than with China. He is also visualising AI sovereignty through a "third way" in AI development – a strategic alliance between European and non-European powers, such as India, which co-hosted the Paris AI Summit.[39] The vision is distinct in fostering interdependence and mutual support among participating stakeholders while charting a development path that is exclusive of the US and Chinese AI

37 Pablo Chavez, "France Pursues an AI 'Third Way'", Centre for European Policy Analysis (*CEPA)*, 13 February, 2025, https://cepa.org/article/france-pursues-an-ai-third-way/.
38 Ibid.
39 Ibid.

ecosystems. A notable example is France's multi-billion-euro investment in domestic AI compute infrastructure as a potential counter to Microsoft's Stargate initiative. Apart from French firms like Orange and Thales, the effort is also backed by the UAE and Canadian investors, exemplifying the multilateral dimension of France's strategy. Macron has also proposed joint efforts with India, signallin a broader interest in building cross-regional coalitions around shared values and AI infrastructure.[40]

Despite the North Atlantic Treaty Organization partnership, France's insistence on AI sovereignty is seen as a response to US export controls under both the President Joe Biden and Trump administrations. By limiting the overseas sale of advanced semiconductors and high-performance computing capacity, these controls constrain global access to cutting-edge chips while strengthening AI development within the US. Although Washington has recently permitted limited shipments of NVIDIA's H200 chips to China, this relaxation has not altered the broader trajectory of US technological containment.[41]

China's DeepSeek model has also served as a wake-up call for France and the EU, galvanising French efforts to scale its own models, including those developed by the flagship start-up Mistral.[42]

France's efforts have encountered roadblocks with the open-source chatbot Lucie, launched as part of the France 2030 initiative in early 2025 and subsequently taken offline due to serious performance issues. Developed with support from OpenLLM France, Linagora and the National Centre for Scientific Research, Lucie was to showcase France's capacity to compete with global LLM leaders. Instead, it revealed underlying weaknesses.[43] It struggled with basic logic, maths and factual accuracy and was widely criticised for premature release.

The incident reignited debates over France's AI priorities, with critics highlighting over-emphasis on symbolic leadership and prestige-

40 Ibid.

41 Michael C. Horowitz, Chris McGuire and Zongyuan Zoe Liu, "The Consequences of Exporting Nvidia's H200 Chips to China", *Council on Foreign Relations*, 9 December 2025, https://www.cfr.org/expert-brief/consequences-exporting-nvidias-h200-chips-china.

42 Ibid.

43 "Yes Tussaud, "France's AI Setback as Lucie LLM Pulled After Just Two Days", *CTOL Digital*, 2 February 2025, https://www.ctol.digital/news/france-ai-setback-lucie-llm-pulled-after-two-days/.č

driven initiatives, as opposed to building foundational infrastructure or supporting applied AI use cases. Extending the thought, there are concerns that Europe may risk framing AI primarily as a financial or reputational asset, with market headlines taking precedence over emphasising utility applications.[44]

Furthermore, some opinions also criticise the strategy of competing head-on with the US or China in general-purpose LLMs, arguing in favour of France and the EU pursuing the development of targeted AI applications, high-quality training datasets and open compute infrastructure.[45]

44 Pascale Davies, "'Devoid of any meaning': Why experts are calling the Paris AI Action Summit a 'missed opportunity'", *Euronews*, 14 February 2025, https://www.euronews.com/next/2025/02/14/devoid-of-any-meaning-why-experts-call-the-paris-ai-action-summit-a-missed-opportunity.

45 Pablo Chavez, "France Pursues an AI 'Third Way'", op. cit.

Comparisons between Approaches

AI has transitioned from a specialised research domain into a critical general-purpose technology impacting key sectors and industries such as healthcare, autonomous vehicles, finance and national security. Initially, the evolution of AI and discussions around it were focused on the ethical dimensions of transparency, fairness and accountability. Over time and with AI's extensive application across various critical industries, the limitations of a voluntary, principle-based framework became clear, underscoring the need for enforceable regulation caused by concerns over algorithmic bias, privacy erosion and the broader societal impacts of automation and surveillance.

As seen from the experiences discussed in the previous chapter, countries are responding with AI governance frameworks that balance innovation with regulatory oversight. There appears to be a growing consensus that risk-based regulatory frameworks evaluating AI systems by potential societal harm are preferable to those imposing blanket rules. These frameworks impose stricter obligations for high-risk applications (for example, biometric surveillance and critical infrastructure), while allowing flexibility for low-risk uses, such as data analytics. Such classification, though, might be difficult to operationalise due to the fast-changing nature of AI systems.[46] Indeed, available research on the subject points to the difficulty of defining regulatory thresholds.[47]

The EU has spearheaded legislative efforts with the risk-based AI Act, which will be fully enforceable by 2027. The Act classifies AI systems based on risk levels, setting a global benchmark for responsible AI use.[48] Modelled after the General Data Protection Regulation (GDPR), it represents the most comprehensive global effort to formally regulate AI. Its risk-tiered structure imposes strict requirements on high-risk systems, including transparency, data governance and post-market surveillance. The EU's global regulatory weight, manifesting

46 Amir Al-Maamari, "Between Innovation and Oversight: A Cross-Regional Study of AI Risk Management Frameworks in the EU, U.S., UK and China", Faculty of Computer Science and Mathematics, University of Passau, 11 March 2025, https://arxiv.org/pdf/2503.05773.

47 "AI Act: Risk Classification of AI Systems from a Practical Perspective", *Applied AI Initiative*, March 2023, https://www.appliedai.de/en/insights/ai-act-risk-classification-of-ai-systems-from-a-practical-perspective/.

48 Amir Al-Maamari, "Between Innovation and Oversight: A Cross-Regional Study of AI Risk Management Frameworks in the EU, U.S., UK and China", op. cit.

through the 'Brussels effect', may encourage global AI-intensive businesses to consider EU standards as a global template, thereby extending the normative influence beyond Europe.[49]

In contrast to the EU, the US treats LLMs as global digital infrastructure, with companies such as OpenAI, Anthropic and Meta shaping their development. It is following a decentralised, innovation-friendly policy, entrusting regulation to sectoral agencies such as the Food and Drug Administration and the National Highway Traffic Safety Administration, which are issuing domain-specific guidelines.[50] The sectoral flexibility, while limiting binding regulations, encourages innovation, with compliance being mostly voluntary and ethical oversight industry-led. The regulatory landscape in the US, though, is increasingly being shaped by the clout of the AI lobby. Leading AI firms such as OpenAI, Anthropic, Scale AI and Nvidia are not only lobbying for light regulation but also pursuing large federal contracts from a government IT budget, where AI is a growing focus.[51] OpenAI and Anthropic, which began as cautious, research-first organisations, are deeply engaged with the government. OpenAI, the creator of Chat Generative Pre-trained Transformer (ChatGPT), has been urging the federal government to fast-track permits for AI data centres, expand the national grid and invest heavily in energy systems to support AI at scale. Nvidia, on the other hand, has registered in-house lobbyists for shaping regulations.[52]

However, lobbyists are not necessarily able to influence regulation. Trump's 'One Big Beautiful Bill Act'[53] initially provided for a 10-year moratorium on state and local regulation of AI – a demand widely driven by industry interests. But in a sweeping bipartisan vote, the Senate removed the provision, marking the inclination of the state, if necessary, to step in to stem corporate influence.[54] While the federal government remains heavily invested in AI development, particularly in national security and infrastructure, the Senate move signals a

49 Ibid.
50 Ibid.
51 Mohar Chatterjee, "The AI lobby plants its flag in Washington", *Politico*, 6 June 2025, https://www.politico.com/news/2025/06/06/the-ai-lobby-plants-its-flag-in-washington-00389549
52 Ibid.
53 "H.R.1 - An act to provide for reconciliation pursuant to title II of H. Con. Res. 14", 119th Congress (2025-2026), Congress.Gov, https://www.congress.gov/bill/119th-congress/house-bill/1/text.
54 Clare Duffy, "US Senate votes to strike controversial AI regulation moratorium from Trump agenda bill", *CNN*, 1 July 2025, https://edition.cnn.com/2025/07/01/tech/senate-strikes-ai-regulation-moratorium-agenda-bill.

counterweight to industry-led governance, reaffirming the role of public interest mobilisation and state-level oversight in shaping the future of AI regulation.[55] Thus, while the US does not have centralised regulation, its AI trajectory is being decisively shaped by legislative priorities, alongside industry-led advocacy and infrastructure agendas.

As discussed in the previous chapter, the UK aspires to be a global AI leader through a flexible, pro-innovation regulatory model. Its approach emphasises sector-specific oversight, with individual regulators such as the Financial Conduct Authority issuing tailored guidelines for AI applications in their domains.[56] While this enables rapid experimentation and scaling, the absence of a centralised coordination mechanism can lead to regulatory fragmentation and uneven oversight, particularly for high-risk applications. The risk is obvious since the UK's AI governance lacks the binding force of law found in the EU's AI Act.

China's AI governance is deeply integrated into a broader national strategy with the state actively regulating, funding and shaping AI development. It has implemented rules for technologies like facial recognition and generative AI and mandated algorithmic audits and registration. There are also laws imposing real-time monitoring of AI-generated content, emphasising national security and social stability.[57] The centralised model allows rapid deployment of initiatives aligned with state goals but has raised concerns around censorship and the potential export of authoritarian digital governance models.

France, while aligning with the EU's regulatory framework, is actively promoting AI sovereignty through public investment and international alliances. Macron's administration has launched AI R&D initiatives to reduce dependency on US platforms. It is also serving as a bridge between the overarching Brussels-style regulations and national ambitions for a strong domestic AI ecosystem, supported by projects like the Kyutai open science lab and global partnerships.[58]

55 Ibid.
56 Amir Al-Maamari, "Between Innovation and Oversight: A Cross-Regional Study of AI Risk Management Frameworks in the EU, U.S., UK and China", op. cit.
57 Ibid.
58 Ibid.

Leading Asian technology hubs such as Singapore and the UAE are also following distinct regulatory approaches. Singapore's light-touch regulatory model, premised on transparency and sectoral pilots, allows it to balance innovation with trust. Long-term strategies such as Smart Nation 1.0 (2014) and Smart Nation 2.0 (2024), along with the National AI Strategy 2.0, envisage AI as a driver of both innovation and social empowerment.[59] Institutions like the Infocomm Media Development Authority and Government Technology Agency have been key actors in implementing the strategy through their focus on equipping the local workforce with AI literacy and enhancing use of AI in providing public services.[60] Singapore has made significant advances in developing LLMs. AI Singapore's Sea Lion model, released in April 2025, has reasoning capabilities with plans to add voice and visual recognition to broaden its applicability in a linguistically diverse region. Sea Lion currently recognises 13 languages, including Javanese, Sundanese, Malay, Tamil, Thai, Vietnamese, English and Chinese, and has already been adopted by major regional firms like Indonesia's GoTo Group.[61] Given the prohibitively high cost of building LLMs from scratch, Singapore has pursued continuous pre-training, building on existing models to reduce costs while expanding capabilities.[62] This is an interesting example of a strategically agile state anchoring itself in the global LLM landscape while optimising resources and tailoring innovation to regional needs.

The UAE's embedding of AI into its long-term economic vision is reflected in the appointment of a Minister of State for AI, development of national AI strategies and investments in high-profile global partnerships. The country is relying heavily on AI for diversifying its economy and becoming a global technological hub.[63] The National AI Strategy 2031 projects that AI will contribute an estimated US$91 billion (S$122.85 billion) to the economy within

59 Government Technology Agency of Singapore (GovTech Singapore), *Smart Nation 2.0: Initiatives in Singapore*, TechNews Article, (Singapore: Government Technology Agency of Singapore, 30 December 2024), https://www.tech.gov.sg/technews/our-enhanced-smart-nation-vision-paving-the-way-for-a-new-digital-era.

60 Government Technology Agency of Singapore (GovTech Singapore), *The History of AI – Part 2: Singapore's AI Journey*, (Singapore: Government Technology Agency of Singapore, 31 July 2025), https://www.tech.gov.sg/technews/the-history-of-ai-part-2-singapore-ai-journey.

61 Krist Boo, "S'pore's AI large language model Sea-Lion to offer more features as more firms use it in S-E Asia", *The Straits Times*, 5 May 2025, https://www.straitstimes.com/business/spore-ai-model-sea-lion-to-offer-more-features-as-businesses-adopt-it-for-south-east-asia-use.

62 Ibid.

63 Shamma Al Qutbah, "The UAE's Bold Leap into the Global LLM Race", *TRENDS Research & Advisory*, 30 April 2025, https://trendsresearch.org/insight/the-uaes-bold-leap-into-the-global-llm-race/?srsltid=AfmBOor4DqbjO-RWPRrx1VvVlATWhx5lWiQncu9NrZWtU_I_6ZRbo4_w.

six years and aims for AI to account for 20 per cent of non-oil GDP by 2031.[64] Partnering with US businesses is significant to this goal, as seen from Microsoft's US$1.5 billion (S$2.03 billion) deal with Emirati AI national champion Group 42 Holding Ltd. Key initiatives include the creation of MGX, an AI investment vehicle for mobilising US$100 billion (S$135 billion) in assets and strategic partnerships with US firms such as OpenAI, Microsoft and BlackRock to expand AI infrastructure.[65] On developing LLMs, the UAE has made significant advances through its Technology Innovation Institute, which developed the Falcon series of open-source LLMs. The models are designed to be resource-efficient and accessible, allowing businesses and individual developers to deploy AI applications on consumer devices without requiring high-end GPUs. This open-source approach fosters collaboration and positions the UAE as a regional leader in AI innovation.[66] The UAE has also been a first-mover in establishing a Ministry of AI (2017) and a dedicated AI university, embedding AI governance and development at the highest strategic levels.[67] Both Singapore and the UAE demonstrate how smaller and technologically capable states can set credible AI standards, integrate AI into strategic development agendas and amplify their global influence.

64 Ibid.

65 Gregory C. Allen et al., *The United Arab Emirates' AI Ambitions*, Report, (Washington, D.C.: Center for Strategic and International Studies (CSIS), 24 January 2025), https://www.csis.org/analysis/united-arab-emirates-ai-ambitions.

66 Ben Wodecki, "Inside Falcon: The UAE's open source model challenging AI giants", *Capacity Media*, 5 February 2025, https://www.capacitymedia.com/article/2ednrsm6eglrmfzs429ds/long-reads/article-inside-falcon-the-uaes-open-source-model-challenging-ai-giants.

67 Ibid.

A Homegrown Large Language Model in India: Overambitious or Essential?

India is relatively late in positioning its role in the global AI landscape. Notwithstanding its undisputed strengths in R&D, innovation and AI applications, the decision to develop LLMs has not been a natural one. Influential opinions have argued that India should refrain from building a home-grown LLM from scratch and instead prioritise practical applications of AI for addressing its socio-economic development challenges, including employment.[68] For a developing country like India, the opportunity cost of investing in an LLM is substantial, as it entails diverting scarce government resources from development expenditure, including potentially innovative applications for better public service delivery, to an area where the risk-return payoffs are uncertain.

Contrasting these arguments are those in favour of India building indigenous LLMs, largely to enable more effective distribution of public goods and to enhance digital literacy through local languages. With more than twenty official languages and several dialects, only a home-grown LLM, as felt by many, can be truly inclusive and synchronous with the country's cultural diversities. The technical and infrastructural capacity hurdles to achieving the goal, though, are significant. The necessary conditions for building an LLM from scratch include powerful computing resources (notably GPUs), high-quality training data and massive investments in training. While India generates vast quantities of unique linguistic data, much of it is undigitised or of low quality for effective training. AI-powered language applications, such as Bhashini, aim to overcome linguistic barriers by creating open-source datasets for Indic language. Given India's geographical size and population, the scale of the ask is formidable.

India's own history of indigenous technology efforts further underscores the risks of overcommitting to foundational AI projects. India's early efforts to produce semiconductors through the state-owned Semiconductor Complex Limited (Ltd), established

68 "'If India has $50 billion to spend…': Nandan Nilekani reaffirms focus on AI infra over foundation models", *Business Today*, 14 December 2024, https://www.businesstoday.in/technology/news/story/if-india-has-50-billion-to-spend-nandan-nilekani-reaffirms-focus-on-ai-infra-over-foundation-models-457348-2024-12-14.

in 1976, failed to yield the desired results. More recently, private entrepreneurial efforts to replace global technology products have struggled to scale sustainably. Short video applications launched as domestic alternatives to TikTok, such as Chingari, Mitron and Josh, initially benefited from regulatory protection but failed to replicate TikTok's algorithmic sophistication and global competitiveness.[69] India's record in building foundational technologies is not distinguished. While creating tariff walls can bring in some technology-intensive manufacturing investments and encourage local technology diffusion, this strategy might not work for developing indigenous LLMs. Capacity bottlenecks are also conspicuous, especially in computing. Training a cutting-edge LLM requires thousands of GPUs, access to advanced semiconductor supply chains and large-scale data centres. India currently lacks sufficient capacities in these areas. Without these, training would be slow and costly, making the local LLM globally uncompetitive.

Some industry leaders have justifiably questioned the rationality of a sovereign LLM development strategy model. They argue that there is slight incremental advantage in building India's own LLM, given the wide availability of powerful models globally and further that India should focus on building applications to address specific emerging market and Global South issues, such as healthcare, education and financial inclusion.[70] This perspective suggests India's comparative advantage lies not in replicating global LLMs but in developing AI applications tailored to local needs. Smaller, specialised models that are faster to train and cheaper to deploy could be embedded in rural and underserved settings. Combining global foundation models with local datasets, curated through initiatives like Bhashini or synthetic data generation projects like InstructLab, may yield more practical and inclusive outcomes.[71] In this respect, the case against India building its own LLM is not about engaging in a strategy against investing in AI. It is a view emerging from a pragmatic recognition of resource constraints, historical lessons and India's comparative advantage.

69 "Challenges in post-TikTok era: Why indian short-video apps face investor dwindle", *Business Upturn*, 28 January 2024, https://www.businessupturn.com/business/funding/challenges-in-post-tiktok-era-why-indian-short-video-apps-face-investor-dwindle/.

70 Vallari Sanzgiri and Thomas K Thomas, "No huge advantage in building your own LLMs: TCS CEO Krithivasan", *The HinduBusinessLine*, 15 January 2025, https://www.thehindubusinessline.com/info-tech/no-huge-advantage-in-building-your-own-llms-tcs-ceo-krithivasan/article69092060.ece.

71 "Scaling AI for Bharat: The blueprint for multilingual language models", CIOL, 4 May 2025, https://www.ciol.com/strategy/scaling-ai-for-bharat-the-blueprint-for-multilingual-language-models-9030735.

The Case for Investment in India's Foundational Artificial Intelligence Capability

With the emergence of AI as a GPT, LLMs are becoming foundational infrastructure, supporting governance, commerce, education, healthcare and national security. Advanced AI systems are becoming as ubiquitous as electricity and the Internet. The urge for India, the world's most populous and projected third-largest economy by 2030, to invest in LLMs is to ensure that the lack of home-grown foundational capacities does not enhance its strategic dependency and reduce digital sovereignty. Relying solely on foreign models has profound risks. Imported AI systems are often opaque "black boxes", offering little visibility into how data is processed, managed, or secured. The possibility of such models resulting in large-scale data security breaches or regulatory non-compliance, if integrated across various administrative functions and citizen services and industrial operations, is significant. Moreover, dependence on foreign LLMs might enable foreign nations and corporations to control access, features and pricing, leading to a strategic 'weaponisation' of control, similar to that being witnessed for such commands over energy, rare earths and semiconductors. This could have onerous consequences for India during geopolitical standoffs.

As mentioned in an earlier chapter, the limitations on extending content outreach in local languages, if models are trained predominantly on English and Western data, are another factor weighing in favour of India developing its own LLM. As such, indigenous LLMs offer India multiple advantages, as these models can be trained on datasets that reflect Indian languages, cultural contexts and societal norms, thereby ensuring bias reduction and contextual accuracy. Home-grown LLMs can enable data sovereignty by keeping sensitive information within national borders and complying with India's security protocols and privacy regulations. They also create room for customisation. LLMs optimised for Indian agriculture, health care and education could provide transformative benefits at scale. Homegrown models also generate user trust by being transparent about data processing and assuring stakeholders of their commitment to Indian values and national priorities.

The key question is: can India, given its resource constraints, follow an LLM development model optimising its economic and strategic interests? The Chinese DeepSeek example, a product of a whole-of-nation approach combining state-backed investment, deep-technology startups and sustained research, might be too capital-intensive for India. With research spending at 0.6 per cent of GDP compared to China's 2.4 per cent, India needs to think differently.[72] Examples like the UPI and the Chandrayaan moon mission are evidence of creative disruptions from innovations secured through limited budgets. The challenge is to secure similar achievements in building home-grown LLMs. The challenge is particularly significant given the deficient supply-side capacities.

72 Vishwa Mohan, "India improves its R&D expenditure but lags behind many countries including China, USA and Israel", op. cit.

India's Artificial Intelligence Ecosystem: Current Capabilities and Gaps

The US and China are locked in a deeply competitive race to outpace each other in the development and adoption of frontier AI. Businesses from both countries are racing ahead with applications having commercial, strategic and military implications. The weight of their competitive advances are shaping their dominance in shaping the rules for global AI. As discussed in the earlier chapters, other prominent global economies, notably the UK, France, Singapore, the UAE and the EU as a whole, are developing their own strategies and establishing a presence in the global AI space. Strategic motives, driven by both commercial interests and the desire to avoid AI dependencies on foreign actors, are guiding these strategies. The dual urgency also influences India's AI growth plans.

India's recognition of the strategic importance of AI was evident in the launch of the National AI Mission in 2024, which outlined seven key elements of the AI stack: computing infrastructure, data, talent, R&D, capital, algorithms and applications.[73] The majority of resources in the Mission are committed to building compute capacity through an extensive network of GPUs.[74] There are supporting arms within the Initiative to encourage startups, data sets and skills. In what is largely the first signal of the Indian state committing to the development of foundational models, the innovation efforts under the Mission are to have '…a specific emphasis on indigenous LMMs and domain-specific models, leveraging edge and distributed computing for optimal efficiency'.[75]

The large-scale procurement of GPUs, along with building a robust domestic digital infrastructure for AI development, is aimed to position India for hedging against one of the most pressing geopolitical risks in AI, that is, the concentration of advanced semiconductor capacity in Taiwan.[76] In a global environment where

73 Anirudh Suri, "The Missing Pieces in India's AI Puzzle: Talent, Data and R&D", *Carnegie Endowment for International Peace*, 24 February 2025, https://carnegieendowment.org/research/2025/02/the-missing-pieces-in-indias-ai-puzzle-talent-data-and-randd?lang=en.

74 Press Information Bureau (PIB), *Cabinet Approves Over Rs 10,300 Crore for IndiaAI Mission, will Empower AI Startups and Expand Compute Infrastructure Access*, Press Release, (New Delhi: Ministry of Electronics & Information Technology, 7 March 2024), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2012375&reg=3&lang=2.

75 Ibid.

76 Anirudh Suri, "The Missing Pieces in India's AI Puzzle: Talent, Data and R&D", op, cit.

access to chips influences national security, this was a prudent intervention. Yet, like many countries, India's emphasis on chips and infrastructure has come at the expense of equally important elements of the AI stack – data, talent and R&D – where investments have been lower. A fragmented strategy that leaves gaps in the intellectual and institutional capacity required to harness it fully can put the system on shaky foundations.

India's talent base is often described as its strongest asset, given its vast pool of Science, Technology, Engineering and Mathematics graduates and a developer community that is already the second largest on GitHub. This community is expected to overtake that of the US by 2028, underscoring India's comparative advantage in medium and lower-tier AI talent.[77] Notwithstanding this talent pool, the country faces an overall shortage of AI professionals, which might become a serious capacity issue, with demand for such professionals expected to outpace supply in the foreseeable future. A smaller number of highly skilled AI professionals in the country is a result of top-tier technical talent, trained domestically at the undergraduate level, migrating to the US and Europe for brighter academic and professional prospects.[78] The South Asian region and India are lagging behind the rest of the world in 'workforce-readiness' of new entrants to the workforce in terms of suitability for twenty-first-century jobs, especially those involving AI.[79] Employers highlight the unsuitability of many engineering graduates from India, who often require significant upskilling to be competitive in AI-driven industries. This leaves India with an abundance of implementers and developers but a shortage of cutting-edge researchers and data scientists.[80] Addressing these deficits requires building world-class academic and research ecosystems at home, comprising modern curricula and research facilities, along with incentives to retain top-tier talent.

If talent is India's latent strength, data is its most underutilised asset. Despite being one of the world's largest smartphone, internet and digital transaction markets, India has not translated its footprint into

77 Ibid.

78 Ibid.

79 United Nations Children's Fund (UNICEF), *More than half of South Asian youth are not on track to have the education and skills necessary for employment in 2030*, Press Release, (New York: UNICEF, 30 October 2019), https://www.unicef.org/press-releases/more-half-south-asian-youth-are-not-track-have-education-and-skills-necessary.

80 Anirudh Suri, "The Missing Pieces in India's AI Puzzle: Talent, Data and R&D". op. cit.

usable datasets for AI innovation. Much of the country's digital data is locked away on servers run by global technology firms, leaving Indian startups and researchers at a comparative disadvantage. Even well-funded domestic players, such as Sarvam AI, have highlighted their reliance on synthetic data due to the scarcity of large-scale, high-quality Indian datasets.[81] Public sector data, on the other hand, suffers from fragmentation and poor structuring. The government's strategy has leaned heavily on building centralised data platforms, but the reliance on state-led initiatives risks excluding the private sector and slowing innovation. Some studies recommend government departments unlocking their datasets under explicit privacy norms and private firms are incentivised to share anonymised transaction data.

R&D remains a critical capacity gap. Although India's output of AI-related academic research papers is increasing, the quality and originality of the contributions often lag behind those of global leaders. Patent filings in AI remain limited, reflecting a lack of emphasis on innovation-driven R&D.[82] More importantly, the institutional infrastructure for AI R&D is thin. The shortage of dedicated, globally competitive AI research institutions remains a serious problem, leading to the outward migration of top talent. The problem needs to be addressed by incentivising industry to fund AI research at universities, establishing research parks and fostering global partnerships, such as the Nokia-Indian Institute of Science collaboration. Without such measures, India's R&D ecosystem will remain inadequate to the scale of its ambitions.

Taken together, these gaps in talent, data and R&D highlight the distance between India's aspirations and its current capabilities. The first-mover advantages enjoyed by the US and China are formidable, as are those for other countries discussed earlier. India must treat AI not just as a sectoral policy challenge but as a national capability-building project, with the same seriousness it applied to space and digital public infrastructure.

81 Ibid.
82 Ibid.

The Current Strategy

Arriving at the right template for India's AI regulation, including an approach for foundation AI, is not an easy task. Several of India's economic, social and cultural characteristics are unique, even among the larger community of nations comprising the Global South. The various country examples discussed in the paper make it evident that there is no 'one-size-fits-all' approach that countries can follow in this regard. Overall, though, the experiences make it clear that the overriding interest is in fostering innovation while managing risk. The EU leans towards universal guardrails, the US prioritises private innovation, the UK prefers sectoral agility, and China uses centralised oversight to align AI with state goals. For India, which is looking to scale its AI capacity and build resilient regulatory systems, this spectrum of global approaches provides valuable lessons. However, it also makes it evident that there are hardly any global approaches so far that can substantially connect with India's diverse priorities.

For India, a national strategy to build a local LLM must evolve through an effective public-private partnership. The resource constraints of the public sector in India cannot be wished away, as there is an urgent need to deploy those resources in several social sectors. The private sector in India must respond proactively if a globally competitive LLM is to be developed in India. The partnerships must underpin AI innovation, as they did for UPI and India's IT services boom. Supercomputing infrastructure, especially GPU clusters, must be expanded to support large-scale training. Localised datasets also need to be curated at scale, drawing from community-driven and open-source efforts. India must deepen its contributions to global open-source platforms such as HuggingFace and GitHub, reinforcing its reputation as a hub of innovation. A strong regulatory framework is equally essential to ensure the ethical deployment of AI while encouraging experimentation and entrepreneurship.[83]

BharatGen, curated by Indian Institute of Technology (IIT) Bombay, in a consortium including IIT Madras, IIT Kanpur, IIT Kharagpur and IIT Mandi; Indian Institute of Management Indore; and Indian Institute of

83 Amlan Mohanty and Shatakratu Sahu, "India's Advance on AI Regulation", *Carnegie Endowment for International Peace*, 21 November 2025, https://carnegieendowment.org/research/2024/11/indias-advance-on-ai-regulation?lang=en.

Information Technology (IIIT) Hyderabad and IIIT Delhi, is supported by the National Mission on Inter-Disciplinary Cyber-Physical Systems of the Department of Science and Technology of the Indian government.[84] This is India's first effort to build a sovereign LLM that is multilingual and multimodal, supporting more than 20 Indian languages through text, speech and document-vision models. It has already developed foundational text (Param-1), speech (Shrutam and Sooktam) and document vision (Patram) models. The initiative is working closely with industry partners, including International Business Machines (IBM) and National Association of Software and Service Companies (NASSCOM) and is evolving into a distinct corporate entity.[85]

As BharatGen moves forward, there are issues that need to be addressed to ensure the initiative's efforts yield desirable results. These include investing in the AI stack: computing capacities, high-quality datasets and governance frameworks are prerequisites for any sustained AI ecosystem. Along with physical infrastructure, such as data centres and compute clusters, regulatory clarity on data governance and ethical standards is also necessary. As the Singapore experience demonstrates, systematically developing an AI stack for small and medium-scale models can, over time, support the transition to larger-scale innovation. India's existing national digital stack offers a unique advantage here. However, it requires targeted expansion to meet AI-specific demands.

The prospects of a robust digital infrastructure have considerably brightened after Google's decision to invest US$15 billion (S$20.25 billion) in building an AI data centre in the coastal city of Vishakhapatnam, located in India's eastern coastal state of Andhra Pradesh.[86] Google has described the project as its largest AI hub to be established outside the US. The size of the investment is significant for creating large-scale infrastructure, which is precisely what India is looking for.

84 Press Information Bureau (PIB), *Dr. Jitendra Singh hails "BharatGen" as India's first sovereign multilingual and multimodal AI driven Large Language Model*, op. cit.

85 Hemali Chhapia, "IIT-Bombay steps into future with its own AI firm", *The Times of India*, December 8, 2025, https://timesofindia.indiatimes.com/india/iit-bombay-steps-into-future-with-its-own-ai-firm/articleshow/125821723.cms.

86 Munsif Vengattil, "Google to spend $15 billion on AI data centre in biggest India investment", *Reuters*, 14 October 2025, https://www.reuters.com/world/india/google-invest-10-billion-data-centre-south-india-2025-10-14/.

Following this, Amazon and Microsoft unveiled a combined US$52.5 billion (S$70.88 billion) plan to expand AI infrastructure, cloud services and local R&D. Amazon is committing US$35 billion (S$47.25 billion) by 2030 and Microsoft is committing US$17.5 billion (S$23.63 billion). The latter's investment also includes a new hyperscale cloud region in Hyderabad, a cluster of data centres set to go live by mid-2026. These investments highlight the growing involvement of US technology companies in India's AI ecosystem, providing critical infrastructure and capabilities. However, unlike BharatGen, these efforts are not directly focused on developing a home-grown LLM. Together, these developments underscore the complementary role of global private investment and domestic initiatives in shaping India's AI strategy.[87]

While building foundational models and LLMs through BharatGen and similar other potential initiatives in the future, the obvious benefits of domain-specific and smaller-scale models, such as Indian-language models enhancing inclusion and accessibility, multimodal AI tailored to local use cases and resource-efficient edge AI deployable across the country's diverse regions, are undisputed. These models can address the rising demands for healthcare, agriculture, education and financial inclusion. BharatGen's products are tailored to address specific requirements for farmers and small sellers.[88] They are certainly effective in ensuring a more inclusive and better delivery of public services. These models can also provide exportable solutions for South Asia, where demographic and linguistic similarities make Indian innovations regionally applicable.

Following BharatGen's efforts and investments by Google and Microsoft, an interesting trajectory is emerging in India's AI development space. While sensitivities regarding future dependencies on externally developed, foreign-sourced foundational models have led to indigenous efforts like BharatGen, the digital infrastructure growth necessary for powering AI applications is largely driven by investments from US businesses. This is perhaps unavoidable, as US technology businesses, including Google, Microsoft, Amazon, Walmart and Meta, are deeply entrenched in

87 Abhishek Dey, "Amazon, Microsoft pledge mega AI investments in India", *BBC*, 10 December 2025, https://www.bbc.com/news/articles/c3w79pgn8peo.

88 Press Information Bureau (PIB), *Dr. Jitendra Singh hails "BharatGen" as India's first sovereign multilingual and multimodal AI driven Large Language Model*, op. cit.

India. Introducing AI applications in their business models is a strong imperative for these businesses as they look to consolidate and expand their national presence. Indeed, US technology businesses have built a conducive and favourable digital ecosystem in India, which puts them at a distinct advantage compared with other global AI champions. A significant number of Global Capability Centres (GCCs) in India belong to large US businesses [89] making them key actors in developing AI content and applications in India. It is, therefore, obvious that future AI development in India will involve US businesses significantly. The question in this regard is to what extent this role will shape the AI governance framework in the country.

India's development priorities argue in favour of it anchoring its strategy in an open-source and collaborative ethos. Supporting public-private partnerships and contributing to the global open-source ecosystem can help avoid dependencies on foreign commercial LLMs and strengthen India's global credibility as a responsible AI actor. This is particularly important in a global geopolitical context where overdependence on a handful of global firms could become a long-term vulnerability, especially if critical sectors like government services, healthcare, education and defence become heavily reliant on externally developed and owned AI applications. India also needs to better align its AI-trained workforce with national innovation goals. At present, most of the country's top AI talent contributes to GCCs serving global businesses, creating value primarily for foreign ecosystems. Redirecting this capacity towards indigenous innovation through targeted incentives, national research programmes and integration into small language model development can help it retain talent while building expertise for future LLM initiatives.

A pragmatic, staged approach, securing the foundation for sovereign AI capacity while avoiding premature overreach, keeps the option of a sovereign LLM active and open in the long term, without making it an overpowering short-term goal. It is interesting to examine an example such as Singapore, which has systematically built capabilities by investing in infrastructure, workforce training and incremental model development, rather than attempting a direct leap into frontier LLM

89 Amitendu Palit, "India's GCC's drive service exports ahead of manufacturing", ISAS Publications, 23 December 2024, https://www.isas.nus.edu.sg/papers/indias-gccs-drive-service-exports-ahead-of-manufacturing/.

competition. Both Singapore and the UAE underscore how strategic investment in the AI stack, coupled with targeted model

development, can yield global influence without competing head-on with the US or China. Similarly, France's hybrid approach shows private-sector actors spearheading LLM development under a state-supported framework. While backing EU regulation, France continues to support sovereign LLM development through public investment and private collaboration. All these experiences are instructive, and India can draw from each of them while adapting them to its own scale, governance capacity and development needs.

By declaring its plan to develop an indigenous LLM, India has made its strategic ambitions clear. Time will reveal how this ambition aligns with the growth of an "Indian" regulatory framework on AI and how strategically influential the framework may become.

About the Authors

Dr Amitendu Palit is a Senior Research Fellow and Research Lead (Trade and Economics) at the Institute of South Asian Studies at the National University of Singapore. He is an economist specialising in international trade and investment policies, free trade agreements, supply chains, connectivity, cross-border data flows and the Indian economy. He sits on the World Economic Forum's Global Future Council on Trade and Investment. He is Senior Research Fellow (Honorary) at the Wong Centre for the Study of MNCs and Adviser for Athena Infonomics.

Earlier, Dr Palit worked for several years in the India Ministry of Finance and in the Ministries of Industry and Civil Supplies. He handled macroeconomic policies, including trade, investment, industrial development, small and medium-sized enterprises, entrepreneurship and futures trading. He wrote annual economic surveys and participated in annual budgetary consultations. He was on the Advisory Committees of the Planning Commission of India and the International Labour Organisation (ILO).

Dr Palit has edited and authored several books. The latest ones are *Seeking Middle Ground: Land, Markets and Public Policy* (OUP, 2019; co-edited); *Seven Decades of Independent India* (Penguin, 2018; co-edited) and *Employment Policy in Emerging Economies* (Routledge, 2017; co-edited). His other books include *The Trans-Pacific Partnership, China and India: Economic and Political Implications* (Routledge, 2014), *China India Economics: Challenges, Competition and Collaboration* (Routledge, 2011) and *Special Economic Zones in India: Myths and Realities* (Anthem Press, 2008; co-authored). He has published in several peer-reviewed academic journals. He is a columnist for India's *Financial Express* and a regular contributor for East-West Centre, East Asia Forum and *China Daily*. He is an expert for BBC, Bloomberg News, CNA, CNBC, ABC, CGTN and Doordarshan (India). He has been a resource person for the Commonwealth Secretariat, ILO, United Nations Development Programme, Copenhagen Consensus and IIFT India.

Ms Kanika Kaur is a Research Analyst at the Institute of South Asian Studies at the National University of Singapore (NUS). She holds a

Master's degree in International Affairs from the Lee Kuan Yew School of Public Policy at NUS, with a specialisation in International Security.

Ms Kaur's research focuses on foreign policy analysis, South Asian geopolitics and traditional security, with particular attention to India-China relations, Southeast Asia's evolving strategic dynamics and Indian foreign policy. She is proficient in qualitative and quantitative analysis using R, Python and Excel and adopts a data-driven approach to policy research.

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Institute of South Asian Studies
National University of Singapore
29 Heng Mui Keng Terrace
#08-06 (Block B)
Singapore 119620
Tel (65) 6516 4239
Fax (65) 6776 7505
URL www.isas.nus.edu.sg