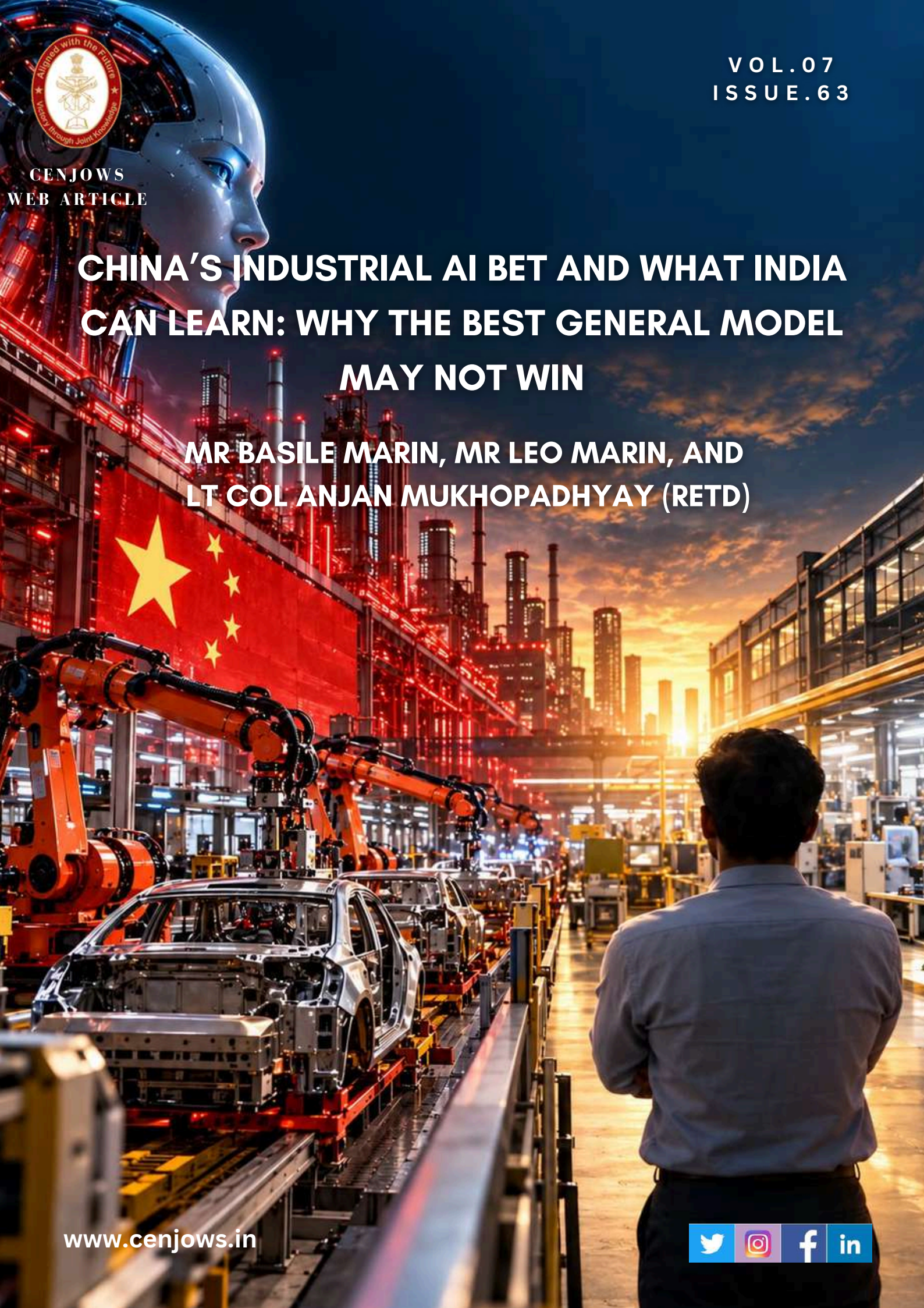




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CHINA'S INDUSTRIAL AI BET AND WHAT INDIA CAN LEARN: WHY THE BEST GENERAL MODEL MAY NOT WIN

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**CHINA'S INDUSTRIAL AI BET AND WHAT INDIA
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CENJOWS

China's Industrial AI Bet and What India Can Learn: Why the Best General Model May Not Win

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Does industrial AI need more data—or more specialised data? The answer matters geopolitically.

If AI leadership depends mainly on building the strongest general-purpose model, advantage will accrue to actors able to train at the frontier. The decisive inputs are therefore access to vast computing capacity, elite research talent and the capital required to finance increasingly expensive training runs. These assets determine who can push the underlying model's capabilities furthest.¹

But if general-purpose models become sufficiently capable and widely accessible, value is likely to migrate from model creation to industrial adaptation. Success will then depend less on marginal improvements in benchmark performance than on embedding AI into factories, energy systems, logistics networks and specialised equipment. This requires proprietary industrial data, domain expertise, systems integration, physical infrastructure, supply-chain control and the capacity to manufacture and deploy AI-enabled products at scale.²

In the first scenario, the United States holds the stronger position. It concentrates the leading general-purpose model developers, advanced-chip designers, hyperscale cloud providers, research universities and venture-capital markets.³ It is also exceptionally effective at attracting international scientific talent and financing costly frontier-model training.⁴ China benefits from abundant engineers, substantial state support and an increasingly competitive open-source ecosystem, but its restricted access to advanced semiconductors remains a significant disadvantage.⁵

In the second scenario, China's relative position improves considerably. If AI leadership depends on adapting models to factories, vehicles, ports, power systems and industrial machinery, China can exploit the scale and diversity of its manufacturing base.⁶ Its dense supplier networks allow software, sensors, equipment and production processes to be improved together.⁷ Extensive deployment also creates a feedback loop: more factories generate more operational data, which produces better specialised models and enables cheaper subsequent deployment.⁸

The United States would retain important advantages in enterprise software, cloud computing, aerospace, biotechnology, defence and other advanced industries.⁹ American firms might also capture value by supplying the chips and models underlying Chinese applications. Nevertheless, China has more opportunities to integrate AI into physical production at scale.¹⁰ Thus, America is favoured if AI remains principally a race to create intelligence; China gains if it becomes a race to industrialise it.

More Knowledge is Not Always More Useful Knowledge

Large language models derive much of their power from the breadth of their training. They can connect chemistry, thermodynamics, engineering research, maintenance manuals and knowledge drawn from thousands of other domains. This breadth makes them exceptionally versatile and gives an advantage to the countries and companies capable of assembling the greatest compute, capital and research talent.¹¹

Yet, that breadth becomes a constraint when industrial performance depends on a small number of highly specific relationships. For example, optimising a biomass gasifier may require understanding how one locally sourced feedstock's moisture, ash composition and particle size interact with a particular reactor's temperature profile.¹²

These relationships may exist somewhere in a general model's training data, yet represent only a tiny fraction of the knowledge shaping its overall performance.¹³

This creates a division of strengths. A general-purpose model may be superior for theoretical research because its breadth allows it to connect concepts across fundamental sciences and identify relationships between otherwise separate fields. Industrial performance, however, often depends on mastering a narrow set of interactions specific to a particular machine, feedstock or production line. A specialised model trained on operational data may therefore outperform the general model in industry, even if it possesses far less knowledge overall.¹⁴ The general model may be better at explaining the underlying science, while the specialist model is better at predicting how the process will behave.

For manufacturers, the decisive question is consequently not simply which system possesses the most knowledge, but which concentrates the most relevant knowledge on the problem being solved. If this is where AI creates the greatest economic value, manufacturing scale becomes an important source of technological power: every deployment produces data and experience that improve the next one.¹⁵

China is Building Around Specialisation

China is combining increasingly capable general-purpose models with a broad open-weight ecosystem, substantially reducing the cost of industrial specialisation. Rather than building models from scratch, developers can deploy existing foundations locally, adapt them to proprietary operational data, and concentrate investment on the assets that determine industrial performance: process knowledge, systems integration and real-world validation.¹⁶

Chinese industrial policy is directing this top-down architecture toward manufacturing. A national plan published in January 2026 targets the deployment of three to five general-purpose models across industry, alongside sector-specific models, 1,000 industrial AI agents, 100 high-quality industrial datasets and 500 application scenarios.¹⁷

capable models → specialised applications → industrial deployment → operating experience → better specialised systems

Steelmaking offers an early example. Liuzhou Steel says 33 AI models are already deployed across scheduling and process-control tasks.¹⁸ A common foundation is divided into increasingly specialised knowledge pockets tied to individual processes: experience stays local where context matters, while validated lessons can still circulate across the wider system.¹⁹ More strikingly, a March 2026 report from the U.S.–China Economic and Security Review Commission notes that Alibaba’s Qwen family had generated more than 100,000 derivatives on Hugging Face.²⁰

Once these specialised systems enter factories, the flow reverses. Industrial operations generate repeated observations linking conditions, interventions and physical outcomes, creating operating experience that can be generalised to strengthen foundational systems to create a cumulative feedback loop.²¹

How India can Build its Own Specialist Models

India can emulate the theoretical principles of China’s specialist AI strategy while building it on its own distinct existing competitive advantages.²²

India’s industrial base does not mirror China’s. China dominates large-scale manufacturing, including electronics, machinery, batteries, solar equipment and integrated supply chains. India is comparatively stronger in pharmaceuticals, refined petroleum, automotive components, information-technology services and engineering design, while much of its manufacturing remains fragmented among smaller firms.²³ Consequently, India’s best move is to become the world’s industrial-AI integration and export platform. Rather than competing directly with the United States in capital-intensive frontier-model training or with China in mass manufacturing, India should adapt open-weight models to sectors where it already possesses scale and expertise.²⁴

Most importantly, Indian AI companies should build their models around the principle that has guided much of the country’s industrial buildup for the past forty years: frugal engineering.²⁵ Unlike in Western or in East Asian countries, where plants can afford extensive sensor networks, complete equipment replacement or frontier-scale computing, Indian engineering construction companies are accustomed to cost-conscious industrial designs. Especially for brownfield projects, where the new owner revamps an existing asset, Indian engineers have become exceptionally skilled at

working with incomplete data, older machinery and heterogeneous production environments.²⁶ If Indian technology firms integrate this domestic know-how into their AI models, Indian AI could become far more exportable to the developing economies of South-East Asia, South America, and Africa than American or Chinese AI.

To achieve this, Indian technology firms could combine domain engineers with software teams to build low-cost systems capable of operating with incomplete data, older machinery and heterogeneous production environments. Supported by the IndiaAI Mission's shared compute, indigenous foundation models and national data platform, developers could adapt open-weight models and concentrate investment on sectoral knowledge, integration and deployment rather than costly training from scratch.²⁷ These systems could first be validated in Indian plants and then exported through the country's global IT services networks to manufacturers across emerging economies. This strategy would simultaneously exploit India's affordable engineering talent, process-industry expertise, tradition of frugal innovation, multilingual software capabilities and established access to international corporate customers.²⁸

In short, India may not outspend the United States on frontier models or out manufacture China. Its opportunity is to become the country that makes industrial AI adaptable, affordable and deployable across the widest range of real-world conditions.

The AI Race is Moving Downstream, But the Winner's Unknown

As general-model performance converges, more of the economic differentiation is moving downstream—from building foundation models to adapting and deploying them in specific industries. This changes the nature of the competition because specialised AI is shaped not only by algorithms but by the environments that generate its training data.²⁹

The United States produces exceptionally rich data in highly digitised, capital-intensive industries. Its specialist systems are therefore likely to be strongest in fields such as aerospace, biotechnology, semiconductor design, defence, finance and cloud-based enterprise management.³⁰

China generates a different type of advantage: high-volume data from dense manufacturing networks, automated factories, ports, logistics systems and consumer-

hardware supply chains. Because production, suppliers and deployment are geographically concentrated, Chinese specialist models may become strongest at production scheduling, quality control, robotics, equipment optimisation and rapid scaling.³¹

India produces a third kind of industrial data, combining advanced pharmaceutical, refining and automotive facilities with smaller manufacturers, older machinery and uneven sensor coverage. Although less standardised and harder to exploit, these data could support a distinctive advantage. Indian engineers have extensive experience in frugal engineering and brownfield modernisation under constraints of capital, information and infrastructure. Models trained in these environments could learn to operate with incomplete data, heterogeneous equipment and limited computing resources.³²

India should therefore adapt China's specialisation strategy to its own strengths. Rather than matching American spending on frontier models or Chinese manufacturing scale, it could combine open-weight foundations, process expertise and globally connected IT services. Indian companies could validate affordable specialist systems in domestic plants before exporting them across Southeast Asia, Africa and Latin America. India's industrial AI would thus be optimised for adaptability: integrating with existing equipment, functioning under imperfect conditions and making AI accessible across diverse production environments.³³

Declaration

I declare that this manuscript is being submitted exclusively to CENJOWS for publication consideration, is original, and has not been published or submitted elsewhere. I further certify that it contains no classified, restricted, or sensitive information and is based entirely on open-source material suitable for publication in the public domain.

ENDNOTES

¹ Ben Cottier et al., “The Rising Costs of Training Frontier AI Models,” *arXiv*, May 31, 2024, <https://doi.org/10.48550/arXiv.2405.21015>; Jaime Sevilla et al., “Training Compute of Frontier AI Models Grows by 4–5× per Year,” *Epoch AI*, May 28, 2024, <https://epoch.ai/data-insights/training-compute-of-frontier-ai-models-grows-by-4-5x-per-year>.

² David J. Teece, “Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy,” *Research Policy* 15, no. 6 (December 1986): 285–305, [https://doi.org/10.1016/0048-7333\(86\)90027-2](https://doi.org/10.1016/0048-7333(86)90027-2); Organisation for Economic Co-operation and Development, *The Adoption of Artificial Intelligence in Firms: New Evidence for Policymaking* (Paris: OECD Publishing, 2025), <https://doi.org/10.1787/f9ef33c3-en>.

³ Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025* (Stanford, CA: Stanford University, 2025), https://hai-production.s3.amazonaws.com/files/hai_ai_index_report_2025.pdf; Semiconductor Industry Association, *2025 SIA Factbook* (Washington, DC: Semiconductor Industry Association, 2025), <https://www.semiconductors.org/resources/factbook/>.

⁴ Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025*; Cottier et al., “Rising Costs of Training Frontier AI Models.”

⁵ Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025*; US Department of Commerce, Bureau of Industry and Security, “Commerce Releases Clarifications of Export Control Rules to Restrict the PRC’s Access to Advanced Computing and Semiconductor Manufacturing Items,” April 4, 2024, <https://www.bis.gov/press-release/commerce-releases-clarifications-export-control-rules-restrict-prcs-access-advanced-computing>.

⁶ Richard Baldwin, “China Is the World’s Sole Manufacturing Superpower,” *VoxEU*, Centre for Economic Policy Research, January 17, 2024, <https://cepr.org/voxeu/columns/china-worlds-sole-manufacturing-superpower>; International Federation of Robotics, “China Tops World Record of 2 Million Factory Robots,” September 25, 2025, <https://ifr.org/ifr-press-releases/news/china-tops-world-record-of-2-million-factory-robots>.

⁷ World Bank and Development Research Center of the State Council, *Innovative China: New Drivers of Growth* (Washington, DC: World Bank, 2019), <https://documents1.worldbank.org/curated/en/833871568732137448/pdf/Innovative-China-New-Drivers-of-Growth.pdf>.

⁸ Organisation for Economic Co-operation and Development, *Artificial Intelligence Markets* (Paris: OECD Publishing, 2026), https://www.oecd.org/en/publications/artificial-intelligence-markets_d531d73f-en/full-report.html; OECD, *Adoption of Artificial Intelligence in Firms*.

⁹ Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025*; National Science Board, National Science Foundation, *The State of U.S. Science and Engineering 2024* (Alexandria, VA: National Science Foundation, 2024), <https://ncses.nsf.gov/pubs/nsb20243>.

¹⁰ International Federation of Robotics, “China Tops World Record”; Baldwin, “China Is the World’s Sole Manufacturing Superpower”; World Bank and Development Research Center of the State Council, *Innovative China*.

-
- ¹¹ Rishi Bommasani et al., “On the Opportunities and Risks of Foundation Models,” *arXiv*, July 12, 2022, <https://doi.org/10.48550/arXiv.2108.07258>; Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025* (Stanford, CA: Stanford University, 2025), https://hai-production.s3.amazonaws.com/files/hai_ai_index_report_2025.pdf.
- ¹² Yali Gao et al., “Syngas Production from Biomass Gasification: Influences of Feedstock Properties, Reactor Type, and Reaction Parameters,” *ACS Omega* 8, no. 35 (2023): 31620–31631, <https://doi.org/10.1021/acsomega.3c03050>; Pulla Rose Havilah et al., “Biomass Gasification in Downdraft Gasifiers: A Technical Review on Production, Up-Gradation and Application of Synthesis Gas,” *Energies* 15, no. 11 (2022): 3938, <https://doi.org/10.3390/en15113938>.
- ¹³ Bommasani et al., “Opportunities and Risks of Foundation Models.”
- ¹⁴ Faezeh Ghasemi et al., “Domain-Specific versus General Large Language Models: A Review and Empirical Benchmark in Real Medical Texts,” *Scientific Reports* 16 (2026), <https://doi.org/10.1038/s41598-026-62884-7>; Organisation for Economic Co-operation and Development, *The Adoption of Artificial Intelligence in Firms: New Evidence for Policymaking* (Paris: OECD Publishing, 2025), <https://doi.org/10.1787/f9ef33c3-en>.
- ¹⁵ Organisation for Economic Co-operation and Development, *Artificial Intelligence Markets* (Paris: OECD Publishing, 2026), https://www.oecd.org/en/publications/artificial-intelligence-markets_d531d73f-en/full-report.html; Aaditya Shukla et al., “Adaptive Data Flywheel: Applying MAPE Control Loops to AI Agent Improvement,” *arXiv*, October 30, 2025, <https://doi.org/10.48550/arXiv.2510.27051>.
- ¹⁶ Ngor Luong, *Two Loops: How China’s Open AI Strategy Reinforces Its Industrial Dominance* (Washington, DC: U.S.–China Economic and Security Review Commission, March 23, 2026), <https://www.uscc.gov/research/two-loops-how-chinas-open-ai-strategy-reinforces-its-industrial-dominance>.
- ¹⁷ Ministry of Industry and Information Technology et al., “Implementation Opinions on the ‘AI + Manufacturing’ Special Initiative,” originally published January 7, 2026, translated by the Center for Security and Emerging Technology, March 2, 2026, <https://cset.georgetown.edu/publication/china-ai-plus-manufacturing-initiative-opinions/>; State Council of the People’s Republic of China, “China Aims for Secure, Reliable Supply of AI Core Tech by 2027,” January 8, 2026, https://english.www.gov.cn/news/202601/08/content_WS695f1b55c6d00ca5f9a087b9.html.
- ¹⁸ Huawei, “Liuzhou Steel Group, Huawei, and China Mobile Launch the Xuantie Steel Model,” April 1, 2026, <https://e.huawei.com/en/news/2026/industries/oil-gas/xuantie-steel-large-model>.
- ¹⁹ Huawei, “Liuzhou Steel Group, Huawei, and China Mobile Launch the Xuantie Steel Model”; “Foundation Models for the Process Industry,” *Engineering* (2025), <https://doi.org/10.1016/j.eng.2025.03.023>.
- ²⁰ Luong, *Two Loops*. The report states that Qwen derivatives accounted for more than 100,000 models on Hugging Face, many of them small, task-specific adaptations produced by third-party developers.
- ²¹ Luong, *Two Loops*. The report describes two mutually reinforcing processes: an open-model ecosystem that accelerates model adaptation and a physical deployment loop in

which manufacturing, logistics and robotics generate real-world data that feed back into model improvement.

²² Ngor Luong, *Two Loops: How China's Open AI Strategy Reinforces Its Industrial Dominance* (Washington, DC: U.S.–China Economic and Security Review Commission, March 23, 2026), <https://www.uscc.gov/research/two-loops-how-chinas-open-ai-strategy-reinforces-its-industrial-dominance>.

²³ United Nations Industrial Development Organization, *Industrial Development Report 2026* (Vienna: UNIDO, 2026), <https://www.unido.org/idr2026>; World Trade Organization, *Trade Policy Review: India—Summary*, WT/TPR/S/488 (Geneva: WTO, 2026), https://www.wto.org/english/news_e/news_docs/S488_sum_e.pdf; World Bank, *India Country Economic Memorandum: Becoming a High-Income Economy in a Generation* (Washington, DC: World Bank, 2025), <https://www.worldbank.org/en/country/india/publication/india-country-economic-memorandum-becoming-a-high-income-economy-in-a-generation>.

²⁴ David J. Teece, “Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy,” *Research Policy* 15, no. 6 (December 1986): 285–305, [https://doi.org/10.1016/0048-7333\(86\)90027-2](https://doi.org/10.1016/0048-7333(86)90027-2); Organisation for Economic Co-operation and Development, *The Adoption of Artificial Intelligence in Firms: New Evidence for Policymaking* (Paris: OECD Publishing, 2025), <https://doi.org/10.1787/f9ef33c3-en>.

²⁵ Kirsten Bound and Ian Thornton, *Our Frugal Future: Lessons from India's Innovation System* (London: Nesta, 2012), https://media.nesta.org.uk/documents/our_frugal_future.pdf; Marina Dabić et al., “Frugal Innovations: A Multidisciplinary Review and Agenda for Future Research,” *Journal of Business Research* 142 (March 2022): 914–929, <https://doi.org/10.1016/j.jbusres.2022.01.032>.

²⁶ Bound and Thornton, *Our Frugal Future*. The literature establishes India's broader strength in resource-constrained and cost-conscious innovation. It does not, however, provide a comprehensive international comparison proving that Indian engineering companies are systematically more capable than Western or East Asian firms in brownfield environments; that element remains an informed strategic assessment.

²⁷ IndiaAI, “IndiaAI Compute Capacity,” accessed September 16, 2026, <https://indiaai.gov.in/hub/indiaai-compute-capacity>; IndiaAI, “IndiaAI Innovation Centre,” accessed September 16, 2026, <https://indiaai.gov.in/hub/indiaai-innovation-centre>; IndiaAI, “AIKosh: India's National Platform for AI Datasets and Innovation,” accessed September 16, 2026, <https://aikosh.indiaai.gov.in/>; IndiaAI, “IndiaAI Compute Portal,” accessed September 16, 2026, <https://compute.indiaai.gov.in/>.

²⁸ Directorate General of Commercial Intelligence and Statistics, *A Quick View of India's Trade Scenario* (Kolkata: Government of India, August 2025), <https://www.dgciskol.gov.in/writereaddata/Downloads/20250819155439A%20Quick%20View%20of%20Indias%20Trade%20Scenario.pdf>; World Trade Organization, *Trade Policy Review: India—Summary*; Engineering Export Promotion Council of India, “Export Statistics,” accessed September 16, 2026, <https://www.eepcindia.org/export-statistics>.

²⁹ Organisation for Economic Co-operation and Development, *Artificial Intelligence Markets* (Paris: OECD Publishing, 2026), https://www.oecd.org/en/publications/artificial-intelligence-markets_d531d73f-en/full-report.html; Ngor Luong, *Two Loops: How China's Open AI Strategy Reinforces Its Industrial Dominance* (Washington, DC: U.S.–China Economic and Security Review Commission, March 23, 2026), <https://www.uscc.gov/research/two-loops-how-chinas-open-ai-strategy-reinforces-its-industrial-dominance>. The OECD documents

falling quality-adjusted model prices and increasingly contested model leadership, while the USCC report develops the argument that deployment and specialised real-world data may create an alternative route to AI leadership.

³⁰ National Science Board, National Science Foundation, *The State of U.S. Science and Engineering 2024* (Alexandria, VA: National Science Foundation, 2024), <https://ncses.nsf.gov/pubs/nsb20243>; Stanford Institute for Human-Centered Artificial Intelligence, *Artificial Intelligence Index Report 2025* (Stanford, CA: Stanford University, 2025), https://hai-production.s3.amazonaws.com/files/hai_ai_index_report_2025.pdf; Organisation for Economic Co-operation and Development, *Measuring the Digital Transformation: A Roadmap for the Future* (Paris: OECD Publishing, 2019), <https://doi.org/10.1787/9789264311992-en>. These sources document the United States' concentration of R&D, commercial AI activity and digitally intensive industries; the prediction regarding the fields in which US specialist models will be strongest remains a reasoned inference.

³¹ United Nations Industrial Development Organization, *Industrial Development Report 2026* (Vienna: UNIDO, 2026), <https://www.unido.org/idr2026>; Luong, *Two Loops*. The USCC report specifically argues that China's manufacturing, logistics and robotics deployments generate specialised physical-world data that can feed back into model improvement.

³² World Trade Organization, *Trade Policy Review: India—Summary*, WT/TPR/S/488 (Geneva: WTO, 2026), https://www.wto.org/english/news_e/news_docs/S488_sum_e.pdf; World Bank, *India Country Economic Memorandum: Becoming a High-Income Economy in a Generation* (Washington, DC: World Bank, 2025), <https://www.worldbank.org/en/country/india/publication/india-country-economic-memorandum-becoming-a-high-income-economy-in-a-generation>; Kirsten Bound and Ian Thornton, *Our Frugal Future: Lessons from India's Innovation System* (London: Nesta, 2012), https://media.nesta.org.uk/documents/our_frugal_future.pdf. The sources establish India's mixture of advanced industries, fragmented firms and resource-constrained innovation. The proposition that these conditions will produce superior specialist models is prospective rather than empirically demonstrated.

³³ IndiaAI, "IndiaAI Compute Portal," accessed September 16, 2026, <https://compute.indiaai.gov.in/>; IndiaAI, "IndiaAI Innovation Centre," accessed September 16, 2026, <https://indiaai.gov.in/hub/indiaai-innovation-centre>; IndiaAI, "AIKosh: India's National Platform for AI Datasets and Innovation," accessed September 16, 2026, <https://aikosh.indiaai.gov.in/>; Directorate General of Commercial Intelligence and Statistics, *A Quick View of India's Trade Scenario* (Kolkata: Government of India, August 2025), <https://www.dgciskol.gov.in/writereaddata/Downloads/20250819155439A%20Quick%20View%20of%20Indias%20Trade%20Scenario.pdf>