NEXT IAS

DAILY EDITORIAL ANALYSIS

TOPIC

INDIA'S AI AMBITION: NEED FOR FOCUSED INVESTMENT & PUBLIC INFRASTRUCTURE

www.nextias.com

INDIA'S AI AMBITION: NEED FOR FOCUSED INVESTMENT & PUBLIC INFRASTRUCTURE

Context

- **India's growing AI ambitions**, the **IndiaAI Mission** and the **AI Impact Summit** have renewed debate on building indigenous research capabilities and establishing global leadership in artificial intelligence.

Understanding the Global AI Landscape

- Artificial Intelligence (AI) research broadly covers ten interconnected areas: foundation models, reasoning, AI agents, multimodal AI, AI safety, robotics, AI for science, specialised hardware, data and learning methods, and AI governance.
- The global AI landscape is primarily shaped by players like the **United States, China** and the **European Union.**
  - **The United States** leads in foundation models, reasoning, AI agents, safety, AI for science and advanced hardware. Its leadership is supported by substantial private investment, advanced computing infrastructure and global research talent.
  - **China** has emerged as a leader in robotics and AI research output while rapidly narrowing the gap in foundation models and semiconductor capabilities.
  - **The European Union** has taken a leading role in AI governance through the EU AI Act, which establishes a risk-based regulatory framework for AI systems.
- While the US and China dominate technological development, competition in multimodal AI, efficient computing and data-learning methods remains intense.

India's AI Readiness

- India's AI ecosystem is gradually transitioning from technology adoption towards indigenous research and innovation.
- The **IndiaAI Mission** aims to strengthen computing infrastructure, develop indigenous AI models, support startups and promote responsible AI.
- Key developments include:
  - Mobilisation of more than 45,000 GPUs through the common computing infrastructure initiative.
  - Development of indigenous foundation models through selected research and industry teams.
  - Expansion of AI data centres and computing infrastructure.
  - Strengthening AI research through academic institutions and startups.
  - Hosting the AI Impact Summit, culminating in the New Delhi Declaration endorsed by 92 countries, strengthening India's role in global AI governance.
- However, India's frontier research capabilities remain relatively limited compared with the US and China.

India's Emerging Strengths

- **Multilingual AI:** Initiatives such as **AI4Bharat, BharatGen, Sarvam AI and Bhashini** are developing language models, datasets and tools across India's 22 scheduled languages.
  - These capabilities also have potential applications in multilingual societies across Africa and Asia.
- **Applied AI Solutions:** Indian institutions are developing AI applications to address real-world challenges:
  - **Wadhwani AI:** AI-based tuberculosis screening and cotton pest management.
  - **IIT Ropar's Annam.AI:** Weather intelligence and agricultural solutions.
  - **IIT Kanpur's Airawat Research Foundation:** AI-based air-quality monitoring.
- **Digital Public Infrastructure (DPI):** Aadhaar, UPI and other digital platforms demonstrate India's ability to develop population-scale, affordable and interoperable digital systems.
  - It provides a valuable foundation for developing AI as a public utility.

India's Existing Challenges

- **Limited Frontier Research:** Insufficient investment in fundamental AI research and advanced model development.

- **Computing Dependency:** Heavy reliance on imported GPUs and advanced semiconductor technologies.
- **Talent Constraints:** Shortage of specialised researchers, doctoral graduates and experienced AI scientists.
- **Weak Indigenous IP:** Limited ownership of globally competitive AI technologies and intellectual property.
- **Underdeveloped Robotics:** Relatively weak capabilities in advanced robotics and physical AI.
- **Safety & Governance Gaps:** Need for stronger research on algorithmic bias, privacy, explainability and AI misuse.

Where Can India Develop Global Leadership?

- **Multilingual & Voice-First AI:** Develop open-source AI models for underserved languages, enabling inclusive access to digital services, especially for rural populations and non-English speakers.
- **Frugal AI:** Develop smaller, energy-efficient and affordable models capable of running on inexpensive smartphones, vehicles and agricultural equipment, including in offline environments.
- **AI as Public Infrastructure:** Integrate reliable AI solutions into healthcare, agriculture, education, disaster management and land administration, particularly in resource-constrained settings.
- **AI Evaluation & Trust:** Develop multilingual benchmarks, deepfake detection systems, bias assessment tools and safety standards suited to the needs of developing countries.
    - These priorities can position India as a provider of affordable, inclusive and socially relevant AI solutions for the Global South.

Way Forward: Building India's AI Research Ecosystem

- **Establish a Dedicated Institution:** Create a National AI Development Organisation, modelled on the institutional approach of NPCI, with government, industry, financial institutions and academic participation.
    - It can coordinate research, infrastructure and large-scale deployment.
- **Ensure Long-Term Funding:** Provide 25,000–30,000 crore annually for a decade, concentrating resources on selected strategic research priorities rather than spreading investments thinly.
- **Promote Open Research:** Make publicly funded models, datasets and benchmarks openly accessible.
    - Implement the **Data Empowerment and Protection Architecture (DEPA)** in mission mode to develop trusted data-sharing frameworks, strengthening platforms such as **AIKosh and Bhashini.**
- **Make Government First Customer:** Use public procurement to create demand for indigenous AI solutions and facilitate their expansion across government departments.
- **Strengthen Research Talent:** Establish 1,000 research chairs, introduce several thousand doctoral fellowships and attract Indian researchers working abroad.
- **Expand Computing and Semiconductor Capabilities:** Increase shared GPU access, strengthen national supercomputing infrastructure and promote indigenous, energy-efficient AI chip design through initiatives such as Semicon India.

Conclusion

- India must move beyond being merely a consumer of AI technologies towards becoming a creator of globally competitive AI solutions.
    - Its success will depend on indigenous intellectual property, sustained research investment and responsible innovation.
- India should pursue a distinctive development pathway i.e. **affordable, multilingual, energy-efficient and inclusive AI that works for billions of people** rather than entering the crowded race to build the world's largest AI models.
    - It can transform India's digital public infrastructure success into a global AI leadership opportunity.

Source: BS

Daily Mains Practice Question

[Q] Discuss how India can leverage its digital public infrastructure through Aadhaar and UPI to emerge as a global leader in Artificial Intelligence (AI) research.