NEXT IAS

DAILY EDITORIAL ANALYSIS

TOPIC

NEED FOR INDIA'S SOVEREIGN AI MODEL

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Context

- The question of whether India should develop its own sovereign, foundational AI model has gained prominence as the world increasingly relies on artificial intelligence for various applications.
  - With global tech giants dominating the AI landscape, the idea of India building its own AI model is both ambitious and strategic.

About

- As **artificial intelligence (AI)** becomes central to economic and strategic policymaking, nations are racing to establish their leadership in this transformative technology.
- The rise of **AI foundation models** — *large-scale AI systems trained on massive datasets* — has raised concerns over technological dependence, data security, and national sovereignty.
- While countries like the **United States and China** have developed their own sovereign AI models, **India currently relies on models built by foreign corporations** such as OpenAI, Google DeepMind, and Meta.

Understanding a Sovereign AI Model

- A sovereign AI model refers to **an AI system developed, trained, and maintained within a country**, using its own resources, data, and infrastructure.
- **Unlike AI models** built by multinational corporations, **a sovereign AI model** ensures that control over the data, decision-making processes, and ethical considerations remains in the hands of national stakeholders.

Why Does India Need Its Own Foundational AI Model?

- **Data Sovereignty and Security:** AI models are heavily dependent on data, and India generates one of the largest pools of digital data in the world.
  - Relying on foreign AI models raises concerns about data privacy, security, and potential misuse.
  - A homegrown AI model would ensure that India's sensitive data—ranging from healthcare records to financial transactions—remains within the country.
- **Reducing Dependence on Foreign Technology:** Currently, India depends on AI systems built by American and Chinese companies.
  - These models operate under the policies and governance frameworks of their home countries, potentially limiting India's ability to deploy AI in critical areas like defense, governance, and cybersecurity.
  - Developing an indigenous model would reduce this dependency and allow India to chart its own AI future.
- **Alignment with Indian Values and Languages**: Existing AI models are primarily trained on English-language datasets and Western-centric perspectives.
  - A sovereign Indian AI model can be designed to support regional languages and cultural contexts, making it more inclusive for India's diverse population.
  - It can significantly boost AI adoption in rural and non-English-speaking populations.
- **Boosting Innovation and Economic Growth:** An indigenous AI model could foster a thriving AI ecosystem in India, encouraging startups, academic institutions, and industry collaborations.
  - It would create high-skilled jobs, attract investment, and position India as a global AI hub.
- **National Security and Defense Applications:** AI is increasingly being used in military applications, intelligence gathering, and cybersecurity.
  - Relying on foreign-built AI models in such domains can pose a significant national security risk.
  - A sovereign AI model would ensure that India has full control over its defense AI systems.

Challenges in Building a Foundational AI Model in India

- **Computational Power and Infrastructure:** Training large AI models requires massive computing resources, including high-performance GPUs and TPUs.
    - India's current supercomputing infrastructure lags behind global AI powerhouses like the US and China.
    - To build a sovereign model, India would need significant investment in data centers, AI chips, and cloud computing.
- **Data Scarcity and Quality:** While India generates vast amounts of data, much of it is unstructured, fragmented, and not properly labeled for AI training.
    - The country must focus on improving data collection, annotation, and accessibility to develop high-quality AI models.
- **Talent and Expertise:** India has a strong IT workforce, but expertise in AI research, particularly in training foundational models, is still limited.
    - The country needs to invest in AI education, research institutions, and global collaborations to build a skilled AI workforce.
- **High Costs and Investment Requirements:** Developing a sovereign AI model requires billions of dollars in funding.
    - The Indian government must work with private sector companies, startups, and academia to secure the necessary investment.
    - Unlike tech giants such as Google and Microsoft, Indian firms have limited financial capacity to fund large-scale AI projects.
- **Regulatory and Ethical Challenges:** India must ensure that its AI model adheres to ethical AI principles, including fairness, transparency, and accountability.
    - Clear regulatory frameworks must be established to prevent misuse and bias in AI applications.

What Should India Need To Do?

- **Invest in critical foundation models:** Building foundational models for *critical areas like national security, healthcare, and governance* while relying on global models for less sensitive sectors.
    - **India's own foundation models** offer unparalleled advantages in *cultural representation, data sovereignty, and strategic autonomy.*
- **Build a DPI For Foundation Model Builders:** India should develop datasets, APIs, tools for labelling and curating data, platforms for delivery of services, fine-tuning to a specific context, etc. It should create this as a **mission-mode programme.**
    - The **initiatives of the AI4Bharat Centre** at the Wadhwani School of Data Science and Artificial Intelligence (WSAI) demonstrate that a **homegrown model** can serve India's multilingual population better.
    - **Sarvam AI** has already developed **Sarvam 1, India's first homegrown large multilingual language model,** in collaboration with **Nvidia**.
- **Encourage Advanced AI Research & Translation:** India needs to focus on physical AI *(embodied in robots)*, as well as neurosymbolic reasoning *(rule-based logic to enhance AI's decisionmaking)*.
    - Public-private partnerships, international collaborations, and phased investments in AI research could reduce risks while fostering a robust AI ecosystem.
- **Develop National AI infrastructure:** Under its **IndiaAI Mission**, the govt is planning to create a high-performance AI computing infrastructure comprising over 10,000 GPUs, high performance computing clusters, secure cloud storage, and scalable AI research hubs.
    - Other nations are already developing their **'Nextgen AI Factories'** – **Denmark, with its Gefion supercomputer**, and **Japan, through its AI Grid initiative.**

Way Forward: A Collaborative Approach

- Government, industry, and academia collaborate to create an open-source Indian AI model, supported by public-private partnerships.
- India partners with global AI research institutions to leverage existing expertise while ensuring its model aligns with national interests.
- The focus is on developing AI models tailored to India's needs, such as AI for agriculture, healthcare, governance, and linguistic diversity.

Conclusion: A Strategic Necessity

- While building a sovereign AI model presents significant challenges, it is a strategic necessity for India. AI is set to become a key driver of economic growth, national security, and technological innovation.
- India must act decisively to invest in AI research, infrastructure, and policy frameworks to develop a homegrown AI ecosystem.

Source: TH

Mains Practice Question
Analyze the potential benefits and challenges of India building a sovereign, foundational AI model. Consider factors such as data sovereignty, national competitiveness, cultural relevance, financial investment, and technical expertise.