Navigating AI Growth in India

This editorial is based on "[Copyright's tryst with generative AI](#)" which was published in The Hindu on 19/05/2025. The article highlights that Copyright law, evolving with technology, now faces the challenge of regulating generative AI's use of copyrighted works while balancing creators' rights and innovation.

For Prelims: [Artificial Intelligence (AI)](#),[INDIAai Mission](#), [National Strategy on AI, Responsible AI for All](#),[Digital Personal Data Protection Act 2023](#), [Skill India](#), [NITI's AIRAWAT](#), [EU AI Act](#), [Responsible AI for Youth](#) [GPAI Summit(2023)](#), [Digital Public Infrastructure (DPI)](#), [National Research Foundation](#).

For Mains: Significance of Artificial Intelligence in Growth and Governance and Related Concerns.

[Artificial Intelligence (AI)](#) is no longer a distant frontier- it is a **transformative force** reshaping India's growth trajectory. From revolutionising agriculture to redefining public service delivery, AI holds immense potential to drive **economic inclusion and governance efficiency**. With visionary initiatives like the [INDIAai Mission](#), India is not just adopting AI but actively shaping a uniquely indigenous **AI ecosystem**. Yet, alongside opportunity comes the urgency to address challenges around infrastructure, data, regulation, and equity.

What Opportunities does Artificial Intelligence Present for India's Growth and Governance?

- **Strategic Economic Multiplier: Artificial Intelligence (AI)** is projected to add nearly **$967 billion** to India's economy by 2035.
    - This figure from **NASSCOM and Accenture** suggests a transformative **15%** increase in India's **gross value added (GVA)**.
- **Economic Transformation:** AI adoption can significantly enhance productivity, quality, and **operational efficiency** across industries.
    - [India's IT services sector](#) alone is expected to gain **$500 billion** in economic value by 2030 through AI integration.
    - Also as per a recent survey, [Generative AI](#) could boost India's $254-billion software sector productivity by **43–45%**, with top gains in software development, as firms rapidly integrate AI into operations.
- **Empowering Agriculture:** AI-enabled crop monitoring and predictive analytics are revolutionizing agricultural productivity and risk management.
    - For instance, **Microsoft's AI Sowing App** boosted groundnut yields in **Andhra Pradesh** by 30%, demonstrating tangible impact.
- **AI in Healthcare Diagnostics:** AI-powered diagnostic tools bridge **healthcare gaps** in

underserved and remote regions effectively.
- Startups like **Qure.ai** leverage AI for early **tuberculosis detection**, drastically reducing diagnostic turnaround times.
- **Improving Education Access:** AI personalizes education by tailoring content to individual student needs and learning styles.
  - Platforms such use AI to customize learning experiences for millions across diverse Indian demographics.
- **Democratization of Knowledge & Innovation:** AI enables broader access to **information and affordable infrastructure** for startups and researchers.
  - Initiatives like **IndiaAI Mission** provide subsidized **Graphics Processing Units (GPU)** access, leveling the playing field for all innovators.
- **Governance through AI-led Data Analysis:** AI facilitates **real-time government decision-making** by processing large volumes of public data.
  - The **Ministry of Road Transport** utilizes **AI** for optimizing traffic flow, enhancing road safety and reducing congestion.
- **Public Sector Efficiency:** AI modernizes public service delivery, boosting speed, transparency, and citizen engagement.
  - **Delhi Police's Crime Mapping Analytics** uses AI for hotspot identification and proactive patrolling strategies.
- **Financial Inclusion Expansion:** AI-based credit scoring expands financial access to unbanked and underbanked populations in India.
  - Fintech firms employ alternative data with AI to generate credit scores for first-time borrowers.
- **Boosting MSME Competitiveness:** AI provides **MSMEs** with predictive analytics, automation, and enhanced customer insights.
  - **Small Industries Development Bank of India's (SIDBI)** partnership with Google empowers **MSMEs to adopt AI**, improving operational efficiency and growth.
- **Environmental Management:** AI-driven **climate models** assist in pollution forecasting and urban environmental risk mitigation.
  - The **Central Pollution Control Board** applies AI to predict air quality and issue timely public alerts.
- **Smart City Initiatives:** AI underpins smart city projects optimizing traffic, waste management, and energy efficiency.
  - **Pune Smart City** utilizes **AI-enabled surveillance** and **mobility analytics** for enhanced urban governance.
- **AI-Driven Judicial Reforms:** AI tools streamline case scheduling and improve legal research efficiency in courts.
  - Supreme Court's **Supreme Court Vidhik Anuvaad Software(SUVAAS)** platform offers AI-powered translation services, aiding multilingual legal processes.
- **Enhancing National Security:** AI strengthens border surveillance and cybersecurity by enabling advanced threat detection.
  - DRDO's **AI facial recognition systems** protect critical installations and sensitive zones effectively.
- **Supporting Skilling and Employment:** It is estimated that AI has the potential to generate 20 million jobs by 2025, contingent on robust skilling initiatives.
  - **NASSCOM's FutureSkills Prime** platform trains professionals in AI, data science, and cybersecurity domains.
- **India as an AI Export Hub:** India leverages its AI talent pool to become a global center for AI outsourcing and innovation.
  - With over 400,000 AI professionals, India ranks among the world's leading AI talent hubs.

Figure: AI for progress: some leading initiatives for growth
1. Skill India AI Portal
2. National AI Skilling Program
3. AI Youth Bootcamp
4. AI in Vocational Training
5. AI Research and Innovation Fund
6. AI Competency Development Centers
7. Collaborations with Global Tech Giants

What are the Major Challenges Facing AI Adoption?

- **Inadequate Data Ecosystem:** India suffers from fragmented, low-quality, and poorly annotated datasets essential for AI training.
    - Initiatives like the **National Data and Analytics Platform (NDAP)** aim to unify data, yet **challenges persist**.
- **Low R&D Investment:** India's AI research spending is under **0.1%** of GDP, far less than **US and China** investments.
    - This limited investment curtails the development of indigenous AI technologies and foundational models.
- **Shortage of Skilled Workforce:** Only about **4%** of India's workforce is **formally skilled** in AI and related digital technologies.
    - The **National Strategy on AI** by NITI Aayog highlights the need to upskill 10 million youth urgently.
- **Sectoral Digital Divide:** AI adoption is concentrated in IT and finance, while sectors like **textiles and rural healthcare** lag behind.
    - Poor digital infrastructure and lack of **AI awareness impede MSME** and agricultural sector participation.
- **Ethical and Privacy Concerns:** AI systems risk perpetuating bias, discrimination, and surveillance without responsible governance.
    - India currently lacks comprehensive legislation to govern **AI ethics**, **privacy, and data**

protection.
- **Copyright Challenges:** Copyright law has evolved alongside technology, protecting creators while adapting to new forms of expression.
    - Today, **generative AI challenges** the law by using copyrighted works for training without direct reproduction.
- **Limited Industry-Academia Collaboration:** Academic AI research often remains disconnected from industry needs due to weak partnerships.
- **Infrastructure Gaps:** As of 2023, about 45% of the Indian population had no internet access, limiting widespread AI adoption.
    - Projects like **BharatNet** aim to improve last-mile connectivity but face uneven implementation.
- **Underutilization of Public Sector Data:** Government datasets are often outdated and not machine-readable, reducing AI usability.
    - The **Open Government Data Platform** seeks to standardize and improve public data accessibility.
- **Fragmented Regulatory Landscape:** AI regulation is scattered across domains without unified national legislation, causing confusion.
    - A cohesive national AI law is essential to streamline deployment and governance at scale.
- **Slow Startup Scaling:** India hosts over **3,000 AI startups**, yet most struggle with access to capital and mentorship.
    - The **Startup India Seed Fund Scheme** supports early-stage ventures but faces uneven rollout.

How can India Strategically Navigate the Future of AI for Inclusive and Ethical Development?

- **Adopt a Rights-Based AI Framework:** India must embed fairness, accountability, and privacy protections in all AI deployments.
    - **NITI Aayog's "Responsible AI for All"** advocates algorithmic governance centered on **equity and ethics**.
- **Strengthen Data Protection Regime:** Robust data privacy laws ensuring consent, grievance redressal, and enforcement are vital.
    - The **Digital Personal Data Protection Act 2023** provides a foundation but requires clearer enforcement.
- **Bridge the Skilling Divide:** Inclusive AI growth demands upskilling rural and marginalized youth through targeted programs.
    - Initiatives like **FutureSkills Prime** and **Skill India** should integrate AI modules in vocational training.
- **Promote Indigenous Innovation:** Reducing dependence on foreign AI models requires public-private investment in local R&D.
    - **INAI (INtel AI)** collaborative AI development in Telangana exemplifies **tailored solutions** for Indian contexts.
- **Ensure Equitable Access to AI:** Deployment must focus on social sectors- health, agriculture, education- with vernacular localization.
    - AI for All initiative aims to democratize AI access by addressing linguistic and geographic diversity.
- **Deploy AI in Governance Responsibly:** Government AI use must avoid exclusion, bias, and lack of transparency in public services.
    - **NITI's AIRAWAT** platform fosters trusted AI models for efficient and ethical service delivery.
- **Foster Multi-Stakeholder Governance:** Inclusive regulatory bodies with participation from civil society, academia, and industry are critical.
    - An **AI advisory council** is recommended to balance innovation with regulatory oversight.
- **Create Sector-Specific Regulations:** Tailored guidelines are needed for sectors like healthcare and finance to manage unique risks.
    - These should address **AI explainability**, liability, and **ethical challenges** effectively.

What is the Way Forward for Responsible and Effective AI

Development?

- **Invest in Scalable Computational Infrastructure:** India must enhance **cloud computing, data centers**, and **distributed networks** for growing AI demand.
    - Prioritizing rural and underserved regions will help bridge the rural-urban digital divide effectively.
- **Enact Inclusive and Global AI Regulations:** India should formulate AI policies aligned with global frameworks like the **EU AI Act**.
    - Risk-based regulation with transparency and accountability will promote ethical AI deployment.
- **Democratize AI Education and Skills Training:** Expanding initiatives like **Responsible AI for Youth** and **IndiaAI FutureSkills** is imperative.
    - These programs must target rural and marginalized communities to build a diverse AI workforce.
- **Promote High-Quality Data Governance:** Implement governance frameworks ensuring data accuracy, privacy compliance, and unified access.
    - Platforms like the **IndiaDatasets Programme** will boost AI reliability and citizen trust.
- **Foster Consent-Based Data Sharing:** Consent-driven data policies encourage transparency and empower citizens in AI governance.
    - Such sharing enables efficient, personalized public services and supports data-driven policymaking.
- **Support Inclusive AI Ecosystems:** AI tools must address linguistic diversity and socio-economic inequalities across India.
    - Developing **vernacular AI applications** will enhance accessibility and social inclusion.
    - India emphasized the importance of a multi-stakeholder framework during the **GPAI Summit(2023)**, bringing together governments, industry, academia, and civil society to **advance safe, inclusive, and responsible AI** for sustainable global development.
- **Monitor, Evaluate, and Adapt AI Policies:** Establish real-time impact assessments to ensure AI policies remain relevant and effective.
    - Continuous refinement using data insights will help address evolving technological challenges.
- **Enhance Cybersecurity Frameworks:** Deploy AI-enabled threat detection and predictive analytics to safeguard digital infrastructures.
    - Strengthening **Digital Public Infrastructure (DPI)** security is critical for national resilience.
- **Leverage International Collaboration:** Global partnerships, such as the **US-India AI Initiative**, accelerate sector-specific AI applications.
    - Collaborations foster knowledge exchange and tailor solutions to India's unique developmental needs.
- **Strengthen R&D Ecosystems:** The **National Research Foundation** should promote academia-industry-government partnerships.
    - Such collaborations speed innovation and deployment of AI solutions addressing local challenges.

Conclusion

India's AI journey is at a decisive turning point, blending innovation with responsibility. By addressing challenges and leveraging its **demographic, linguistic, and digital strengths**, India can lead the world in **inclusive AI**. A strategic, ethical, and citizen-centric approach will ensure AI becomes a true catalyst for national transformation.

> ### *Drishti Mains Question:*
>
> Discuss how Artificial Intelligence can act as a catalyst for India's economic growth and governance transformation.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims:

Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (2020)

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

(a) 1, 2, 3 and 5 only

(b) 1, 3 and 4 only

(c) 2, 4 and 5 only

(d) 1, 2, 3, 4 and 5

Ans: (b)

Mains:

Q. Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? (2023)

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