

4. Transforming India with Artificial Intelligence- Science & Technology

Over ₹10,300 crore investment & 38,000 Graphics Processing Unit (GPUs) powering inclusive innovation. India is strategically leveraging Artificial Intelligence to drive inclusive economic growth and governance through the IndiaAI Mission and initiatives like BharatGen, aiming to build sovereign infrastructure and a skilled workforce while addressing challenges like the digital divide and data privacy.

Introduction to Artificial Intelligence (AI)

Definition- AI is the ability of machines to perform tasks requiring human intelligence, such as learning from data, adapting to inputs, recognising patterns, and making decisions.

Mechanism- Modern AI relies on large datasets, algorithms, and Large Language Models (LLMs), improving through continuous data feedback.

Status- No longer a niche technology, AI is now a general-purpose technology (like electricity) with economy-wide spillover effects.

Recent Breakthroughs in AI

Generative AI- Models like GPT-5 and Google Gemini create content across education, healthcare, and creative sectors.

Multimodal AI- Technologies like DALL-E 3 and LLaMA integrate text, image, and video processing.

Biomedical Research- AlphaFold predicts protein structures, transforming drug discovery.

AI-Robotics- Robots can now learn and make autonomous decisions.

Software Development- Tools like GitHub Copilot X and Codex automate code generation.

Voice AI- Platforms like ElevenLabs enable realistic voice synthesis.

Climate Science- Models like GraphCast improve weather prediction accuracy.

India's AI Ecosystem- Current Status

Metric	Details
Tech Sector Revenue	Projected to cross USD 280 billion this year.
Employment	Over 6 million people employed in the tech and AI ecosystem.
Global Capability Centres (GCCs)	Hosts 1,800+ GCCs, with 500+ focused specifically on AI.
Startups	~1.8 lakh startups; 89% of new startups used AI last year.
Enterprise Adoption	87% of enterprises are actively deploying AI solutions (NASSCOM Score- 2.45/4).
Key Sectors	Industrial, Automotive, Retail, BFSI, and Healthcare contribute 60% of AI value.
Global Competitiveness	Ranked 3rd globally in AI competitiveness (Stanford 2025 Tool).

Government Initiatives

IndiaAI Mission- A national-level programme approved in March 2024 to strengthen India's AI innovation ecosystem.

Objective- Position India as a global AI leader via research, computing infra, and skilling.

Implementation- Digital India Corporation (DIC) under MeitY.

Key Pillars of IndiaAI Mission

- IndiaAI Compute Infrastructure- Establishing a high-end ecosystem with over 10,000 GPUs. Provides resources to startups and researchers.
- IndiaAI Innovation Centres (IICs)- Centres of Excellence for research in agriculture, healthcare, and governance.
- IndiaAI Datasets Platform (AIKosh)- Unified repository hosting 5,500+ datasets and 251 AI models across 20 sectors. Ensures secure access and privacy.
- IndiaAI Application Development- Supports solutions for India-specific needs (e.g., healthcare, climate). Sector-linked hackathons like CyberGuard AI Hackathon.

5. IndiaAI FutureSkills Program- AI labs in Tier 2/3 cities (31 labs launched via NIELIT). Focus on training professionals from foundational to advanced levels.
6. IndiaAI Startup Financing- Funding via grants and venture partnerships. Global Programme Helps startups expand to Europe (e.g., Station F partnership).
7. Responsible AI Framework- Developing ethical governance for fairness and accountability. Setting up an IndiaAI Safety Institute.

2. India AI Impact Summit 2026

Date- February 2026.

Key Events

1. AI Pitch Fest (UDAAN)- For startups, focusing on women-led and differently-abled innovators.
2. AI Expo- Exhibition on Responsible Intelligence with 300+ exhibitors.
3. Global Innovation Challenges- Open challenges for youth and women to solve public problems.

Symposium- Forum for Global South and international researchers.

3. NITI Aayog Report- AI for Inclusive Societal Development

Focus- Supporting India's 490 million informal workers.

Vision- AI to amplify capabilities rather than replace workers; aiming for global leadership in inclusive AI by 2035.

Mission- Digital ShramSetu Mission to deploy frontier technologies for the informal sector.

Phased Roadmap

Phase	Timeline	Focus Area
Phase 1	2025-2026	Mission Orientation- Drafting charter, engaging stakeholders.
Phase 2	2026-2027	Institutional Setup- Governance structures, legal readiness, design.
Phase 3	2027-2029	Pilots- Testing in high-readiness sectors; last-mile adoption.
Phase 4	2029+	Nationwide Rollout- Scaling solutions across states/cities.

4. Other Key Initiatives

Centres of Excellence (CoEs)- Established in healthcare, agriculture, sustainable cities, and education (Budget 2025).

Sarvam AI- Building India's sovereign open-source LLM ecosystem for Aadhaar services.

Bhashini- Digital inclusion tool supporting 20 languages and 350+ AI models for speech/translation.

BharatGen AI- India's first government-funded multimodal LLM (launched June 2025) supporting 22 languages.

AI in Everyday Life (Sectoral Applications)

Healthcare- Clinical support for early diagnosis and scan analysis. Collaborations with ICMR and HealthAI for ethical innovation.

Agriculture

1. Kisan e-Mitra- Virtual assistant for scheme access.
2. National Pest Surveillance System- Uses satellite and weather inputs for crop health.

Education

1. CBSE- AI modules from Class VI; optional subject for Class IX-XII.
2. DIKSHA- AI features like keyword search.
3. YUVAi- Trains students in applied AI themes.

Governance & Justice- e-Courts Phase III AI for scheduling and translation. Translating High Court judgments into regional languages.

Weather

1. IMD- Uses AI for rainfall and cyclone forecasting.
2. MausamGPT- Weather advisory chatbot under development.

Opportunities for Economic Growth

1. Productivity-Led Growth- AI automates repetitive tasks, boosting output per worker without necessarily reducing employment. Potential to add \$1.7 trillion to the economy by 2035.

2. Expanding IT Services- Global AI services market to reach \$297 billion by 2027. Indian firms (TCS, Infosys) leading large-scale projects.
3. Governance Multiplier- Data-driven targeting reduces welfare leakage. Predictive analytics improves administrative responsiveness.
4. Inclusion via Voice AI- Tools like Bhashini break language barriers for the elderly and informal workers.
5. Climate Resilience- Early-warning systems for disasters (floods, cyclones) reduce economic damage.

Challenges Posed by AI

Data Privacy & Trust- Weak consent mechanisms and enforcement gaps in the DPDP Act, 2023. Risk of eroding public trust in governance.

Digital Divide- Concentration in urban/formal sectors risks deepening social inequalities. Rural areas lack devices and digital skills.

Concentration of Compute & Capital- High cost of GPUs creates entry barriers.

Technological Dependency- Reliance on foreign Big Tech (Google, OpenAI) raises strategic sovereignty concerns.

Skill Polarisation- Skill Deficit Only 51% of graduates are employable (Economic Survey). Risk of widening income inequality without timely reskilling.

Disruption of Business Models- Small traders and artisans lose competitiveness to AI-enabled e-commerce.

Algorithmic Bias- "Black-box" systems can reproduce social discrimination and reduce accountability.

Cybersecurity Risks- 20,41,360 incidents reported in 2024 (CERT-In). Small businesses lack capacity to secure AI systems.

Way Forward

To harness AI effectively, India requires a coordinated strategy-

1. Build Sovereign Infrastructure- Invest in public AI compute capacity (GPUs, Cloud) to reduce foreign dependence.
2. Strengthen Data Governance- Standardise data collection and prioritise bias-checked, India-specific datasets via AIKosh.
3. Develop Adaptive Workforce- Move beyond coding to AI literacy; focus on human-AI collaboration.
4. Problem-First AI- Incentivise solutions for real challenges (Agriculture, Health) rather than just tech-driven innovation.
5. Responsible Deployment- Institutionalise independent audits and explainability to ensure fairness.
6. Support MSMEs- Provide targeted funding and access to public compute to enable innovation.
7. Climate & Tourism Integration- Use AI for resource monitoring (NAPCC) and personalised tourism (Dekho Apna Desh).

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