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Artificial Intelligence Ecosystem in India

COMPREHENSIVE REPORT BY STRATEGIC POLICY LAB
PART 1; Introduction, Strategy & Government

INTRODUCTION

Artificial Intelligence (AI) refers to technologies that enable machines to mimic human intelligence. While AI is often associated with futuristic, thinking machines, today it primarily involves pattern-matching software analyzing vast datasets to predict outcomes, like detecting pre-cancerous lesions or managing customer service. These tools are powerful but understanding their societal impact requires moving past the hype.

This report focuses on India's AI ecosystem, outlining key policy initiatives and the country's progress in the field. Globally, national governments began exploring AI for social efficiency in the early 2000s, with the US pioneering in national security. Post-2010, the explosion of "big data" through social media and smartphones expanded AI's potential. In the US, "surveillance capitalism" has embraced AI as a key driver of economic growth, while the EU, concerned about privacy, is moving toward a human-centric approach to AI regulation.

In India, AI presents a unique opportunity. As per NASSCOM, AI and data could add US$ 450–500 billion to India's GDP by 2025. The government is deeply committed to AI development, recognizing its potential to improve literacy, healthcare, transport, and innovation—especially benefiting the masses. India's AI could transform society, empowering billions if used to serve the public good. However, if misdirected, global powers may exploit AI at the expense of the people, with far-reaching consequences.

[1] https://shoshanazuboff.com/book/about/
[2] https://nasscom.in/knowledge-center/publications/unlocking-value-data-and-ai-india-opportunity

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APPROACH

We began the survey by looking at the Government initiatives followed by Industry deployment and civil society initiatives. An exhaustive list of most active players impacting the developments in the ecosystem and mapped hereinafter in the following chapters.

Although a number of government ministries, departments and organizations affiliated with the Government of India (GoI) are active in the building of AI ecosystem, Ministry of Electronics and Information Technology (MeitY) and National Institute for Transforming India (NITI Aayog) have remained the main driving forces. Established in 2015, NITI Aayog serves as the apex public policy think tank of the Government of India. In 2018, it published a strategy paper titled, "National Strategy for Artificial Intelligence" #AI4ALL" stating the benefits of adopting AI in five principal sectors.

Healthcare	Education
Smart Mobility	Transportation
Smart Cities and Infrastructure	

In the same year, MeitY formed four committees to explore AI's impact on India's economy and society. These committees were tasked with identifying key AI applications, suggesting AI solutions to enhance government services and reduce costs, addressing challenges related to employability, skilling, and re-skilling, recommending R&D frameworks and Centres of Excellence, and advising on legal, data privacy, and cybersecurity policies. These reports are analyzed and summarized in this report.

The National AI Portal of India, https://indiaai.gov.in/ is a joint initiative of MeitY, National eGovernance Division ("NeGD") and National Association of Software and Service Companies ("NASSCOM"). It serves as the canonical repository of all AI developments in India. It professes the creation of 20 million AI-enabled jobs by 2025. The claim is that, India, equipped with a large proportion of IT-skilled workforce occupies a vantage position to leverage the near-transformative potential of AI before most others do.

In 2022, leading Industry body NASSCOM[1] came up with a report on AI adoption trends in India, beginning with four key sectors that could contribute ~60% of AI's potential value-add of $450-500 bn to India's GDP by 2025 and established an AI Adoption Index that "aims at introducing AI maturity assessment for end-user enterprises". Everyday, numerous startups are being found that are purporting to use AI in several industries ranging from healthcare, manufacturing, education, retail, communication , energy, utilities amongst other sectors.

We see only two policy initiatives that focus on driving any ethical framework for AI. One is the identification of seven (7) principles for responsible AI by NITI Aayog which has also proposed the creation of a Council of Ethics and Technology to create, monitor and govern AI initiatives. Second is the Draft Personal Data Protection Bill,2019 that is yet to be enacted after years of discussion but aims to provide some control over data collection by entities. will ignite a discussion about the current laws and practices that govern the development of AI and related practices and whether they are conducive for a democracy in the 21st century.

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CENTRAL GOVERNMENT

A number of government ministries, departments and organizations ranging from the Ministry of Electronics and Information Technology ("MeitY"), Ministry of Commerce and Industry ("MCI"), Department of Science and Technology ("DST"), the Office of Principal Scientific Adviser to the Government ("PSA"), Department of Space ("DoS"), Department for Promotion of Industry and Internal Trade ("DPIIT") to the central government think tank NITI Aayog play a major role at the Central level.

The research and development on AI by the Central Government started in 2017 with an initiative by the MCI. And, within a year different ministries, departments and organizations of the Government started taking initiatives to study the implementation and deployment of AI. The literature on AI under each of the bodies mentioned above grew exponentially from 2018. However, MeitY and NITI Aayog have remained the main driving forces under the AI ecosystem in the Central Government with Shri Rajeev Chandrashekar, Minister of State, MeitY and Shri. Amitabh Kant, CEO of NITI Aayog spearheading the AI initiatives as well as their implementation in the Central Government.

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AI TASKFORCE

The Task Force on Artificial Intelligence for India's Economic Transformation ("AI Taskforce") was constituted on 24 August, 2017 under the aegis of the Ministry of Commerce and Industry, GoI to realize the vision of embedding AI in our economic, political, and legal processes.[1] This was the first official body constituted by the Central Government of India aimed to conduct research on the AI ecosystem and make recommendations to deploy AI in the government, industries and research institutions. On 20 March, 2018 the said Taskforce released its report wherein it recommended that in India, AI should be seen as a scalable problem solver rather than just a booster of economic growth. The Report inter-alia recommends for (i) establishing a National Artificial Intelligence Mission (N-AIM) to coordinate all AI-related activities (ii) facilitating the setting up of data banks, exchanges and ombudsman (iii) standard settings (iv) enabling policies pertaining to data and provision for tax incentives (v) human resource development by including AI related curriculum in education (vi) reskilling by identifying set of skills for AI (vii) international rule making by participating actively in international policies and (vii) bilateral cooperation through leveraging partnerships to develop AI solutions for social / economic problems and to share best regulation practices.[2]

[1] https://pib.gov.in/newsite/PrintRelease.aspx?relid=170231
[2] https://dpiit.gov.in/sites/default/files/Report_of_Task_Force_on_ArtificialIntelligence_20March2018_2.pdf

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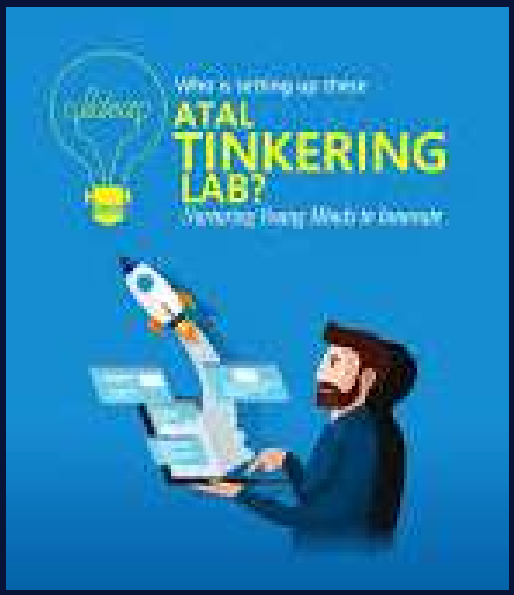
NITI AAYOG

ATAL INNOVATION MISSION

Atal Innovation Mission ("AIM") seeks to foster enterprise building by providing financial support to innovators to set up enterprises. To achieve the objectives set for itself, AIM has undertaken initiatives under the aegis of Atal Tinkering Labs ("ATL"), Atal Incubation Centres ("AIC"), Atal New India Challenges ("ANIC") and Mentor India ("MI").

Atal Tinkering Labs ("ATL"), aim to foster a culture of innovation in young minds enrolled in grades 6 to 12 by creating learning space to develop skills and become adept at new technologies such as AI and Atal Incubation Centres ("AIC") aims to create world-class incubation centres focused on supporting start-up incubatees that contribute to technological innovation in fields such as AI.



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NITI AAYOG

RESPONSIBLE AI

In February, 2021 NITI Aayog released its first part of the two-part approach paper titled "Responsible AI #AIForALL".[1] The approach paper divides ethical considerations into systems consideration and societal consideration and widely explores them after taking into account expert consultations and interviews. The paper further looks at the legal, regulatory and technology based approaches for managing AI systems and recommends 7 principles for responsible management of AI which are the principles of safety & reliability, equality,inclusivity & non-discrimination, privacy & security, transparency and accountability.[2]

The paper recognizes the need for fine balancing between large-scale adoption of AI for public good and protecting societal interest. Currently India lacks a legislative framework to govern the use of AI.[3] The closest it has come to articulating an AI specific regulation is the draft Personal Data Protection (PDP) Bill, 2019. All future AI legislation as also the contemporary ones, are mandated to follow the principles of constitutional morality, as dictated by the Supreme Court of the country and demonstrated by legal precedents which derive their authority from the Fundamental Rights enshrined under Articles 14, 15, 16, 21, and 38 of the Constitution of India.

[1] https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf
[2] https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf
[3] https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf

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PM STIAC

On 28 August, 2018, the PSA established the Prime Minister of India's Science, Technology and Innovation Council ("PM STIAC").[1] The AI Mission is led by PM STIAC in collaboration with the MeitY, NITI Aayog and DST is aimed to engage with academia and industry to facilitate the development of core research capability by deploying AI in Healthcare, Education, Agriculture, Smart Cities and Infrastructure, including Smart Mobility and Transportation sectors.

[1] https://static.psa.gov.in/psa-prod/psa_custom_files/Order%20-%20PM-STIAC.pdf

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ANNEXURE

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LIST OF ABBREVIATIONS

AFRS	Automated Facial Recognition System
AI	Artificial Intelligence
AIC	Atal Incubation Centres
AICTE	All India Council of Technical Education
AIM	Atal Innovation Mission
AMCHAM	American Chamber of Commerce in India
ANIC	Atal New India Challenges
ASSOCHAM	Associated Chambers of Commerce & Industry
ATIL	Atal Tinkering Labs
CCAOI	Cyber Cafe Association of India
CII	Confederation of Indian Industry
CAOI	Cellular Operations Association of India
CrPC	Code of Criminal Procedure
DPIIT	Department for Promotion of Industry & Internal Trade
FICCI	Federation of Indian Chambers of Commerce & Industry
GPAI	Global Partnership on Artificial Intelligence
IAMAI	Internet and Mobile Association of India
ICCPR	International Covenant on Civil and Political Rights
ICT	Information and Communication Technologies
IP	Internet Protocol
IPC	Indian Penal Code
ISPAI	Internet Service Providers Association of India
IT	Information Technology
IUSSTF	Indo-US Science and Technology Forum
LEA	Law Enforcement Agency
MeitY	Ministry of Electronics and Information Technology
MHRD	Ministry of Human Resources Development
MI	Mentor India

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LIST OF ABBREVIATIONS

NAIRP	National Artificial Intelligence Resource Platform
NASSCOM	National Association of Software & Services Companies
NeGD	National E Governance Division
NGO	Non-Governmental Organization
NITI Aayog	National Institute for Transforming India
NLTM	Natural Languages Translation Mission
NPNT	No Permission No Take-Off
OECD	Organization for Economic and Cultural Development
OHCHR	Office of the High Commissioner of Human Rights
CCAOI	Cyber Cafe Association of India
PM STIAC	Prime Minister of India's Science, Technology & Innovation Council
PSA	Principal Scientific Advisor
SFLC.in	Software Freedom Law Centre, India
SDG	Sustainable Development Goals
STEM	Science, Technology, Engineering & Mathematics
TIFAC	Technology Information Forecasting & Assessment Council
UDHR	Universal Declaration of Human Rights
UGC	University Grants Commission
UIDIA	Unique Identification Authority of India
UK	United Kingdom
UN	United Nation
UNESCO	United Nations Educational Social & Cultural Organization
USA	United States of America
USAIA	US-India AI Initiative
WEF	World Economic Forum