



AI IN INDIAN GOVERNANCE AND PUBLIC SERVICES

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Recognising the transformative potential of AI, the Government of India has undertaken concrete steps to encourage the domestic adoption of AI in a responsible manner and build public trust in the use of this technology, placing the idea of 'AI for All' at its very core. Large datasets may be utilised to harness the potential of AI to foster data-driven perspectives and facilitate the effective development and implementation of robust policies and schemes. As the proliferation of AI in citizen-centric public services accelerates, the imperative for establishing robust ethical guardrails becomes increasingly evident to safeguard against potential misuse and ensure responsible deployment. Towards these ambitions, the Government of India has also notified the Digital Personal Data Protection Act to protect citizens' privacy, safety, and trust concerning their personal data and enhance the accountability of entities collecting and processing personal data.



Artificial Intelligence has been around for a long time; the term 'Artificial Intelligence' was first used by John McCarthy in 1956. However, in the last year or so, with the advent of Generative AI and the launch of ChatGPT by OpenAI, AI has become a buzzword. This has also been enabled by the rapid expansion of data and computing capabilities. Today, AI can be harnessed to solve societal challenges in health care, education, and agriculture, build innovative products and services, increase efficiency, elevate competitiveness, and enable economic growth, contributing to an improved quality of life. Recent advances in AI have also significantly enhanced its potential to transform governance, public service delivery, citizen engagement, and catalyse large-scale socio-economic transformation.

In the past decade, India has formulated a distinctive approach to digital transformation through the 'Digital India' programme. Prioritising inclusivity and accessibility, the India Stack projects on digital identity (Aadhaar), digital payments (UPI), and Digilocker, among others, have helped drive the digital transformation that the whole world looks up to. Given this background, India is strategically poised to employ AI to transform public service delivery for efficiency in governance, innovation, and improved citizen engagement.

A recent industry report focusing on Generative AI (GenAI) suggests that GenAI holds the potential to contribute up to 1.5 trillion dollars to India's GDP by 2030. Reinforcing India's pivotal role in this transformative field, the Stanford AI Index 2023 also ranks the nation as the foremost country in AI skill penetration. The burgeoning AI landscape in India is further exemplified by a robust startup ecosystem, ranking 5th in the number of newly Funded AI Companies by geographic area and attracting significant investments exceeding \$475 million in GenAI startups in the past two years. This signifies the confidence and interest from both domestic and international investors in India's AI capabilities and innovation. Leveraging this momentum, it becomes imperative for India to strategically incorporate AI in public service delivery, ensuring that the nation harnesses its AI prowess for equitable socio-economic development.

India's Approach

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steps to encourage the domestic adoption of AI in a responsible manner and build public trust in the use of this technology, placing the idea of 'AI for All' at its very core. The productivity gains offered by leveraging AI, as well as its potential to empower citizen participation in governance, have made it ubiquitous in India's approach to governance and public service delivery.

The Government of India's flagship initiative, the National Programme on Artificial Intelligence (NPAI), aims to nurture the building blocks of the domestic AI ecosystem through four key interventions:

- **National Data Management Office (NDMO):** Recognising data as the foundational element for AI innovation, the NDMO aims to enhance data quality, utilisation, and accessibility, modernising government practices to fully unlock the potential of data and the AI innovation ecosystem.
- **National Centre on AI (NCAI):** NCAI is envisaged as a sector-agnostic entity that identifies AI solutions for public sector problem statements and facilitates their nationwide deployment, aiming to drive large-scale socio-economic transformation.
- **Skilling for AI:** This pillar aims to revamp technical education infrastructure, particularly ITIs and polytechnics by building data labs that can help equip the workforce with AI-ready skills and mitigate the disruptions caused by the accelerated adoption of AI.
- **Responsible AI:** Emphasises the need to address potential biases and discrimination in AI adoption through the development of indigenous tools, guidelines, frameworks etc., and suitable governance mechanisms.

These concerted efforts of the Government towards leveraging AI for social good can be enhanced by augmenting public sector services through AI, leading to increased efficiency and improved outcomes. Large datasets may be utilised to harness the potential of AI to foster data-driven perspectives and facilitate the effective development and implementation of robust policies and schemes. The adoption of evidence-based decision-making, facilitated by AI, enables policymakers to access comprehensive data insights, ensuring that decisions and policies are anchored in evidence, ultimately leading to more targeted and impactful socio-economic benefits.

Further, AI integration in public service delivery enhances data analysis, automates repetitive tasks, and streamlines decision-making processes, unlocking new levels of efficiency, innovation, and citizen engagement across various sectors. This shift towards data-driven governance is also enhancing transparency and enabling participatory governance. Beyond efficiency, AI catalyses inclusive development, breaking traditional barriers and driving large-scale social transformation. Initiatives aimed at providing services to all, irrespective of geographical or socio-economic constraints, exemplify AI's potential to foster equitable access.

Key Government Initiatives Leveraging AI

The Government of India is pioneering the approach of harnessing the power of AI for social good, applying AI in education, healthcare, agriculture, languages, and other critical sectors. To illustrate the impact of AI, a few key initiatives that have reaped dividends with the integration of AI and related technologies have been detailed below:

UMANG (Unified Mobile Application for New-Age Governance)

UMANG serves as a unified platform, offering all Indian citizens a singular point of access to pan-India e-government services, spanning from central to local government bodies. The platform provides access to 1836 vital government services encompassing a wide spectrum of areas such as education, Covid-19 vaccinations, public transport, employment guidance, passport applications, utilities, cybercrime reporting, and more. Since its launch in 2017, UMANG has aimed to propel India towards mobile governance by enabling citizens to get access to all public services with one super app.

To eliminate technology and language barriers and enhance the long-term adoption of key Government programmes and initiatives, AI was leveraged to transform UMANG into a more inclusive solution. UMANG, the Government's citizen-centric app, has introduced a voice-based chatbot, or virtual assistant. Developed using conversational AI technologies, this chatbot enables users to inquire about various Government services in both Hindi and English using either voice or text inputs.

DigiYatra

The DigiYatra initiative, spearheaded by the Ministry of Civil Aviation, marks a revolutionary step towards leveraging artificial intelligence (AI) to enhance the air travel experience for citizens.

DigiYatra is a biometric-based boarding system for Indian airports.

The DigiYatra initiative, implemented through the DigiYatra App, eases entry into airports, security checks, and boarding with a seamless registration process. Users verify their mobile numbers and integrate DigiLocker or offline Aadhaar for secure authentication. The app uses facial recognition technology, where users upload a selfie, enhancing security and expediting the boarding process. This initiative eliminates the need for passengers to present their boarding pass or identification at multiple checkpoints, significantly reducing queuing time. The security measures are strengthened through a system that maps each passenger to their Passenger Name Record (PNR), ensuring that only legitimate passengers gain entry at every checkpoint. Moreover, the real-time information on passenger load obtained by the airport operator facilitates improved resource planning. The streamlined process has enhanced airport throughput, providing a more efficient and secure travel experience for passengers while minimising queuing times and maximising the utilisation of resources.

Digital India Bhashini

Digital India Bhashini (National Language Translation Mission) is an initiative launched by the Ministry of Electronics and Information Technology that is building speech-to-speech machine translation systems for various Indian languages and dialects and evolving a Unified Language Interface (ULI). The mission is working towards creating a 'voice-based internet' that is accessible in vernacular Indian languages and building multilingualism as well by developing the next generation of 'conversational' government apps and websites. This will enable citizens to access digital services in their own language, further increasing digital inclusion and accessibility.

Bhashini leverages AI to establish its building blocks, such as language and speaker identification, precise speech-to-text conversion, accurate translation across multiple languages, transliteration, semantic comprehension for actions like responding to queries, and sophisticated speech synthesis, which includes the ability to produce speech output in the language of choice with options for selecting the preferred speaker gender (male or female). The Bhashini app is available on the Play Store and App Store for people to use. Bhashini has also enabled voice-based UPI transactions.

Applications of AI in Urban Governance

Several government departments across States— including municipal corporations and police, are using image recognition and AI for near-real-time monitoring of traffic and the infrastructure of the city. The solution deployed has demonstrated highly promising outcomes, detecting 1,000 violations per hour and reporting over 50,000 catastrophic issues.

The AI model for infrastructure and traffic monitoring employs advanced image recognition and sensor data analysis to detect and report issues such as potholes, damaged manhole covers, non-functional traffic lights, and streetlights. The model is also trained to detect traffic infractions, including speeding, rash driving, failure to wear a seatbelt, and issues such as broken taillights or headlights. The solution has been very innovatively deployed, wherein Cab and Food-delivery aggregator drivers are incentivised to provide video and image footage to the AI model when they are driving around cities. This has significant costs for municipal corporations and police, as they don't need to deploy surveillance cameras. By continuously monitoring civic infrastructure and traffic violations, this model facilitates timely intervention and maintenance, resulting in cost savings as well as safer and more efficiently managed urban environments.

Applications of AI in Health Care

DRDO's Centre for Artificial Intelligence and Robotics (CAIR) has developed ATMAN AI, an AI-based Covid detection application software using Chest X-rays (CXRs), which can classify the images into normal, Covid-19, and pneumonia classes using a limited number of sample images. This secure, web-based solution was developed to optimise Chest X-rays for rapid detection of Covid-19-triggered lung abnormalities. The ATMAN backend incorporates a specifically tuned Deep Convolutional Neural Network designed to accurately identify Covid-19, overcoming the challenge of a limited dataset of Covid X-ray images. Additionally, the software ensures image quality by automatically pre-processing images to address varying illumination levels, offering easy navigation and accessibility through a range of devices over the Internet.

The Ministry of Health and Family Welfare has also implemented projects wherein Ai-based models are being used to analyse X-Ray and mammography images to detect tuberculosis and breast cancer.

These solutions help address the challenge of a lack of trained radiologists in rural and remote areas.

AI-Based Pest Management System

CottonAce, an AI-driven early warning system, is aiding farmers in safeguarding their crops by offering timely, localised advice on pesticide application. Developed by Wadhvani AI, the AI system has undergone successful piloting. In collaboration with the Better Cotton Initiative and the Maharashtra Government. It is currently operational in Gujarat, Maharashtra, and Telangana, benefiting over 18,000 farmers. Following the integration of this AI system, farmers have witnessed a significant 25 per cent increase in cotton crop yields.

Lead farmers or extension workers install the CottonAce app, uploading photos of pests collected in commonly used pheromone traps. The AI algorithm identifies and counts the pests, determines the infestation level, and provides actionable advice to the farmer. This information is then shared with neighbouring 'cascade' farmers, who do not require additional tools, including smartphones. The app functions on a simple smartphone, even in offline areas with low network coverage, and is available in nine languages (English, Hindi, Marathi, Gujarati, Telugu, Kannada, Tamil, Odia, and Punjabi).

AI Applications in Agriculture

The Government of Telangana has deployed an AI solution that has the capability to leverage agricultural data and provide actionable inputs that can potentially increase crop yield. The initiative involves accurately delineating field boundaries for approximately 60,000 agriculture fields, providing precise data on acreage, forested areas, and irrigation structures with an impressive 85% accuracy. The solution is also enabling landscape monitoring and event detection models to deliver valuable information on crop types, sow and harvest schedules, as well as the identification of water bodies.

Another AI-based solution deploys sensors in crop fields that help estimate moisture content in the soil. Mapping it with weather data regarding rains and the stage a crop is in helps make predictions of the irrigation needed, and the farmer gets prompts on his mobile phone about when he should be switching on the submersible pump for irrigation and for how long. It is estimated that this simple solution can save up to 42% of water for paddy.

AI-Based Attendance Monitoring (Shiksha Setu)

The government of Assam has developed a mobile application called 'Shiksha Setu' for recording the digital attendance of both students and teachers. The application includes an AI-based facial recognition attendance system, which has been implemented across 44,000 schools in the state. The facial data of all students has been entered into the system, and all schools in the state have been geo-tagged and geo-fenced. The attendance is recorded in real-time, and analysis can be conducted on a group or individual basis.

Through this system, proxy attendance has been eliminated, and teachers who used to either not come to school or arrive late now attend punctually. The system has also identified and removed 4 lakh ghost students. This has resulted in significant cost savings for the Government in PM Poshan, school uniforms, and textbook supplies. However, the most significant advantage is that now concrete figures on absenteeism and dropout rates are updated daily. The system highlights how many children have not attended school for 1, 2, 3, 4, or more weeks, allowing authorities to contact the parents and inquire about the reasons for their prolonged absence. This has also helped reduce dropout rates.

There are many more such solutions, and the Ministry of Electronics and IT has published a compendium featuring 75 success stories that highlight the transformative use of AI in enhancing public service delivery in India. These can be accessed through: <https://www.meity.gov.in/writereaddata/files/75-75-India-AI-Journey.pdf>

Way Forward

As the proliferation of AI in citizen-centric public services accelerates, the imperative for establishing robust ethical guardrails becomes increasingly evident to safeguard against potential misuse and ensure responsible deployment. To ensure that adequate guardrails are in place to protect citizens, India is adopting a multi-stakeholder approach to designing and adopting voluntary frameworks, policies, and legal mechanisms for the development, deployment, and use of AI that is safe and accessible for all.

Towards these ambitions, the Government of India has also notified the Digital Personal Data Protection Act to protect citizens' privacy, safety, and trust concerning their personal data and enhance the accountability of entities collecting

and processing personal data. The legislation is intended to bolster data protection in the country. India is also in the process of notifying the National Data Governance Policy to maximise the efficiency of data-led governance and public service delivery and catalyse data-based research and innovation by enabling data sharing in an ethical, safe, and secure manner. Efforts towards the development of Responsible AI frameworks are also underway through initiatives by the Bureau of Indian Standards (BIS), the Telecommunication Engineering Centre (TEC), and other organisations. Further, to aggregate and evangelise knowledge outputs on the latest developments in AI, the Ministry of Electronics and IT has launched the INDIAai portal (<https://indiaai.gov.in/>).

India, as the largest Global South economy leading the AI race, stands in a unique position to lead efforts towards global cooperation on AI, ensuring that the global discourse around AI is more balanced and inclusive and takes into account the needs and priorities of the Global South. The Hon'ble Prime Minister's directive to the leaders of the G20 countries on creating a human-centred governance framework for harnessing the power of AI for Good and for All is aligned with this vision.

India has reiterated its commitment to promoting innovation while regulating the misuse of AI on various international forums, including as the Lead Chair for the Global Partnership on Artificial Intelligence (GPAI). In the Annual GPAI Summit, hosted in New Delhi in December 2023, the GPAI Ministerial Declaration was signed by 29 member countries, including the European Union. This came in the background of the G7 leaders' statements on the Hiroshima AI Process, the Bletchley Declaration, and the G20 New Delhi Leaders' Declaration, which all have highlighted the need for global collaboration, inclusively, to promote trustworthy AI that supports the good of all. □

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