

Sikkim AI Policy 2025

A Framework for Responsible and Sustainable Digital Transformation



**Department of Information Technology,
Government of Sikkim**

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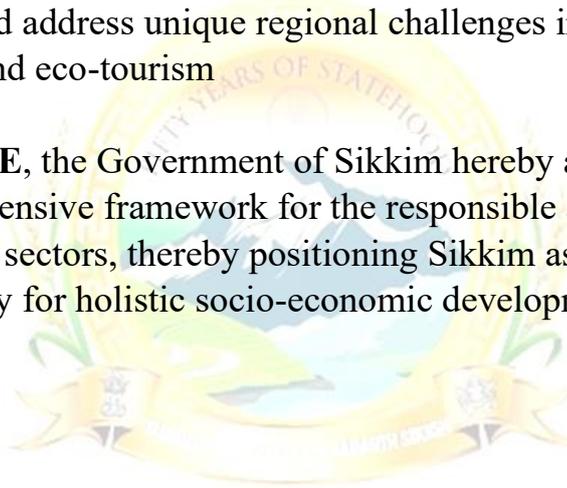
Preamble

WHEREAS the Government of Sikkim recognises AI technology as a strategic and foundational digital infrastructure for a transparent, secure, and efficient government, and

WHEREAS, the State is committed to fostering a citizen-centric, trustworthy, and digitally empowered ecosystem, in full alignment with the Government of India's vision of a "Digital India" and the Ministry of Electronics and Information Technology's (MeitY) "National AI Strategy", and

AND WHEREAS, this policy serves as a testament to the State's resolve to leverage this immutable technology to enhance public service delivery, drive economic growth, and address unique regional challenges in areas such as organic agriculture and eco-tourism

NOW, THEREFORE, the Government of Sikkim hereby adopts this AI Policy to provide a comprehensive framework for the responsible and sustainable application across all sectors, thereby positioning Sikkim as a model for leveraging technology for holistic socio-economic development.



Foreword

In the spirit of "Digital India" and the progressive vision of our Hon'ble Prime Minister, the State of Sikkim stands at the cusp of a new era of digital governance. We recognise that in our journey towards a more prosperous and equitable future, embracing transformative technologies is not just an option but a necessity. The Sikkim AI Policy is a testament to this commitment.

This document is the culmination of extensive consultations with a wide array of stakeholders, including domain experts, technology leaders, academic institutions, and government officials. It is built upon the foundational principles of trust, transparency, and accountability, which are inherent to the ethos of Artificial Intelligence. Our approach is neither a blind leap nor a cautious crawl, it is a calculated, strategic, and citizen-centric framework designed to leverage the power of this technology to solve real-world challenges specific to our state from ensuring the authenticity of our organic produce to providing secure and tamper-proof land records.

We believe that by aligning ourselves with the national-level infrastructure and policies, we can accelerate our digital transformation journey while contributing to the larger vision of a connected and technologically advanced India. This policy provides a roadmap, but its true success will lie in our collective resolve to implement it with diligence, integrity, and a steadfast focus on serving our people.

Introduction

Artificial Intelligence (AI), is becoming an integral part of every single facet of our lives. Artificial Intelligence by definition is “the ability of a machine or Computer system to copy human intelligence processes, learn from experiences, adapt to new information and perform human-like activities.” For AI enabled processes and machines, all the data is equivalent to what experiences and information has been to humans.

AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. Initially conceived as a technology that could mimic human intelligence, AI has evolved in ways that far exceed its original conception. With incredible advances made in data collection, processing and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity and enhance productivity. As AI’s capabilities have dramatically expanded, so have its utility in a growing number of fields.

The following key factors have enabled the growth and expansion of Artificial Intelligence:

- The volume of digital data
- Ease of storing the data
- Exponential improvement of computing power

Some of the broad areas which are envisioned to benefit mostly from AI in solving societal needs are below:

- a) Healthcare: increased access and affordability of quality healthcare,
- b) Agriculture: enhanced farmers’ income, increased farm productivity and reduction of wastage,
- c) Education: improved access and quality of education,

- d) Smart Cities and Infrastructure: efficient and connectivity for the burgeoning urban population, and
- e) Smart Mobility and Transportation: smarter and safer modes of transportation and better traffic and congestion problems.

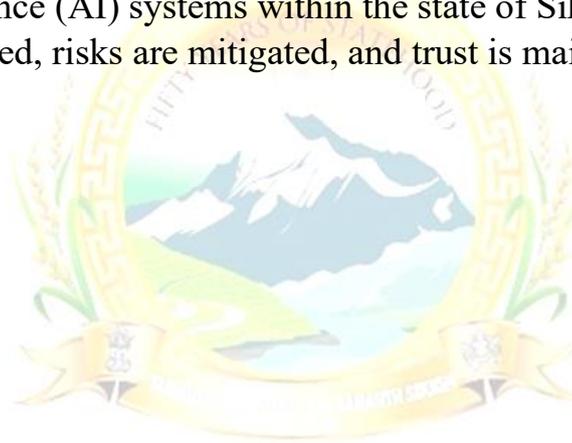
It is estimated that the computing power needed to train AI is now rising much faster than ever before. The computing power of systems used for man's first expedition to moon is at least 4 times less powerful than a current smart phone. As the industries embark up on the journey to make Artificial Intelligence an integral part of their operations, decision making and marketing, Government will be playing a pivotal role. Governments are responsible for providing a conducive ecosystem for research and innovation, companies, startups, training organizations, regulatory bodies for a technology like Artificial Intelligence to prosper.

There has been tremendous activity concerning AI policy in different countries over the past couple of years. Governments in USA, UK, France, Japan and China have released their policy and strategy papers relating to AI. In order to establish a leadership role, it is important for the state of Sikkim to take the plunge and start by releasing an AI Policy to initiate the roll out of an ambitious programme that would ensure for the state of Sikkim its rightful place in this transformational era.

Vision

The Government of Sikkim is committed to adopting emerging technologies and it recognizes the central role that Artificial Intelligence plays in building an enabling environment for emerging technologies. Sikkim has shown a phenomenal growth in IT services in last few years. Sikkim is the first state to implement AI based Traffic Management system for traffic management across the state.

The Vision is to establish guidelines and governance for the responsible, ethical, and legally compliant development, acquisition, deployment, and use of Artificial Intelligence (AI) systems within the state of Sikkim, to ensure benefits are maximized, risks are mitigated, and trust is maintained among stakeholders.

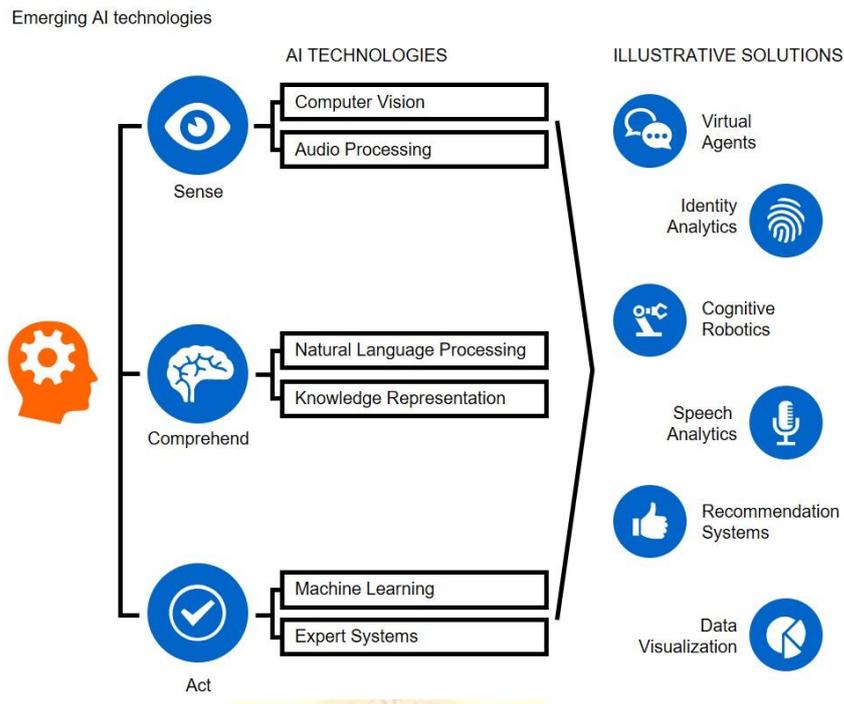


History of Artificial Intelligence

AI is not a new phenomenon, with much of its theoretical and technological underpinning developed over the past 70 years by computer scientists such as Alan Turing, Marvin Minsky and John McCarthy. AI has already existed to some degree in many industries and governments. Now, thanks to virtually unlimited computing power and the decreasing costs of data storage, we are on the cusp of the exponential age of AI as organisations learn to unlock the value trapped in vast volumes of data.

AI is a constellation of technologies that enable machines to act with higher levels of intelligence and emulate the human capabilities of sense, comprehend and act. Thus, computer vision and audio processing can actively perceive the world around them by acquiring and processing images, sound and speech. The natural language processing and inference engines can enable AI systems to analyse and understand the information collected. An AI system can also take action through technologies such as expert systems and inference engines or undertake actions in the physical world. These human capabilities are augmented by the ability to learn from experience and keep adapting over time. AI systems are finding ever-wider application to supplement these capabilities across enterprises as they grow in sophistication.

Irrespective of the type of AI being used, however, every application begins with large amounts of training data. In the past, this kind of performance was driven by rules-based data analytics programs, statistical regressions, and early “expert systems.” But the explosion of powerful deep neural networks now gives AI something a mere program doesn’t have the ability to do the unexpected.



AI gets categorised in different ways and it may be useful to understand the various categories, their rationale and the implications.

- Weak AI vs. Strong AI:** Weak AI describes "simulated" thinking. That is, a system which appears to behave intelligently, but doesn't have any kind of consciousness about what it's doing. For example, a chatbot might appear to hold a natural conversation, but it has no sense of who it is or why it's talking to you. Strong AI describes "actual" thinking. That is, behaving intelligently, thinking as human does, with a conscious, subjective mind. For example, when two humans converse, they most likely know exactly who they are, what they're doing, and why.
- Narrow AI vs. General AI:** Narrow AI describes an AI that is limited to a single task or a set number of tasks. For example, the capabilities of IBM's Deep Blue, the chess playing computer that

beat world champion Gary Kasparov in 1997, were limited to playing chess. It wouldn't have been able to win a game of tic-tac-toe - or even know how to play. General AI describes an AI which can be used to complete a wide range of tasks in a wide range of environments. As such, it's much closer to human intelligence.

- c) Superintelligence: The term "superintelligence" is often used to refer to general and strong AI at the point at which it surpasses human intelligence, if it ever does.



Definitions

The following definitions are being provided:

1. **Artificial Intelligence (AI):** Artificial Intelligence (AI) is a system capable of performing tasks that normally require human intelligence, including learning, reasoning, perception, generation of content, etc.
2. **Generative AI:** Generative AI is an AI that produces new content (text, images, audio, video) based on prompts or input.
3. **Sensitive Data / Personal Data:** Personal Data is data that is identifying or could cause harm if misused.
4. **High-risk AI Application:** High-risk AI applications are AI applications where errors could lead to significant harms (legal, safety, financial, reputational).
5. **Stakeholders:** Stakeholders are anyone impacted by the AI system: users, customers, employees, society, etc.
6. **Agentic AI:** Agentic AI refers to artificial intelligence systems that can act with a degree of autonomy, pursuing goals, making decisions, and taking actions without constant human oversight. (e.g. Healthcare IT, Ticket booking, HR recruitment, etc.)
7. **Machine Learning:** Machine Learning is a subset of AI where systems learn patterns from data instead of being explicitly programmed. Examples are recommendation engines like used in E-commerce websites (Amazon, Flipkart), forecasting models.
8. **Deep Learning:** Deep Learning is a specialized branch of Machine Learning using neural networks with many layers to handle complex tasks like image recognition, speech, and natural language processing.

9. **Algorithm:** An algorithm is a precise list of steps to take, such as a computer program. AI systems contain algorithms, but typically just for a few parts like a learning or reward calculation method.
10. **IOT:** The **Internet of Things (IoT)** refers to a network of physical devices, vehicles, appliances, and other objects embedded with sensors, software, and network connectivity, enabling them to collect and share data.
11. **Operational Intelligence (OI):** Operational intelligence (OI) is a form of real-time analytics that provides organizations with visibility and insight into their data, events, and business operations.
12. **Blockchain:** Blockchain is a distributed ledger technology that records transactions across multiple computers in a way that ensures the data is secure, immutable, and transparent. Each transaction is stored in a block, and these blocks are linked together in a chain, forming a blockchain.
13. **Himalayan AI Consortium:** Himalayan AI Consortium is a global network of academic institutions. The Himalayan University Consortium (HUC) contributes to enhanced collaboration among universities and other knowledge-generating and exchange institutions within and outside the Hindu Kush Himalaya (HKH) region.
14. **Machine to Machine (M2M):** Machine to Machine is direct communication between devices using any communications channel, including wired and wireless.

Scope

The AI policy for the state of Sikkim applies to:

- All employees, contractors, vendors, partners, and third parties in the state of Sikkim who work with AI systems.
- All AI systems / tools / services (including but not limited to machine learning models, generative AI, decision-support systems, predictive analytics) used for development, operation, procurement, or business operations.
- All data used by or in AI systems (training, validation, inference) and all outputs produced.

Geographical and Ecological Scope: The scope of this policy extends to the development, deployment, and governance of Artificial Intelligence across all departments and public service delivery channels within the State of Sikkim. Crucially, the policy's implementation is **contextualized and prioritized** to address the unique challenges inherent to the **Himalayan ecosystem**, including **geological instability, remote connectivity limitations, and high climate vulnerability**.

Define Key Focus Areas (Thematic Scope): The primary focus areas for AI development under this policy are systems that enhance **Disaster Resilience** (e.g., **Landslide/Flood Early Warning**), improve **Access to Services in remote areas** (e.g., **Drone-based Healthcare Delivery**), and support **Ecological Sustainability and Cultural Preservation**. This policy will prioritize AI solutions that address these fundamental regional constraints over general-purpose applications.

Inter-State and Cross-Sectoral Scope: The policy's scope includes fostering **inter-state collaboration** with other Himalayan regions through mechanisms like the **Himalayan AI Consortium**, for the purpose of shared data, knowledge transfer, and joint infrastructure initiatives (e.g., High-

Performance AI Computing). Furthermore, the policy dictates a **mandatory cross-sectoral approach**, requiring data-sharing and coordinated AI strategy implementation among all relevant State departments, particularly those involved in disaster management, environment, and social welfare.

Disaster Alerts using AI

An AI powered alert system will help in early detection of flood, cyclones, Earthquakes, forest fires and landslides for the state of Sikkim. The AI powered system will analyse data from satellite images, seismic activity and river water levels and provide real time monitoring using sensors (IoT devices) to provide faster and accurate alerts. Some of the benefits of AI powered alerts are:

- Early warnings save lives
- Reduced property damage
- Faster emergency response
- Better evacuation planning
- Data-driven decision making

ISO/IEC 42001 is the first international standard for establishing, implementing, and improving an Artificial Intelligence Management System (AIMS), aimed at ensuring responsible and ethical AI practices across organizations. The AI policy should adhere to ISO/IEC 42001.

Core Principles

The Core principles of the AI policy are as below:

- **Fairness & Non-discrimination:** AI systems must not discriminate or perpetuate bias. Regular assessments for bias should be conducted.
- **Transparency:** Clear documentation of how AI systems work, what data they use, limitations, and who is responsible. Where feasible, explainability of AI decisions.
- **Accountability:** Clear assignment of responsibility for each AI system—who develops, reviews, approves, and maintains it. Mechanisms for audit, oversight, and redress.
- **Privacy & Data Protection:** Data used must comply with applicable laws/regulations. Minimize data collection; anonymize or pseudonymize where possible; secure storage; limit access.
- **Security & Robustness:** Systems should be secure against misuse, adversarial attacks, or unintended consequences. Maintain testing, validation, monitoring.
- **Human Oversight:** AI tools should support human decision-making rather than replace it for critical functions. Humans should review and approve AI outputs especially in sensitive / high-risk situations.
- **Ethical Use & Social Good:** AI should be used in ways consistent with societal values, not violate human rights, dignity, or welfare.

1. Principles for Ecological and Environmental Focus:

These principles ensure that AI development and deployment are aligned with the preservation of Sikkim's fragile Himalayan ecosystem.

- **Ecological Sustainability:**

All AI initiatives must adhere to the highest standards of **environmental stewardship**. This mandates the **minimization of the carbon footprint** of AI infrastructure (e.g., data centres, High-Performance AI Computing (HPAIC) facility) and the **active deployment of AI solutions** for tasks like **glacier monitoring, biodiversity tracking, and combating environmental degradation**.

- **Disaster Resilience and Safety:**

The primary measure of success for critical AI systems shall be their contribution to **enhancing public safety and disaster resilience**. AI applications must prioritize the development of **robust, reliable, and timely early warning systems** for landslides, floods, and other natural hazards common to the state.

2. Principles for Socio-Cultural and Regional Focus:

These principles address the unique social, cultural, and political context of Sikkim, ensuring AI serves all communities equitably.

- **Community-Centric Development:**

AI solutions must be designed and deployed in collaboration with, and for the benefit of, **local and indigenous communities**. This requires systems to be **developed and tested in local languages** and to **respect traditional knowledge systems** during data gathering and application design.

- **Cultural Preservation:**

AI applications should actively contribute to the **preservation and documentation of Sikkim's unique cultural heritage**, including **endangered indigenous languages, traditional arts, and historical data**. No AI system shall be deployed that risks the homogenization or misrepresentation of local culture.

- **Inclusivity and Accessibility:**

The policy is committed to bridging the **digital divide** in remote and underserved areas. AI systems must be designed for **minimal technical overhead**, delivered through **accessible interfaces (e.g., voice, local scripts)**, and utilize **low-bandwidth solutions** suitable for the state's connectivity challenges.

- **Data Sovereignty and Local Control:**

Data collected within Sikkim, particularly information related to its **natural resources, indigenous communities, and strategic infrastructure**, must be governed by the principle of **State Data Sovereignty**. The state reserves the right to control, manage, and restrict the export or unauthorized use of this critical data.

- **AI COE (AI Centre of Excellence):**

An AI Centre of Excellence (AI CoE) is a centralized body within an organization or government that leads AI strategy, governance, innovation, and implementation. An AI COE will be established within the state of Sikkim.

The AI COE will help in the following:

- Drive Innovation – Explore AI use cases and new technologies
- Standardization – Create AI frameworks, tools, and governance policies
- Skill Development – Train employees in AI and data science
- Project Support – Help business units implement AI solutions
- Risk & Compliance – Ensure AI systems follow legal and ethical guidelines

The AI COE will be multidisciplinary in role. It will consist of the following:

- Leadership
 1. Chief AI Officer / Head of AI
 2. AI Program Director

- Technical Team
 1. Data Scientists
 2. ML Engineers
 3. AI Architects
 4. Data Engineers

- Governance & Support
 1. Legal & Compliance Officer
 2. Cybersecurity Expert
 3. Risk Management Officer
 4. Domain Experts (Banking, Health, Disaster Management, etc.)

- Advisory Board
 1. Academic Expert
 2. Industry Advisors
 3. Policy Representatives

The AI COE will have the following powers:

- Strategic Powers
 1. Approve AI standards and frameworks
 2. Recommend AI investment priorities
 3. Evaluate and approve AI use cases

- Operational Powers

1. Access enterprise data (as per policy)
2. Review AI vendor selection
3. Audit AI systems for compliance

- Governance Powers

1. Enforce AI ethics guidelines
2. Stop or suspend high-risk AI projects
3. Conduct risk assessments



Key Pillars

1. **Data Exchange Platform and HPAIC**
2. **Skilling and Education**
3. **Governance, Ethics and Privacy**
4. **Research and Innovation**
5. **Security in AI**

1. Data Exchange Platform and HPAIC

- **Open Data Exchange Platform:** Sikkim shall formulate its Open Data Policy followed by the development of Sikkim's Open Data Portal to host various datasets. Collaboration across departments and research organizations is important to increase the quality and volume of data that can be used to train Artificial Intelligence algorithms. After building the core data sets from government and implementing the data provider certifications, a Data Exchange Platform will be operated by the government where all the AI partners can upload relevant and useful datasets. An Open Data Exchange Platform will increase the cross collaboration across various stakeholders and will foster innovation in the arena of Artificial Intelligence. For ease of use, data visualization tools and data narratives will be enabled for this data. APIs will also be developed to provide access to static and real time data.
- **Creating Public Sector Datasets:** Data availability is the primary prerequisite for Artificial Intelligence. Specific data sets owned by various government departments would be one of the most invaluable datasets for all the stakeholders. Government of Sikkim will collaborate with educational and research institutes to identify such relevant data sets and will provide them in the state's open data platform. Government aims to ensure that the datasets of the

identified focus areas are created and are available for public use in due course.

- **Collaboration with Corporates to Create Datasets:** The AI of today is heavily dependent on the collection, usage and processing of data. In the process of collecting useful datasets, the government will collaborate with research institutions for collecting data sets that can be shared with a wider pool of innovators.
- **Data Provider Certifications:** Data plays a vital role in developing AI services. But it is equally important to ensure that the datasets are safe, ethical and of high-quality. Hence, the State will initiate a Certification program for the data providers (Government, Research institutions and Industry) which focuses on the theme of ethics for shared data and would be as per the Data Privacy Law that is to be enacted by the Government of India.
- **Establishing a High-Performance AI Computing Facility:** Computers with accelerated hardware are capable of increasing the speed of the system that governs Artificial Intelligence. With the continuous increase in the volume of data, the requirement for High- Performance AI Computing facilities is constantly increasing. Access to High-Performance AI Computing (HPAIC) infrastructure is an important prerequisite for AI.

A new High-Performance AI Computing (HPAIC) infrastructure will be created as a shared facility to boost local AI-innovation capacities of academia, SMEs, startups and for social impact projects in Sikkim.

2. Skilling and Education

Special programs need to be ideated and initiatives planned to build the AI oriented talent pool in Sikkim.

- **AI-focused up skilling:** Data labelling, annotation, preparation, structuring and cleansing tasks account for more than 80% of the time involved in most AI and machine-learning projects. Government of Sikkim will train BPOs and other similar workforce for data labelling roles to capture this opportunity.
- **AI Startup Internship Program:** Government of Sikkim will partner with incubators/accelerators to offer Sikkim's college students / Entrepreneurs the opportunities to work with AI startups, and receive college credits on successful completion of internship. The program would culminate with a Hackathon-to foster innovation, applied learning and peer learning.
- **AI Talent Alignment:** AI focused curriculum and faculty development programs would be developed based on inputs given by AI product companies, to bridge the skill-gap in the job market. These courses would be delivered across the Sikkim in partnership with skilling partners.
- **Foundation of AI for All:** A set of courses which can be offered for free would be posted on online platforms of Sikkim. The state would organize webinars across Sikkim universities, featuring pioneers of AI.
- **Developing and deploying AI tools for teaching and documenting endangered tribal languages:** Government of Sikkim should develop and deploy AI tools for teaching and documenting endangered tribal

languages prevalent in Sikkim, and integrating these tools into the state's education curriculum and community centres.

3. Governance, Ethics and Privacy

Availability and access to accurate data is the cornerstone for any Artificial Intelligence related research and Artificial Intelligence becoming an integral component of day-to-day life, we must ensure that data which is used to run all the AI algorithms is trustworthy, fair and ethical.

Protecting the privacy of citizens of Sikkim is of utmost importance to the government of Sikkim. Government envisions taking all the necessary steps to ensure highest level of transparency.

- **Artificial Intelligence Ethics Committee:** The government shall ensure that artificial intelligence and machine learning algorithms are as ethical as they are intelligent. A Working Committee will be established to identify the key AI ethical concerns - Accountability, Bias, Transparency, Privacy, Security and Safety-and develop sector specific guidelines for AI use cases.

The Committee will be led by academicians from top institutes and consist of representatives from government, industry and research bodies etc.

The Working Committee would prepare and release a set of advisory guidelines, codes of practice, governance frameworks and will recommend various mechanisms to operationalize the recommendations. This would ensure ethical usage of data and bias-free decision-making algorithms to safeguard the privacy of citizens. Companies operating using the data published by government or affiliated authorities will be required to share a compliance report detailing the ethical and appropriate usage of data.

- **Cultural Sensitivity Review:** The Artificial Intelligence Ethics Committee is mandated to ensure cultural sensitivity in all AI applications, specifically requiring a review for any system that interacts with traditional knowledge, indigenous languages, or cultural practices.
- **Data for Indigenous Communities:** The policy shall establish a framework for the protection and governed use of data belonging to Indigenous and Tribal Communities, ensuring their free, prior, and informed consent for data collection and processing related to their traditional knowledge, lands, or culture.
- **Guidelines for ethical usage of data:** The state will be developing guidelines for data integrity and retention policies. Moreover, data security measures applicable to the service including how data is collected using the service will be securely stored and accessed. The state government will be defining its data governance guidelines, in alignment with the government policies.
- **Government AI Procurement Guidelines:** In consultation with the AI Ethics Working Committee, the government will adopt recommended AI procurement guidelines. These may include encouraging the use of explainable AI to ensure that AI decision-making (i.e. the decisions and/or insights generated by AI) is as transparent as possible. The government may also explore mechanisms to enable interpretability of the algorithms internally and externally as a means of establishing accountability and contestability.
- **Training the user government agencies:** Operational or service staff must have enough knowledge or training on the solution to understand how to use it. The training must include, but not be limited to: the capabilities and limitations of the AI service, procedures to interpret and act on the output of the service, and as applicable to the deployment context, understand where human review is required for decisions that produce legal effects concerning individuals.

- **AI innovation domains:** The state will accelerate AI Innovation efforts in domains like agriculture and allied sectors, education and skill development, industry, health care, rural and urban development, power development, law enforcement, mobility and improving citizen's centric delivery of services.
- **Tourism and Cultural Heritage:** The Tourism and Cultural Heritage must include
 1. **Heritage Digitization:** Utilizing **3D scanning and AI archiving** of monuments, artifacts, and cultural sites.
 2. **Traditional Medicine Integration:** **AI documentation and analysis of indigenous healing practices** to support validation and preservation of traditional knowledge.

4. Research and Innovation

- **Academic Collaboration:** The state of Sikkim will enter into partnerships with reputed universities/research centres / Entrepreneurs to facilitate cross learning - via exchange programs for faculty and research students. Government of Sikkim will also rope in premier educational institutions in the state for the same.
- **Patenting Guidelines for AI – based Innovations:** It is necessary to support the startups/SMEs/innovators which come out with new Intellectual Property.

Many of the innovators don't protect their own intellectual property because of lack of awareness and process expertise. The government will engage experts from techno-legal domain to educate innovators about the importance and procedure of IPR filing.

- **Government-priority Applied Research:** Government may offer research grants to academicians working in applied AI for focus areas of the state of Sikkim.

5. Security in AI

The importance of data security in AI systems is becoming increasingly important. In Government, data security is a major concern on account of substantial amount of sensitive information being handled. AI, specifically generative AI relies heavily on data for training and decision- making, making it vulnerable to potential security risks.

Some major compelling reasons underlying the critical need for data security in AI systems are data privacy, data tampering, deliberate attacks by insiders, risks associated with mass adoption, AI-driven attacks etc.

The state of Sikkim will put in place regulations and compliances that shape data security in AI systems viz. data protection, data sovereignty & localization, ethical AI use, auditing, accountability and cyber security standards.

The state of Sikkim will ensure adherence to principles for ensuring data security in AI systems like encryption, data loss prevention (DLP), data classification, tokenization, data masking and data-level access control in accordance with national standards and guidelines issued by MeitY, Government of India.

A Deepfake is a type of synthetic media (video, audio, or image) created using AI, especially deep learning, to realistically replace a person's face or voice with someone else's. AI-powered deepfakes are a powerful but risky technology. They can be useful in entertainment and innovation, but they also pose serious ethical and security

challenges. AI systems can help in analyzing videos, images, and audio to find hidden signs of manipulation. If the face doesn't match real patterns, the system flags it as suspicious. AI deepfake detection uses machine learning and deep learning models to identify whether a video, image, or audio clip has been artificially manipulated.

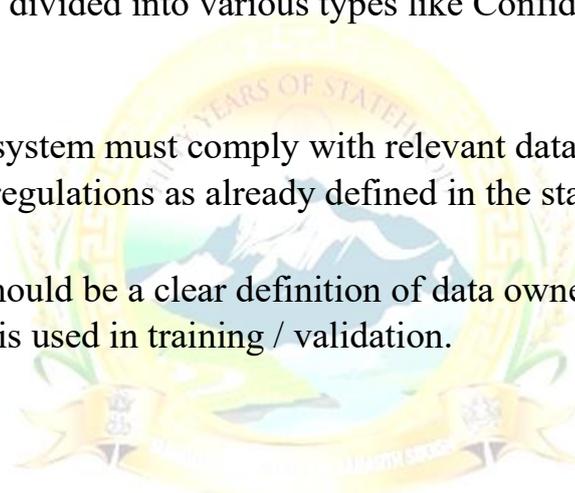
Digital forensics is the process of collecting, analyzing, and preserving digital evidence from devices like computers, mobile phones, servers, and cloud platforms. When combined with Artificial Intelligence (AI), investigations become faster, smarter, and more accurate.



Data Handling and Privacy

The Data handled by the AI systems should have the following features:

- The Data used must be collected lawfully, stored securely and retained only as long as needed.
- Sensitive or personal data should be anonymized or pseudonymized wherever possible.
- Only authorized personnel may access certain data types. There should be role-based access control for accessing data. The access control can be divided into various types like Confidential, Restricted or General.
- The AI system must comply with relevant data protection / privacy laws/regulations as already defined in the state of Sikkim.
- There should be a clear definition of data ownership, data source, and how data is used in training / validation.



Training and Awareness

There should be regular training programs for all staff using or affected by AI, covering basics, ethical principles, risk awareness and tool-specific training.

The AI policy must be updated based on the new changes and risks recognized at any point of time.

There should be an awareness of limitations & potential pitfalls of AI tools. Any Guidance documents or best practices made available internally and must be implemented in the AI policy.



AI Case Studies

Artificial Intelligence has the potential to provide large incremental value to a wide range of sectors globally, and is expected to be the key source of competitive advantage for firms.

- a) **Healthcare:** Application of AI in healthcare can help address issues of high barriers to access to healthcare facilities, particularly in rural areas that suffer from poor connectivity and limited supply of healthcare professionals. This can be achieved through implementation of use cases such as AI driven diagnostics, personalised treatment, early identification of potential pandemics, and imaging diagnostics, among others.
- b) **Agriculture:** AI holds the promise of driving a food revolution and meeting the increased demand for food (global need to produce 50% more food and cater to an additional 2 billion people by 2050 as compared to today). It also has the potential to address challenges such as inadequate demand prediction, lack of assured irrigation, and overuse / misuse of pesticides and fertilisers. Some use cases include improvement in crop yield through real time advisory, advanced detection of pest attacks, and prediction of crop prices to inform sowing practices.
- c) **Smart Mobility, including Transports and Logistics:** Potential use cases in this domain include autonomous fleets for ride sharing, semi-autonomous features such as driver assist, and predictive engine monitoring and maintenance. Other areas that AI can impact include autonomous trucking and delivery, and improved traffic management.
- d) **Retail:** The retail sector has been one of the early adopters of AI solutions, with applications such as improving user experience by providing personalised suggestions, preference-based browsing

and image-based product search. Other use cases include customer demand anticipation, improved inventory management, and efficient delivery management.

- e) **Manufacturing:** Manufacturing industry is expected to be one of the biggest beneficiaries of AI based solutions, thus enabling 'Factory of the Future' through flexible and adaptable technical systems to automate processes and machinery to respond to unfamiliar or unexpected situations by making smart decisions. Impact areas include engineering (AI for R&D efforts), supply chain management (demand forecasting), production (AI can achieve cost reduction and increase efficiency), maintenance (predictive maintenance and increased asset utilisation), quality assurance (e.g. vision systems with machine learning algorithms to identify defects and deviations in product features), and in-plant logistics and warehousing.
- f) **Energy:** Potential use cases in the energy sector include energy system modelling and forecasting to decrease unpredictability and increase efficiency in power balancing and usage. In renewable energy systems, AI can enable storage of energy through intelligent grids enabled by smart meters, and also improve the reliability and affordability of photovoltaic energy. Similar to the manufacturing sector, AI may also be deployed for predictive maintenance of grid infrastructure.
- g) **Smart Cities:** Integration of AI in newly developed smart cities and infrastructure could also help meet the demands of a rapidly urbanising population and providing them with enhanced quality of life. Potential use cases include traffic control to reduce congestion and enhanced security through improved crowd management.

- h) ***Education and Skilling***: AI can potentially solve for quality and access issues observed in the Indian education sector. Potential use cases include augmenting and enhancing the learning experience through personalised learning, automating and expediting administrative tasks, and predicting the need for student intervention to reduce dropouts or recommend vocational training.

Artificial Intelligence is impacting the world in a great way. AI has applications across almost all Industries today. Some of the AI case studies are as follows:

1. IBM Watson Health: Revolutionizing Patient Care with AI

Task/Conflict: The healthcare industry faces challenges in handling vast amounts of patient data, accurately diagnosing diseases, and creating effective treatment plans. IBM Watson Health aimed to address these issues by harnessing AI to process and analyse complex medical information, thus improving the accuracy and efficiency of patient care.

Solution: Utilizing the cognitive computing capabilities of IBM Watson, this solution involves analysing large volumes of medical records, research papers, and clinical trial data. The system uses natural language processing to understand and process medical jargon, making sense of unstructured data to aid medical professionals in diagnosing and treating patients.

Overall Impact:

Enhanced accuracy in patient diagnosis and treatment recommendations.
Significant improvement in personalized healthcare services.

Key Learnings:

AI can complement medical professionals' expertise, leading to better healthcare outcomes.

The integration of AI in healthcare can lead to significant advancements in personalized medicine.

2. Google DeepMind's AlphaFold: Unravelling the Mysteries of Protein Folding

Task/Conflict: The scientific community has long grappled with the protein folding problem – understanding how a protein's amino acid sequence determines its 3D structure. Solving this problem is crucial for drug discovery and understanding diseases at a molecular level, yet it remained a formidable challenge due to the complexity of biological structures.

Solution: AlphaFold, developed by Google DeepMind, is an AI model trained on vast datasets of known protein structures. It assesses the distances and angles between amino acids to predict how a protein folds, outperforming existing methods in terms of speed and accuracy. This breakthrough represents a major advancement in computational biology.

Overall Impact:

Significant acceleration in drug discovery and disease understanding.
Set a new benchmark for computational methods in biology.

Key Learnings:

AI's predictive power can solve complex biological problems.
The application of AI in scientific research can lead to groundbreaking discoveries.

3. Amazon: Transforming Supply Chain Management through AI

Task/Conflict: Managing a global supply chain involves complex challenges like predicting product demand, optimizing inventory levels, and streamlining logistics. Amazon faced the task of efficiently managing its massive inventory while minimizing costs and meeting customer demands promptly.

Solution: Amazon employs sophisticated AI algorithms for predictive inventory management, which forecast product demand based on various factors like buying trends, seasonality, and market changes. This system allows for real-time adjustments, adapting swiftly to changing market dynamics.

Overall Impact:

Reduced operational costs through efficient inventory management.
Improved customer satisfaction with timely deliveries and availability.

Key Learnings:

AI can significantly enhance supply chain efficiency and responsiveness.
Predictive analytics in inventory management leads to reduced waste and cost savings.

4. Tesla's Autonomous Vehicles: Driving the Future of Transportation

Task/Conflict: The development of autonomous vehicles represents a major technological and safety challenge. Tesla aimed to create self-driving cars that are not only reliable and safe but also capable of navigating complex traffic conditions without human intervention.

Solution: Tesla's solution involves advanced AI and machine learning algorithms that process data from various sensors and cameras to understand and navigate the driving environment. Continuous learning from real-world driving data allows the system to improve over time, making autonomous driving safer and more efficient.

Overall Impact:

Leadership in the autonomous vehicle sector, enhancing road safety.
Continuous improvements in self-driving technology through AI-driven data analysis.

Key Learnings:

Continuous data analysis is key to advancing autonomous driving technologies.
AI can significantly improve road safety and driving efficiency.

5. Zara: Fashioning the Future with AI in Retail

Task/Conflict: In the fast-paced fashion industry, predicting trends and managing inventory efficiently are critical for success. Zara faced the challenge of quickly adapting to changing fashion trends while avoiding overstock and meeting consumer demand.

Solution: Zara employs AI algorithms to analyse fashion trends, customer preferences, and sales data. The AI system also assists in managing inventory, ensuring that popular items are restocked promptly and that stores are not overburdened with unsold products. This approach optimizes both production and distribution.

Overall Impact:

Increased sales and profitability through optimized inventory.
Enhanced customer satisfaction by aligning products with current trends.

Key Learnings:

AI can accurately predict consumer behaviour and trends.
Effective inventory management through AI can significantly impact business success.

6. Netflix: Personalizing Entertainment with AI

Task/Conflict: In the competitive streaming industry, providing a personalized user experience is key to retaining subscribers. Netflix needed to recommend relevant content to each user from its vast library, ensuring that users remained engaged and satisfied.

Solution: Netflix developed an advanced AI-driven recommendation engine that analyses individual viewing habits, ratings, and preferences. This personalized approach keeps users engaged, as they are more likely to find content that interests them, enhancing their overall viewing experience.

Overall Impact:

Increased viewer engagement and longer watch times.

Higher subscription retention rates due to personalized content.

Key Learnings:

Personalized recommendations significantly enhance user experience.

AI-driven content curation is essential for success in digital entertainment.

7. Airbus: Elevating Aircraft Maintenance with AI

Task/Conflict: Aircraft maintenance is crucial for ensuring flight safety and operational efficiency. Airbus faced the challenge of predicting maintenance needs to prevent equipment failures and reduce downtime, which is critical in the aviation industry.

Solution: Airbus implemented AI algorithms for predictive maintenance, analysing data from aircraft sensors to identify potential issues before they lead to failures. This system assesses the condition of various components, predicting when maintenance is needed. The solution not only enhances

safety but also optimizes maintenance schedules, reducing unnecessary inspections and downtime.

Overall Impact:

Decreased maintenance costs and reduced aircraft downtime.
Improved safety with proactive maintenance measures.

Key Learnings:

AI can predict and prevent potential equipment failures.
Predictive maintenance is essential for operational efficiency and safety in aviation.

8. American Express: Securing Transactions with AI

Task/Conflict: Credit card fraud is a significant issue in the financial sector, leading to substantial losses and undermining customer trust. American Express needed an efficient way to detect and prevent fraudulent transactions in real-time.

Solution: American Express utilizes machine learning models to analyze transaction data. These models identify unusual patterns and behaviours indicative of fraud. By constant learning from refined data, the system becomes increasingly accurate in detecting fraudulent activities, providing real-time alerts and preventing unauthorized transactions.

Overall Impact:

Minimized financial losses due to reduced fraudulent activities.
Enhanced customer trust and security in financial transactions.

Key Learnings:

Machine learning is highly effective in fraud detection.

Real-time data analysis is crucial for preventing financial fraud.

9. Stitch Fix: Tailoring the Future of Fashion Retail

Task/Conflict: In the competitive fashion retail industry, providing a personalized shopping experience is key to customer satisfaction and business growth. Stitch Fix aimed to offer customized clothing selections to each customer, based on their unique preferences and style.

Solution: Stitch Fix uses AI and algorithms analyze customer feedback, style preferences, and purchase history to recommend clothing items. This personalized approach is complemented by human stylists, ensuring that each customer receives a tailored selection that aligns with their individual style.

Overall Impact:

Increased customer satisfaction through personalized styling services.
Business growth driven by a unique, AI-enhanced shopping experience.

Key Learnings:

AI combined with human judgment can create highly effective personalization. Tailoring customer experiences using AI leads to increased loyalty and business success.

10. Baidu: Breaking Language Barriers with Voice Recognition

Task/Conflict: Voice recognition technology faces the challenge of accurately understanding and processing speech in various languages and accents. Baidu aimed to enhance its voice recognition capabilities to provide more accurate and user-friendly interactions in multiple languages.

Solution: Baidu employs deep learning algorithms for voice and speech recognition, training its system on a diverse range of languages and dialects. This approach allows for more accurate recognition of speech patterns, enabling the technology to understand and respond to voice commands more effectively. The system continuously improves as it processes more voice data, making technology more accessible to users worldwide.

Overall Impact:

Enhanced user interaction with technology in multiple languages.
Reduced language barriers in voice-activated services and devices.

Key Learnings:

AI can effectively bridge language gaps in technology.
Continuous learning from diverse data sets is key to improving voice recognition.



AI & Risk Assessment for Sikkim

Researchers and institutions are using AI-enhanced models for forecasting and assessment of natural disaster risks in Sikkim's Himalayan environment. These systems combine AI, IoT sensors, and data analysis to monitor factors like rainfall, soil moisture, seismic activity, and river dynamics for flood, landslide, and hazard prediction.

In partnership with local organisations and local disaster authorities, AI-linked systems with over 200 sensors collect environmental data and feed it into AI models to generate early warning alerts for landslides and other geophysical risks. These early warnings can give communities and authorities time to prepare.

The Sikkim Police Digital Police initiative uses AI in crime detection and digital evidence analysis. While focused on public safety and law enforcement, such systems represent risk assessment in policing, helping prioritise threat responses and reduce systemic risks.

Sikkim's geographical location in the Himalayas makes it prone to:

- Landslides
- Floods (including glacial lake outbursts)
- Earthquakes

Integrating AI with risk-based assessment helps in:

- Early detection/forecasting
- Real-time monitoring
- Prioritising high-risk zones
- Data-driven mitigation planning
- Supporting emergency preparedness

Legal Framework: Data Protection laws related to AI in Data Privacy

Existing Regulations

- **Digital Personal Data Protection (DPDP) Act, 2023:** India's DPDP Act addresses the collection, processing, and storage of digital personal data. However, it does not explicitly cover AI-related privacy risks, such as automated decision-making or algorithmic transparency. While the DPDP Act emphasizes consent, purpose limitation, and data minimization, these principles may not be sufficient to address complex AI-driven privacy challenges.
- **Information Technology (IT) Act, 2000:** The IT Act provides a framework for cybersecurity and data protection. However, it lacks specific provisions for AI, limiting its efficacy in addressing privacy issues arising from AI applications.
- **Sikkim Data Policy, 2025:** The Sikkim Data Policy provides a framework for how data should be handled and stored. The AI policy must conform to the data standards as defined in Sikkim Data Policy.

Best Practices: How Companies Can Proactively Address AI-Related Privacy Risks

To navigate AI-related privacy challenges, companies should consider adopting best practices that go beyond minimum legal compliance:

1. Implement Transparency Measures

- **Explainability in AI Models:** Companies should strive to make AI algorithms more transparent and explainable. This may involve adopting models that allow for interpretability, enabling both

regulators and individuals to understand how AI decisions are made.

- **Data Disclosure Policies:** Companies should create clear data disclosure policies, informing users about how AI processes their personal information. Transparency fosters trust and ensures that individuals are aware of AI's role in handling their data.

2. Enforce Robust Data Governance

- **Data Minimization:** Organizations should adopt data minimization practices to limit the amount of personal data collected by AI systems. Collecting only essential data not only reduces privacy risks but also aligns with regulatory principles like purpose limitation.
- **Regular Audits and Monitoring:** Periodic audits of AI models are essential to detect biases, inefficiencies, or security vulnerabilities. Companies can use auditing to ensure AI models are compliant with data protection laws and ethical guidelines.

3. Adopt Ethical AI Standards

- **Bias Mitigation Techniques:** Implementing techniques to detect and mitigate biases in AI models can prevent discriminatory practices. Companies should invest in training data that reflects diversity, ensuring that AI models do not reinforce social prejudices.
- **Privacy by Design:** Integrating privacy considerations from the early stages of AI model development can help companies build privacy-compliant solutions. Privacy by design involves embedding privacy controls within AI systems, reducing potential risks to individuals' personal data.

4. Focus on Accountability and Compliance

- **Establish Clear Accountability Structures:** Companies should define accountability structures to ensure responsible AI deployment. Appointing an AI ethics officer or establishing an ethics board can provide oversight and ensure compliance with privacy standards.
- **Stay Updated with Regulatory Developments:** As AI and data privacy laws evolve, companies should monitor regulatory changes and adapt their policies accordingly. Proactively aligning with global standards, such as those proposed in the EU AI Act, can give companies a competitive advantage and ensure compliance.



Funding for AI Projects

The following sources of Funding for AI Projects in the state have been identified.

Sources of AI Funding

- **Government Grants & Programs**
 - National AI missions (e.g., India's National AI Mission)
 - Research councils, innovation labs, state-level schemes
- **Venture Capital (VC) & Private Equity (PE)**
 - Specialized AI-focused funds (Sequoia, Andreessen Horowitz, Accel, etc.)
- **Corporate Investment**
 - Tech giants (Google, Microsoft, Amazon, OpenAI partnerships)
 - Internal R&D budgets
- **International Funding**
 - World Bank, UNDP, IMF, OECD programs supporting AI in governance/SDGs
- **Public-Private Partnerships (PPP)**
 - Joint research centres, AI hubs, incubators

AI Policy and Judiciary

The increasing availability of, and access to, Artificial Intelligence (AI) tools, may have profound impact on diverse fields, including law. While AI tools can be beneficial, their indiscriminate use might result in negative consequences, including but not limited to, violation of privacy rights, data security risks, and erosion of trust in judicial decision making. Therefore, the judicial officers and the staff of the Judiciary are advised to exercise extreme caution while using AI tools.

In this context, the policy aims to establish guidelines for the responsible use of AI tools in judicial work. The objectives are to ensure that AI tools are only used in a responsible manner, solely as an assistive tool, and strictly for specifically owned purposes. The policy aims to ensure that under no circumstances AI tools are used for decision making or legal reasoning. It is also envisioned that the policy will help members of the judiciary and staff to comply with their ethical and legal obligations, particularly in terms of ensuring human supervision, transparency, fairness, confidentiality, and accountability at all stages of judicial decision making.

Guiding principles in the use of AI tools are as follows:

- Transparency, fairness, accountability, and protection of confidentiality are integral aspects of judicial administration, which shall not be compromised by the use of AI tools. It shall be the obligation of the members of the judiciary and employees assisting them to ensure that any AI tool they use for official purposes adhere to these integral principles.
- Most of the AI tools, including the currently popular GenAI tools such as ChatGPT and Deepseek, are cloud-based technologies wherein any information input given by the users may be accessed or used by the service providers concerned to advance their interests, including fine tuning of their models. Submitting information such as facts of the case, personal identifiers or privileged communications or uploading any other documents relating to the litigations to any such AI tools may result in serious violations

of confidentiality. Hence, the use of all cloud-based services should be avoided, except for the approved AI tools.

- With regard to the use of approved AI tools, extreme caution is advised. Any results generated by approved AI tools, including, but not limited to, legal citations or references, must be meticulously verified by the judicial officers. This is applicable to all approved AI tools, including databases of case-laws and statutes that use AI tools to generate, summarise or fine-tune results.
- When AI tools are used to translate legal texts or case laws, the outputs provided must be verified by qualified translators or judges themselves.
- While approved AI tools may be used for routine administrative tasks such as scheduling of cases or court management, human supervision is required at all times while using such tools.
- AI tools shall not be used to arrive at any findings, reliefs, order or judgment under any circumstances, as the responsibility for the content and integrity of the judicial order, judgment or any part thereof lies fully with the Judges.
- The approved AI tools shall be used only for the purposes for which they are supplied or provided.
- Courts shall maintain a detailed audit of all instances wherein AI tools are used. The records in this regard shall include the tools used and the human verification process adopted.
- The members of the judiciary and employees assisting them must participate in the training programs organised by the Judicial Academy or the High Court on the ethical, legal, technical and practical aspects of AI. This may help in a better understanding of the benefits, challenges, as well as risks in using diverse kinds of AI tools.
- If any errors or other issues are noticed in the output generated by any of the approved AI tools, the same should be reported to the Principal District

Court promptly and the Principal District Judge shall forward the same to the IT Department of the High Court without delay, so that appropriate safety reviews can be taken by the IT team immediately.



Government's Role

Area	Recommendation	Government role
Research and Application		
Core Research	Setting up Centre of Research Excellence for AI (COREs)	Identify academic institutions, provide fiscal support to establish COREs focusing on core technology research in AI.
	PhD Scholarships	Institute National AI Fellowships to retain outgoing PhD students and attract researchers from foreign universities with attractive incentives and challenging projects.
	Inter-academia collaboration	Incentivise research collaboration between premier academic institutions through special grants while facilitating the formation of a global expert pool for core AI research.
	Faculty Fellowships	Provide Faculty Fellowships or Chairs in academic institutes to promote research in AI.
Applied Research	Setting up of International Centres for Transformational AI (ICTAIs)	Invite Expression of Interests (EoIs) from industry players to lead ICTAIs in various sectors (health, education, agriculture, smart mobility and smart cities), in collaboration with the government and academia. Build governance structure, provide fiscal support, formulate an IP model for ICTAIs and set up the

		ICTAIs under a PPP model through “challenge method”.
	Setting up ICTAI Inc., overarching entity for ICTAIs	Establish “ICTAI Inc.” as either society / section 8 company, with initial contribution from government and private sector representation, to select and fund ICTAIs.
Common Compute Platform	Setting up AI Research, Analytics and knowledge Assimilation platform (AIRAWAT)	Set up a common cloud platform for Big Data Analytics and Assimilation with a large, power optimised AI Computing infrastructure connecting all COREs, ICTAIs and other academic institutions with National Knowledge Network.
Intellectual Property	Building an attractive IP regime for AI innovation	Set up a task force, comprising jointly of Ministry of Corporate Affairs and DIPP, to examine and

		issue appropriate modifications to the IP regulatory regime pertaining to AI.
Supra-national collaboration	Setting up CERN for AI	Take the lead in bringing together the relevant parties to create People's AI, the CERN for AI – national governments, industry, academia and international community of researchers.
Reskilling and Training		
Workforce	Promote formation of future service sector jobs	Incentivise creation of service sector jobs of the future such as data annotation through tax holidays or inclusion in CSR activities.
	Recognition and standardisation of informal training	Set up AI / Data Science training standards, as per National Skills Qualification Framework, and provide certifications to training institutes.
	Promote employee reskilling	Incentivise investment in training of employees through tax breaks and grants for employers.
Colleges	Expansion of quality education in data science and AI	Incentivise colleges / universities to adopt credit-bearing MOOCs in their curriculum.
	Promote cross disciplinary AI education	Introduce Bridge Courses in AI for postgraduates in non-computer science or data science domains.
Schools	Introducing AI / ML in schools	Introduce AI modules in Atal Tinkering Labs.
Overall	Continuously assess the changing nature of jobs	Constitute a standing committee or taskforce to examine and report on changes in employment induced by adoption AI.

Accelerating Adoption of AI

Data Sharing	Opening up government datasets	Establish platforms for making datasets in the area of social sector (either collected during implementation of a scheme or in normal business processes) available for open public use in a machine readable form.
Data Annotation	Creating and making India specific annotated datasets public (on the lines of ImageNet)	<ol style="list-style-type: none"> 1. Catalyse partnerships with the various academic institutions and public / private agencies in making annotated India specific data available for advancing AI research. 2. Explore partnerships and co-fund building of large corpora of data across domains, as a means of laying the foundation for startups and enterprises to build applications and services tailormade to the Indian context.
Crowdsourcing Annotation	Annotation of data – images, text, speech etc. via crowdsourcing	Announce grand challenge tasks for tagging of images, text or videos, and devising reward based mechanisms through data market place to aggregate the content from the various participating members.
Nation-wide adoption	Enabling a multistakeholder owned and	Create governance guidelines, explore partnerships and co-fund the establishment of: <ol style="list-style-type: none"> 1. <i>Data marketplace</i>

	managed National AI Marketplace	<p><i>2.Data annotation marketplace</i></p> <p><i>3.Deployable model marketplace</i> to develop the data supply ecosystem, ease collaboration, reduce time and cost of collecting & annotating data, and bring multiple solutions deployment at one place for scale and network effect.</p>
Visibility in Collaboration	Making information search for collaborations easier	Set up an AI Database portal for easy dissemination of information on projects being implemented via collaboration among government-academia-industry-researcher - startups to enable resource matching.
Awareness and Adoption in Government	Making decision makers aware about transformative potential of AI	<ol style="list-style-type: none"> 1. Workshops, live demonstrations, 2. AI Readiness Index to highlight best practices across states, and 3. Create Central-State shared fund for AI led development projects to be taken up by States.
Government and PSUs as seeders for network effect	Making governments and PSUs leaders in adoption of social AI tools	<p>Help create a pipeline of AI research projects for the COREs, ICTAIs through grand challenges to be given by the government and PSUs.</p> <p>Incentivise public agencies to adopt and employ AI in delivering service through financial support; extra budgets for R&D; tax incentives and awards.</p>

Partnerships and Collaboration	Industry – Academia – Trade Bodies – Venture Capital Collaboration	Encourage close collaboration between industry, academia, trade bodies and venture capital to implement “AI+X” paradigm.
Startup Support	Support systems for AI based startups	Establish incubation hubs and venture funds specifically for AI startups in collaboration with State Governments.
Responsible AI Development		
Ethical and Responsible Research in AI	Making COREs and ICTAIs adopt ethical practices	Set up a consortium of Ethics Councils at each CORE and ICTAI to define the standard practices and monitor their adoption.
Privacy and Security	Instituting a data privacy legal framework	Address and implement data protection framework, which protects human rights and privacy without stifling innovation in India.
	Creating sectoral regulatory guidelines	Collaborate with industry to come out with sector specific guidelines on privacy, security and ethics – on manufacturing, financial services, identity, telecommunication, robotics etc.
	Collaborating on privacy preserving technology research in AI	Support COREs to do research in new mathematical models and technology for preserving privacy; encourage international collaboration.
Sustainable Research	Setting up Centre for Studies on Technological	Set up CSTS to address issues relating to ethics, privacy, legal aspects, social sustainability and

	Sustainability (CSTS)	global competitiveness of the technologies developed.
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Glossary of AI terms

Term	Definition
AI (Artificial Intelligence)	Computer systems performing tasks that normally require human intelligence.
Machine Learning (ML)	AI where systems learn from data instead of being explicitly programmed.
Deep Learning	Subset of ML using multi-layered neural networks, good for images/speech/text.
Neural Network	A model inspired by the brain, made of interconnected nodes (“neurons”).
Natural Language Processing (NLP)	AI that understands, interprets, and generates human language.
Computer Vision	AI that enables computers to interpret and analyze images/videos.
Supervised Learning	Training with labelled data (inputs + outputs).
Unsupervised Learning	Training with unlabelled data, finding hidden patterns.
Reinforcement Learning (RL)	Learning by trial-and-error with rewards and penalties.
Generative AI	AI that creates new content (text, images, code, etc.).
Transformer Model	Neural network architecture powering LLMs like GPT and BERT.
Dataset	A collection of data used to train/test AI models.
Training Data	Data used to teach the model.
Validation/Test Data	Data used to check model performance.
Bias	Systematic errors due to skewed or unfair training data.
Overfitting	When a model memorizes training data but fails on new data.
Accuracy	Percentage of correct predictions.
Precision	Share of predicted positives that are correct.
Recall	Share of actual positives that were correctly identified.
LLM (Large Language Model)	AI trained on huge text datasets (e.g., GPT).
Chatbot	AI system that simulates human conversation.

Agentic AI	AI capable of taking autonomous actions toward goals.
Fine-Tuning	Adjusting a pre-trained model for a specific task or dataset.
Prompt Engineering	Crafting effective prompts to improve AI outputs.
Embedding	Numeric representation of text/data for similarity and search.
Explainable AI (XAI)	Making AI decisions understandable to humans.
Hallucination	When AI outputs factually wrong but confident-sounding answers.
Fairness	Ensuring AI doesn't discriminate unfairly.
Alignment	Making AI systems follow human goals and values.

