GOVERNMENT OF TAMILNADU

INFORMATION TECHNOLOGY DEPARTMENT

TAMIL NADU SAFE & ETHICAL ARTIFICIAL INTELLIGENCE POLICY 2020

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Executive Summary

Recent years have seen the development and deployment of Artificial Intelligence (AI) based solutions for addressing challenging and previously unsolvable real-life problems. The Tamil Nadu Government, which has always been a forerunner in the adoption and delivery of ICT-based solutions for Good Governance, is investing significant resources for development of AI-based solutions for further improving its Citizen Engagement, Service Delivery and Problem Redressal Processes so that "no Citizen is left behind." However, AI Technologies along with their tremendous benefits also have a potential for being biased and could potentially be misused. Hence the need for a State Level AI Policy that carefully weighs the pros and cons of an Emerging Technology like AI and guides the Policy makers.

The Tamil Nadu State's Policy for Safe & Ethical AI has been carefully crafted, after considering the pros and cons of the technology, to provide a road map for the State's Policy makers for the adoption of AI-based solutions. This Policy recommends the Six-Dimensional **TAM-DEF framework** for evaluation of AI-based systems. The framework's factors like Transparency & Audit, Accountability & Legal Issues, Misuse Protection, Digital Divide & Data Deficit, Ethics and Fairness & Equity, ensure that the evaluation is aligned to democratic values. In addition, the Policy also recommends the use of **DEEP-MAX scorecard**. **DEEP-MAX** provides a path to guide the roll-out of AI solutions. Further, the Policy also provides guidelines for Government Agencies, so that they can procure AI-based solutions that adhere to the AI Policy norms.

The forthcoming proliferation of AI in society is likely to affect all walks of life. This calls for a pro-active AI awareness, capacity building and training for the State's residents, in addition to three pillars of Governance namely, the Executive, the Legislature and the Judiciary. Collaborative partnership with private players and Institutions are essential for ensuring that Innovation is encouraged and the State remains at the cutting-edge of AI.

The Policy concludes with practical guidelines on how this may be achieved while ensuring that Equity, Fairness and Justice are adequately addressed.

1.   Introduction

The potential of Information and Communication Technologies (ICT) in improving the lives of residents is commonly acknowledged. In India, the Government of Tamil Nadu is a leader in the deployment of ICT-based solutions for Resident Engagement, Service Delivery, Improved Governance and Problem Redressal. Tamil Nadu has made massive investments in creating IT infrastructure and in developing end-to-end application software for Efficient Delivery of Government Services to its residents. Tamil Nadu has also made substantial investments to make the State a destination of choice for IT/ITeS Investors from across the world. Tamil Nadu has a vibrant ecosystem of Technology Leaders, Startups, Incubators and Accelerators, Excellent Academic Institutions, a network of Mentors and good number of Venture Capital Funds. In addition, a proactive State Government supports all this development and mitigates risk by providing accessible Sandbox environment and experimentation at scale. As a consequence of this IT eco-system, Tamil Nadu has emerged as a powerful Center of Research and Development in cutting edge Technologies.

In a path breaking ICT Initiative, the Hon'ble Chief Minister of Tamil Nadu had recently announced setting up of a "Center of Excellence in Emerging Technologies (CEET)" under the aegis of Tamil Nadu e-Governance Agency (TNeGA). The Center has been set up and has started functioning with few resources in place. CEET is mandated to work with Government Departments and help them solve their key Governance problems with help of Emerging Technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Blockchain, Drones, Augmented Reality (AR) / Virtual Reality (VR) and others. CEET has started conceptualizing and developing solutions for problems from Health, Education, Rural Development Dept, Agriculture, and Land Registration Departments. A few solutions using Image Recognition have been developed and are ready to roll out at scale. In addition, CEET also extensively engages with Startups and

provides them with opportunities, resources and mentoring to help them solve problems with high social impact and big scale.

2. Artificial Intelligence (AI) – the new engine for growth

Recent years have seen a proliferation of AI-based solutions in all spheres of life. These solutions promise to automate mundane and dangerous tasks, solve problems hitherto unsolved by conventional means and thus create new growth opportunities in terms of products and solutions. As a consequence, AI is estimated to boost India's Annual Growth Rate by 2035. A report of McKinsey Global Institute estimates AI contribution to global economy at US $13 trillion by 2030 *(Bughin, 2018)*. The same report estimates that about 70% companies would be using AI by 2030.

While AI has become the new Buzzword, its definition is continuously evolving. There has been unprecedented growth and maturity in the area of AI in the last decade. We already have autonomous Driverless Cars, Delivery Drones, Voice-Based Personal Assistants Dexterous and Intelligent Humanoid Robots and AI-based Diagnostics of Medical Images.

In contrast to the Natural Intelligence inherent in humans and animals, AI refers to the collection of Technologies that equip machines with higher levels of intelligence to perform various tasks such as Perceiving, Learning, Problem-Solving and Decision Making**.** It refers to the ability of a Computer or a Computer-Enabled Robotic System to process information and produce outcomes in a manner similar to that of the thought process of humans in learning, decision making and problem solving *(Assocham India and PWC, 2017)*.

The key characteristics of an AI-based System are –

1. Learning from Experience.

2. Knowledge-based and Rule-based Reasoning.

3. Image Recognition.

4. Complex Problem Solving with Uncertainty.

5. Natural Language Understanding.

6. Problem Solving with Alternate Prospective.

While discussing AI, it is appropriate to talk of Machine Learning and IoT and their relationship to each other. Machine Learning is one of the fastest growing sub-fields in AI that has provided human level or better performance at certain tasks in recent times. Machines (Software Models of Artificial Neural Network) are fed with large amounts of Training Data. This data is labeled (the actual output which should be generated by the machine given the input) and the machine tries to identify patterns in the input data and tries to predict the outcome for unseen cases. This process is called Supervised Machine Learning.

This proliferation of AI-based Systems has come into our lives riding upon three waves – Miniaturization of Computing Power, Networking of Sensors and Devices, and Affordable Internet Access. The first wave put computation power of mainframes in the hands of the ordinary citizen, the second wave generated massive amounts of data with unprecedented granularity and the third wave made all this accessible to everyone around the world.

> *"A simple device such as a tablet, which we use for reading, browsing and communicating, possesses the equivalent processing power of 5,000 desktop computers from 30 years ago, while the cost of storing information is approaching zero (storing 1GB costs an average of less than $0.03 a year today, compared to more than $10,000 20 years ago)."*
>
> Klaus Schwab - The Fourth Industrial Revolution.

AI Systems have moved from simple Rules-based Expert Systems to the current age of Deep and Convolutional Neural Networks, where these systems are often outperforming human in many areas! The field of AI was founded on the claim that a machine can be

made to simulate human intelligence, which could be precisely described *(McCarthy et al., 1956)*.

Until very recently, none of the breakthroughs in AI lived long enough to catapult this Technology into mainstream use. However, thanks to unlimited compute and storage power and an explosion in Digital Data (from Sensors, Mobile Devices, Surveys and other Advanced Data Collection Techniques), AI is rapidly advancing and is now being used across multiple domains. There is no doubt that this momentum in the advancement of AI and its integration into daily human life is here to stay!

3.   Goals and Objectives of the Policy

Following are the goals of this Policy -

1. To make AI inclusive, free of bias, fair, equitable, ethical and transparent.

2. To encourage fast, efficient, secure and transparent public service delivery with help of AI driven e-Governance applications.

3. To augment and improve existing Governance workflows and processes with help of Artificial Intelligence.

4. To build awareness and help adoption of Artificial Intelligence (AI) in all three branches of Government, namely the Legislature, the Judiciary and the Executive.

5. To encourage research and development in Artificial Intelligence by the academia, start-ups, private and public enterprises.

6. To nurture an ecosystem of easy and open data access to foster innovation in AI.

Following are the primary objectives of this Policy –

1. To provide a framework for inclusive, safe & ethical use of Artificial Intelligence in Government domain and to build fairness, equity, transparency and trust in AI assisted decision making systems.

2. To establish guidelines for the evaluation of an AI Systems before it's rolled out for Public use.

3. To build a mature and self-sustaining Artificial Intelligence Community to aid the growth of Artificial Intelligence in Tamil Nadu and to train and skill people in Tamil Nadu in Artificial Intelligence.

4. To provide access to open data, data models, and computing resources.

5. To build a regulatory sandbox that can be used for researching, building and deploying Artificial Intelligence based applications by start-ups, private and public enterprises, and academia.

6. To promote investments in AI R&D in Tamil Nadu.

4. The Need for a Safe & Ethical Artificial Intelligence Policy

The emergence of Artificial Intelligence (AI) as a potentially Disruptive Technology *(Christensen, 1997)* has posed new challenges for policy formulation in the 21st century. Over the past couple of years, the adoption of AI by Governments around the globe has gained momentum. Today, AI applications are touching human lives in multiple spheres such as Medical Diagnostics, Transportation, Drug Discoveries, Law Enforcement, Military, Space Exploration, Education, Governance and Elderly Care. While every new technology introduced in the society poses a new set of challenges for Public Policy, AI Technology has a few unique characteristics that sets it apart from any other Technology ever seen before *(Scherer, 2016)*:

- **Discreetness:** AI Systems are developed in a discreet manner, where hundreds of thousands of individual coders from across the world experiment and create

new algorithms and techniques every second. Many of them are anonymous and make their code freely available and shareable on platforms like GitHub. Hence it is almost impossible to pin the responsibility of a particular AI module onto an identifiable individual or organisation. If we include other players in the AI Market Ecosystem – the seller, the buyer, the insurer and the product developer – this problem becomes immensely complex to analyse.

- *Diffusiveness:* These systems and algorithms get diffused across Geographies, and often many complex and very powerful AI algorithms are developed with cross-national short-term collaboration.

- *Discreteness:* AI System components can be designed at different places at different points of time without conscious co-ordination. This creates significant complexities during analysis of an AI System for factors such as risk and public safety.

- *Opacity:* The inner workings of an AI-based System may be a Black-Box for Policy makers due to its being kept secret for competitive reasons. Again, the essential decision-making processes of some algorithms like Deep Learning are not explainable by their very nature. The difficulty in understanding the working of AI Systems and Interpretation of their results does not inspire confidence in Policy Makers. This Information Asymmetry Public Policy Response to AI is an uphill battle.

This loosely structured AI Marketplace has made the risk management of an AI System a very complicated process.

This poses some serious challenges for the Governance of AI. It requires a well thought out and systematic Public Policy response. For the Policy Makers, the key challenge is in staying ahead of the technology curve in such a dynamic and rapidly evolving technology scenario.

In areas such as Law Enforcement, Banking or Healthcare, poorly designed AI Systems may interfere with the right to life or the right to freedom of a human being.

For instance, a poorly designed system for evaluating the creditworthiness of a person might deny access to loans to a specific group of people unreasonably or unfairly.

AI systems have often been criticized for having gender and racial bias problems, primarily when used in Law Enforcement. Thus, such systems must be designed to be compatible with Social Values, Ethics, Fairness, Equity and Accountability. Such a design is critical for the survival of a free human society.

Making the regulation task even more challenging for the Government is the fact that Government has twin but conflicting roles in adoption of AI *(Dwivedi et al., 2019)* -

1. ***As a user of AI*** - to better deliver services to Citizens, to improve efficiency, to cut down waste and to optimally allocate resources.

2. ***As a regulator of AI*** - keeping the technology benign and oriented towards improving the lives of its Citizens.

Therefore, it is imperative for the Government to lay down policies and framework to ensure that

   1. All usage of AI is fully compatible with human values and;

   2. That the use of this Technology is inclusive and does not leave anyone behind.

The goal of the Safe and Ethical AI Policy is to allow harnessing the power of AI for the public good while keeping it safe and ethically compatible with human values.

5. Applicability of the Policy

This Policy shall be applicable to:

   1. Any authority or body in Tamil Nadu, established or constituted under any Central or State law and owned or controlled by the Government of Tamil Nadu,

or which receives any aid directly or indirectly from the Government of Tamil Nadu.

2. Any organizational body such as Cooperatives, Trusts, Societies, Public Sector Undertakings and Boards, whose composition and administration is controlled by the Government of Tamil Nadu or whose officers or office bearers are appointed by the Government of Tamil Nadu.

3. Partnerships and Joint Venture Companies of the Government of Tamil Nadu.

6. Framework for Evaluation of AI Systems before public roll-out

The Tamil Nadu Government will use the Six-Dimensional **TAM-DEF** Framework *(Dwivedi et al., 2019)* along with **DEEP-MAX** Scorecard *(Dwivedi et al., 2019)* for evaluating all AI Systems before public roll out.

There are six major challenges to AI implementation in Public Domain *(Dwivedi et al., 2019)*, namely:

1. Transparency & Audit (T)

2. Accountability & Legal issues (A)

3. Misuse Protection (M)

4. Digital divide & Data Deficit (D)

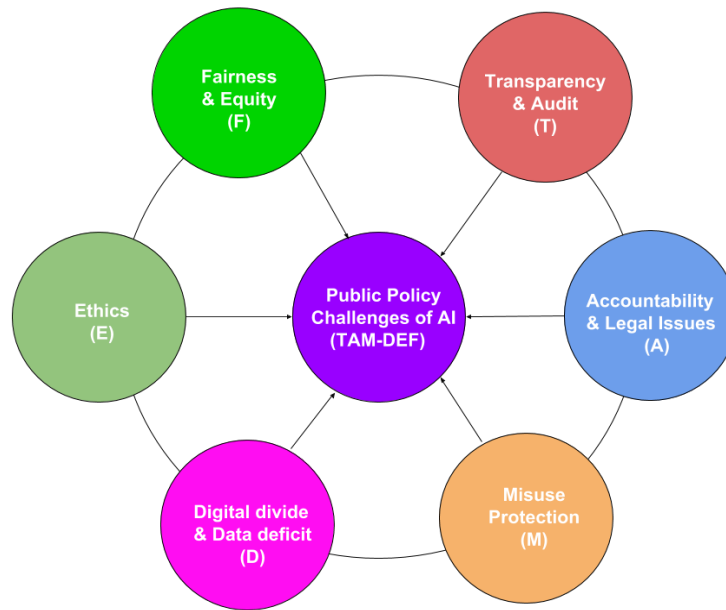5. Ethics (E)

6. Fairness & Equity (F)

Fig.1: Public Policy Challenges of AI

6.1 Transparency & Audit (T)

Most of the AI-based Systems would be regularly interacting with humans in fields such as Finance, Education, Healthcare, Transportation, Law Enforcement and Elderly Care. The Technology providers should be capable of explaining the decision-making process to the user so that the AI System does not remain a Black Box to them. Moreover, the explainability of such system is very important when Government Agencies use these for decision making. Similarly an audit trail of the decisions made would be needed when there are disputes and Public Agencies would be called upon to explain their decisions.

There is also a legal need to explain the decision taken by such systems in case of litigation. An audit trail of decisions made would be required in such cases.

6.2   Accountability & Legal Issues (A)

Without AI, any System designed by a human is only a machine under the control of the operator. So there is never an issue of who is accountable. Almost all Civil and Criminal liability laws of the world, unanimously attribute accountability to Operator, Owner and Manufacturer of the machine in varying degrees depending upon the facts of the case.

However, once machines get equipped with AI and take autonomous decisions, the question of accountability becomes very hard to answer. More so when the algorithm used for decision making is sometimes even unknown to the designer himself. AI machines are capable of inventing superior ways of accomplishing the task given, using a purely unintended route. This can have adverse implications for society.

6.3   Misuse Protection (M)

Like all Emerging Technologies in their nascent stage of development, AI's potential is not fully apparent, even to their developers. Hence, despite the noble intentions of AI Innovators and Policy Makers, there is a possibility of these Technologies being used for other than intended purposes. This is particularly important for a Technology as powerful as AI. Hence, any AI policy has to be far reaching in terms of considering both the positive applications and the possibilities of misuse. Further, the Policy needs to be balanced – one that balances the twin objectives of encouraging innovation without excessive regulation while at the same time ensuring that the possibilities of misuse are minimized.

6.4   Digital Divide & Data Deficit (D)

Since the entire AI revolution has data at its foundation, there is a real danger of Societies that have inadequate access to Information Technology, the Internet and Digitization are left behind. Informed Citizens would tend to gain disproportionately in this Data-Driven Revolution.

Communities having good quality granular data are going to derive the maximum benefit out of this disruption. Those communities where the data is of poor quality or

poor granularity would be left behind in harnessing the power of AI to improve the lives of its Citizens. There is a threat that this Technology would adversely affect communities which are more deficient in data. Unfortunately, it is the low-resource communities which would be hit by this data-deficit because they are the ones who never had the resources to invest in data collection and collation.

Another challenge that emerges from this Technology is the skewed power distribution between Digital Haves and Have-nots. Only those who have the ability, knowledge and resources needed to connect to Online Data-Driven Systems would be heard. The voices of others may not get registered in the system.

6.5   Ethics (E)

Defining Ethics for Machines has proven to be difficult, and to make it computable has been even more difficult. If treated purely from an AI perspective, Ethics can be divided into two sub-components – (i) Privacy and Data Protection, and (ii) Human and Environmental Values. Both these dimensions of Ethics are critical for keeping AI Systems safe for human society.

  a. **Privacy and Data Protection:** Privacy is the topmost concern while using AI Systems. User's private and highly granular data is likely to be stored and shared across the AI Network. The AI Systems must ensure that this data remains protected.

  b. **Human and Environmental Values:** Any AI System has to conform to the Social Value System such as Respect, Dignity, Fairness, Kindness, Compassion, and Equity. It should also be clear if the system should or should not have any preferential duty towards children, elderly, pregnant women, sick and vulnerable.

6.6   Fairness and Equity (F)

AI Systems can create new Social Paradigms, which if left un-regulated and unevaluated, can severely damage the social fabric and expose people lower in the

bargaining hierarchy with a real threat of exploitation and unfair treatment. It would lead to the commoditization of human labour and could chip away at human dignity.

On the other hand, an AI System designed with equity as a priority would ensure that no one gets left behind.

Another critical requirement for an AI System is fairness. They shall be 'trained' in human values, and shall not exhibit any gender or racial bias, and shall be designed to stay away from 'Social Profiling' (especially in Law Enforcement, Fraud Detection, and Crime Prevention Areas). AI Systems designed would have to comply with 'free of bias' norm to prevent stereotyping.

7. The DEEP-MAX Scorecard - Making AI Safe & Ethical for People

To handle the six challenges of AI (TAM-DEF) mentioned above, a simple and easy to use tool is DEEP-MAX *(Dwivedi et al., 2019)* Scorecard. While procuring and deploying any AI based Solution/System, the procuring entity would check if the proposed solution/system conforms to the 7 parameters laid down in the DEEP-MAX Scorecard. TNeGA would assist the procuring Entities/Departments in analyzing the AI Solution/System to ascertain whether they meet the DEE-MAX Scorecard for AI Safety and Ethics. The DEEP-MAX scores for all AI Modules or AI Systems to be used in Public Domain, have to be stored on the AI Certification, Transparency & Scorecard (ACTS) Blockchain Interface, which would be designed by TNeGA. Regular updates of these scores would have to be made on this Blockchain Interface. Till ACTS Blockchain Interface is designed and brought live, TNeGA would suggest an alternate mechanism for storing and updating AI Ethics and Safety Scorecard.

7.1 DEEP-MAX Scorecard

An objective Scorecard based on the six challenges of AI in Public Policy (as outlined in the TAM-DEF framework) is proposed, which, with suitably designed test data sets can

reliably produce a safety and social desirability score for a given AI System by testing it against each of the seven DEEP-MAX parameters.

DEEP-MAX Scorecard is a transparent Point-Based Rating System for AI systems on the seven key parameters of Diversity, Equity, Ethics, Privacy and Data Protection, Misuse Protection, Audit and Transparency, Digital Divide and Data Deficit (Cross Geography and Cross-Society applicability and performance of AI System).

Fig2: DEEP-MAX Scorecard for AI *(Dwivedi et al., 2019)*

7.2   Use of Blockchain for Safe & Ethical AI

The use of Blockchain-based mechanisms in training, testing and misuse protection of AI Systems is a reliable mechanism for ensuring the safety and social desirability of every AI Solution. The creation of an AI Certification, Transparency & Scorecard Blockchain (ACTS-Blockchain) would integrate information about the dataset which was used for training an AI System, and shall ensure whether the training dataset met essential criteria such as Diversity and Equity. Similarly, the ACTS-Blockchain would also carry the seven scores from the DEEP-MAX Scorecard for any given AI System.

ACTS-Blockchain would be a universal and publicly viewable Blockchain. ACTS-Blockchain would create a transparent mechanism for rating and understanding of all Government procured AI Solutions before and after putting it to use.

i. **Training Data Certification:** ACTS-Blockchain would provide a Trusted Mechanism to certify the quality of training data for an AI System module. Questions such as if a given AI System or Module has been trained using a Diverse Dataset incorporating race, Gender, Language, Ethnicity, Religion, and other forms of diversity or not, can easily be verified if the certification is done using ACTS-Blockchain.

ii. **Tamperproof DEEP-MAX Scores:** Any AI Model developed, would be tested on a set of standardized data sets, each measuring one of the seven DEEP-MAX Scores. These scores would be put on the ACTS-Blockchain and each AI Module would be shipped with this trusted scorecard along with its training Data Certificate.

iii. **Built-in Misuse Prevention using Blockchain:** For Public Policy Practitioners, Misuse Protection of AI Systems is a big challenge. A Face Recognition AI System for apprehending dangerous criminals can be easily tweaked for unscrupulous use. In this case, a Blockchain-based record keeping for any substitution or changes in the Criminal Image Database shall help safeguard the system from possible misuse. The ACTS-Blockchain would contain a tamperproof record of the changes made along with the authorization details, making all changes traceable.

7.3 DEEP-MAX Scorecard Updates

AI Systems are self-learning, and the DEEP-MAX Scores, which will ship-out with each AI Module, may no longer be valid after some time. Periodic updates of the DEEP-MAX Scorecard are to be ensured for all AI Systems deployed for public use. The required

periodicity of updates should be established based upon the nature of the AI use case class.

8. Guidelines for Procuring AI Systems in Tamil Nadu: Implementing Ethics Score 'DEEP-MAX' for AI Solutions

All Tamil Nadu Government Procuring Agencies would have to follow the following guidelines before procuring any AI Solution/System –

1. **Consult CEET at TNeGA for AI Procurement:** Departments (including all Organizations and Agencies listed out in section 4 above) are requested to consult the Center of Excellence in Emerging Technologies (CEET) functioning under TNeGA (Tamil Nadu e-Governance Agency) before making any AI procurement.

2. **Evaluate AI on DEEP-MAX Scorecard:** In procuring AI Solutions or AI based Systems, the Procuring Agency should ensure that the AI Solution they plan to introduce into the public space is carefully evaluated along the lines of the challenges as described in the former sections, and has a satisfactory DEEP-MAX score.

3. **Ethics Score for AI – 'DEEP-MAX':** To begin with, a binary score (1 – if the AI System meets the criterion, 0 – if it does not) on the DEEP-MAX Scorecard can be given and depending upon the intended usage of the AI System any inconsequential parameters can be ignored (e.g. Diversity Score for a pest identification solution is probably not relevant).

However, TNeGA would endeavor to bring out a continuous scale 0-10 score for each of the 7 DEEP-MAX parameters and would seek partnerships with research Institutions, Academicians, Experts, Volunteers, Standard Setting Organizations,

other Governments (State, National and International) and Non-Profits Organizations within and outside India, in designing, maintaining and updating suitable test data sets for generating objective scores.

4. **Periodic update of DEEP-MAX Score:** Departments are encouraged to periodically update the DEEP-MAX Scores of the AI Solutions once deployed. Since AI Systems tend to be self-learning, it is important to periodically re-calibrate the 7 DEEP-MAX score parameters against the AI System, to ensure that these systems are not turning rogue. A suggested periodicity is 6 months at most.

5. **ACTS Blockchain for AI:** Tamil Nadu e-Governance Agency would create the ACTS-Blockchain, and the Departments are encouraged to use it for Safe and Ethical use of AI, as described in the previous sections. The ACTS-Blockchain would be made available to the Departments after the Statewide Blockchain Backbone *"Nambikai Inaiyam"* gets rolled out by TNeGA. Till this ACTS comes into being, TNeGA would devise a suitable alternate mechanism to store the ethics scores and update them periodically.

6. **Acceptability Criteria:** Government of Tamil Nadu or Agencies acting on its behalf, shall have the right to determine and revise periodically, acceptability criteria for AI systems based on DEEP-MAX scores for their use cases and to reject/recall any application that does not meet the set criteria.

9. Oversight Mechanism

Departments of Government of Tamil Nadu and other Organizations described in Section 4 for whom this Policy is applicable are expected to strictly adhere to the guidelines discussed in Sec 7. Effective implementation of the guidelines shall be monitored by Safe & Ethical AI Monitoring Committee headed by Chief Secretary with members consisting of Secretary and Senior Officers of select Departments (including

Law Department) and AI/Policy Experts representing leading Academic/Research Institutions.

10. AI Awareness, Capacity Building & Training

AI Systems are going to be deployed in almost every sphere of our lives. As mentioned earlier, AI enabled Transport, AI assisted Medical Diagnosis, AI assisted Education, AI enabled Agriculture, AI enabled Law Enforcement, AI assisted public service delivery, AI assisted Governance are some of the key AI use areas we would be experiencing in immediate future. AI would be used heavily in autonomous decision making. Hence it becomes imperative to build sufficient capacity within the Government, Legislature and Judiciary to be able understand and deal with consequences of AI based decision making processes.

There is a strong need to create awareness about AI Technology and its capabilities amongst Citizens. They would need to understand the basic working of AI, and how it is going to impact their lives.

To achieve these objectives, Government of Tamil Nadu shall work with leading Academic Institutions and Training Arm of Government of Tamil Nadu (such as Anna Institute of Management etc.,) to evolve and roll out an AI Education and Awareness Program. The Program shall take into account the requirements and participation of various stakeholders as discussed below:

10.1 The Citizens

● **Updating the School/College Curriculum**
Government would include AI, its impact on society, and its current development status with appropriate level of details suitable for college students in Science, Engineering and Humanities disciplines as well as school students. Curriculum for Science and Engineering disciplines and faculty skills shall be upgraded sufficiently to groom AI Practitioners and Researchers.

● **Supporting Large Scale AI Training & Skill Building for Youth**

AI can be applied in a wide variety of industry sectors and application areas and the list would only grow over time. This implies there would be growing demand for AI scientists/engineers as well as professionals with skills to support AI development and deployment across sectors such as in data preparation/curation/protection, training AI systems etc., Recognizing this, Government of Tamil Nadu would work out a strategy with the help of Industry Bodies and Academic Institutions to build a sufficient pool of world class AI Experts in Tamil Nadu. Government would encourage TNeGA and other AI user Government Departments to allow a regular intake of interns to work on AI and Data.

- **Awareness for Public**

  Awareness sessions for public would be created with help of appropriate Agencies to educate Citizens about AI. The programs will leverage Digital Content, Social Media and Mobile Technologies for widest possible reach.

10.2 The Executive

Senior Officers of the Government and its Agencies must be fully familiar with the possibilities offered by AI, its potential for misuse and the actions that need to be taken to ensure Safe and Ethical Application of AI based solutions for delivering Citizen Services. The Government would organize AI awareness sessions, workshops and live demonstrations of AI applications for Officers. All the Government employees would be encouraged to undergo short term Orientation/Awareness Sessions leveraging Digital Media and Mobile Technologies for widest possible reach.

10.3 The Legislature

The Legislature would also need to have a good understanding of fundamentals of AI, in order for it to make/amend laws which are effective and relevant in the era of AI. The Government would explore opportunities for short duration primer courses in AI in Institutes of repute in the world, and would also examine the possibilities of International exposure and exchange programs to enable the law makers in adopting the AI best practices of the world.

10.4 The Judiciary

Judiciary plays an important role as one of the key pillars of a vibrant Democracy. With AI based systems becoming increasingly pervasive, it would be necessary to interpret the laws to factor in the AI. It would not only help promote the beneficial use of AI, but it would also prevent misuse of AI and ensure equity, fairness and justice to all. With this goal in mind, the Government would endeavor to work closely with the Judiciary in analyzing the legal implications of AI-based systems and measures needed to mitigate any negative impacts. Government would, in consultation with the Hon'ble High Court, help draw up a program for educating the Judicial Officers in AI and its implications. It would explore opportunities for short duration AI Training Courses for Judicial Officers at National and International Institutes of repute.

11. Promotion and Encouragement for the Use of AI

In order to ensure that the benefits of AI and related technologies reach all sections of the Society, all Departments are encouraged to use this technology, wherever appropriate. The Government with help of TNeGA would help identify AI opportunities across Departments. This involves:

- **Expert Groups:** The Government will set up AI expert groups to identify application opportunities for AI and related solutions.
    i. Expert Groups may be constituted by Academicians, Practitioners and other subject matter Experts.
    ii. For Domain Knowledge, appropriate subject matter experts from Departments should also be involved.

    The Expert Groups will organize Conclaves, Workshops and other Networking Events to:
    i. Encourage discussions and knowledge sharing amongst all stakeholders
    ii. Identify sectors & use cases that will benefit the most from an immediate AI intervention
    iii. Develop sector specific policies/guidelines/procedures.

iv. Disseminate best practices towards procurement, design, development & deployment of AI solutions

v. Study user experience and real-world impact of AI based systems and recommend changes to systems/policy

vi. Recognize and celebrate data providers, systems developers, teachers, regulators and others who significantly contribute to the objectives of this policy

The main agenda of such Conclaves would be problem elicitation, i.e. to encourage the heads of various Departments to come forward with problems faced by their respective Departments and to facilitate a discussion centered around how AI and Technology can solve these problems while keeping in mind all the ethical and safety issues that are associated with it.

- **Open AI Challenges:** Government, through Expert Groups, shall open up Governance challenges to the AI Enthusiasts, Students, Teachers and Startups to find a solution. Once a solution is found, TNeGA would help market the Innovation and provide necessary support to commercialize the technology in a joint ownership of Intellectual Property Rights (IPR) mode.

- **Collaborative AI Research Centers for Governance:** In order to foster a vibrant, collaborative and dynamic culture of research and innovation for AI in the State of Tamil Nadu, the Government will set up *AI for Governance Research Centre* in collaboration with leading Industry players and Academic institutions. The Research Centre is for developing a better understanding of existing core research problems and pushing technology frontiers through the creation of new knowledge, for solving Governance problems, developing/evolving appropriate policies in consultation with all stakeholders and share best practices towards procurement, design, development & deployment of solutions from application-based research.

- **Open Data:** Access to high quality, reliable data is vital for AI systems to be effective. Relevant real-life, anonymized and secure data would help in development of AI based solutions that are practical, feasible, relevant and benchmarked for the local population. Government has huge amounts of data lying in silos in the IT systems of various departments/agencies. In the process of delivering services to its citizens, the Government collects, processes, stores and analyzes citizen data.

    Departments would be encouraged to embrace the idea of open data. Each department will identify datasets that can be shared under the open data policy and regularly publish Catalogs and Resources (Datasets/APIs/Apps) on an open platform. Access to data made available under this policy would take into consideration privacy and confidentiality concerns and shall not be in violation of any Acts and rules of the Government of India or the Government of Tamil Nadu in force.

    An Open Data Task Force would be setup to define and implement standardized processes for classifying different types of data, for the identification and release of shareable datasets, consent mechanisms, tools & platforms for data sharing, licensing considerations as well as overall governance to ensure data sharing is in line with Government objectives and applicable laws, rules and regulations in place. The taskforce would also handle any requests coming from expert groups, research centers, startups, departments and work with respective departments to publish such datasets on open data platform. The Open Data taskforce would be headed by the Chief Executive Officer of TNeGA and include senior officers representing various departments/agencies of Government of Tamil Nadu.

- **Data Platform:** The Government would create an online platform for hosting data and facilitate its access, to encourage:
    i.   Data acquisition, sharing & interoperability
    ii.   Secure data management practices and governance adhering to applicable laws, rules and regulations in place

iii. Researchers and Scientists to work on and find solutions to problems faced by society

iv. Start-ups to work in collaboration with the Government and create products that they can sell to other customers on a revenue sharing basis

v. Enable crowd sourcing of AI/ML solutions

- **AI Sandbox:** The Government would create an **AI Sandbox** for Startups and Individuals for encouraging innovation at the grass-roots level in Tamil Nadu. The high-cost of computing and data infrastructure for AI experimentation and algorithm development could be a barrier to entry for Start-ups and Individuals for development of AI-based solution. In order to mitigate this risk and encourage talented individuals and Start-ups to work in AI, the Government would create a Sandbox Environment which would help experimentation with new and innovative ideas without the risk of failure.

12. Implementation of TN Policy for Safe & Ethical AI

The Department of Information Technology of the Government of Tamil Nadu shall coordinate the overall implementation of the Policy and shall issue necessary Guidelines and revisions to the Policy from time to time.

13.   References

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