

Telecom Regulatory Authority of India

TRAI releases recommendations on “Leveraging Artificial Intelligence and Big Data in Telecommunication Sector”

New Delhi, 20.07.2023 - The Telecom Regulatory Authority of India (TRAI) has today released its recommendations on ‘Leveraging Artificial Intelligence and Big Data in Telecommunication Sector’.

2. The National Digital Communications Policy (NDCP)- 2018 seeks unlocking of the transformative power of digital communications networks for achieving the goal of digital empowerment. NDCP-2018 motivates towards harnessing the power of emerging digital technologies, including 5G, AI, Internet of Things (IoT), Cloud and BD to catalyse the fourth industrial revolution. In order to create a roadmap for AI, emerging technology and its use in the communication sector, vide letter dated 6th June 2019, Department of Telecommunication (DoT) sought recommendation of TRAI on the provision no. 2.2(g) of NDCP-2018 i.e. *“Leveraging Artificial Intelligence and Big Data in a synchronised and effective manner to enhance the overall quality of service, spectrum management, network security and reliability”*.
3. AI being a developing technology, a virtual conference on “Leveraging Artificial Intelligence (AI), Machine Learning (ML) and Big Data (BD) in the Telecom Sector” was organised by the TRAI on 5th and 6th of August 2020. The conference served as a platform to engage with industry experts, telecom service providers, and leading solution providers to gain insights into AI/ML from a telecom perspective. A workshop on "Metaverse" was conducted on 12th September 2022 by TRAI to understand the various dimensions of emerging technologies including AI. TRAI organized another workshop on "Metaverse: Understanding and Regulatory Framework" on 5th December 2022. The workshop aimed to explore the concept, challenges, and opportunities of the metaverse and AI as well as the possible regulatory implications.

4. The impact of AI is not limited to only telecom sector. AI has the potential to impact a wide range of sectors including healthcare, finance, transportation, education, agriculture and many others. Therefore, it is important to take a holistic approach for examining the impact of AI across all sectors rather than focusing only on telecom. As AI technology is still evolving, it took time to examine and bring out the multiple aspects of AI/ML in the telecommunication and other sectors by studying various international practices which are also in the nascent stage. TRAI issued Consultation Paper (CP) on "Leveraging Artificial Intelligence and Big Data in telecommunication sector" on 05th August 2022. In the Consultation Paper (CP), wide ranging issues covering all sectors were included.
5. Based on the comments of the stakeholders, discussion during the Open House Discussion and analysis thereof, the Authority has finalized these Recommendations. In view of the impact of AI in all sectors, the framework which has to be suggested for telecom cannot be treated in isolation and hence a common framework covering all the sectors is being proposed.
6. The salient features of the recommendations are as follows:
 - I. Regulatory Framework for the development of responsible Artificial Intelligence (AI)**
 - i) For ensuring development of responsible Artificial Intelligence (AI) in India, there is an urgent need to adopt a regulatory framework by the Government that should be applicable across sectors. The regulatory framework should ensure that specific AI use cases are regulated on a risk-based framework where high risk use cases that directly impact humans are regulated through legally binding obligations.
 - ii) The broad tenets of the suggested regulatory framework should comprise of-
 - a. An independent statutory authority.
 - b. A Multi Stakeholder Body (MSB) that will act as an advisory body to the proposed statutory authority.

- c. Categorizations of the AI use cases based on their risk and regulating them according to broad principles of Responsible AI.
- iii) An independent statutory authority should be established immediately for ensuring development of responsible AI and regulation of use cases in India. The authority should be designated as “Artificial Intelligence and Data Authority of India” (AIDAI).
- iv) AIDAI should also be assigned the following functions-

A. Regulation Making Functions

- a. Framing regulations on various aspects of AI including its responsible use.
- b. Defining principles of responsible AI and their applicability on AI use cases based on risk assessment. AIDAI should evolve the framework based on its assessment, advice of proposed MSB, global best practices, and public consultation.
- c. Ensuring that principles of responsible AI are made applicable at each phase of AI framework lifecycle viz. design, development, validation, deployment, monitoring and refinement.
- d. Developing model AI Governance Framework to guide organizations on deploying AI in a responsible manner.
- e. Developing model Ethical Codes for adoption by public and private entities in different sectors.
- f. Any other aspect of regulation of AI for orderly growth of the AI sector and protection of the consumers.

B. Recommendatory Functions

- a. Facilitating adoption of future technologies and innovative architectures related to AI models.

- b. Monitoring and making recommendations on the enforcement framework on AI applications and its use cases.
- c. Coordinating with technical standard setting bodies of government like Telecom Engineering Centre (TEC) for accreditation of various labs for testing and accreditation of AI products and solutions and giving recommendations thereof.
- d. Capacity building and infrastructure requirements related to AI- evaluation and giving recommendations to the Government.
- e. Assess the data digitization requirement in the country; review and prioritize the avenues requiring concentrated efforts for data digitization and fix timeframes accordingly.
- f. Be the apex body to oversee all issues related to data digitization, data sharing and data monetization in the country including framing policies and incentivization schemes for data digitalization, data sharing and data monetization.
- g. Define the process framework for use of AI and related technology in data processing, data sharing and data monetization while ensuring the privacy and security of the data owner.
- h. Putting in place an overarching framework for ethical use of data both by the Government as well as by the corporates in India. The framework should address the generic as well as vertical sector specific requirements.
- i. Study the possible impact of upcoming technologies on data ethics and come out with relevant rules/guidelines on the subject.
- j. Creation of a national level mechanism to bring the State Governments, Local Bodies and other agencies onboard to adopt the national policy on data governance.
- k. Creation of a uniform framework to on-board private entities for adoption of national policy on data governance and to enable them and public sector entities to digitalize, monetize and share their data within the privacy and other applicable laws and policies.

1. Creation of a uniform framework for sharing of data available with Government and its entities with industry, educational institutes, R&D Centres, Startups etc. within the privacy and other applicable laws and policies.
- C. **Other Functions**-Considering the nature of functions, AIDAI may take up following activities also-
- a. Setting up regulatory sandboxes for testing AI based solutions.
 - b. Collaborating with standard setting bodies of various sectors for establishing generic and interoperable standards for AI based products and solutions.
 - c. Collaborating with sectoral regulators and vertical ministries in Central and State Governments as well as with local and other authorities on various issues related to AI.
 - d. Collaborating with international regulators and organizations for AI related issues.
 - e. Providing a platform for industry and academia collaboration for ensuring responsible use of AI and capacity building.
 - f. Creating public/institutional awareness for responsible use of AI.
 - g. Compiling and sharing of best practices deployed across sectors for use of responsible AI.
- v) A Multi Stakeholder Body (MSB) should be constituted by the Government to act as an advisory body to AIDAI drawing members from different Ministries/Departments, Industry, Legal expert, cyber expert, Academia and research institutes. MSB may invite representatives of relevant Ministry/ Department of Centre/ State Government on need basis as special invitee.
- vi) For synergy and coordination among different Central and State Ministries and local bodies and for orderly growth of AI and its use cases, the Ministry of Electronics and Information

Technology (MeitY) should be designated as the administrative ministry for AI.

- vii) While defining powers and functions of AIDAI, it should be ensured that the clauses related to exercising transparency through open consultation with stakeholders are applicable to all regulatory decisions and recommendations of AIDAI.
- viii) Considering the sensitivity and far-reaching impact of AI across the nations which defies borders, the Indian Government should collaborate with international agencies and governments of other countries for forming a global agency that will act as the primary international body for development, standardization and responsible use of AI. India should play a leading role in shaping the Global AI standards and governance structures.
- ix) The recommendations on 'Privacy, Security and Ownership of the Data in the Telecom Sector' of July 2018 is reiterated by TRAI and all such provisions of this recommendations which are in the domain of DoT, should be implemented immediately.
- x) The scope of AIDAI should also include making recommendations to create a national level mechanism to bring the State Governments, Local Bodies and other agencies onboard to adopt the national policy on data governance. AIDAI should also recommend a uniform framework to on-board private entities for adoption of national policy on data governance and to enable them and public sector entities to digitalize, monetize and share their data within the privacy and other applicable laws and policies.
- xi) AIDAI's scope of work should also include recommending to the Government a uniform framework for sharing of data available with Government and its entities with industry, educational institutes, R&D Centres, Startups etc. within the privacy and other applicable laws and policies.

II. Adoption of AI in Telecom Sector

- i) DoT should collaborate with Access Service Providers for enhancing the capability of currently deployed systems through use of AI/ML and other new technologies, in order to analyse the data on real-time basis for verification of the total number of mobile connections (across Access Service Providers and across LSAs) against the limit set by DoT.
- ii) DoT's Telecom Security Operation Centre (TSOC) should deploy AI/ML and other new technologies-based tools for generating alerts to minimize network security threats.
- iii) For effective redressal of grievances of telecom customers, AI/ML and other new technologies should be used on data that should flow from networks and redressal systems of Access Service Providers to dash boards of DoT Public Grievance Unit.
- iv) For effective use of AI/ML for UCC Detection and pro-active actions thereof in order to protect customers from phishing, spam and scam, suitable amendments in Indian Telegraph Act, Indian Telegraph Rules and License Conditions related to Unified Licence (UL) with Authorization for Access Services should be made to empower TRAI to direct licensees to enable continuous machine-based identification and monitoring of P2P messages sent in bulk for automatic pattern recognition, anomaly detection, traffic analysis, reputation analysis, signature identification, etc.
- v) Considering the potential use cases of AI in various aspects of telecommunication and broadcasting, and its benefits, DoT, in collaboration with various stakeholders, should encourage the development of AI in various fields of Communications and Broadcasting through indigenous technologies and may appropriately consider funding through Telecom Technology Development Fund (TTDF) or any other scheme of DoT/Government.
- vi) DoT should, in collaboration with organizations such as IISc Bangalore, IIT Madras, IIT Kanpur and other research institutes, launch research in telecommunications in order to develop indigenous AI use cases.

vii) The Authority, in its recommendations on ‘Auction of Spectrum in frequency bands identified for IMT/5G’ dated 11th April 2022 inter alia recommended for formation of a 5G-dedicated Inter-Ministerial Working Group (IMWG), under the Chairmanship of Member (Technology), DoT and a special dedicated Digital Cell, headed by the JS Level officer nominated as member in IMWG, with dedicated technical manpower to formulate the use of digital technologies like 5G, IoT, M2M, AI etc. and development of relevant and affordable use cases. While reiterating it, TRAI recommended that DoT through Inter-Ministerial Working Group (IMWG) formed for implementation and penetration of 5G should coordinate with other sectoral Ministries/ Departments to encourage and develop AI use cases for various sectors by funding from the respective Ministry/ Departmental Budgets.

III. AI Specific Infrastructure and Experimental Campuses

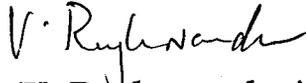
- i) At least one Centre of Excellence for Artificial Intelligence (CoE-AI) should be established in each State/UT for facilitating educational institutions, startups, innovators, researchers and other public/private entities to develop and demonstrate technological capabilities. These centres should have access to high bandwidth, computational facilities and data sets for training AI models. All such centres should also be linked with proposed 5G/6G labs for sharing of resources and knowledge. To galvanize an effective AI ecosystem and to nurture quality human resources these CoE-AIs should allow industry players as well as startups to partner with academia in conducting research, developing cutting-edge applications and scalable problem solutions in various fields such as agriculture, healthcare, education, smart cities, smart mobilities, etc.
- ii) One of the CoE-AIs should establish a centralized portal to be used by all CoE-AIs. The portal should have information regarding various facilities available with individual CoE-AI, process to access such facilities, fee structure, if any, and other relevant details.

IV. Skill Development

- i. DoT should collaborate with MeitY and Ministry of Education to form a committee drawing members from these two ministries, Ministry of Skill Development, All India Council for Technical Education (AICTE) and Industry. The committee should study and recommend following aspects related to Artificial Intelligence from time to time:
 - a. Assessment of current availability and future requirements of AI/ML professionals and skilled manpower in the country and suggest various technical programs for increasing the availability of such professionals and skilled manpower as per assessed future requirements and also for reskilling the existing workforce for facilitating them to AI based opportunities.
 - b. Mechanism for industry/academia collaboration in designing and upgrading AI related curriculum to meet the skillsets required.
 - c. Mechanism to take up collaborative research projects and to open up opportunities for internship and training in industry.
- ii. DoT should take up with All India Council for Technical Education (AICTE) for mandating a course on Ethical Use of AI to students in all technical institutes. DoT should also take up with Ministry of Education for introducing such courses/modules in other non-technical institutes and schools starting from basic education as well.
- iii. DoT through its apex institute, National Telecommunications Institute for Policy Research, Innovations & Training (NTIPRIT), should at the earliest develop courses for Government officers and employees on Ethical Use of AI as well as on Basic Concepts of AI. These courses should be made available on iGOT Platform under Mission KarmaYogi. DoT should also take up with Department of Personnel and Training (DoPT) for mandating these courses for all Government officers and employees as part of their training program.

V. Challenge-based Programs and Bounty Programs

- i. DoT should use 'Digital Communication Innovation Square (DCIS)' scheme to support the startups and other organizations for holding AI/ML events such as challenge programmes and bounty programmes for demonstration of their ideas, collaborating with stakeholders and improvising their solutions/products. DoT should also, through IMWG, coordinate similar efforts in other sectoral Ministries/ Departments.
7. The recommendations have been placed on TRAI's website www.trai.gov.in .


(V. Raghunandan)
Secretary, TRAI