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Re: Telecom Regulatory Authority of India  
[Consultation Paper on Leveraging Artificial Intelligence and Big Data in Telecommunications Sector](#)

The IEEE Standards Association (IEEE SA) appreciates the opportunity to provide comments on the TRIA Consultation paper on “Leveraging Artificial Intelligence and Big Data in the Telecommunications Sector”.

While TRAI is seeking AI and Big Data recommendations in response to questions contained in the Consultation Paper, IEEE SA would like to note that there is significant work underway within its standards development ecosystem that could play an important role in framing how to build AI based capacity and capabilities within the Indian telecom and Information and Communications Technology (ICT) sector.

Accordingly, IEEE SA provides responses to a subset of the questions for consultation below.

#### *About IEEE SA*

*The IEEE Standards Association (IEEE SA) is a globally recognized standards-setting body within IEEE. We develop consensus standards through an open process that engages industry and brings together a broad stakeholder community. IEEE standards set specifications and best practices based on current scientific and technological knowledge. IEEE SA has a portfolio of over 1,500 active standards and over 650 standards under development. As a collaborative body, we liaise and coordinate with many standards organizations from around the world, including international, regional, and national standards bodies, as well as with industry organizations.*

#### *About IEEE*

*IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE and its members inspire a global community to innovate for a better tomorrow through highly-cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted “voice” for engineering, computing, and technology information around the globe.*



**Q8 Whether risks and concerns such as privacy, security, bias, unethical use of AI etc. are restricting or likely to restrict the adoption of AI? List out all such risks and concerns associated with the adoption of AI. Please justify your response with rationale and suitable examples, if any.**

AI is dependent entirely on the governance structure, accountability mechanisms, and algorithms used for data collection, organization, and transfer. As the technological world ventures further towards automation, AI will need to adopt an ethical framework of data management to mitigate the concerns noted (e.g., security, privacy, unethical use). Responsible use and practice of AI systems is a counterpart to AI system trustworthiness. AI systems are not inherently bad or risky, and it is often the contextual environment that determines whether or not negative impact will occur.

The full benefit of AI technologies will be attained only if they are aligned with society's defined values and ethical principles. Risks related to privacy, security, bias, and unethical use of AI impact can impact the adoption of AI, and they fall under a broader umbrella of trustworthiness of AI and Autonomous and Intelligent Systems (AIS). For AI/AIS to be trustworthy it must reflect characteristics of accuracy, explainability, interpretability, reliability, safety, and resilience, and should prioritize values of the technologies' users.

A practical example of an approach to address this is represented in IEEE 7000, Standard Model Process for Addressing Ethical Concerns During System Design, which integrates ethical and functional requirements to mitigate risk and increase innovation in systems engineering design and development. Avoiding risk is a key concern for any organization but focusing solely on physical harms won't provide a full picture of an end user's experience of what is built. Artificial Intelligence Systems (AIS) driving many products and services today are driven by algorithms invisible to users that still deeply affect their data, identity, and values. Despite the best intentions of a manufacturer, without having a methodology to analyze and test how an end user interprets a product, service or system, a design process will prioritize the values of its creators. Responsible Innovation in the algorithmic era requires a values-oriented methodology that complements traditional systems engineering.

**Q9 What measures are suggested to be taken to address the risks and concerns listed in response to Q.8? Which are the areas where regulatory interventions may help to address these risks and concerns? Please justify your response with rationale and suitable examples, if any.**

There is a growing focus on risk-based management approaches and frameworks by various bodies, including the Organization for Economic Cooperation and Development (OECD)<sup>1</sup>, the US National Institute of Science and Technology, via its AI Risk Management Framework<sup>2</sup>, and addressed in the

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<sup>1</sup> <https://www.oecd.org/digital/artificial-intelligence/>

<sup>2</sup> <https://www.nist.gov/itl/ai-risk-management-framework/ai-rmf-development>



pending EU AI Act<sup>3</sup>, to name a few, with the intent to help better manage risks to individuals, organizations, and society associated with AI. Going hand-in-hand with such frameworks, as well as regulatory interventions, is the role of international technical and socio-technical standards and certification programs.

IEEE, through its groundbreaking work around *Ethically Aligned Design*<sup>4</sup> and through a collection of standardization projects and certification schemes is at the forefront of the efforts to help manage risks and benefits of AI or Autonomous Intelligent Systems. In addition, we work very closely with the key political actors to help close the gap between what develops in form of legislation and regulation and the self-regulation efforts by industry, in the form of voluntary standards produced in and through our open and transparent consensus-building platforms.

IEEE SA has a portfolio of standards that address socio- and technical challenges and issues that promote innovation, foster interoperability and honor human values. IEEE global standards cover identifying and mitigating algorithmic bias, for documenting and protecting users' interests in personal data, for evaluating reliability of online messaging, for protecting children's personal information online, for assuring the safety of autonomous and intelligent systems, and other relevant areas. These include:

[IEEE 7000-2021, Standard Model Process for Addressing Ethical Concerns during System Design](#), which provides processes for engineers to translate stakeholder values and ethical considerations into system requirements and design practices.

[IEEE P2817™ - Guide for Verification of Autonomous Systems](#), which identifies existing best practices and provides instruction sets that define valid verification processes for a range of autonomous system configurations. These best practices apply from the lowest level components and software to the highest-level learning or decision making elements (specifically including verification of the inputs to any learning algorithms, such as training data).

[IEEE P2840™ - Standard for Responsible AI Licensing](#), which describes specifications for the factors that shall be considered in the development of a Responsible Artificial Intelligence (AI) license. Possible elements in the specification include (but are not limited to): (1) What a 'Responsible AI License' means and what its aims are (2) Standardized definitions for referring to components, features and other such elements of AI software, source code and services (3) Standardized reference to geography specific AI/Technology specific legislation and laws (such as the EU General Data Protection Regulation – GDPR) as well as identification of violation detection, penalties, and legal remedies. (4) The specification lists domain specific considerations that may be applied in developing a responsible AI license.

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<sup>3</sup> <https://artificialintelligenceact.eu/>

<sup>4</sup> <https://ethicsinaction.ieee.org/#series>



IEEE P2863™ - Recommended Practice for Organizational Governance of Artificial Intelligence, which specifies governance criteria such as safety, transparency, accountability, responsibility and minimizing bias, and process steps for effective implementation, performance auditing, training and compliance in the development or use of artificial intelligence within organizations.

IEEE P2894™ - Guide for an Architectural Framework for Explainable P3119™ - Standard for the Procurement of Artificial Intelligence and Automated Decision Systems, which establishes a uniform set of definitions and a process model for the procurement of Artificial Intelligence (AI) and Automated Decision Systems (ADS) by which government entities can address socio-technical and responsible innovation considerations to serve the public interest.

To learn more about the comprehensive portfolio of IEEE standards in these topical areas, please see: <https://standards.ieee.org/initiatives/artificial-intelligence-systems/standards/>

AI is now pervasively used in technologies that surround us and that influence every aspect of our daily routines, with impacts that go beyond technical concerns and center around ethical dimensions of AI experiences. More is needed to secure against the risks created by the unintended consequences of AI optimizations, which are often amplified by the automation and efficiency gain brought in by the AI. Unethical unintended consequences of those solutions are not always readily apparent, yet they can be prevalent and impactful on society. Factoring ethics in AIS will help protect, differentiate, and grow product adoption.

While capabilities for technical development and deployments of AIS are widely available, the same level of capabilities are not readily formalized for AI Ethics. The possible lack of a clear AI Ethics focused value proposition, and the lack of a contextual model and guidance on what constitutes an ethical solution impede an organization's efforts to integrate AI Ethics into its development. Even when ethical criteria are obvious or well defined, the translation of such high-level values into actionable evaluation criteria is not straightforward. The thoroughness of the exercise is dependent on internal practices and personal competencies of the individuals involved. Further, such AI Ethics practices vary, limiting their re-usability outside of the organization and possibly the option for independent verification. AI Ethics is a nascent discipline. Most organizations and product development teams are either unaware of or unclear on how to reach out to AI Ethics professionals for help in their solution development. This is where certification schemes or programs have a role and can assist with addressing risks and concerns, thereby helping to increase confidence in the technologies and related products and services.

IEEE CertifAIEd(™), a certification program for assessing ethics of AIS, offers such criteria and methodology for the assessment and certification of an AIS against ethical risks. It focuses on four dimensions:

- Privacy: Aimed at respecting the private sphere of life and public identity of an individual, group, or community, upholding dignity



- Algorithmic Bias: Criteria relate to the prevention of systematic errors and repeatable undesirable behaviors that create unfair outcomes
- Transparency: Relate to values embedded in a system design, and the openness and disclosure of choices made for development and operation
- Accountability: Recognize that the system/service autonomy and learning capacities are the results of algorithms and computational processes designed by humans and organizations that remain responsible for their outcomes

Through certification guidance, assessment and independent verification, IEEE CertifAIEd offers the ability to scale responsible innovation implementations, thereby helping to increase the quality of AIS, the associated trust with key stakeholders, and realizing associated benefits.

**Q10 What measures do you suggest to instill trust and confidence regarding a robust and safe AI system among customers, TSPs and other related entities/stakeholders? Whether adopting general principles such as Responsible AI and ethical principles at the time of designing and operationalising the AI models will help in developing ethical solutions and instilling trust and confidence in the users? What may be such principles and who should formulate these and how compliance can be ensured? Please justify your response with rationale and suitable examples, if any.**

To help instill trust and confidence regarding robust and safe AI systems, there is the need to ensure that AIS are deployed responsibly, and developers and operators of AIS are aware of consensus-based global best technical practices, standards, and conformity assessment and certification schemes that recognize and align with end-users; and citizens; values when building and deploying AIS. This encompasses:

- The development of technological communities, the development and dissemination of research and development products, the promulgation of technical best practices, the development of educational programs and the development of technical standards and conformity assessment programs that can extend the capacity of AIS developers and operators to deploy the benefits of such systems in a manner that respects and acknowledges the obligation to hold accountable these systems in their human, social and environmental context.
- Efforts that encourage and facilitate a global, inclusive, and informed dialogue between technological communities, policy makers, regulators, legal professionals, ethicists, philosophers, economists, community representatives, end users and other interested parties regarding best practices for the ethically aligned design of AIS.

**Q35 Whether establishing a system for accreditation of AI products and solutions will help buyers to purchase such solutions or products? If yes, what should be the process of accreditation and who**



**should be authorized or assigned with the task of accrediting such products or solutions? Please justify your response with rationale and suitable examples, if any.**

A system of accreditation of AI products and solutions will require certification schemes and programs based on specifications addressing contextual/ethical aspects of AIS. This is crucial to protect, differentiate and grow product adoption. Such programs will need to provide pathways to scale trustworthy AI implementation by empowering:

- Capacity Building Initiatives: Training institutions to achieve level of personnel credentialing
- Certification Test Labs: Can offer ethical AI systems certifications utilizing expert-based criteria
- Assessment: Assessment bodies can offer AIE client evaluations and increase their own internal expertise

IEEE CertifAIEd offers such an ecosystem with a process that consists of three core phases: (1) an exploratory profiling phase where the AIS ethical scope, complexity, and impact are clearly defined and agreed upon between the parties; (2) an assessment phase during which the organization's AIS is evaluated against the identified criteria and evidence requirements provided; and (3) an independent certification phase, resulting in the issuance of a CertifAIEd mark, attesting to the AIS's conformance to ethical criteria.