

Comments of Intel Corporation on “Consultation Paper on Leveraging Artificial Intelligence and Big Data in the Telecommunication Sector”

Intel Corporation (Intel) appreciates the opportunity to submit comments to the Telecom Regulatory Authority of India (TRAI) on the “Consultation Paper on Leveraging Artificial Intelligence and Big Data in Telecommunication Sector”. Intel provides responses to a subset of the questions for consultation below.

Intel is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore’s Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers’ greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform business and society for the better. Founded in 1968, Intel is a leading global semiconductor supplier; its processors, memory, storage, and other products power much of the world’s computing capability, including Artificial Intelligence (AI) applications that use machine learning and deep learning techniques as well as telecommunication network infrastructure.

Issues for Consultation

Q1. What may be the most appropriate definition of Artificial Intelligence (AI)? What are the broad requirements to develop and deploy AI models in a telecom sector? Whether any major challenges are faced by the telecom service providers in adopting AI? Please justify your response with rationale and global practices, if any.

The topic of how to appropriately define Artificial Intelligence has been the subject of lengthy deliberations. For example, the OECD provides the following explanation:

An AI system is a machine-based system that is capable of influencing the environment by producing an output (predictions, recommendations or decisions) for a given set of objectives. It uses machine and/or human-based data and inputs to (i) perceive real and/or virtual environments; (ii) abstract these perceptions into models through analysis in an automated

manner (e.g., with machine learning), or manually; and (iii) use model inference to formulate options for outcomes. AI systems are designed to operate with varying levels of autonomy.¹

ISO/IEC 22989:2022 defines an AI system as an

engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives

Note 1 to entry: The engineered system can use various techniques and approaches related to artificial intelligence (3.1.3) to develop a model (3.1.23) to represent data, knowledge (3.1.21), processes, etc. which can be used to conduct tasks (3.1.35).

Note 2 to entry: AI systems are designed to operate with varying levels of automation (3.1.7).²

Although these types of definitions can be useful in terms of trying to factually explain how an AI system functions or the capabilities of an AI system, defining AI in terms of regulations is more challenging. For example, proposed regulatory language may be too broad resulting in including a wider swath of technologies than intended to be regulated. This could lead to a new approach in terms of thinking about the definition of AI in the context of regulations. For example, the UK, in their recent policy paper on “Establishing a pro-innovation approach to regulating AI” stated the following:³

Our preferred approach therefore is to set out the core characteristics of AI to inform the scope of the AI regulatory framework but allow regulators to set out and evolve more detailed definitions of AI according to their specific domains or sectors. This is in line with the government’s view that we should regulate the use of AI rather than the technology itself - and a detailed universally applicable definition is therefore not needed. Rather, by setting out these core characteristics, developers and users can have greater certainty about scope and the nature of UK regulatory concerns while still enabling flexibility - recognising that AI may take forms we cannot easily define today - while still supporting coordination and coherence.

The reasoning is that instead of regulating a technology (set by a definition) the focus should be on its use.

¹ <https://oecd.ai/en/ai-principles>

² <https://www.iso.org/obp/ui/#iso:std:iso-iec:22989:ed-1:v1:en>

³ <https://www.gov.uk/government/publications/establishing-a-pro-innovation-approach-to-regulating-ai/establishing-a-pro-innovation-approach-to-regulating-ai-policy-statement>

Q3. Whether deployment of 5G and beyond technologies will help to accelerate adoption of AI in all the sectors and vice versa? Please justify your response with suitable illustrations including global practices, if any.

The deployment of 5G and beyond technologies (as well as other technologies) is expected to accelerate digitalization, create massive connections by machine type communications, and generate huge amount of data. These developments can facilitate the adoption of AI in various sectors.

Q4. Do you think that a number of terminologies such as Trustworthy AI, Responsible AI, Explainable AI etc. have evolved to describe various aspects of AI but they overlap and do not have any standardised meanings? If yes, whether there is a need to define or harmonise these terms? Please justify your response with rationale and global practices, if any.

Explainable AI is usually referred as one of the key characteristics of Trustworthy AI⁴. The terms Trustworthy AI and Responsible AI are often used interchangeably, albeit Responsible AI tends to denote “how” an organization or government are set to develop and deploy Trustworthy AI.⁵ This terminology has been well-disseminated by now. It is unlikely to warrant the development new workstreams to define or harmonize these terms. For example, as described above, the UK is now focusing on use cases rather than definitions.

Q.8. 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.

Governments are now considering how to balance these risks and concerns listed in the question with the benefits from AI innovation and deployment in setting principles and safeguards for the responsible stewardship of trustworthy AI. The OECD’s “Artificial Intelligence in

⁴ See for example:

https://www.nist.gov/system/files/documents/2022/08/18/AI_RMF_2nd_draft.pdf

<https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai>

<https://oecd.ai/en/ai-principles>

⁵ <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449>

Society”⁶ provides more information about the benefits of AI as well as a summary of challenges related to human values, fairness, human determination, privacy, safety and accountability, among others.

Q.9. 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.

As AI may be used in many different use cases and settings with varying degrees of risk, regulators may consider how to select policy measures that are context specific and risk and principles-based, as well as ways to reduce compliance burden to necessary measures, and how to leverage internationally accepted standards. This approach focuses on high-risk applications, while balancing the risks and benefits of a given AI application with appropriate oversight. Overly complex and onerous oversight could impede countries from reaping AI’s economic and societal benefits.

As AI is a complex and evolving topic, the following considerations may be beneficial to take into account: i) risk-based accountability approaches combined with flexible regulatory guidelines allow organisations to adopt the most appropriate processes and policies and allocate resources accordingly; ii) the ongoing voluntary standardisation work developed by international standardisation organisations (e.g. ISO/IEC JTC 1/SC 42 AI) will have increasing relevance in meeting regulatory objectives and iii) leveraging technologies like data anonymization, federated learning, and blockchain can reduce privacy concerns.

Q.10. 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

⁶ https://www.oecd-ilibrary.org/science-and-technology/artificial-intelligence-in-society_969ff07f-en

suitable examples, if any.

By mapping cross-sector value-based principles⁷ to specific sectoral contexts, policymakers can identify the high-risk use cases of AI for which there are regulatory gaps in oversight. The development and deployment of responsible AI systems to meet these value-based principles can be guided through references to international standards (e.g., ISO/IEC JTC 1/SC 42 AI).

Q.11 Whether there is a need of telecom/ICT sector specific or a common authority or a body or an institution to check and ensure compliance of national level and sector specific requirements for AI? If yes, what should be the composition, roles and responsibilities of such authority or body or institution? Please justify your response with rationale and suitable examples or best practices, if any.

AI is a horizontal technology which can be integrated within many vertical industries, with different use cases and in various settings. As such, there is no “one-size fits all” approach to regulate all AI applications. Before setting any specific or common authority to regulate AI applications, it is suggested that policymakers consider whether an existing authority or body or institution already has the responsibility of regulatory oversight for that sector as well as the capability and capacity to consider the introduction of AI within that sector. Otherwise, there might be overlapping responsibilities among different authorities which may add confusion and/or complexity in terms of compliance. The first step is to fully analyze and utilize existing legal frameworks or laws in each sector, amending if appropriate, in recognition of new AI applications.

Q.15 Whether there is a gap between requirement and availability of skilled AI workforce? If so, what measures are required to be taken to ensure availability of adequate skilled workforce in AI domain? Please respond along with suggestions with supporting details and best practices.

We are witnessing increased digitalization worldwide. The digital economy is contributing to more than 15% of world GDP, growing at two and a half times faster than the physical world GDP, as per World Bank. Hence, more widespread digital readiness

⁷ <https://oecd.ai/en/ai-principles>

skills, especially for emerging technologies like Artificial Intelligence, becomes more critical for countries, their societies, and their industries.

Intel's purpose is to 'create technology that improves the life of every person on the planet. Making technology inclusive and expanding digital readiness' is a key component of Intel's RISE 2030 goals and critical to the company's corporate purpose and growth. Intel has rolled out the Intel® Digital Readiness Program globally in partnership with government, academia, civil society, and industry stakeholders. This shared value and shared responsibility program portfolio aim to demystify and democratize tech superpowers like AI for broader diverse and non-technical audiences, irrespective of their location, gender, and ethnicity.

Intel is committed to expanding digital readiness by partnering with 30 country governments and 30,000 institutions worldwide to empower more than 30 million people with AI skills for current and future jobs by 2030. Intel has partnered with 26 country governments with more than 50 public-private partnerships, enabled 22000 institutions, and trained more than 3 million people as of August 22.

In India, Intel's "AI for Youth" program is available in 22k approximately 22,000 CBSE schools, and while our "Responsible AI for Youth" program is available in all government schools to empower youth on AI technology and social skills in inclusive ways. We also introduced "AI for Citizens" in partnership with the government of India to foster public awareness of AI with the goal of reaching 10 million citizens. Intel is also partnering with government & industry partners like Dell and Acer to bring AI workforce readiness programs to broader schools and colleges. In addition, Intel also partners with NeGD on "Digital Dialogues" to educate government leaders on AI. Intel is committed to demystifying and democratizing AI skills in India and has already trained more than 2 million people. Intel encourages local government and academia to form more public-private partnerships to build AI ready nation.

Q.19 (a) Which are the currently used privacy enhancing and privacy preserving technologies facilitating adoption of AI and BD? Are there any challenges in using these technologies? How these challenges can be addressed? (b) Which are the potential technologies likely to be available in near future to further strengthen

privacy? Please justify your response with rationale and suitable examples, if any.

The amount of data collected, processed, and inferred is increasing. Strong encryption, de-identification, and security techniques serve the purpose of protecting individuals' privacy and the secure handling of data. Privacy-enhancing and security techniques can mitigate data -related risks at design and at runtime (e.g., in the context of AI systems, through trusted execution environments, homomorphic encryption, federated machine learning). The widespread promotion and utilisation of these technologies could contribute to the security and resilience of the data ecosystem of India.

Q.28 Whether experiments are required to be backed by regulatory provisions such as regulatory sandbox to protect experimenters from any violation of existing regulations? Whether participation of government entities or authorities during experimentation will help them to learn and identify changes required in the existing regulations or introducing new regulations? Please justify your response with rationale and suitable examples, if any.

Regulatory sandboxes can be useful constructs which provide companies with opportunities to test their AI systems in a controlled environment, while allowing regulators to better understand the technology and the adequacy of the regulatory framework.