DG/COAI/2022/346
November 07, 2022

Shri Anand Kumar Singh
Advisor (QoS),
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi - 110002

Subject: COAI response to the TRAI CP on "Leveraging Artificial Intelligence and Big Data in Telecommunication Sector"

Dear Sir,

This is with reference to the TRAI Consultation Paper on "Leveraging Artificial Intelligence and Big Data in Telecommunication Sector" issued on 05th Aug 2022.

In this regard, please find enclosed COAI response to the Consultation Paper.

We hope that our submission will merit your kind consideration and support.

Thanking you

Regards,

Lt. Gen Dr. SP Kochhar
Director General

Copy to:

1. Shri V. Raghunandan, Secretary, TRAI, Mahanagar Door Sanchar Bhawan, Jawaharlal Nehru Marg, New Delhi – 110002.

2. Shri Mahendra Srivastava, Pr Advisor (QoS), TRAI, Mahanagar Door Sanchar Bhawan, Jawaharlal Nehru Marg, New Delhi – 110002.

COAI Response on Consultation Paper on Leveraging Artificial Intelligence and Big Data in Telecommunication Sector

We thank the Authority for providing us the opportunity to share the response to this consultation paper on Leveraging Artificial Intelligence and Big Data in Telecommunication sector.

Terms such as artificial intelligence (AI) and big data have come up to describe the explosion of data that has taken place along with the new technologies that have evolved and have helped in sorting through this data and deriving value from combining and analyzing large data sets.

However, the concept of AI and Big Data and its use across various sectors of economies, including Telecommunications, is still at a very nascent stage. It is important to be mindful of the fact that AI is not a telecom service or a connectivity solution, rather a wider ICT technology that is emerging as an IT capability that can be customized over a period of time to solve a lot of today's problems.

Given that its exploration and use is still at a nascent stage and will be very much driven by how the wider IT and computing capabilities of organizations develop, any specific regulatory intervention/ mandate / regulation around its deployment in telecom networks or services will constrain not only its development but the adoption of it as well.

We are of the considered view that the regulator should leave the emergence, deployment and adoption of AI and Big Data in the telecom sector to the market players for now, as each player will have a different set of techno-commercial considerations and solutions to look at based on their own networks and service needs.

In any case, Telcos have always been at the forefront of bringing such innovations not just as external service offerings, but also to optimize their own network and service operations. It goes without saying that it is in the Telcos' best interest to continue to bring more efficiency within their network operations and performances, to drive costs optimization, increase customer satisfaction and generate better efficiencies.

We submit and stress that before we frame any regulation related to AI and BD in the country, it is imperative that a comprehensive PDP Bill and NPD Governance Framework is put in place to strike balance between harnessing potential of AI & BD and protecting interest of a data principal. Accordingly, we request and suggest the Authority should also allow for formulation of PDP Bill and NPD framework before coming out with any recommendation on leveraging AI and Big Data in Telecommunication sector.

It is important that AI policy and regulatory framework should promote reliable, robust, and responsible AI applications, which will contribute to public trust in AI. Given the early stage of AI technology maturity and deployment into products and services for consumers, our view is that it is premature to prescribe or enact legislation, which could stifle innovation.

Although it is important that AI policy and regulatory framework should promote reliable, robust, and responsible AI applications, which will contribute to public trust in AI. In due course it should be followed by a framework guided by Principles through formation of a Multi Stakeholder Body.

It is with this background in mind that we provide our response to questions raised by the TRAI in the paper.

Q.1. 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.

COAI Response:

1. The Authority has rightly acknowledged in this consultation that till date there is no one-specific globally accepted definition of AI. Globally, solution providers and organizations categorize AI applications based on their capabilities and functionalities. Therefore, it is probably best at this point to leave this definition to the market forces since there are still various moving factors that have to be taken into consideration.

2. While there is a potential of large-scale adoption of AI in a variety of sectors, the adoption of AI is still in very initial stages in India. Thus, the ecosystem is still going through an evolution phase.

3. There are definitions of AI given by ETSI, ISO/IEC 2382-28 and NITI Aayog. All these an attempt to define the same technology in different ways. However, since the technology is still evolving, it may not be possible to have one appropriate definition of AI. As the technology evolves appropriate definition of AI will emerge with time.

4. In the telecom industry, there are a number of networks related and customer-focused problems. In order to create and implement AI models in the telecom industry, it is necessary to analyze and make the various solutions available for each of them. AI can be deployed to resolve some of the following challenges faced by the Telecom sector:

   a. Data Privacy & Security norms act as major road blocks in efficient rollout of use cases & hence, require review. We believe that development and enactment of a comprehensive Personal Data Protection Bill and a Non-Personal Data Protection Framework can resolve personal data related concerns and hence same should be taken up on priority by the Government.

   b. Data Volumetric running into Petabytes, speed, scale, variety of data, data quality, retention period, regulatory norms for data storage & data monetization opportunities need to be looked into.

Q.2. Whether the big data in the telecom sector may be utilized for developing AI models? For efficient and effective handling of big data, whether there is a need for adoption of special programming models or software frameworks? Please justify your response with suitable examples and global practices, if any.

COAI Response:

1. With the transition to 5G and IoT, the amount of data generated by telecom networks each day is expected to rise even further. Big data can be used to enhance operational efficiency of the TSPs.

2. However, it is pertinent to note here that sharing of data available with TSPs is governed by licensing framework and TSPs may not be able to share subscriber data or any other data with other sectors.

3. Further, adoption of special programming models or software frameworks should be left to TSPs, and they may do so based on customer needs and market forces.

4. We would like to urge that caution be exercised by defining or prescribing any specific AI models, platforms etc., as it may limit and constrain the adoption of AI or indeed its natural development. It also depends on the end objective/outcome being targeted or the business goal being envisioned to be achieved.

5. We believe that it is imperative to develop a suitable regulatory framework for promoting Responsible AI in the country. Hence efforts should be undertaken to develop the required ecosystem which allows secure data handling and sharing between entities while protecting the interest of data principal. Given the lack of the required ecosystem, we stress that no regulatory mandate should be prescribed for TSPs to share the data with a third party, which can harm the interest of the users.

Q.3. 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.

COAI Response:

1. Other sectors, apart from Telecom in India, may foresee revenue uptick from AI use cases in marketing and sales, product and service development and supply-chain management, etc. This revenue growth would be possible due to the sales and demand forecasting, spend analytics of the customers, prediction of consumer behavior and similar other data analysis and deployment of AI tools.

2. However, as the 5G commercial launch is at a very initial stage, it is difficult to comment on what it might bring. We have seen in the past that any new technology brings with it different usages which are often times difficult to predict. We would therefore want to

see how individual users and organisations use 5G and how enterprises think of using 5G to create new use cases before commenting.

Q.4. 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 standardized meanings? If yes, whether there is a need to define or harmonize these terms? Please justify your response with rationale and global practices, if any.

COAI Response:

1. The terminologies such as Trustworthy AI, Responsible AI, Explainable AI etc., should be looked for the whole AI ecosystem in the country and not limited to telecom sector. NITI Aayog released 'Working Document towards Responsible #AIforAll' ('**Working Document**') in July 2020 *(chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.niti.gov.in/sites/default/files/2020-11/Towards_Responsible_AIforAll_Part1.pdf)*. This Working Document invited comments from stakeholders on principles which should drive the regulatory approach for development of Responsible AI environment in the country. We suggest that Principles for evolution of Responsible AI should be developed as a unified approach by all relevant departments.

2. There is a need to balance ethical considerations of AI with need for innovation. This can be achieved through evolution of a 'Responsible AI', as defined in the Working Document, which can contribute to achieving a fair society, by helping to increase citizens' well-being in ways that foster equality in the distribution of economic, social and political opportunity.

Q.5. Which are the applications of AI and BD already being used by the TSPs in their networks to improve Quality of Service, Traffic Management, Spectrum Management and for Security purposes? Please list out all such applications along with the level of maturity of such applications. Please specify whether they are at trial stage or pilot stage or have reached the deployment stage? Details should include type of AI models, methods to access data, and procedures to ensure quality of data.

COAI Response:

1. TRAI in its consultation paper has stated that TSPs in India are deploying AI in various areas of their operations.

2. As 5G is rolled out and technology evolves, we believe that the TSPs will further scale up deployment of AI to enhance network operations, efficiency, and customer experience.

3. The use of AI and BD within TSP networks is driven more by our zeal to find innovative methods and approaches that will help bring internal efficiency and optimization within TSPs' networks and services, than as a product solution to market.

4. Also, the deployment of AI/BD is still so nascent that there is no risk of any market failure, which may invite regulatory intervention.

Q.6. What are the major challenges faced by the telecom industry, including policy and regulatory, in developing, deploying, and scaling applications of AI listed in the response to Q.5? How can such challenges be overcome? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. Absence of Data Protection Bill is a major challenge towards adoption of AI. The Data Protection Bill will lay down how the data is to be utilised, restrictions on the use of personal data without consent of citizens, propose a framework that would regulate cross-border transfer of data, and accountability of data fiduciaries handling such data, removal of personal data among other things.

2. Beyond a comprehensive PDP Bill, there will be a need to develop a Non-Personal Data (NPD) governance framework and form an AI Oversight Advisory Body which lays guidelines for a Responsible AI.

3. We understand that the Government of India proposes to come out with a new Data Protection Bill and a Digital India Bill. These bills should provide the required legal framework and clarity for compliance and adoption of AI in India.

4. Although AI is growing at a rapid rate, it is still in the process of evolving and therefore there are challenges to implementing it because of limited AI expertise and knowledge, access to quality data, and AI specific infrastructure.

5. AI is still at an evolving stage and it is important to let organizations use it freely to get relevant business outcomes. As with any new technology, challenges about explain ability, skill set, accuracy and so on will arise, this should be addressed in due course of time through a principle based framework.

6. However, AI's prospects will get restricted if developers may only use data for pre-defined purposes, which will stifle innovation at this evolving stage of AI across various sectors.

Q.7. In which areas of other sectors including broadcasting, existing and future capabilities of the telecom networks can be used to leverage AI and BD? Please justify your response with rationale and suitable examples if any.

COAI Response:

1. Media companies face a herculean task of categorizing the countless pieces of content that are produced every minute and making them simple for viewers to search for. This is due to the fact that the process involves watching videos, identifying specific locations, scenes, or objects within them, and then classifying and adding tags. AI may be used to examine the contents of videos, objects, images, etc. in order to complete this task on a large scale. The objects and scenes in images that are specific to the needs of the business can be identified by AI tools. Metadata tagging is the name of this mechanism. This technology is being used by content creators or media publishing, hosting, and broadcasting platforms to organize their media assets in a highly structured and precise manner.

2. Further AI may be leveraged by media companies for providing customers with content that caters to their specific interests, thus offering them a highly personalized experience.

3. AI is also used by Broadcasting companies for subtitle generation in various multilingual videos.

4. AI has been playing a vital role in other sectors like healthcare, agriculture, education, smart cities and infrastructure, smart mobility, and transportation, etc. by improving accessibility, affordability, and quality.

5. There are certain areas wherein AI has the potential to add more value:

   a. Transforming Customer Experience
   b. Improving Business Decision-making and Processes
   c. Achieving Operational Excellence
   d. Detecting Fraud

6. Having said that, we reiterate that such applicability and solution development will have to be carried out by TSPs depending upon the level and quality of data they have, the IT systems and capabilities they have – which in many cases may be dependent on vendors supplying such systems, again a techno-commercial decision of the particular Telco involved – and hence, be left on the industry to try, evolve and adopt.

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.

COAI Response:

1. The telecom sector has been a champion in adopting new technologies and has been continuously upgrading its network. The sector has put robust systems in place and hence in telecom sector there will not be any issue with regard to Privacy and Security. The issue of biased data being used will also not arise in telecom sector.

2. In light of this, it is essential to comprehend the laws and regulations that are relevant depending on where, how, and in which industry AI is used. To protect privacy and security, one should abide by the applicable data protection law in the country or jurisdiction.

3. Regardless of where they are - at home, at work, or in public - AI can be used to recognise, track, and keep an eye on specific people across a variety of devices. This means that even if your personal information is anonymized once it is included in a large data set, an AI may be able de-anonymize this information using assumptions made by other devices. These issues may need to be taken care of in the proposed Data Protection Law.

4. An artificial intelligence (AI) model may replicate human bias in choosing that group if the data used to build the model is biased against that group. A number of factors, including the subjective decisions made when selecting, gathering, and processing the data, can cause data to be biased.

5. Another risk could be of data poisoning where the attackers may interfere with the training of an AI model through data injection, deletion, or manipulation, causing the model to pick up incorrect biases and failing to accomplish its intended task.

6. Another risk is using the wrong kind of algorithm(s) to solve a problem, using bad data, or selecting the wrong algorithm parameters. Model bias could cause an algorithm to overlook the important connection between data inputs (features) and desired outcomes (predictions).

7. As the Authority has also highlighted in this consultation paper, there is no one cure-all for the broad spectrum of risks associated with AI and organisations must apply an informed risk-prioritisation plan as the initial step in an effective, dynamically updated AI risk-management approach anchored in both legal guidance and technical best practices.

8. Considering the same, we believe that any new technology will bring such challenges with itself. However, it is not the technology itself which creates the risks but rather the outcome for which the technology is being used.

9. We, therefore, don't believe that the risks are specific to AI – they are specific to any kind of data usage by any digital enterprise and that is an area that is already under governance.

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.
   &
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 operationalizing 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.

COAI Response:

1. TSPs have an exceptional track record in terms of trust and keeping customer data secure right through the history of the ICT industry. In fact, TSP licenses T&Cs have been so stringent at times that TSPs have struggled to innovate and compete with various non-regulated entities. Hence, it is more about awareness than instilling trust among TSP customers through any regulatory measures. Instead of regulating the AI **for now, the right thing to do might be to let the technology mature and drive ethics through outcome-based regulations/laws which are common to all digital enterprises.**

2. While the concerns highlighted by the Authority in the Consultation paper are well noted, it is important for the regulator to adopt a cautious approach when intervening with ex-ante regulations. Any regulations that fail to reflect market realities can throttle growth of the data economy in India.

3. For most organisations, AI is a way to better achieve the outcomes which they were anyway attempting to get to through traditional means – whether it be operational efficiency or improving customer experience and so on. Hence, the regulations should only intervene when there is a demonstrable market failure that has an impact on the consumers and that can clearly be attributed to AI/BD biases. It should not impose blanket restrictions on ways of implementing algorithms, which clearly is a domain internal to a user (e.g., a TSP).

4. Since the risks and rewards of AI deployment though evolving and gaining traction are still at a nascent level, it is too early to deliberate or prescribe measures in this regard. We reiterate that AI/BD adoption should be left to the market to be developed, especially since a lot of such aspects will likely automatically get addressed once India gets a data protection law.

5. Additionally,

    a. NITI Aayog has published principles of responsible AI in "*Approach Document for India Part 1 – Principles for Responsible AI*" and in this paper NITI Aayog has

suggested various principles for adoption of AI systems. These principles are as follows:

(i) **Principle of Safety and Reliability**: AI should be deployed reliably as intended and sufficient safeguards

(ii) **Principle of Equality:** AI systems must treat individuals under same circumstances relevant to the decision equally.

(iii) **Principle of Inclusivity and Non-discrimination:** AI systems should not deny opportunity to a qualified person on the basis of their identity.

(iv) **Principle of Privacy and Security:** AI should maintain privacy and security of data of individuals or entities that is used for training the system. Access should be provided only to those authorized with sufficient safeguards.

(v) **Principle of Transparency:** The design and functioning of the AI system should be recorded and made available for external scrutiny and audit.

(vi) **Principle of Accountability:** All stakeholders involved in the design, development and deployment of the AI system must be responsible for their actions.

(vii) **Principle of Equality:** AI systems must treat individuals under same circumstances relevant to the decision equally.

(viii) **Principle of protection and reinforcement of positive human values**: AI should promote positive human values and not disturb in any way social harmony in community relationships.

b. Further, as stated in response to Question 1 above, we submit that the adoption of AI is still in very initial stages in India and the ecosystem is still going through an evolution phase. Hence the principles listed above cannot be cast in stone and may require a review/ change as the technology adoption increases.

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.
 &
Q.12. In response to Q.11, if yes, under which present legal framework or law such authority or body or institution can be constituted and what kind of amendments will be required in the said law? Or whether a new law to handle AI and related technologies is a better option? Please justify your response with rationale and suitable examples or best practices, if any.

COAI response:

1. Most importantly, we first reiterate that the adoption of AI is still in very initial stages in India and the ecosystem is still evolving. Hence NO compliance requirement should be proposed on the industry.

2. We do not believe that any existing or new authority/body/institution is needed, or any regulatory intervention is needed to prescribe compliance w.r.t AI and related aspects specifically in the Telecom sector. AI is still evolving; is an IT-driven capability that is more capable of helping optimise and bring efficiencies within a telecom network or service than any standalone parameter that enables a telecom service. Therefore, we believe, that there should not be any sectoral specific regulatory / legal interventions in this regard.

3. Further, as and when an overarching national legislative framework encompassing all user sectors and the economy is finally developed, and when the principles and parameters of AI are finally defined, it may then be an appropriate time to review sector developments and assess whether a proportionate and appropriate intervention is apposite, in view of evidence at that time.

4. However, at a later stage, at a national overarching level, a cross sectoral multi-stakeholder body cutting across various sectors, and thus having representation from all sectors of the economy, should be set-up to further develop and refine the guidelines/ principles for adoption of AI in India.

5. At the cost of repetition, we emphasize that all sectors of the economy should be a part of this cross sectoral multi-stakeholder body and the same should not be limited to IT and Telecom.

Q.13. Whether telecom/ICT industry is facing constraints such as access to data, lack of computing infrastructure, lack of standards, and R&D in the adoption of AI and BD technologies? Please list out all such constraints with adequate details.

COAI Response:

1. No, we do not believe that we are facing any constraints at this point in time in terms of adopting the AI and BD technologies.

2. With the evolving techniques in AI/BD, the compute and storage industry is also growing. This is helping in terms of taking advantage of enhanced compute requirements. TSPs are already deploying such new generation hardware and at present there are no constraints.

3. Although we reiterate that in absence of any comprehensive regulation allowing the data fiduciaries to share such data for AI and BD in a secure environment, accessibility to telecom data will continue to remain a challenge for all the stakeholders. Hence

government should focus on enactment of PDP Bill, development of standards for data handling (collection, storage, and integrations etc.), data sharing, protection of data, privacy and ethical standards for adoption AI.

Q.14. What measures are required to make data and computing infrastructure available and accessible to developers and also to make data/AI models interoperable and compatible? Please respond along with examples, best practices and explanatory notes.

COAI Response:

1. No specific measures are required at present, and we believe the market should be allowed to evolve on its own here. Interoperability or compatibility standards will follow once major successes are found in different sectors, which currently are still evolving. At that time too, we believe that industry or academic bodies will be at a better place to define those than the regulatory interventions.

2. Having said that as submitted in previous response, at a later stage, a cross sectoral multi-stakeholder body, cutting across various sectors and thus having representation from all sectors of the economy, may be set-up to further develop and refine the guidelines/ principles for adoption of AI in India, at a national level; including wider cross-sectoral issues related to **interoperability and compatibility of Data/ AI Models**. Specifically, from a telecom operator standpoint, we do not see any bottleneck or constraint, hence no specific regulatory measure is needed at present.

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.

COAI Response:

1. Since the technology is evolving at a very fast pace there may be a gap between requirement and availability of skilled AI workforce.

2. To overcome this scenario, there should be professional courses that should be available at graduation and/or post-graduation level across universities to enable skilling for AI/BD technologies. Research and Development centres should be made available for data analysis and testing of the AI model. This would lead the country to the next level of deployment of AI models in different industrial sectors.

3. AI is getting used across the industry and new use cases are getting developed every day. There is explosion in terms of demand for a skilled workforce. With more and more AI/ML and BD courses being offered at undergraduate and postgraduate level by various universities, this demand is likely to be met. TSPs are also helping by training and building up their own teams to work in this area.

Q.16. What initiatives do you suggest to democratize data required to develop AI models in the telecom sector? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. We believe that the Government has been very pro-active in setting up the data portal (India.gov.in – national portal of India) and making it available. We believe that this can be opened up and evangelized further to get citizen data with the right governance.

Q.17. Whether the authority or body or institution as suggested in response to Q.11 may also be entrusted with the task to manage and oversee collection, cataloguing and storage of data? Whether such authority or body or institution need to be entrusted to generate and make available synthetic data? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. As stated in our response to Question 11 above, we submit that a cross sectoral multi-stakeholder body, cutting across various sectors, and thus having representation form all sectors of the economy, should be set-up at a later stage to further develop and refine the guidelines/ principles for adoption of AI in India, however only at a national level. No telecom specific mandate or regulation should be prescribed at this stage.

2. This cross sectoral multi-stakeholder body may also oversee collection, cataloguing and storage of data.

Q.18. Whether the legal framework as envisaged in para 3.5.3 and Q.12 should also enable and provide for digitalization, sharing and monetization for effective use of the data in AI without affecting privacy and security of the data? Please justify your response with rationale and suitable examples if any

COAI Response:

1. We understand that the Government of India proposes to come out with a new Data Protection Bill and a Digital India Bill. These bills may provide the required legal framework for compliance and adoption of AI in India, including a framework for digitalization, sharing and monetization of effective use of the data.

2. Furthermore, presently there is adequate regulatory oversight to ensure data privacy and data security of customer data for the licensed service providers. In India, TSPs are operating under a well-defined, robust, and stringent regulatory regime with regard to data privacy and security.

3. As an additional safeguard, to boost data monetization in the country, while preserving the privacy of the individual, all data monetization initiatives need to pay heed to issues

concerning intellectual property, logistical and technological delivery, security, and privacy.

4. At an overall basis, we believe that issues related to this question relate to a much wider aspect of Data Protection and Privacy, which the proposed DP Act/Bill will try to address, and no overlapping institutions/mechanisms should be created lest they add avoidable costs and complexities.

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.
&
Q.20. Whether the list of technologies provided in response to Q.19 are adequate to handle all the perceived risks and concerns in the AI domain? Or is there a need to develop new privacy preserving architecture? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. Data anonymization is a complex issue and needs wider consultation with all sectors of the economy including all the various government departments and ministries. Data anonymization cannot be adopted by telecom or IT sector alone. However, the guidelines governing Data anonymization have not yet been finalised by the Government and there is a complete lack of clarity with regard to these guidelines.

2. We understand that the Government of India proposes to come out with a new Data Protection Bill and a Digital India Bill and we hope that these Bills will address all pertinent issues including that of Data anonymization. These bills should provide the required legal framework and clarity for compliance and adoption of AI in India, including clarity on issues pertaining to security and privacy.

Q.21. Whether the next generation telecom network architectures such as AI at edge, federated learning, TinyML or their combination can offer solutions to meet both privacy as well as intelligence requirements? Please justify your response with rationale and suitable examples, if any.
&
Q.22. What type of technological advancements are happening for running the AI models on the end user devices to overcome constraints in respect of processor, memory, battery etc.? Whether special tools, programming languages, and skills are required to be developed to build such AI models? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. Once the new Data protection bill is put in place by the Government, which lays down various principles and guidelines, technologies such as AI at edge, federated learning, TinyML or their combination will be able to provide solutions which meet both privacy and security requirements as defined by the Bill.

2. We submit that that the next generation telecom network architectures such as AI at edge, federated learning, TinyML mentioned by the Authority for protecting privacy and giving enhanced experience are still at an evolving stage and we will have to wait to see if they can provide any additional capabilities to meet privacy and intelligence requirements.

3. No specific comment for Q22, However, we would like to reiterate that the aspects touched upon in the questions above relate to futuristic developments which may or may not take place, and where IT, computing developments or capabilities of the future would only be able to indicate what the future could hold, and not to any certainty.

Q.23. Considering availability of new privacy preserving architectures as suggested in response to Q.19 and Q.20, what is the likelihood of emergence of new business and operational models? Whether such models will raise issues related to ownership and responsibilities? What do you suggest to address these issues? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. We expect that the proposed new Data Protection Bill will help in crystallizing issues related to ownership and responsibilities which arise from new business and operational models.

2. We would like to reiterate that the aspects touched upon in the questions above relate to futuristic developments which may or may not take place, and where IT, computing developments or capabilities of the future would only be able to indicate what the future could hold, and not to any certainty. The same will progress gradually with the deployment of technology.

Q.24. Whether the concept of "Operator Platform" would help in providing AI based solutions in a unified and more equitable manner? Apart from popular federated use cases of edge cloud federation, Cloud XR, Cloud Gaming, whether this concept may also be applied for public service delivery and in making public policies that are data-driven? Whether there is a need to take initiatives for developing and demonstrating advantages of concept of "Operator Platform"? If so, what steps and measures are suggested to launch such initiatives? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. No specific comment, however, we would like to reiterate that the aspects touched upon in the questions above relate to futuristic developments which may or may not take place, and where IT, computing developments or capabilities of the future would only be able to indicate what the future could hold, and not to any certainty. The development and deployment of "Operator Platform" has to align with the market demand, use-cases, and commercial deliberations; it should not be driven through any compliance obligations.

Q.25. Whether there is a need to create AI-specific infrastructure for the purpose of startups and enterprises in the telecom sector to develop and run AI models in an optimized manner? Whether such an infrastructure should cover various real-world scenarios such as cloud AI, edge AI and on-device AI? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. We submit that AI specific Infrastructure already exists and will evolve further with adoption of 5G. Private cloud service providers such as AWS, MS Azure, GCP are already providing & augmenting excellent AI compatible infrastructure including devices today as well as upgrading it as per real-time use cases and scenarios.

2. We submit that TSPs are building their infrastructure to work on AI use cases. There is no need to create AI specific infrastructure or any specific guidance to develop and run AI models in an optimized manner further. As regards start-ups, they have the freedom and option to choose the available infrastructure from Web Scalars if they choose to work in this area and in any case all the entities in the wider digital ecosystem keep on collaborating with each other on mutual and commercial terms.

Q.26. Whether the emerging trends of development of foundational AI models such as GPT-3, Gopher etc. are leading to democratization of AI space by offering fine-tuned or derived AI models? Whether such a trend will also help in reducing costs for the AI developers? Whether similar approach will help in development of large-scale AI model for the telecom sector? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. Existing models may be used, and it may be best to train other models on them. However, the telecom sector and other sectors of the economy cannot be tied down to the existing models.

2. Models will evolve with time and driven by market forces and competition, new models which help in saving time and costs will emerge.

3. The use case defines a model to be chosen and it is up to the developer which model or set of models is most appropriate. We suggest that no prescriptive regulatory intervention should be applied in case of the development activity as this area is ever evolving.

Q.27. Whether there is a need to establish experimental campuses where start-ups, innovators, and researchers can develop or demonstrate technological capabilities, innovative business, and operational models? Whether participation of users at the time of design and development is also required for enhancing the chances of success of products or solutions? Whether such a setup will reduce the burden on developers and enable them to focus on their core competence areas? Please justify your response with rationale and suitable examples, if any.
&
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.
&
Q.29. In response to Q.27 and Q.28, whether establishing such a campus under government patronage will enable easy accessibility of public resources such as spectrum, numbering, and other resources to the researchers? Whether it would be in mutual interest of established private players as well as start-ups, innovators, and enterprises to participate in such experiments? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. This is a much wider area that should be dealt with at the level of a national AI policy/framework rather than a telecom-specific intervention. The AI is still evolving at an overarching level across industries, and there is no market failure specific to our industry.

2. Setting up of experimental campuses where start-ups, innovators, and researchers can develop or demonstrate technological capabilities will be a good initiative that will provide impetus to new and innovative products and solutions which leverage Big Data and AI.
3. Further, we believe that establishing such a campus under government patronage will enable easy accessibility of public resources such as spectrum, numbering, and other resources to the researchers.

4. We believe that Regulatory Sandbox will provide necessary environment to test and demonstrate the AI solutions for the industry. It will also protect developers during experimentation stage, from any probable violation of existing regulations. It would also be helpful for policy makers to review existing regulations and address such concerns

using alternative ways. Creation of Regulatory Sandbox will thus play a positive role in nurturing the entire ecosystem.

5. **At a much larger principle level, the adoption of a regulatory sandbox may help to achieve the goal of AI through experimentation.** It should be explored whether a regulatory sandbox can provide the means to demonstrate the strength of privacy-preserving techniques, since it could help in building trust over a period of time. However, any such idea should be independently discussed among the relevant stakeholders to assess the outcomes that the intervention would like to achieve, which in absence of intervention is not happening.

Q.30. Whether active participation in the international challenge programs such as ITU AI/ML 5G challenge will help India's telecom industry in adopting AI? Whether similar programs are also required to be launched at the national level? Whether such programs will help to curate problem statements or help in enabling, creating, training and deploying AI/ML models for Indian telecom networks? What steps or measures do you suggest to encourage active participation at international level and setting up of such programs at national level? Please justify your response with rationale and suitable examples, if any.
   &
Q.31. Whether AI/ML developers should launch bounty programs to establish trust in the public about robustness of measures taken by them to protect privacy in their products or solutions? Whether conduction of such programs will help companies or firms to improve their products or solutions? Whether such programs should be conducted under the supervision of the government, or an institution established/assigned for this purpose? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. MeitY introduced and implemented numerous programs to deploy rising technologies like Artificial Intelligence, Machine Learning, Blockchain, IoT, Robotics, and Big Data for the collective good of millions of Indians.

2. *"AI pe Charcha"* was yet another initiative of MeitY launched in 2021 which involved a series of panel discussions with leaders from the government as well as the industry from across the globe. During the events, the academicians and researchers shared their views and experiences on AI, breakthrough innovations, related case studies and practices as well as the challenges faced by AI.

3. Thus, we have various programs in India. In addition to the same participation in the international programs such as ITU AI/ML, 5G challenge will help the industry in adopting AI.

4. Since the implementation of AI will affect all economic sectors, even though the telecom sector can make a contribution, it cannot manage these programmes on its own. Along

with academic institutions, MeitY/DoT/TRAI should be in charge of these programmes, though it might be preferable to run them under the direction of the government or a specific institution.

Q.32. Whether the telecom industry is required to adopt a Machine Learning Operations (MLOps) environment to develop, train, validate and store ML models? Whether there is also a need to establish a DataOps feature store to help MLOps for training purposes? What standardisation is required in terms of interoperability and compatibility for MLOps to function in a federated manner? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. As the technology evolves and market matures, TSPs may adopt a Machine Learning Operations (MLOps) environment to develop, train, validate and store ML models on a need basis, determined by customer needs and market requirements.

2. Any technology specific mandate/intervention should not be prescribed. These developments should be left to market forces to adopt depending upon techno-commercial dynamics and outcomes an entity would like to achieve while using these approaches or not.

3. Further, these standards are very specific to developers and **no intervention is required in this regard.**

Q.33. Whether active participation in the international bootcamp programs such as MIT Bootcamps, Design Thinking Bootcamp by Stanford University etc. will help India's telecom industry workforce to find international developers' community, navigate challenges and learn from experiences of others? Whether similar programs are also required to be launched at the national level? What steps or measures do you suggest encouraging active participation at the international level and setting up of such programs at the national level? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. Academic institutes in India should organise various bootcamps which will help India's workforce from all sectors of the economy to interact with international developers' community, navigate challenges and learn from experiences of others.

2. Active participation from India in the various international bootcamp programs may also be encouraged as the same will help the industry workforce to gain knowledge and learn from experiences.

3. Active participation in these programs may be encouraged by creating awareness about these programs.

4. In any case, academia and professionals keen on upskilling themselves in these developments keep on participating in such global fora. There is no telecom sector specific mandate or intervention that is required here. However, the government at national level should keep on assessing such global developments and integrate them as part of national curricula as appropriate.

Q.34. Whether the courses or programs related to AI/ML currently being offered by various institutions and universities in India are adequate to meet the capacity and competence required to develop and deploy AI solutions or products in the telecom networks? If not, what additional steps or measures are suggested to fill the gap? Please justify your response with rationale and suitable examples, if any.

COAI Response:

1. As technology has evolved, various Universities in India have started offering programs in Data Analytics, AI/ML.

2. We understand that close coordination between academia and industry may ensure that courses offered by universities are up to date and are aligned with industry practices.

3. Please ref. answer to Q.33.

Q.35. 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.

COAI Response:

1. Since this technology is still evolving, we are of the view that there should NOT be any accreditation of AI products and solutions.

Q.36. Whether creating a framework to prepare a list of prequalified suppliers of AI products or solutions will help industry including government agencies to procure AI products or solutions? Whether there is a need to formulate a standard Code of Conduct or guidelines for AI related procurements? What should be the typical elements of such a Code of Conduct or guidelines including guidelines on trusted source and who should be tasked to formulate such a Code of Conduct or guidelines? Please justify your response with rationale and suitable examples, if any.
&

Q.37. Whether there is a need to prepare and publish a compendium of guidance, toolkits and use cases related to AI and BD, to foster adoption in the telecom sector? If yes, what should be the process to prepare such a compendium and who should be assigned this task? Please justify your response with rationale and global best practices, if any.

COAI Response:

1. Refer to our response to Q 35 and, in any case, a lot of these aspects will get addressed on their own as AI adoption evolves, gains scale. Even though the technology is at a nascent stage in the country, there is no issue of availability of qualified suppliers. Further, the use cases and deployments will vary on case to case basis and across sectors and will hugely depend on the business objective/target intended to be achieved through the same. Therefore, we do not foresee the need to prepare a list of prequalified suppliers of AI products or solutions or any need to formulate a standard Code of Conduct or guidelines for AI related procurements.

2. Compendium or manual of guidance, toolkits and use cases offered by AI & Big Data Analytics products & solutions will help the consumer to understand its features, configurations, perceived risks & threats etc. better and adopt with full awareness and trust. However, the same shall not be restricted to telecom sector since various organizations are involved in the research and development of AI systems and the adoption of the technology be fostered across all the applicable sectors.

Q.38. Whether there is a need to establish telecom industry-academia linkages specifically for AI and BD to accelerate the development and deployment of AI products and solutions? Whether there is a need to establish Centers of Excellence (CoEs) for this purpose or it can be achieved by enhancing the role of existing TCoE? Please justify your response with rationale and global best practices, if any.
  &
Q.39. Whether there is a need to establish telecom industry-academia linkages specifically for AI and BD for AI related skill development? Please give the suggestions for strengthening the industry-academia linkages for identification of the skill development courses. Please justify your response with rationale and global best practices, if any.

COAI Response:

1. The industry and academia already work closely together since TSPs require skilled manpower from time to time as technology evolves.

2. At a larger national level, establishing of industry-academia linkages for AI and BD will accelerate the development and deployment of AI products and solutions. These linkages should cover all sectors of the economy.

Q.40. Any other issue which is relevant to this subject? Please suggest with justification.

COAI Response:

1. We reiterate that absence of Data Protection Bill is a major challenge towards adoption of AI. The Data Protection Bill will lay down how the data is to be utilised, restrictions on the use of personal data without consent of citizens, propose a framework that would regulate cross-border transfer of data, and accountability of data fiduciaries handling such data, removal of personal data among other things. Absence of these guidelines leads to lack of clarity and creates a blind spot for TSPs

2. We understand that the Government of India proposes to come out with a new Data Protection Bill and a Digital India Bill. These bills should provide the required legal framework and clarity for compliance and adoption of AI in India.

*****