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CONSULTATION PAPER ON LEVERAGING ARTIFICIAL INTELLIGENCE (AI) & BIG DATA (BD) IN TELECOM SECTOR

1. Refer Consultation Paper on the subject and your letter number C-5/1/(1)/2022-QoS dated 01 November 2022.

2. It is indeed an excellent initiative on the part of TRAI to come up with the said Consultation Paper which is need of the hour. Comments on the subject Consultation Paper are given in succeeding paragraphs.

3. **Inclusion of MoD in Development of AI Strategy**. In the past few years, countries around the world have taken several initiatives to frame strategies to guide and foster the development of AI and mitigate the risks associated with it. Countries have made specific organisations responsible for developing their respective AI strategies. It is recommended that, akin to some countries like France wherein Ministry of Armed Forces is involved in development of AI strategies (refer Table 1.1 of subject paper), MoD in GoI be involved in same so as to align the AI strategy to the security and data intelligence requirements of Armed Forces.

4. **Operational Security**. The AI based data analytics on BD may be shared with appropriate stakeholders to enhance operational and internal security aspects. Security infrastructure to prevent loss of data including BD in respect of users/users' online behaviour etc should be put in place by each stakeholder and same should undergo regular audits by Law Enforcement Agencies.

5. **AI & BD for Defence Telecom Infrastructure**.

(a) The complete communication backbone of major ISP's is IP-MPLS based that makes use of plethora of network switching elements and hence an ever-increasing risk of cyber attacks exists. Though in telecom industry, there exists a variety of solutions to protect the network and devices from such attacks, yet most of these solutions are static in nature and behave in a reactive manner, which may not be efficient to counter attacks proactively.

(b) Armed Forces have major dependency on civil hired media as all the important military stations are interconnected through same. Here, AI can play the role of analysing millions of events and identifying possible threats from malwares exploiting zero-day vulnerabilities to identifying risky behaviour which may lead to a phishing attack or download of malicious codes. At the same time keeping in mind the security implications of any such analysis on networks used by Armed Forces, the AI strategy being promulgated needs to be suitable modulated.

6. **AI & BD for Unstructured/Noisy Wireless Intercepts**. In areas of Speech Recognition and Natural Language Processing (NLP), deep learning algorithms bring more practicality than the classical machine learning algorithms. More deep learning algorithms are continuously being developed by academia and industry. It is recommended that the same may be utilised by TRAI to develop AI and BD applications and share with Armed Forces for Natural Language Processing of raw noisy/ unstructured wireless intercepts.

7. **AI Applications for Management of Defence Optical Fibre Network and Exclusive Defence Telecom Infrastructure**. The AI strategy is already giving out details in respect of use of AI and BD for traffic management in networks, network planning, maintenance, monitoring, optimisation and configuration. It should also aim at fostering certain AI based applications for expansion and management of Defence Optical Fibre Network / Exclusive Defence Telecom Infrastructure as per traffic flow.

8. **Mobile Tower Optimization**.

(a) Planning and maintenance of network of mobile towers becomes much easier compared to existing systems.

(b) Internet of Things (IoT) sensors at mobile towers will make it easier to analyse all the data more efficiently.

9. **Data Management and Predictive Analysis.** AI and Machine Learning (ML) technologies will analyse the network hardware and traffic attributes to make effective and efficient decision for improving services as per the needs of the customer as well as improving margins.

10. **Detecting Irregularities/Frauds**. AI and ML algorithms will be able to automatically detect irregularities and frauds in real time without need for human intervention.

11. **Access to Data/Insights for Internal Security**. The telecom industry generates and stores tremendous amount of data in terms of call data records and network data. It also comprises of data with respect to customer profiles including mobility and device data, customer usage patterns and location data. The AI strategy should focus/leverage this information for strengthening the Internal Security, especially, in disturbed areas.

12. **Improved Customer Satisfaction**. Customer related issues will be resolved at a much faster rate.

13. **Testing of Various Models**. Exhaustive testing of various models verifying responses in extreme conditions needs to be undertaken.

14. AI and BD technologies, though still in nascent stages in the Indian context, hold great promise for facilitating decision making in telecom sector and enhancing the security, responsiveness and efficiency of civil & military telecom networks.

15. For information and necessary action please.

(Surjit Bhowmick)
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For Signal-Officer-in-Chief