



World telecom day: Role of tech standards, and the need for interdisciplinary approach

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The anniversary of the signing of the first International Telegraph Convention and the creation of the International Telecommunication Union (ITU) is celebrated on May 17 as the World Telecommunication and Information Society Day. The theme this year is 'Bridging the Standardization Gap'. The Secretary General of the ITU, Houlin Zhao, has indicated in his message that the upcoming 5G standards, augmented by AI and autonomous systems, will support a new range of applications from self-driving cars to safer and smarter cities.

Standards promote interoperability, and act as a platform for large-scale adoption of technologies. Standard bodies such as the ITU, Institute of Electrical and Electronics Engineers (IEEE), 3rd Generation Partnership Project (3GPP), American National Standards Institute (ANSI) and International Organization for Standardization (ISO) have been promoting standards for the development and adoption of technologies worldwide. Although some countries and companies developed country-specific standards—such as the Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) by China and Betamax (video tape recording standard) developed by Sony—most failed to attract adoption. Oz Shy, the noted economist, in his book 'The Economics of Network Industries' illustrates how countries and firms benefit by mutually recognising standards compared to recognising their own standards in their product offering.

Most technology standards developed so far are, in general, country- or region-agnostic—such as the IEEE 802.11 standard for Wi-Fi or the Long Term Evolution (LTE) by 3GPP. However, as autonomous systems powered by AI and big data are being deployed across sectors, countries have started developing local standards and guidelines for privacy protection, preserving human rights and expressions, traceability, and accountability for legal protection, amongst others. One of the reasons for this emerging paradigm is that attributes such as privacy, data protection, sovereignty of nations, and human autonomy can have different

connotations and interpretations across demographics, gender, race, religion, and geographical regions. Hence, it is a challenge for global firms to produce products and services that meet the varying standards.

To cite one initiative that has garnered worldwide support is the Unicode Standard for consistent encoding, representation, handling of text expressed in most of the world's writing systems. The standard is maintained by the Unicode Consortium, and as on March 2019 the most recent version—Unicode 12.0—contains a repertoire of 137,993 characters covering 150 modern and historic scripts, as well as multiple symbol sets and emojis. Organisations such as the ICANN have adopted Unicode as a replacement of ANSI.

Notable work has been started by the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems along with organisations such as the Japanese Society for Artificial Intelligence, the Dalai Lama Center for Ethics and Transformative Values at MIT, and the Systems, Man, and Cybernetics Society in the development of standards on Ethically Aligned Design (EAD)—the first version of which has been released in March 2019. Building on eight core principles such as human rights, well-being, transparency and accountability, the EAD is likely to inspire IEEE P7000 series of standards in the future for AI and autonomous systems. As machines powered by AI increasingly mediate our cultural, societal, economic and even political interactions, the EAD augurs well. A couple of examples from the EAD deserve attention. Our societies have not yet established standards or guidelines as to how human norms and values should be incorporated into intelligent and autonomous systems. The values vary across cultures, regions and races. However, when the autonomous systems increasingly take over human oversight and autonomy in many aspects of our lives, then they need to incorporate and learn the norms and values of the societies with which they interact. The systems and algorithms must act responsibly without any bias or discrimination; embedding clear traceability of the causes of failure, if any; and be responsible and accountable. The recent enactment of algorithmic accountability requirements (in the US) require standards for verification and validation of algorithms that are embedded in autonomous systems.

As technologies such as mobile broadband, robotic voice assistant, face recognition and biometric sensors embrace individuals and societies, an interdisciplinary approach to ethical and trustworthy autonomous systems is the need of the hour. In a research paper that appeared in the 'Nature', a collection of 23 authors from as many countries and institutions pointed out that the study of AI systems and machine behaviour requires cross-disciplinary efforts including computer scientists, social scientists, economists, psychologists and lawyers. Research institutes and government funding agencies can play a very important role in the design and development of large-scale neutral and interdisciplinary studies in AI, which can explore, apart from the technical aspects, the principles from other sciences to build guidelines and standards for autonomous systems.

China has taken the lead, with close to \$15 billion investment in AI research. In India, the NITI Aayog has drafted a strategy for AI, proposing creation of a National AI Marketplace (NAIM). Hopefully, these initiatives should promote the development of standardised autonomous products and systems that behave responsibly and even with a bit of emotion!

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