



Webinar - World of Standards

M2M/IoT & Emerging Technologies

Dinesh Chand Sharma
Director- Standards and Public Policy
Project SESEI

(Invest India– 10-08-2021)

Outline

- About Project SESEI
- European Standardisation System & Global Harmonization
- Indian Standardization System & Global Harmonization
- Policy & Standardization Initiatives around emerging technologies (India & Europe)
 - 5G
 - Internet of Things (IoT)
 - Artificial Intelligence (AI)
 - Blockchain

Project SESEI

Project is a permanent presence in India

SESEI (Seconded European Standardization Expert in India) is a local face for the European standardization community in India: Dinesh Chand Sharma



Why SESEI: India is a major trade partners for Europe, Increasing role of standards to gain market access and Evolving & complex nature of regulatory and standardization landscapes, Sharing best practices, work together

Sector: ICT: M2M/IoT, Security, 5G, NFV/SDN, e-Accessability, eHealth, eCALL ! **Electrical equipment including Consumer Electronics:** Smart Grid, Smart Meter, LVDC, Micro- Grid, Lift Escalator ! **Mobility:** Connected Cars, ITS, e-Mobility, Railways ! **Smart Cities:** Mobility, Waste, Energy, ICT ! **Energy Efficiency & Circular Economy etc.**

www.sesei.eu , www.sesei.in , www.eustandards.in

Standards & Regulation

What is a standard?

It is a document that defines technical or quality requirements with which current or future products, production processes, services or methods may comply



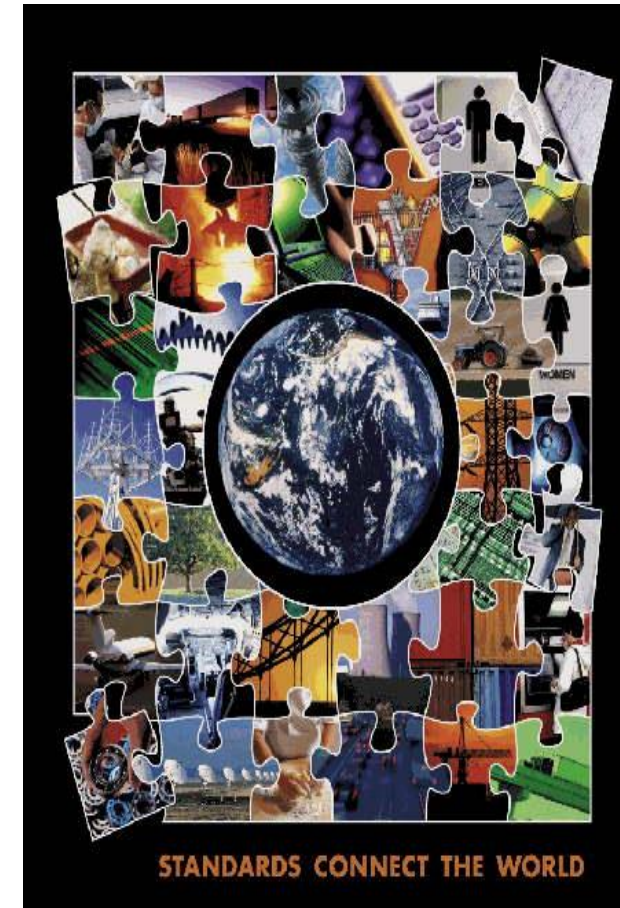
Standards are :

- Always voluntary
- Consensus based
- Established by all interested parties
- Driven mainly by Industry
- Drafted by technical experts
- Approved by a recognized, independent standardization body



Why standards are important?

- Enhance safety of products
- Promote common understanding
- Facilitate trade by reducing TBs
- Promote interoperability of products and services
- Benefits of economies of scale
- Support environmental sustainability
- Facilitate the uptake of innovation and reflect the outcome of research and development



Standards are Business tools

- **Comply** with national legislation

✓ *Eg. EN 30 Domestic cooking Appliances burning gas*



- Increase **confidence** of consumers & social communities in products & services

✓ *Eg. EN 71-1: 2014 Safety of toys - Part 1: Mechanical and & physical properties*



- Improve **safety** of workers

✓ *Eg. Series EN 13087 – Protective helmets – Test methods*



- Boost **innovation**: vehicle for transferring technical knowledge and provide market validation of research projects

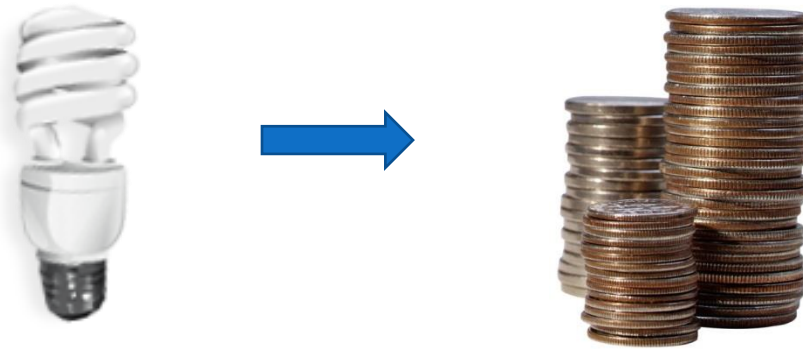


✓ *Eg. CWA 16379 - Fuels and biofuels – Pure plant oil fuel for diesel engine concepts*

Standards are Business tools

- Increase ***effectiveness, efficiency*** & allow companies to ***save money***

✓ Eg. EN ISO 50001 - Energy management systems – Requirements with guidance for use



- Enhance ***accessibility***

✓ Eg. EN 81-70 - Rules for the improvement of the accessibility of existing lifts for persons including persons with disability



Standards are Business tools

- Improve **quality** of services and comparability
 - ✓ Eg. EN 16224 - Healthcare provision by chiropractors



- **Environmental** protection & **sustainability**
 - ✓ EN 13432 – Requirements for packaging recoverable through composting and biodegradation



- Promote **understanding** - common **terminology**
 - ✓ EN ISO 18513 Tourism services Hotels and other types of tourism accommodation - Terminology



Standards are Business tools

- Promote **interoperability** of products & services
 - ✓ Eg. EN ISO 12855- Electronic fee collection – Information exchange between service provision and toll charging
 - ✓ Eg. Telecommunication Standards GSM/WCDMA (2G,3G,4G) etc.



The Evolution of 5G



European Standards & Legislation

The European Standardization Organizations



Recognition by EU Regulation 1025/2012
= standardization as a tool for supporting competitiveness
and challenges of the society

ESO's are integrated with International

Objective - Avoid duplication of work at International and European levels with an aim for a identical worldwide and European standards



“Vienna Agreement” with
Chemistry, Material, Energy, Environment, Transport,
Construction, Services, eMobility etc



CEN: 32% of
portfolio
identical to ISO



“Frankfurt Agreement” with
Electricity, Electro-technical



CENELEC: **72%**
of portfolio
identical to
(+ another
6% based on)
IEC standards



MoU for telecommunications sector (ITU-T),
Agreement on radio-communication sector (ITU-R)
Information & Communication Technologies (ICT)

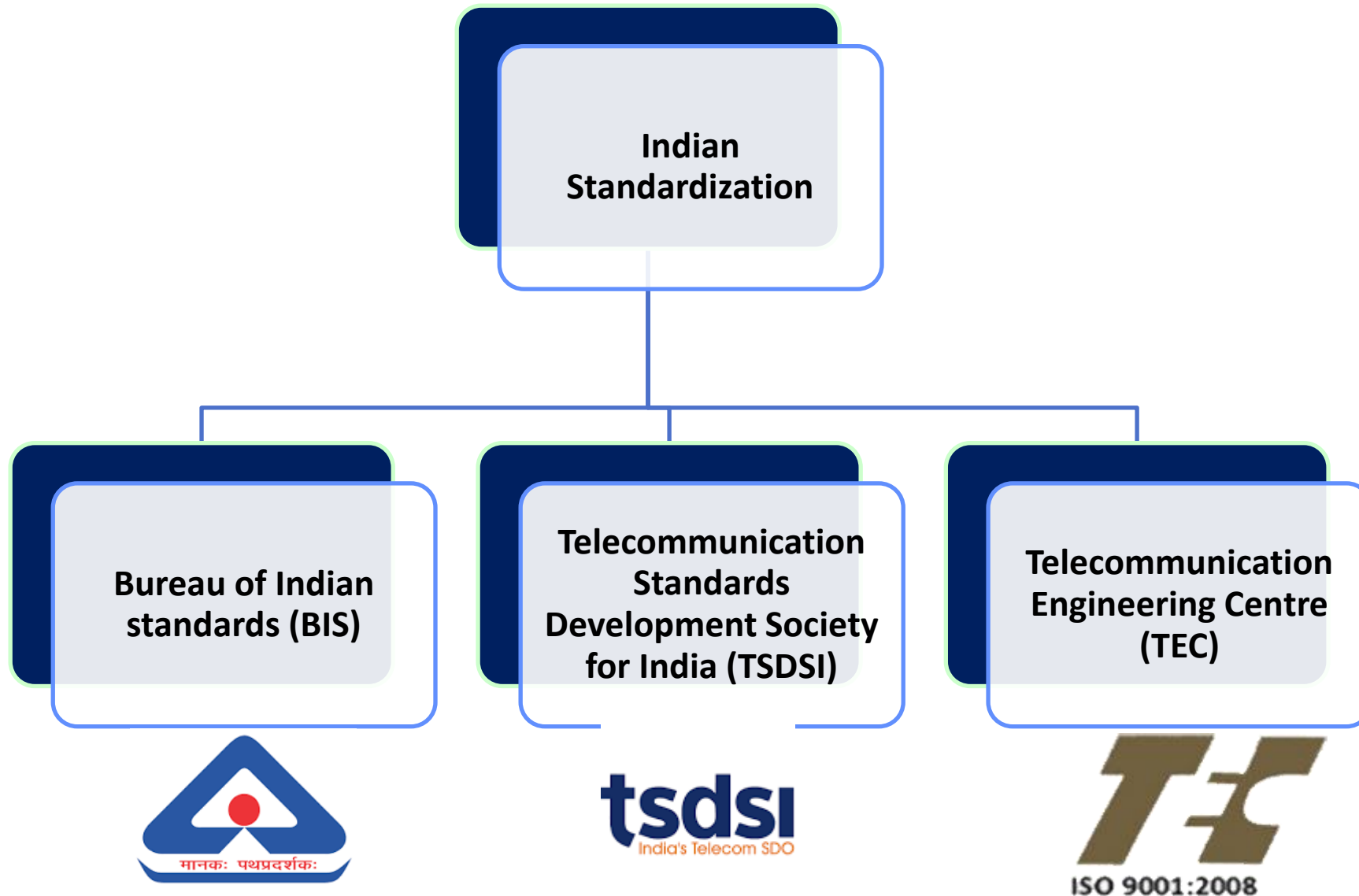


Founding Partner to 3GPP & oneM2M



Indian Standardization System

Main Standardization bodies in India



Bureau of Indian Standards (BIS)

- ✓ The National Standards Body of India : Bureau of Indian Standards (BIS) took over work of Indian Standards Institution (ISI) through enactment of BIS Act (1986) by the Indian Parliament
 - ❑ ISI was set up in 1947 as a registered society, under a Government of India resolution.
- ✓ BIS is functioning under the ministry of Consumer Affairs and food & Public Distribution.
- ✓ The key activities of BIS are as follows:
 - ❑ Standards Formulation, Conformity Assessment (ISI Mark), Hallmarking of Jewelry, Management System Certification, Laboratory Services and Training
- ✓ BIS is engaged in formulation of Indian Standards through 16 divisional councils and has published over 21000 Indian Standards
- ✓ WTO-TBT: BIS is an enquiry point and Dept. of Commerce the notification authority
- ✓ Global Harmonisation
 - ❑ Founding member of ISO and IEC member since 1911
 - ❑ 30 Memorandum of Understanding (MoU) & 07 Bilateral Agreements

Telecommunication Standards Development Society, India (TSDSI)

- ❑ TSDSI was formed on 7 January 2014, with an objective to contribute to next generation telecom standards and drive the eco-system of IP creation in India.
- ❑ It is an autonomous 'not for profit' SDO for Telecom products and services in India
- ❑ Department of Telecommunications (DoT) & Ministry of Electronics and Information Technology (MEITY), Govt. of India are jointly supporting TSDSI as India's Telecom/ICT SDO.
- ❑ **Key functions:**
 - ✓ Develop standards to support new requirements based on research & innovation
 - ✓ Take Indian requirements to global standards organizations;
 - ✓ Creating and Safe-guarding related IPRs;
 - ✓ to create standards based manufacturing expertise in the country;
 - ✓ transparent, open-to-all-members process for making standards.
 - ✓ Providing guidance and leadership to other developing countries

Collaboration with International and other Forum

- ❑ Cooperation agreements with 7 international SDOs: ARIB (Japan), ATIS (USA), CCSA (China), Continua Health Alliance, USA (IoT in Health), ETSI (Europe), TTA (Korea), TTC (Japan)
- ❑ MoU with GCF, 5G AI, TIA etc.
- ❑ Member of ITU
 - TSDSI has introduced an indigenous developed 5G candidate standard at ITU WP-5D Meeting in Geneva held during December 10-13, 2019.
- ❑ Organizational Partner (OP) of 3GPP along with six other Regional Standardization bodies
 - TSDSI has transposed 295 Specifications of 3GPP (select specifications from Rel 10 to Rel 13) for IMT Advanced (as per ITU-R M.2012-3) into TSDSI Standards (<https://members.tdsi.in/index.php/s/QCGsyjJocsm8RKj>)
- ❑ Partner Type I of oneM2M
 - TSDSI has Transposed oneM2M Specifications Rel 2 (comprising 17 specifications and 10 technical reports) into TSDSI Standards. (<https://tdsi.in/onem2m/>)
 - TSDSI has begun work on transposition of Release 3 specifications of oneM2M.
- ❑ Constituent SDO of Global Standards Collaboration (GSC)

Telecommunication Engineering Centre (TEC)

- TEC is the engineering wing of DoT under Ministry of Communication
- **TEC Functions:**
 - Specification of common standards with regard to Telecom network equipment, services and interoperability.
 - Prepare and Publish Generic Requirements (GRs), Interface Requirements (IRs).
 - Issuing Interface Approvals, Certificate of Approvals, Service Approvals & Type Approvals.
 - Formulation of Standards and Fundamental Technical Plans.
 - Interact with multilateral agencies like APT, ETSI and ITU etc. for standardization.
 - Provide technical support to DOT and technical advice to TRAI & TDSAT.
 - Coordinate with C-DOT on the technological developments in the Telecom Sector for policy planning
- M2M WGs at TEC have released 14 Technical Reports
- TEC is implementing Mandatory Testing and Certification of Telecom Equipments (MTCTE)
- TEC has approved adopting TSDSI transposed oneM2M Rel. 2 specifications as National Standards
- TEC participates & follow programmes of standardization bodies such as ITU, 3GPP, OneM2M, ETSI (Member), GSMA, IEEE etc. directly/indirectly



Emerging Technologies

❑ List of Emerging Technologies standardized by ETSI or touched by our standardization:

- 5G
- Internet of Things (IoT)
- Mobile Communications
- Multi-access Edge Computing (MEC)
- Securing Artificial Intelligence (SAI)
- Smart Body Area Networks
- Smart appliances
- Smart cities
- Smart Grids
- Smart Metering
- Zero touch network & Service Management (ZSM)
- Human Factors (HF) and accessibility
- 3GPP Telecom Management
- Augmented Reality
- automotive Intelligent Transport Systems (ITS)
- Broadband Satellite Multimedia
- Broadband Cable Access
- Broadband Wireless Access
- Certification Authorities and other Trust Service Providers
- Cybersecurity
- Broadcast
- Digital Enhanced Cordless Telecommunications (DECT)
- Energy efficiency (EE)
- Experiential Networked Intelligence (ENI)
- Environmental Aspects

Complete list can be access here

<https://www.etsi.org/technologies>

Policy Initiatives (Europe & India)

(5G, IoT, AI, BC)



5G

Europe

- In 2013, EC established **Public Private Partnership on 5G (5GPPP)** to accelerate R&D in 5G technology.
 - funded by Horizon 2020 and is being organized in 3 phases:
 - Phase 1: future 5G network architecture (2015-2017): 19 research projects
 - Phase 2: Move towards demonstration and experiments with the involvement of the vertical industries (2017-2019): 21 projects,
 - Phase 3: End to end 5G platforms, connected and automated mobility, trials across vertical industries and long term 5G evolution: 15 new projects
 - A first set of 6G projects has also been launched under 5G-PPP with the Hexa-X flagship system project complemented with 8 projects investigating specific technologies
- EC launched **5G Action Plan for Europe in 2016** to start launching 5G services by end of 2020 in all EU member states,
- In 2018, EC launched **European 5G observatory** to monitor the progress of the 5G Action Plan and to focus on 5G developments in Europe.

India

- Government sets up a High Level Forum (HLF) to articulate the Vision for 5G in India.
 - ✓ HLF has published a report "Making India 5G Ready"
- **Building an End-to-End 5G Test Bed:** three-year program began in March 2018 to advance R&D in 5G
 - This program has been awarded to IIT Madras, IIT Hyderabad, IIT Delhi, IIT Kanpur, CEWIT, SAMEER and IISc Bangalore.
- **Telecom Regulatory (TRAI) released White Paper on 'Enabling 5G in India'**
 - highlights the specifications of the 5G technology, architecture of 5G network, spectrum requirements for 5G networks, the regulatory issues & challenges and areas that will require investment for 5G deployment.
- **National Digital Communication Policy-2018 (NDCP-2018):**
 - Emphasizes on Hi-speed internet, IoT/M2M by rolling out 5G technologies
- May 2021, DoT allocated spectrum in 700 Mhz band, 3.3-3.6 gigahertz (Ghz) and 24.25-28.5Ghz for 5G trails for Telecom operators.

Internet of Things (IoT)/M2M

Europe

- In May 2015 “**Digital Single Market Strategy**” was adopted that includes elements which lead Europe a step further in accelerating developments on IoT
 - As part of “**Digitising European Industry**, EC published “**Advancing the Internet of Things in Europe**” that specifies the EU's IoT vision.
- In 2015, EC initiated **Alliance for Internet of Things Innovation (AIOTI)** to open a stream of dialogue among IoT players in Europe
 - To foster experimentation, replication, and deployment of IoT and supporting convergence and interoperability of IoT standards; gathering evidence on market obstacles for IoT deployment; and mapping and bridging global, EU, and member states' IoT innovation activities.
 - AIOTI activities are carried out through groups, which focus on well-defined areas of development. These include horizontal areas: research, innovation eco-systems, policy, standards, green deal and distributed ledger technologies, as well as vertical, cross-disciplinary activities, focused on key IoT issues.
- In order to support IoT R&I, ‘**IoT European Platform Initiative (IoT-EPI)**’ was launched in 2016.
- EC is currently supporting 12 Large-Scale Pilot projects under the focus area **Digitising European Industry** in Horizon 2020, with a financial contribution of more than €200 million.

India

- Union Cabinet approved the new telecom policy “**National Digital Communications Policy (NDCP) 2018**” to cater to the modern technological advancements such as 5G, IoT, M2M etc. in the Telecom Sector.
- **National Telecom M2M Roadmap 2015**: released by DoT for the growth of M2M
 - Efforts towards assimilation of various M2M standards
 - Approach towards M2M adoption in different sectors of economy.
- **Draft Internet of Things (IoT) Policy**: released by DeitY/Meity in 2016 to create an IoT industry of USD 15 billion by 2020
- **As part of Digital India Initiative, Government has announced Centre of Excellence for internet of Things (CoE-IoT)**
 - NASSCOM is establishing CoE-IoT along with Meity, ERNET and State Governments to build IoT ecosystem in India
- In 2017, TRAI released **recommendations** allowing all telecom licence holders to provide M2M services using any spectrum.
- DoT, on June 26, 2021, have released draft **guidelines** for Registration Process of M2M Service Providers (M2MSP) and WPAN/WLAN Connectivity Provider for M2M Services

Artificial Intelligence (AI)

Europe

- EC launched **“European AI Alliance”**: a community of stakeholders and experts in AI Field.
 - a place to share practices, contribute to the AI ethics guidelines, Network and encourage activities related to the development of AI.
- EC released its Communication COM(2018) 237 **‘Artificial Intelligence for Europe’** in April 2018.
 - Setting out a European initiative on AI, which is part of its “Delivering on the Digital Single Market: 3rd Data package”.
- On 10th April 2018, Twenty-five EU countries agreed to work together in AI domain and signed **declaration on AI cooperation**.
- **Digitising Europe Programme in AI**: €2.5 billion is planned to help spread AI across the European economy and society. This budget builds on the **European approach on AI**.
- In May 2018, **GDPR** – a wide-ranging regulation intended to strengthen and unify data protection for all individuals within the EU – went into effect.
 - On 8 April 2019, the High-Level Expert Group on AI presented **Ethics Guidelines** for Trustworthy AI

India

- In August 2017, Commerce Ministry established a **Task force on AI** to kick-start the use of AI for India's economic transformation.
- In Feb 2018, MEITY formed 4 committees to prepare a roadmap for AI.
 - Committees addressed citizen centric usage, data platform, skilling, reskilling, R&D, legal, regulatory, ethical and cybersecurity. Committees' reports are available **here**
- In June 2018, Government think-tank, NITI Aayog unveiled its **discussion paper on national strategy on AI** which aims to guide R&D in new and emerging technologies.
 - Identified five sectors including Healthcare, Agriculture, Education, Infrastructure and Transportation that can benefit from the adoption of AI
- Government of India also planning to start National programme on AI to harness the benefits of emerging technologies in identified areas.

Blockchain (BC)

Europe

- European Commission's strategy is designed to support a 'gold standard' for blockchain technology that embraces European values and ideals in its legal and regulatory framework.
- In February 2018, EC launched “EU Blockchain Observatory Forum” to accelerate blockchain innovation and development of blockchain ecosystem within EU
- In April 2018, 21 Member States and Norway agreed to sign a Declaration creating **European Blockchain Partnership (EBP)** and cooperate in the establishment of a European Blockchain Services Infrastructure (EBSI) that will support the delivery of cross-border digital public services, with the highest standards of security and privacy.
 - Eight more countries have joined the Partnership, bringing the total number of signatories to 30.
- EU provides funding for blockchain R&I projects under Horizon Industry programme by supporting investment.

India

- NITI Aayog has come up with National blockchain policy draft paper titled “Blockchain — The India Strategy” recognising many crucial areas blockchain technology can significantly benefit the country.
 - It covers the basics of distributed technology, its potential framework for India, the implementation challenges, lessons from NITI Aayog's own PoCs, its use cases, and recommendations for India's national blockchain strategy
- National Informatics Centre (NIC) has set up the centre of excellence (CoE) in blockchain technology in Bengaluru, Karnataka
 - It operates as a coordinated, interoperable blockchain ecosystem around the nation, allowing all partners to benefit from shared learning, experiences and resources.
 - focus on advancing blockchain technologies, platforms, assets and systems to develop industry understanding and implementation of blockchain technologies.

Standardization work (Europe & India)

(5G, IoT, AI, BC)



5G – 3GPP Release Schedule

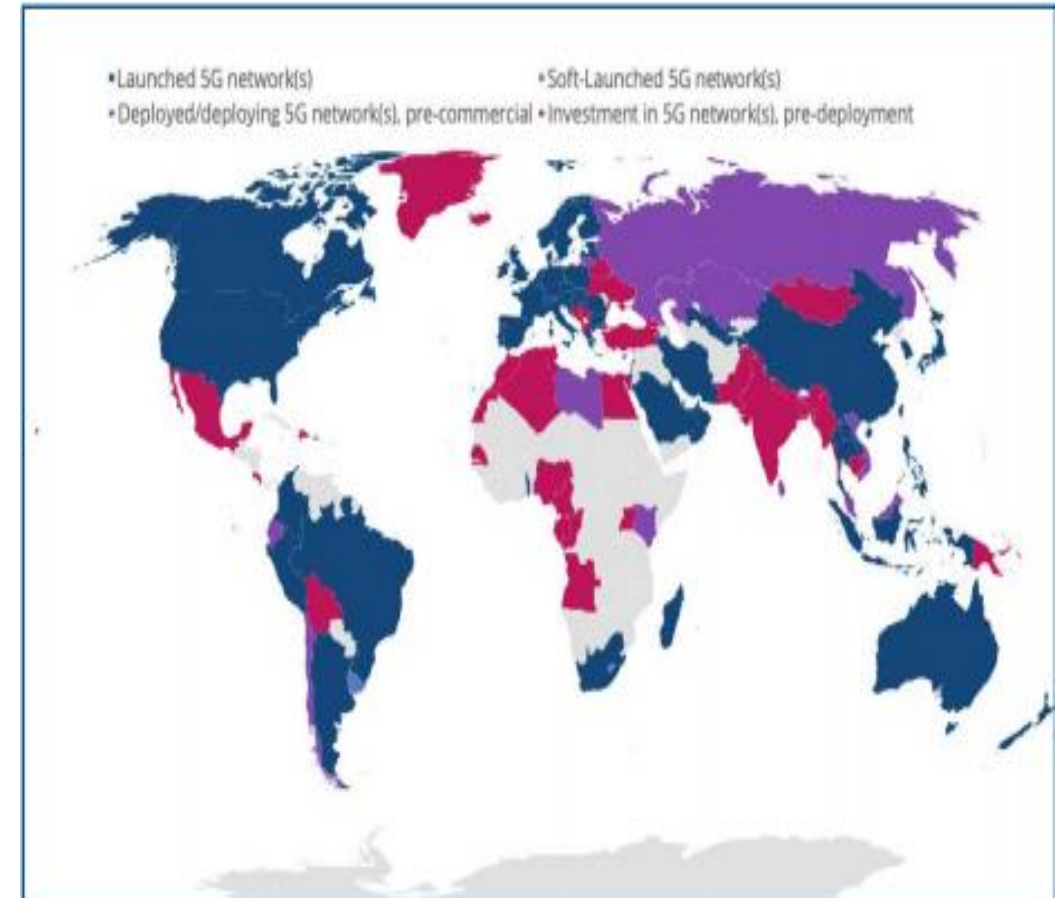
- Phase 1 (Rel-15) addresses the more urgent subset for commercial deployments
- Phase 2 (Rel-16) Completes the 3GPP IMT 2020 submission (ITU-R) and addresses all identified use cases & requirements...
- E-meetings and COVID-19 have challenged the ability of the groups to meet the timelines (right) and delayed Release 17's initial timeline by about six months.
- After 3GPP meeting in Dec 2020, the planned dates for Release 17's physical layer, functionalities and protocol work freezes are December 2021, March 2022 and June 2022, respectively.
- Some preliminary work on Release 18 has also begun, the relevant package approval is currently scheduled for late in the fourth quarter this year or early in Q1 next year.



5G – Commercial rollout overall

- 169 operators in 70 countries/territories who have (as of mid-March 2021) announced 3GPP-compatible 5G service launches (either mobile or FWA)
- GSA has identified:
 - 79 operators in 42 countries investing in 5G standalone for public networks in the form of trials, plans, paying for licences, deploying, or operating networks.
 - identified 159 operators providing commercial 5G mobile services and 63 operators with 5G FWA/wireless broadband services.
- 252 operators deploying or operating TDD based LTE or 5G networks
- 443 operators in 133 countries/territories investing in 5G mobile or 5G FWA/home broadband networks.
- South Korea, China, and the United States are the countries that lead the world in building and deploying 5G technology.
- In India, key telecom players like Airtel has showcased its 5G technology over a commercial network in Hyderabad, while Reliance Jio is ready to test its 5G technology.

Global 5G network launch status



Source: GSA report

Standardization work in Europe

Européen Télécommunications Standards Institute (ETSI):

- **ETSI TC SmartM2M**: developing standards to enable M2M services and applications and certain aspects of the Internet of Things (IoT)
- **ETSI specialist task Force 505**: published two TRs covering IoT standards
 - [ETSI TR 103375, SmartM2M; IoT Standards landscape and future evolutions](#)
 - [ETSI TR 103376, SmartM2M; IoT LSP use cases and standards gaps](#)
- ETSI TC on Cybersecurity has released the first globally applicable cyber security standard (ETSI [EN 303 645](#)) for consumer IoT devices.
- **ETSI Industry Specification Group on Securing AI (ISG AI)** is responsible for developing technical specifications to mitigate threats arising from deployment of AI throughout multiple ICT-related industries
- **ETSI ISG under the label Experiential Networked Intelligence (ENI)** also aims to help operators facilitate their network deployment by using AI techniques
- **ETSI ISG PDL** analyses and provides the foundations for the operation of permissioned distributed ledgers, with the ultimate purpose of creating an open ecosystem of industrial solutions to be deployed by different sectors

CEN/CENELEC:

- Beginning 2019, Technical Boards of CEN and CENELEC set up a Focus Group on AI to develop an **AI standardization Roadmap for Europe** that is available [here](#).
 - based on recommendations presented in [CEN-CENELEC response to the EC White Paper on AI](#) and the [German Standardization Roadmap for AI](#), CEN/CENELEC established a JTC 21 'Artificial Intelligence' which is responsible for development and adoption of standards for AI and related data, as well as provide guidance to other Technical Committees concerned with AI.
- CEN and CENELEC jointly created in 2017 a **Focus Group on Blockchain and Distributed Ledger Technologies (DLT)** to identify specific European needs and requirements for the implementation of Blockchain and DLT in Europe, and to map these needs against the work items of **ISO/TC 307 'Blockchain and distributed ledger technologies'**.
 - identification of specific requirements has been formalized in the [CEN-CENELEC White Paper](#) 'Recommendations for Successful Adoption in Europe of Emerging Technical Standards on Distributed Ledger/Blockchain Technologies'.
 - **CEN/CLC/JTC 19** is responsible for the development and adoption of standards for **Blockchain and Distributed Ledger technologies**

Standardization work in India

Bureau of Indian Standards (BIS):

- Division Council LITD of BIS is responsible for developing Electronics & IT standards through its subcommittees:
 - **LITD 27: Internet of Things and Related Technologies:** standardization in field of IoT and related technologies including sensor networks; wearable electronic devices and technologies; and big data.
 - ISO/IEC JTC 1/SC 41: IoT and related technologies; & ISO/IEC JTC 1/WG 9: Big data, IEC/TC Wearable electronic devices
 - **LITD 29: Blockchain and Distributed Ledger Technologies**
 - **LITD 30 on Artificial Intelligence (AI)**
 - ISO/IEC JTC1/SC42 with same Title & Scope

Telecommunications Standards Development Society, India (TSDSI):

- TSDSI Radio Interface technology (5Gi) is now part of ITU-R recommendation M.2150
- TSDSI SG on M2M/IoT has published [various TRs](#) covering Indian Use cases
- TSDSI has Transposed [oneM2M Specifications Rel 2 \(comprising 17 specifications and 10 technical reports\)](#) into TSDSI Standards.
- TSDSI has also transposed [295 Specifications of 3GPP](#) (select specifications from Rel 10 to Rel 13) for IMT Advanced (as per ITU-R M.2012-3) into TSDSI Standards
- TSDSI is working closely with International SDOs and it is:
 - Member of ITU
 - Organizational Partner (OP) of 3GPP along with six other Regional Standardization bodies
 - Partner Type I of oneM2M

Telecom Engineering Centre (TEC):

- TEC, engineering wing of DoT has released [14 Technical Reports](#) on various topics in M2M/IoT domain.
 - TEC is also developing guidelines/Code of practice for Consumer IoT Security
- **TEC has formed various [National Working Groups \(NWGs\)](#)** corresponding to respective ITU-T Study Groups
- TEC has approved adopting TSDSI transposed oneM2M Rel. 2 specifications as National Standards
- DoT has also formed a committee on standardisation in AI technologies to develop necessary AI standards.
 - scope of committee is to identify the gaps and challenges towards developing the standards in different areas of AI; develop these AI standards with India specific requirements and formulate the framework for AI Indian stack.
 - Committee [has invited papers](#) on AI

Thank you!

Dinesh Chand Sharma

(Seconded European Standardization Expert in India)

Director – Standardization & Public Policy

SESEI C/O EBTC, DLTA Complex, Gate No 3, 1st Floor, 1, Africa Avenue,
New Delhi 110029

Mobile: +91 9810079461, **Tel:** +91 11 3352 1525,

dinesh.chand.sharma@sesei.eu

www.sesei.eu ⇔ www.sesei.in