



Twenty Eighth National  
Conference on Communications



# Workshop on “Standards Driven Research” at NCC 2022

24 May 2022, 1000-1700 IST



# Workshop on “Standards Driven Research” at NCC 2022

< Invited talk >

< **Study Group – Services & Solutions** >

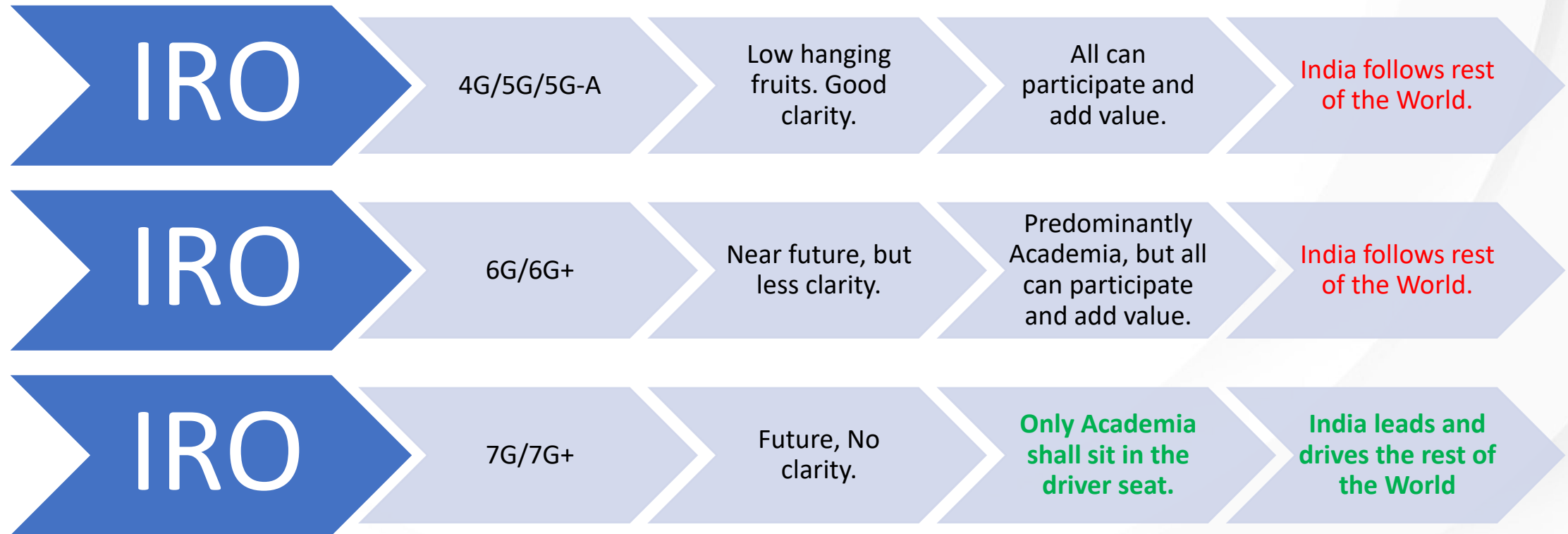
< By >

< Mahesh Nayaka Mysore Annaiah >

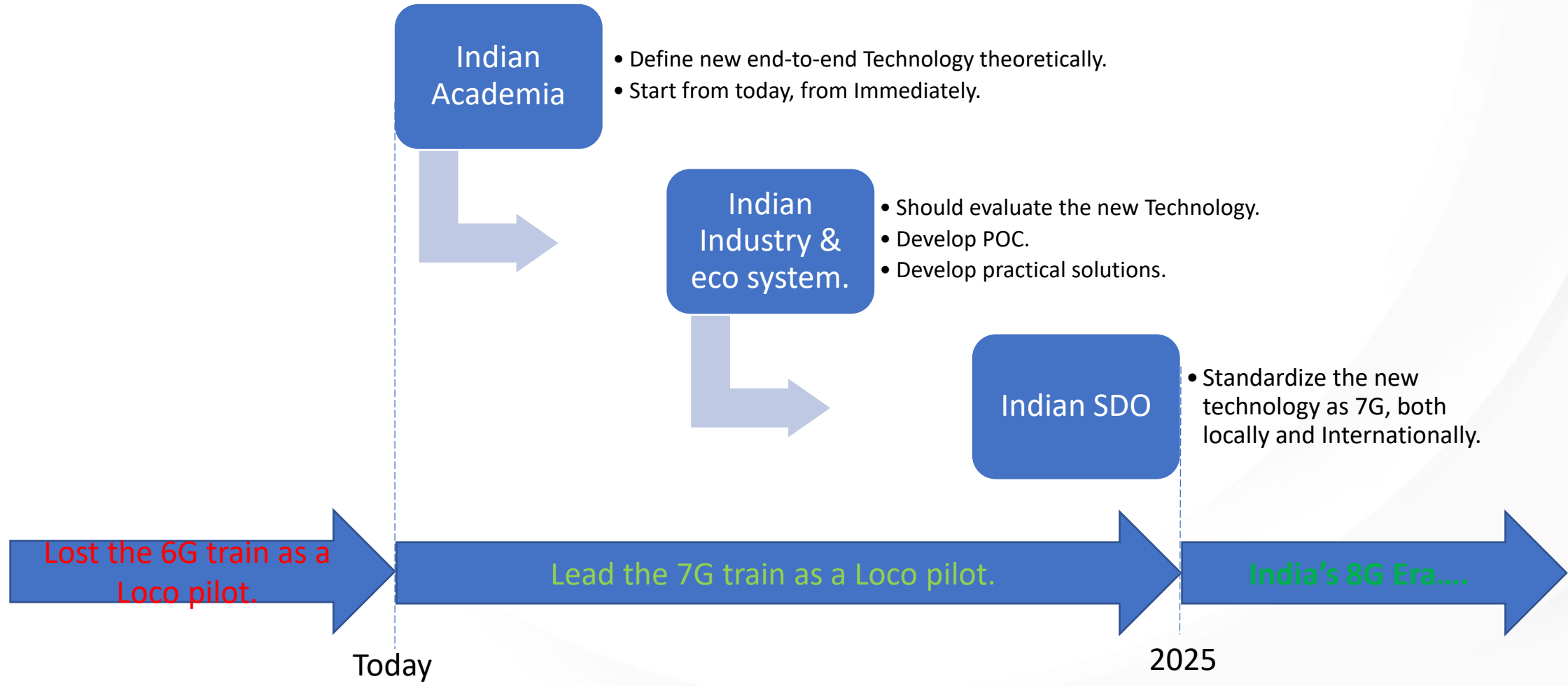
< Interim SGSS Chair >

< SGSS \_SDR@NCC2022 (24May22).pptx >

# Session name: Immediate Research Opportunities [IRO].



# India's dream: Lead the World in xG Mobile technology.



# Standardization activities of SGSS.

This is where the main content of this slide can be put :

1. Definition of requirements for telecom industry and related services and applications, including:
  1. Service level requirements and features for various domains and applications (e.g. IoT/M2M, Automotive, Public safety, Health). **Applicable to 5G, 6G and beyond.**
2. Development of end-to-end service capabilities and architecture, based on the requirements, including:
  1. Technical specifications for application layer functional elements and interfaces.
  2. System aspects such as QoS, QoE interoperability, etc. **In 6G, QoPE, etc.,**
  3. Data management aspects such as schemas, analytics, provisioning, etc.
  4. Localization components in services and systems e.g. Indian languages.

# Standardization activities of SGSS.[Cont...]

3. Security and Privacy aspects in the end to end telecom networks [[Applicable to 5G, 6G and beyond.](#)].  
It includes

1. Determining the security and privacy requirements for telecom networks including the mobile cellular and fixed-line networks across user equipments, access network, transport network, core network and service layer security aspects.
2. Specifying the related security architectures and protocols.

4. Energy performance for telecommunication networks including access, user equipment, aggregation, core including the underlying transport systems, [[Applicable to 5G, 6G and beyond.](#)]  
including:

1. Setting the energy performance related requirements across the end to end network
2. Benchmarking network energy performance
3. Energy optimization for networks
4. Energy performance testing

5. Recommendations of test requirements and evaluation methodologies for any service level conformance testing activities.



# Standardization activities of SGSS.[Cont...]

- SG-Services&Solutions is also responsible for liaison for regulatory aspects between TSDSI and external govt. agencies on the above topics as required, in coordination with TSDSI secretariat
- SG-Services&Solutions works closely with SG-Networks for those aspects that are related to security in access network, core networks or wireless/wireline based backhaul networks.



# WG-1: Security-Trust-Privacy-Data Protection Standards. current activities:

- **Study of Post-Quantum-Cryptography for Future 5G Networks and Application Verticals.**
  - Shall present the study of existing security algorithms in 5G Networks and thereafter analyse Quantum Threats to Security Algorithms used in 5G Networks.
  - The study of existing security algorithms in 5G Networks shall be as per the released 3GPP standards.
  - The TR will review recent/ ongoing/ planned work in other SDOs and Industry bodies and shall try to develop incremental recommendations and proposals.
- **KYC norms for machine & custodian verification (SI 77)**
  - To develop a Technical Report on “Digital Process For Know Your Machine Custodian”.
  - Includes Buyer Custodian change process .
  - Includes Process to Update of new Custodian details to M2M ASP platform.





# WG-1: Security-Trust-Privacy-Data Protection Standards. current activities:[Cont...]

- User data and Privacy protection.
  - To recommend a technical framework for ensuring transparency, choice and control over the sharing of personal information being created at the interface between the user and the User Equipment (UE).
  - The objective of the framework is to prevent the potential misuse and abuse of personal information by assuring the user's right to privacy.

# WG-2: Applications and Service Layer Standards, AI/ML

## Current activities:

- **Creation of Edge Intelligence standards for latency and privacy management (SI 90)**
  - Study on Edge Intelligence standards for haptics related IIoT use cases with a purpose to providing requirements to enable development of a common standard to enable edge intelligence and application deployment for Tactile applications of critical nature (IIoT/IoS/IoT/haptic-based) in the MEC environment.
- **Service Delivery using 5G Broadcast for TV, Radio, IPTV and File-casting (SI 91)**
  - This report describes the Service Delivery using 5G Broadcast for TV, Radio, IPTV and File-casting. An instantiation of a 5G Broadcast System is presented in this technical report, referred to as LTE-based 5G Broadcast. LTE-based 5G Broadcast is a profile of existing 3GPP specifications that addresses all requirements of a 5G Broadcast System. The 3GPP based 5G Broadcast System along with associated features, the reference architecture, deployment model, and informative implementation guideline of such a system are also provided in this document. This technical report also provides the description of 3GPP solutions that may be utilized to deploy linear television, radio services, IPTV and filecasting.



# WG-2: Applications and Service Layer Standards, AI/ML

## Current activities: [Cont...]

- **Indian Language support for Financial transaction (SI 67).**
  - To produce a TR with recommendations that can enable the use of Indian languages in mobile financial transactions. The report includes
    - Requirement Analysis
    - Gap Analysis and Requirement Confirmation
    - International Best Practices
    - Recommendations
- **National Language Preference Repository for Indian Mobile Users [NIP 278 ]**
  - Describes the architecture, data model and protocol for the National Language Preference Repository (NLPR) and the Service Based Interface between the NLPR and its contributors and beneficiaries and over which the service to update and check the language preference of a mobile user as conceptualized in TSDSI TR 6014 V1.0.0 Support for Indian Languages in Mobile Transactions shall be provided. The document shall also provide the protocol definitions and message flows, and the API for each service offered by the NLPR.



# WG-2: Applications and Service Layer Standards, AI/ML

## Current activities: [Cont...]

- **A database of icons and terms in Indian languages for financial transactions [NIP 279 ]**.
  - To create a database of simple, standardized and open-source icons and terms in Indian languages for financial transactions that have been evaluated for recognition and recall. The objective is to cover the 22 scheduled languages of India (Assamese, Bengali, Bodo, Dogri, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Maithili, Nepali, Oriya, Punjabi, Sanskrit, Santhali, Sindhi, Tamil, Telugu, Urdu) and English.
- **Inter-Domain Service Automation (IDSA) [NIP 267]**
  - As technology options evolve, bringing connectivity benefits to microfinance community needs to overcome the following challenges: -
    - Adaptive solution platform which can be customized for the stakeholder needs and environment,
    - Flexible deployment mechanisms,
    - Exploiting various work-flow mechanisms,
    - Ability to use latest innovations like AI/ML,
    - Distributed ledger technologies (DLT) where needed,
    - Cross-domain collaboration to build solution pipelines keeping end-users in mind,
    - Agility by using rapid solution development e.g., dev-ops methods

The following technical study reports are to be done based on this:

- Technical report which studies the challenges and potential solution options.
- Develop use cases and use case requirements

# WG-3: Smart Infra, Critical Communications, Cloud & IoT

## Current activities:

- **Rural Broadband Services & Architecture (SI 85).**
  - To study rural use cases, identify requirements relating to network security, management, slicing, study current broadband infrastructure in rural areas, and ongoing architectural efforts (BIS/LITD 28 )and identify gaps. How to deliver both broadband and IoT services in rural areas by integrating different access and backhaul wireless technologies will also be highlighted with an aim for increasing the livelihood opportunities in rural areas through optimal access ICT services.
- **Study of technical aspects for deployment of a pan-India Broadband PPDR network based on PS-LTE and 5G technology (SI 86)**
  - To recommend minimum technical requirements for services and architecture aspects to ensure effective setup of a hybrid BB-PPDR network (leveraging existing commercial networks as appropriate) based on the 3GPP technologies (PS-LTE technology).



# WG-3: Smart Infra, Critical Communications, Cloud & IoT

## Current activities: [Cont...]

- **Communications Requirements & Recommendations for the Energy Sector (SI 87).**
  - To propose to have a detailed analysis of the Smart Grid and AMI network, such as to understand the -
    - AMI Use Cases and Communication related Requirements
    - Relevant International Standards and Communication Profiles (ISO, ITU, oneM2M)
    - Key nodes of the AMI topology, node architecture, segments of the AMI/ SCADA/ Smart Grid communication (smart meter – Gateway, smart meter – walk by handheld, gateway – head end, head-end to meter data collector, data center firewall, metering system headend - meter data repository, etc.)
    - volume of nodes that generate data, node wise data packet types, command and control packet types, direction of data flows, data traffic periodicity, volume etc.
    - SLA, Reliability and QoS aspects
    - Recommendations for the Segment wise/ Use Case wise Network Technology deployment



# WG-3: Smart Infra, Critical Communications, Cloud & IoT

## Current activities: [Cont...]

- **WI proposal for Cloud Service Specification (WI1-NIP197).**
  - To define TSDSI standards document which covers the Interoperability and Portability Standards for Cloud Computing. This document covers architecture, APIs for achieving Cloud Interoperability, Data portability, Compute / Application portability, Network portability, Security.
- **Study UAV/Drone 3GPP-5G standards applicability to India use cases(NIP 274).**
  - To capture the UAV/Drone related use cases relevant to Indian region which use 3GPP 5GS features defined for UAV. It will define additional requirements (in addition to req. mentioned in TSDSI TR 6007) relevant to new scenarios for regulatory bodies. Report will also profile the 3GPP 5G UAV/UAS features for Indian specific use cases.

# SGSS : 6G Applications and Services [Examples]

## eHealth

- Remote Robotic Surgeries.
- Remote Surgeries by Doctors.
- Intelligent Wearable devices.
- Wireless Body Area Networks.
- Security & Resources allocation.
- AI driven Health services.
- Telemedicine.
- Block Chain Technology.
- Human Brain to Computer communications.
- Etc.,

## UAV/UAS

- Handling vast deployments of UAVs.
- Internet of Drone Things[IoDT].
- Autonomous UAV driving.
- UAV for public safety.
- UAVs for Multimedia Applications.
- UAV Image processing at Edge.
- Impacts on Applications and services due to Cell & UE connected UAVs.
- UAV Energy harvesting mechanisms.
- Wireless Energy Transfer for UAVs.
- Etc.,

## IoT

- IoBT/ IoMT [Battlefield/ Military]
- IoE [Everything]
- IoD [Drones/ UAVs]
- IoMT [Medical]
- IoNT/ IoBNT [Nano / Bio Nano things]
- Etc.,



# SGSS : 6G Applications and Services [Examples]

- Holographic Communications [Using all senses]
- Autonomous Vehicular Systems. [Vehicle to Everything(V2X)]
- Impact on Applications and services due to Ubiquitous networking. [Sea-ground-air-space]
- Industry 5.0 applications [Factory of the future]
- Context aware service applications [Due to precise localization and high resolution sensing]
- Smart Energy sector.
- Autonomous Robotics.
- AI/ML at Applications Layer. [Both Edge and Cloud].
- Impact of Applications and Services due to Quantum Computing Systems.
- Etc.,



# Thank You

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