**Quarterly Newsletter** of the Telecommunications Standards Development Society, India

# tsdsi NEWSLETTER

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## HIGHLIGHTS (July-September 2024)

### TSDSI publishes Standards on

Methods and Interface Design for RIS-assisted Communication Systems (TSDSI STD 5003 V1.0.0)

Standardization of common data payload for adaptive traffic control system and other Intelligent Transportation system (TSDSI STD 5004 V1.0.0)

* Details Overleaf

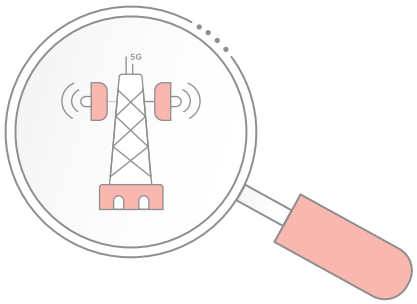
### TSDSI releases Technical Reports on

Study on system requirements related to Metaverse use cases in mobile network (TSDSI TR6032 V1.0.0)

Enhancement of the Privacy of User Subscription Identity in Future Networks (TSDSI TR6031 V1.0.0)

## INVITED ARTICLE

TSDSI has released a Technical Report on "Rural Broadband Services and Architecture". Our members are now working on further studies related to this subject and a standard is also being developed on Rural Broadband. This edition carries an "Invited Article" from Dr Abhishek Thakur, IDRBT on "Rural Broadband Service Architecture to Realise the Rural Phygital Marketplace".



## STANDARDIZATION ACTIVITIES

### TSDSI has published following new Technical Standards:

- **Methods and Interface Design for RIS-assisted Communication Systems** (TSDSI STD 5003 V1.0.0): This standard specifies the architecture, interfaces and mechanisms in a RIS-assisted communication system Intelligent Reflecting Surface consists of multiple meta-elements that are reflective in nature and can be used to direct the RF signal in a desired direction through appropriate technical measures. Introducing RIS in a network helps to solve coverage issues at low cost. Other applications comprise interference management, joint sensing and communication, energy saving, etc.

- **Standardization of common data payload for adaptive traffic control system and other Intelligent Transportation system** (TSDSI STD 5004 V1.0.0): The Standardization of Common Data Payload for Adaptive Traffic Control Systems and Other Intelligent Transportation System Products proposes an ontology for smart city use cases, facilitating the integration of multi-vendor products and dashboards deployed in smart cities. For different IoT products, such as traffic controllers used in smart cities and integrated with smart city dashboards, a standardized common service layer needs to be connected to multivendor traffic controllers and other intelligent transportation system products. Currently, such standardization of data payloads is not available in India, and it is expected to facilitate the integration of different intelligent transportation system products for comprehensive deployment scenarios. This standard may also have applications for global contributions. This would help eliminate compliance delays in the deployment of various intelligent transportation system applications for public use in smart cities.

### Following Technical Reports have been released:

### Services and Solutions:

- Study on system requirements related to Metaverse use cases in mobile network (TSDSI TR6032 V1.0.0)
- Enhancement of the Privacy of User Subscription Identity in Future Networks (TSDSI TR6031 V1.0.0)

### Technical Activities

TSDSI members are currently conducting technical studies and developing standards in the areas of 6G, 5G enhancements, broadcast offload, spectrum studies, wireless backhaul, VLC, quantum communications, Security, application layer interfaces and related protocols, services architecture and frameworks. New proposals on topics in these areas and additionally from the TSDSI Standardization Roadmap 3.0 are being deliberated in the Networks, and Services & Solutions Study Groups.

Following new technical activities have been initiated in July-September 2024 period:

### SG-Networks:
### Development of Standards:

- Update to TSDSI Standard (TSDSI STD 5003 V1.0.0) on Methods and interface design for RIS-assisted communication systems (WI1-NIP367)
- Profile for Smart Meters (WI1-NIP358)

### Technical Studies:

- Trusted node mapping for diverse Quantum channels (SI144)
- Underwater QKD (SI145)

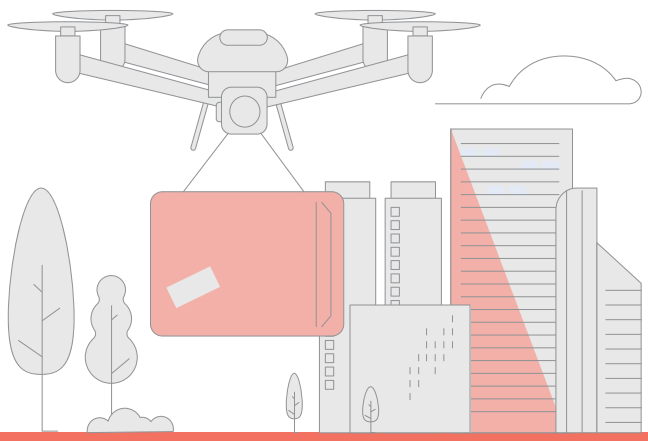
### SG-Services and Solutions:
### Technical Studies:

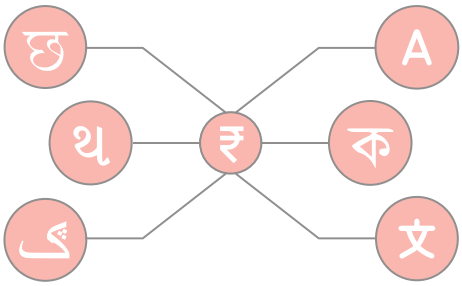
- Easing Operations using ML/AI solution for 6G and beyond (SI139)
- Service requirements and reference architecture for Railways Communications using 5G (SI140)
- Study on Network Capabilities Exposure (SI141)
- Interoperability of Multi-vendor QKD Hardware using SDN (SI142)
- Public Safety Use Cases for 6G Networks (SI143)

Please visit here for a full list of ongoing Technical activities.

Please reach out to sweta@tsdsi.in and Chandrakanta@tsdsi.in for details of our technical activities in the Networks and Services & Solutions Study groups respectively.

List of Liaisons received and sent by TSDSI can be viewed at https://tsdsi.in/liaison-statements/





## PRE-STANDARDIZATION ACTIVITIES

TSDSI has constituted Technology Roadmap Item Proposal (TRIP) Forums to carry out discussions with stakeholders in select areas with the objective of recommending topics that can potentially be taken up for developing standards within TSDSI. The forums are open to participation by non-members.
The following TRIP forums are currently active:

### Automated Electric Transportation TRIP Forum

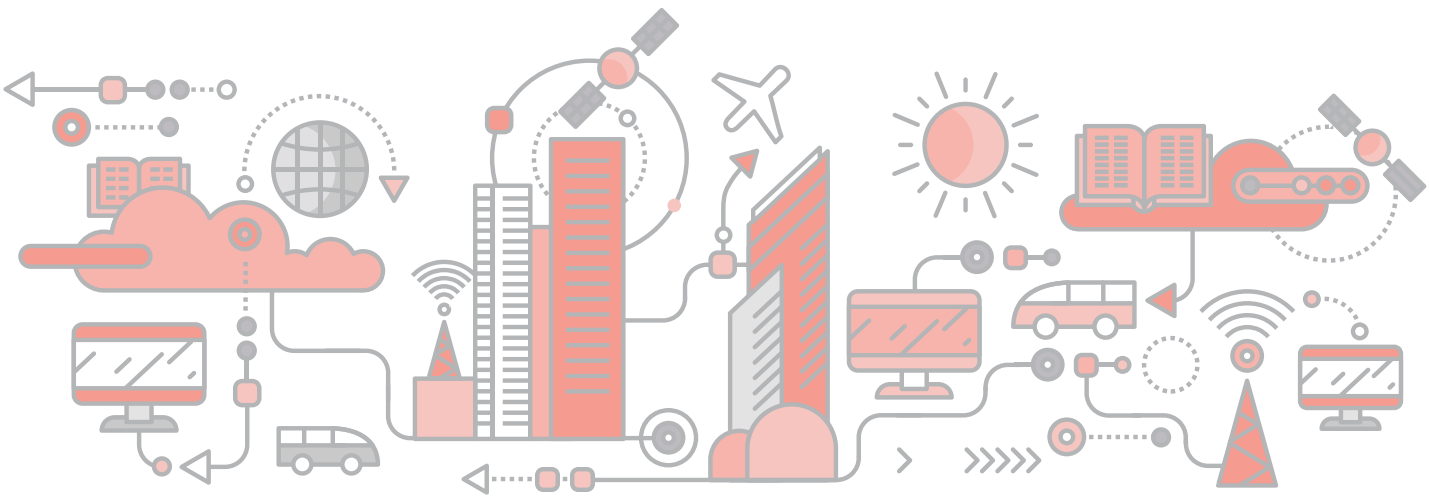
This forum is deliberating on development of a standardized reference architecture for automated electric vehicles (EVs) in dedicated lanes to enhance safety, address traffic congestion, and improve road utilization through market-driven solutions. It will also address various use case scenarios for automated electric vehicles in general, e.g. platooning, road and traffic object monitoring, automated toll vehicle tracking, traffic signage detection, emergency and warning scenarios etc. For each scenario current gaps in standardization, technology and infrastructure will also be assessed Technology implementation aspects like lateral control, guided navigation control, location granularity (NaVIC), emergency handling technologies as well as technology stacks necessary to support various use cases will also be studied and suggestions to fill the gaps through standardisation are proposed to be provided.

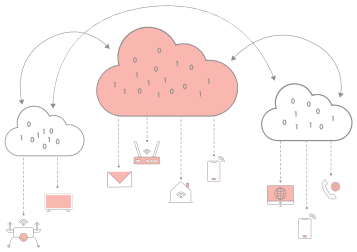
If you are interested in contributing in the above area, please reach out to Sweta Singh (sweta@tsdsi.in)

### IoT/M2M TRIP Forum

This forum is actively working with stakeholders from various verticals such as Fintech, Agri-Tech, Healthcare, and Smart Cities for assessing readiness of the current digital infrastructure, to come out with recommendations for a suitable roadmap for future deployments. The forum is also studying the global standards landscape including oneM2M for this purpose.

If you are interested in contributing in the above area, please reach out to Chandrakanta Rathore (Chandrakanta@tsdsi.in)





## GLOBAL STANDARDS ROUNDUP

### ITU-R:

6 TSDSI Delegates attended the ITU-R WP5D #46 meeting, held from 25 June to 2 July 2024 in Geneva.

### ITU-T:

TSDSI members submitted proposals to the SG13 - Future networks and emerging network technologies for new work items on "Use cases for application initiated on-demand end-to-end QoS provisioning in multi-user telerobotics" [1023], and "Use cases for wireless E-band multibeam backhaul supporting rural connectivity" [1148] in its Q20 Meeting.

TSDSI expert made a presentation to the ITU-T CITS Meeting held on 13 September 2024.

### WTSA 2024:

The World Telecommunication Standardization Assembly (WTSA-24) is being hosted by the Department of Telecommunications (DoT) in New Delhi from 15 to 24 October 2024. TSDSI members have contributed to several resolutions for the assembly through Telecom Engineering Centre (TEC).

TSDSI is also supporting the Kaleidoscope 2024 conference which is being held alongside the WTSA from 21 to 23 October 2024.

TSDSI has been carrying out capacity building and mentoring activities to enable stakeholders to contribute to the above and related events.

### 3GPP:

TSDSI member organizations sent 347 representatives to 19 meetings of the 3GPP, who made 768 contributions in the period July-September 2024.

### oneM2M:

TSDSI member experts participated and made contributions to the oneM2M technical plenary meeting held in September 2024 (TP#66) in Sophia Antipolis, France (in hybrid mode).

## PARTNER ENGAGEMENTS

### 11th 5G Global Event:

TSDSI (Telecommunications Standards Development Society, India) organized this event in collaboration with six leading 5G/6G organizations from around the world, including 5G Americas from the Americas, 6G Brasil from Brazil, IMT-2020 (5G) PG from China, 6G-IA from the European Union, 6G Forum from South Korea and XGMF from Japan.

The theme of the meeting was: "Unlocking the Future: Convergence of AI, Cloud, and Networks in Telecom". The event served as a platform for experts from Brazil, China, Europe, Japan, South Korea, the US and India to discuss topics related to current AI and Cloud Implementation Models in 5G Networks, Multi-Access Edge Computing Use Cases with AI, regional experiences from 5G deployments, and the path to 6G with AI and cloud, in four technical sessions. It helped in understanding the views from across the regions on the potential opportunities, challenges, standardization and deployment strategies of AI and cloud in 5G and 6G.


### TSDSI-WWRF RIS Workshop:

TSDSI conducted an online workshop on Reconfigurable Intelligent Surfaces (RIS) on 17 September 2024 in partnership with Wireless World Research Forum (WWRF).

The workshop provided an overview of the standard recently published by TSDSI, titled "Methods and Interface Design for RIS-assisted Communication Systems." It featured keynotes by expert speakers including Prof. Arzad Alam Kherani (Chair of the TSDSI working group on Application Layer Standards) and Prof. Angeliki Alexiou (Chair of the WWRF Working Groups on Radio Communication Technologies and High Frequency Radio Technologies).

## PROGRAMS

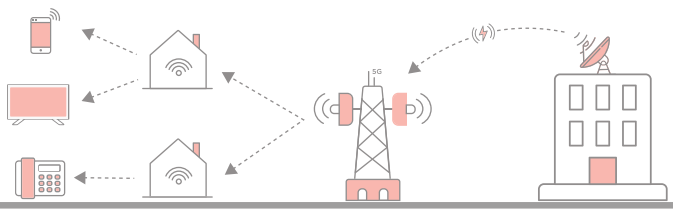
### TTDD2024:

TSDSI organised the 7th edition of its Annual Flagship Conference "TSDSI Tech Deep Dive (TTDD) 2024 from 16 to 19 July 2024. Its theme was "Realizing the 6G Vision: Societal Needs, Usage Scenarios & Technologies". It deliberated on topics related to Usage Scenarios, Emerging Technology Trends, Ubiquitous Intelligence: AI/ML enabled Future Networks, Security & Privacy, Spectrum Aspects for 5G Advanced and 6G, Rural Broadband Technology Landscape in 6 fully online technical sessions. The conference theme session "Realizing the 6G Vision – Societal Needs" was held in hybrid mode in Indian Habitat Centre, New Delhi. Key findings from the conference technical sessions on Usage Scenarios and Technologies was used as a reference point for the discussions in this session.

The conference featured 70 expert speakers from within India and around the world, and saw participation by 589 unique delegates (including 273 repeat participants).

### Key takeaways from the technical deliberations in the conference are given below:

- 6G networks will prioritize smart communication and efficiency, leveraging AI to enhance user experience and anticipate needs.
- Security is a major concern, with quantum cryptography emerging as a potential solution for protecting privacy and infrastructure.
- Bridging the digital divide in India was a focus, exploring innovative technologies to provide internet access and enhance education in remote areas.

INVITED ARTICLE

The article "Rural Broadband Service Architecture to realise the Rural Phygital Marketplace" deals with deployment models for the rural broadband service architecture for delivery of services to the rural society for various vertical sectors and applications like smart agriculture, transport, banking and many others. It deals with capacities and capabilities of remote management, administration, maintenance and delivery in the digital marketplace. The work is an outcome of a TSDSI technical study of architectures and developmentof standards for providing broadband services to citizens in gram panchayats and villages. TSDSI is now working on the 2nd phase of the study as well as standardization activities related to the subject. The work will also contribute to the government's 5G Intelligent Village Initiative, which seeks to leverage 5G technologies to uplift rural communities, addressing critical pillars such as agriculture, education, healthcare, governance, and sustainability.

## Rural Broadband Service Architecture to Realise the Rural Phygital Marketplace

**Abhishek Thakur, IDRBT**

**Context:**

According to Indian Council for Research on International Economic Relations (ICRIER) report (https://bit.ly/3AwUiAW), a 10% increase in Internet subscribers in India results in a 3.2 percent increase in the rate of growth of State per capita GDP. The National Broadband Mission 2019 was set up to enable fast track growth of digital communications infrastructure, bridge the digital divide for digital empowerment and inclusion, and provide affordable and universal access to broadband for all.

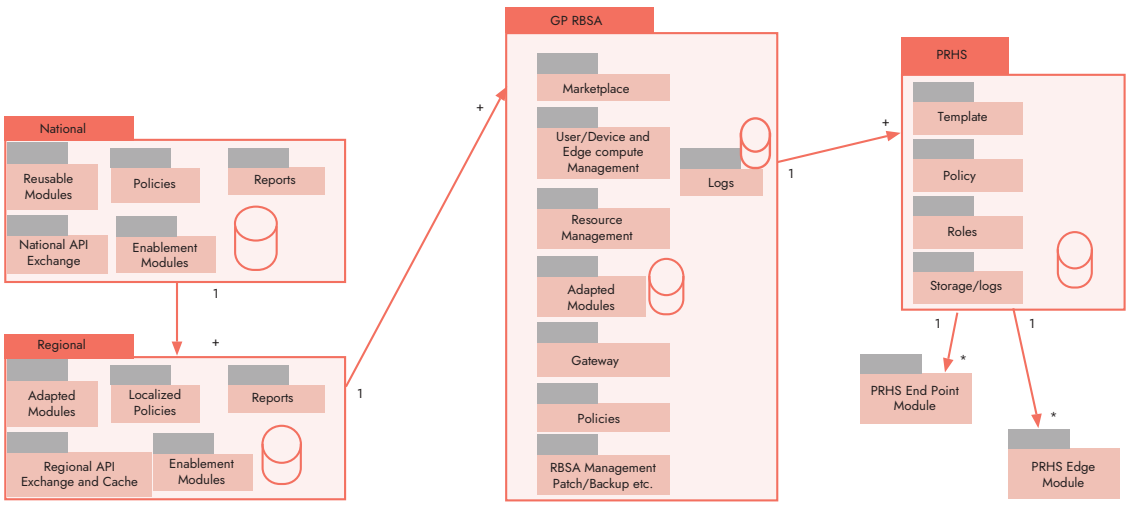
The flagship BharatNet Project is targeted to extend to all inhabited villages beyond all Gram Panchayats by 2025 with a **"Broadband"** speed up to 50 Mbps by 2025. It is expected to be used for connecting institutions such as hospitals, police stations, panchayat offices, schools, and colleges, anganwadis, etc., using the Rural Broadband network. It will help in the delivery of e-Governance application **"Services"** such as e-health, e-education, e-commerce, cashless transactions, etc. in rural areas.

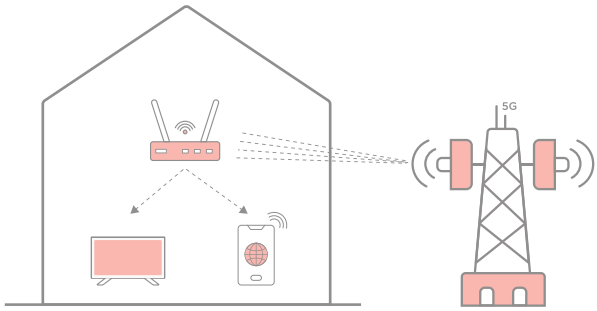
The application-level service delivery requires service enablement functions supporting all technology features like QoS, Service Management, Auto-failover, Security, SLA Management etc. for effective network integration. Rural technology platforms need to be cost efficient, economically viable and be able to support local entrepreneurs. It is also important that these platforms are easy to manage and troubleshoot, while scaling for millions of sites.

**TSDSI Report (TSDSI TR 6023 V1.0.0) on Rural Broadband Service Architecture:**

The Services and Solutions study group of TSDSI undertook a study of current broadband infrastructure in rural areas and various ongoing network deployments (such as PMWANI, BharatNet, TSP/ISP networks) and architectures/technology options for providing broadband to citizens in Gram Panchayats (GP) and Villages. It came out with a recommendation for an access agnostic service Layer that will offer rural centric services and improve utilization of existing connectivity infrastructure in Gram Panchayats and beyond. A technical report on a Rural Broadband Service Architecture (RBSA) framework that will foster local entrepreneurship and rural livelihood opportunities; provide scale for next generation innovators to focus on rural digital scenarios has been published. It covers the service enablement and network provisioning functions like edge/backhaul provisioning, local/regional/national service templatization, registry etc.

RBSA proposes a **rural digital marketplace** for Phygital[1] services coupled with tiered management and governance frameworks to ensure glocalization[2] for rural society. The digital marketplace is supported by access agnostic service layer which provides integration with digital-public-infrastructure (DPI) that spans beyond RBSA deployment through API integration with platforms like Aadhaar, DigiLocker and UPI. Target beneficiaries include service providers, government agencies across verticals, application developers and hardware providers for both the ICT aspects (sensors, devices, MEC) and vertical resources like pump-sets, tractors/harvesters, IP-cameras, rural enterprises (food processing / cold storage), etc. Besides equipment from other verticals – e.g. tablet with Aasha healthcare workers or smart devices for education, or PoS devices for payments, smart milk-collection cans etc. can integrate and co-innovate for RBSA.






INVITED ARTICLE

It proposes to have a semi-autonomous lightweight edge stack in the rural areas with capability of remote management and maintenance. The local MEC enables cost-efficient service deliveries for workflows across diverse verticals such as agriculture, education, healthcare, transport etc. It recommends deployment of the Digital marketplace with MEC at gram-panchayat level.

Since technical capabilities are lacking at most rural locations, RBSA deployment should be autonomous with self-healing capabilities. RBSA allows hierarchical governance of the platform so that local community (say panchayat) sets the local policies, while state / national level policies are remotely administered. Other management aspects like patches and upgrades, accounting and audit, data backup/replication, MEC management, API integration to external world are provided through regional/national enablement-blocks.

The report discusses a several use cases across verticals with varied QoS like bandwidth, error rates and delay tolerance. It elaborates realization of a sample Phygital workflow related to farm irrigation and maps the workflow activities to RBSA platform (end user devices, MEC, network connectivity) and rural entities (farmer, pump-set owner, bore-well owner, water and humidity sensors, payment platforms etc.).

Further work on defining the modules and APIs for various blocks of RBSA is currently going on in TSDSI. The contributing members are also exploring avenues to pilot few workflows of the RBSA Marketplace which in order to further refine the architecture based on the experience. Thereafter, a sandbox environment of the RBSA marketplace would be created to provide a test bed for developing further applications relevant to use cases in the rural areas. Subsequently hackathons would help identify and implement relevant use cases to enrich repository of ready-to-use workflows, activity templates and sensor/device integration.

1. Physical + Digital service - e.g. digitally enabled irrigation or transport with people helping deliver the service.

2. Global solutions with flexibility for adapting to local needs – i.e. local applications and localized policy settings and control.

**Acknowledgement:**

The author would like to acknowledge contributions by experts from IDRBT, C-DOT, ERNET, Tejas Networks, IIIT Hyderabad, Astrome, Sookta, IIT Bombay, IIT Madras, SETS for coming out with the proposed RBSA.

***Dr Abhishek Thakur***
**Assistant Professor, IDRBT**

Abhishek Thakur is an Assistant Professor at the Institute for Development and Research in Banking Technology, where he works on 5G Use Cases Lab for BFS, Open-source technologies and FinTech collaboration. His research interests include multimedia communications, financial inclusion and rural ICT deployments. In his more than 25 years career, split across industry and academia, he has developed multiple global solutions for both product and services-based organizations.

## ANNOUNCEMENTS

### TSDSI Outstanding Technical Contributions Awards

The TSDSI Outstanding Technical Contributions (OTC) Award recognizes the efforts and contributions of individuals in progressing the development of a standard. It recognizes an individual's efforts in contributing to and/or championing a technical activity within TSDSI during the year.

Awardees for the financial year 2023-24, Dr Rashmi Kamran, Mr Sandeep Agarwal, Ms Shwetha Kiran and Dr A Paventhan, were felicitated on 19 July 2024 by Ms Tripti Saxena, Sr. DDG and Head, Telecommunication Engineering Centre, in the concluding day session of TSDSI Tech Deep Dive (TTDD) 2024 Conference in New Delhi.


## EVENTS

TSDSI is hosting the 3GPP SA WG meetings in Hyderabad from 14th to 18th October 2024. Visit here for details.
Visit here for the Upcoming Calendar of Events.

## MEMBERSHIP UPDATES

TSDSI welcomes following organisations that joined us as members in July-September 2024:

**New Corporate Members:**
Kigen India Private Limited, Tata Teleservices Limited, MV Mobility Limited, QuNu Labs Private Limited

The full member list can be viewed here https://tsdsi.in/present_members/.
To apply for TSDSI membership, please visit https://tsdsi.in/membership/.

# ABOUT **TSDSI**

Telecommunications Standards Development Society, India (TSDSI), aims at developing and promoting India-specific requirements, standardizing solutions for meeting these requirements and contributing these to international standards, contributing to global standardization in the field of telecommunications, maintaining the technical standards and other deliverables of the organization, safe-guarding the related IPR, helping create manufacturing expertise in the country, providing leadership to the developing countries (such as in South Asia, South East Asia, Africa, Middle East, etc.) in terms of their telecommunications-related standardization needs.

TSDSI is recognised by the Department of Telecommunications as India's Telecom Standards Development Organisation (SDO).

TSDSI is registered as a Society under the Societies Registration Act (Act XXI of 1860).

This issue covers activities from 1 July 2024 to 30 September 2024
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