

A Transdisciplinary Framework for 5G and Future Networks Applications and Services Industry Connections Activity Initiation Document (ICAID)

Version: 2.0, 05 April 2023

IC21-005-02 Approved by the CAG 10 July 2023

Instructions

- Instructions on how to fill out this form are shown in red. Please leave the instructions in the final document and simply add the requested information where indicated.
- Spell out each acronym the first time it is used. For example, "United Nations (UN)."
- Shaded Text indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact

Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person's information may also be provided.

Name: Narendra Mangra

Email Address: nmangra@ieee.org

Employer: GlobeNet, LLC

Affiliation: GlobeNet, LLC

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

2. Participation and Voting Model

Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

Individual-Based

3. Purpose

3.1 Motivation and Goal

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

The Transdisciplinary Framework is a sustainable integrated ecosystem, networks, and governance framework that align priorities, capabilities, and constraints. This framework provides a pathway for stakeholder engagement across disciplines in a structured manner. It may be used to address complex scenarios that include smart cities, rural development, and even climate change.

Until now, most of the communication designs/architecture have taken a bottom-up approach wherein the applications are made to fit the underlying physical layer. The ecosystem that gets developed thus gets rigid and it becomes very difficult to introduce newer components and to an extent even understand the implications of each component in the overall architecture and design.

Thus, it is proposed that we develop a structured sustainable communication framework that is flexible, adaptable, and scalable for newer ecosystems. The framework is intended to be formulaic and can be extended for different ecosystems and may be used by governments, industry, and academia. It highlights both the areas of interest and gaps that should also be considered.

- (Business Focus) - Ecosystem of Ecosystems -- what do we need within and among ecosystems
 - Includes industry structure and competitor analysis, e2e supply chain, concepts. The ecosystem stage represents set(s) of industries
- (Technical Focus) - Network of Networks - what do we need to provide anticipated ecosystem needs (and how do we deploy with extension)
 - Use case categories and network operations enhancements to provide generalized 5G drivers and enablers (and deployment guide by extension – may drive link budgets for design work). Sec 4.2.1..2.2.5 breaks down what you need for deployments (Second Edition of Future Networks INGR Application and Services Framework)
 - Key Network components enable current / future technology equipment capabilities. May also enable some compensation, e.g. circumvent core/edge capabilities with additional RAN capabilities (should match with the bullet above)
- (Governance/Business Focus) - Function of Functions -- how do we use the Applications Driven Framework more effectively
 - Strategic/Tactical – inc pilots and other initiatives to improve economic development, quality of life, attractiveness/retention of residents (employees), new markets, expanded offerings, etc
 - Operational – ranges from basic functionality to competitiveness

3.2 Related Work

Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

- IEEE INGR Application and Services Transdisciplinary Framework
- P1950.1 - Standard for Communications Architectural Functional Framework for Smart Cities
- IEEE Public Safety Task Force
- ICNAID IC20-018 Transforming the Telehealth Paradigm: Sustainable Connectivity, Accessibility, Privacy, and Security for All

3.3 Previously Published Material

Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

List the previously published material, if any.

White Paper on 5G Enabled Agriculture Ecosystem: Food Supply Chain, Rural Development, and Climate Resiliency, Jan 30, 2023,

3.4 Potential Markets Served

Indicate the main beneficiaries of this work, and what the potential impact might be.

- Diverse stakeholders, sectors, and geographies related to
 - Ecosystems, e.g. agriculture, health care, public safety,
 - Networks, e.g. network component approach for fixed and mobile terrestrial and non-terrestrial networks
 - Governance, e.g. strategic, tactical, and operations functions
- Complex Scenarios, e.g. smart cities, rural development, pandemics, climate change
- Any communication ecosystem and architecture

3.5 How will the activity benefit the IEEE, society, or humanity?

Describe how this activity will benefit the IEEE, society, or humanity.

Coordinated non-siloed approach to maximize economies of scale and scope through alignment of

1. **Separate and focused programs** – intra & inter ecosystem alignments to address focused objectives, e.g. agriculture, public safety, telehealth
2. **Increase value across IEEE activities** – alignment across separate IEEE programs such as INGR, ICs, and PARs to increase overall value, e.g. using the transdisciplinary framework as a basis for smart cities, cross-IC collaboration between the Telehealth and Transdisciplinary Framework’s treatment of agriculture to address rural development. This increases the overall value proposition of the individual initiative as we introduce a systematic approach.
3. **Extend reach towards external entities** – Engage external stakeholders through pilots and best practices, e.g. agriculture pilot programs

Achieve IEEE's goal of developing a transdisciplinary framework that is flexible, scalable, and adaptable.

- New projects to be delivered across diverse sectors
- New activities, projects, programs can be the outcome of the program. This is an excellent opportunity to extend the reach and depth of 5G enabled applications and services across several industries.

4. Estimated Timeframe

Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: 06/2025

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCOM and the responsible committee of the IEEE SA Board of Governors. Should an extension be required, please notify the ICCOM Administrator prior to the two-year mark.

5. Proposed Deliverables

Outline the anticipated deliverables and output from this IC activity, such as documents (e.g., white papers, reports), proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

- 1) Identifying gaps in existing standards
- 2) New proposals for standards based on the gaps
- 3) Identification of Recommended Practices
- 4) Workshops and Events
- 5) Webinar support for the IEEE SA Telecom & Connectivity practice as needed.
- 7) Reports
- 8) Collaboration initiatives (refer to Clause 3.2)
- 9) Designing and building working prototypes that will be tested on the field

5.1 Open Source Software Development

Indicate whether this IC Activity will develop or incorporate open source software in the deliverables. All contributions of open source software for use in Industry Connections activities shall be accompanied by an approved IEEE Contributor License Agreement (CLA) appropriate for the open source license under which the Work Product will be made available. CLAs, once accepted, are irrevocable. Industry Connections Activities shall comply with the IEEE SA open source policies and procedures and use the IEEE SA open source platform for development of open source software. Information on IEEE SA Open can be found at <https://saopen.ieee.org/>.

Will the activity develop or incorporate open source software (either normatively or informatively) in the deliverables?

6. Funding Requirements

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government, or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICCOM.

No expenses anticipated apart from the basic support

7. Management and Procedures

7.1 Activity Oversight Committee

Indicate whether an IEEE Standards Committee or Standards Development Working Group has agreed to oversee this activity and its procedures.

Has an IEEE Standards Committee or Standards Development Working Group agreed to oversee this activity? No

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name

Chair's Name: Full Name

Chair's Email Address: who@where

Additional IEEE committee information, if any. Please indicate if you are including a letter of support from the IEEE Committee that will oversee this activity.

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

7.2 Activity Management

If no Activity Oversight Committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc.).

Executive Committee of this program will manage the activities.

7.3 Procedures

Indicate what documented procedures will be used to guide the operations of this activity; either (a) modified baseline *Industry Connections Activity Policies and Procedures* ([entity](#), [individual](#)), (b) *Abridged Industry Connections Activity Policies and Procedures* ([entity](#), [individual](#)), (c) Standards Committee policies and procedures accepted by the IEEE SA Standards Board, or (d) Working Group policies and procedures accepted by

the Working Group’s Standards Committee. If option (a) is chosen, then ICom review and approval of the P&P is required. If option (c) or (d) is chosen, then ICom approval of the use of the P&P is required.

(b) Industry Connections Activity Policies and Procedures Abridged Version

8. Participants

8.1 Stakeholder Communities

Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity and will be invited to participate.

Service Providers, Semiconductor Manufacturers, OEMs, ODMS, Telcos, Technology Providers

8.2 Expected Number of Participants

Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

~25 Individuals

8.3 Initial Participants

Provide a few of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Use the following table for an individual-based activity:

Individual Name	Employer	Affiliation
Narendra Mangra	GlobeNet, LLC	GlobeNet, LLC
Sandeep Agrawal	C-DOT	C-DOT
Dr. Ashutosh Dutta	JHU/APL	JHU/APL
Subhas Mandal	HFCL Ltd.	HFCL Ltd.
Subodh Gajare	Cisco	Cisco

8.4 Activity Supporter/Partner

Indicate whether an IEEE committee (including IEEE Societies and Technical Councils), other than the Oversight Committee, has agreed to participate or support this activity. Support may include, but is not limited to, financial support, marketing support and other ways to help the Activity complete its deliverables.

Has an IEEE Committee, other than the Oversight Committee, agreed to support this activity? No

If yes, indicate the IEEE committee’s name and its chair’s contact information.

IEEE Committee Name: Committee Name

Chair's Name: Full Name

Chair's Email Address: who@where

Please indicate if you are including a letter of support from the IEEE Committee.