

Connectivity Harmonization of the Digital Citizen
Industry Connections Activity Initiation Document (ICAID)
Version: 2.0, 6 August 2019
IC17-011-02 Approved by the IEEE-SASB 5 September 2019

Instructions

- Instructions on how to fill out this form are shown in red. It is recommended to leave the instructions in the final document and simply add the requested information where indicated.
- **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: Gerard James Hayes, Ph.D.

Email Address: gerard.hayes@wirelesscenter-nc.org

Phone: +1 919 900 0603

Employer: Wireless Research Center of North Carolina

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).

Entity-based

3. Purpose

Realizing the Immersive Future City: Design, Development & Deployment Considerations across The Digital Citizen's Journey via Standardized Technologies & Interoperable Technical Implementations

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.

This ICAID proposes a multi-stream effort to address the design implications and technology implementations with a unique, core focus on the development of the immersive environment that will impact all present and future Digital Citizens.

With the evolution towards ubiquitous connectivity of the "Digital Citizen", the interoperability and standardization of devices, data, and connectivity are critical for maintaining consistent and persistent states across multiple identity interactions and ultimately, the resultant environment.

The scope of this ICAID encompasses the following 7 work streams that touch upon multiple facets of connectivity: hardware, wireless, and data:

Work stream 1: Wireless Wearable Testbed (WWT)

- Establish a network of open testbeds and qualitative "development platforms" for the research and development of wireless wearable solutions for commercial, medical, and mission critical (e.g. first responder and military) applications.
- Support the advancement of In-body, On-body, and Near-body applications from Personal Area Network (PAN) to Wide Area Network (WAN) connectivity.
- Frequency, protocol, and device agnostic to support existing, planned, and experimental wireless devices and solutions from commercial-ready to academic investigations.

Work stream 2: Wearable to Clinical Data Stream Optimization.

- Identify the interoperability gaps from sensor through network.
- Foster optimization of data collection and data transmission to meet network challenges and device limitations.

Work stream 3: Expand the Digital Journey beyond PAN/WAN

- Situational conditions (such as V2x, digital home, digital ER/OR, and digital care)
- Devices, such as car platforms and mobile devices.

Work stream 4: Develop a Blockchain communication protocol with 360 data perspective.

Work stream 5: Consider Implementation Challenges on a Global Front in a future city environment (such as GDPR and PSK2).

Work stream 6: Harmonization and coordination with other IEEE and Industry Initiatives (such as 5G and IoT).

Work stream 7: Support Education, Outreach and Interoperability Events

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.).

With its unique emphasis on the Digital Citizen, the efforts that are proposed by this ICAID complement a broad range of system-level activities, such as the CTIA Over-the-Air (OTA) radiated performance characterization efforts, the NSF funded Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST) Center ERC, IEEE's 5G and IoT initiatives, and the Industrial Internet Consortium (IIC) efforts.

Coordination with Smart City Initiative.

3.3. Previously Published Material

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

N/A

3.4. Potential Markets Served

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

1. Wearable and medical devices: consumer, clinical, mission critical (such as first responder and military).
2. Smart City Candidate Cities & Transportation Manufacturers who have real world use cases that will benefit from interoperable and persistent identity states while maintaining individual's right to personal data agency
3. Data & Telecom (5G) Standards + Interoperability Experts
4. Cyber-experts with experience in blockchain and digital ledger technologies whose solutions lend towards identity management approaches that support secure micro and large data transactions
5. Trust in Agency & Identity markets and policy developers that are interested in implementing technical solutions relative to the enhanced, augmented environment with persistent data and identity states
6. Retail industry would also see value from this initiative related to a mix of in location as well as connected/mixed reality applications.

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: 9/2021

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCom and the IEEE-SA Standards Board. 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.

Over the next two year period, a broad range of deliverables are expected from the identified work streams.

Work stream 1, anticipated deliverables include the establishment of in-situ quantitative testbeds and qualitative "development platforms" (such as an operating room, emergency room, and elder care facility) where pre-standardization characterizations and commercial viability can be assist for emerging devices. This qualitative assessment can lead to proposals for test methodologies and standards, simulation tool models, human phantom tool models, and proposals for conferences and workshops to promote the testbed.

Work stream 2, anticipated deliverables include white papers, reports, and proposals for standards, conferences, and workshops. Work stream 2 has been combined with Work stream 4 (Develop a Blockchain communication protocol with 360 data perspective). The resulting workstream has been highly effective with a formal report, "EEE-Standards Association Pre-Standards Workstream Report: Clinical IoT Data Validation and Interoperability with Blockchain" issued on 28 February 2019. An extension of this IC will further enable the standardization effort that has begun.

Work stream 3, anticipated deliverables include white papers, reports, proposals for test methodologies and standards, simulation tool models, and proposals for conferences and workshops.

Work stream 4, anticipated deliverables include white papers, reports, proposals for standards, and proposals for conferences and workshops.

Work stream 5, anticipated deliverables include white papers, reports, and proposals for conferences and workshops.

Work stream 6, anticipated deliverables include white papers, reports, and proposals for conferences and workshops.

Work stream 7, anticipated deliverables include proposals for conferences, presentations, and workshops.

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 ICom.

Industry Connections staff will provide standard support as made available to all IEEE-SA IC activities. Activity members will provide any needed support for hosting meetings, marketing activities that exceed basic IC support. These efforts will also continue to seek funding as needed through sponsorships and grants.

7. Management and Procedures

7.1. IEEE Sponsoring Committee

Indicate whether an IEEE sponsoring committee of some form (e.g., an IEEE Standards Sponsor) has agreed to oversee this activity and its procedures.

Has an IEEE sponsoring committee agreed to oversee this activity?: Yes

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

Sponsoring Committee Name: IEEE Sensors Council Standards Committee

Chair's Name: Gerard James Hayes

Chair's Email Address: gerard.hayes@ieee.org

Chair's Phone: +1 919 900 0603

7.2. Activity Management

If no IEEE sponsoring 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).

This activity will be managed by officers elected by participants engaged in the activity. Participants may opt for a committee style approach with chair, vice-chair, etc. as needed to be determined at the initial participant meetings.

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*, (b) Sponsor policies and procedures accepted by the IEEE-SA Standards Board, or (c) Working Group policies and procedures accepted by the Working Group's Sponsor. If option (a) is chosen, then ICCCom review and approval of the P&P is required. If option (b) or (c) is chosen, then ICCCom approval of the use of the P&P is required.

This effort will use baseline *Industry Connections Activity Policies and Procedures*

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.

Government & Private entities including, but not limited to Medical, IoT, Telecom, R&D, Academia.

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.

10 to 15 Entities

8.3. **Initial Participants**

Provide a list 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 entity-based activity:

| Entity | Primary Contact | Additional Representatives |
|--|--|--|
| Wireless Research Center of North Carolina | Gerard James Hayes Gerard.hayes@wirelesscenter-nc.org | Scott Vance scott.vance@wirelesscenter-nc.org |
| NCSU/ECE Department | Troy Nagle | |
| NCSU/ASSIST | Adam Curry | Veena Misra |
| IT'IS Foundation | Neils Kuster | |
| NIST | Kate Remly | |
| Wireless Systems Solution | Laslo Gross | |