INCOSE Symposium Submission and Reviewer Categorization

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Version 2.1

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Revision History

Date	Version	Primary Authors	Primary Sources & Changes
2010	1.1	Yoshi Ohkami, Nobuaki Minato	Initial recorded version based on INSIGHT Vol.(13), I(1), p. 13-15
29 Sep 2011	1.2	Quoc Do	Updates for domains & enablers with input from Anne O'Neil, Eileen Arnold and Terje Fossnes
10 Jul 2017	2.0	David Endler, Mike Celentano	Input elicited from TechOps, Board of Directors, Events Committee, Industry Outreach Board, and version 1.2 contributors. Reduced jargon by changing "Enablers" to "Topics" and "Sectors" to "Domains". Increased scope to reflect current usage of these categories for papers, panels & tutorial submissions. Domains were changed to reflect currently active and anticipated areas of SE work. 12 domains were added, 7 were clarified, and 1 was retired. Topics were changed to reflect a balanced list based on the active and emerging topics as well as key areas of the SE Handbook, 15288, and Vision 2025. 10 topics were added, 12 were clarified, and 3 were retired. "Other Topic" and "Other Domain" choices will now require the submitter to enter a word or phrase to help with reviewer allocation and life cycle management of these categories. To help the submitters & reviewers understand some categories, examples are given in parentheses.
06 Aug 2019	2.1	David Endler, Gretchen Peacock	Added Diversity as a topic

INCOSE Symposium Submission and Reviewer Categorization

A. Introduction

Objectives

This document defines the Systems Engineering (SE) domains and SE topics that are used to categorize submissions for INCOSE International Symposium (IS). Those domains and topics are used to

- allocate skilled reviewers to submissions of papers, panels & tutorials and to
- facilitate compilation of IS program.

Approach to Version 2.1

The current list of topics and dmomains was reviewed after IS 2019 and it seems that the list is still good enough. At the same time, it was requestd to include another topic "Diversity". INCOSE Technical Operations (TechOps) Leadership decided to add "5.10 Diversity (cultural boundaries, diverse engineering teams, training underserved groups, etc.)" under "5. Cross-Cutting Systems Engineering)".

This topic is for papers that show the importance and value of diversity in enabling, promoting, and advancing systems engineering and systems approaches to address complex societal and technical challenges for a better world. Example topics include working across cultural boundaries, the importance and value of diverse engineering teams, and training/education targeting traditionally underserved groups.

Approach to Version 2.0

An update of the domains and topics is necessary to ensure alignment with ISO 15288:2015 and INCOSE SE Handbook v4. Furthermore, INCOSE Technical Operation (TechOps) was restructured in 2016 and additional working groups were founded since the last revision of this document. This revision also considers the strategic objectives defined in INCOSE Vision 2025.

This version attempts to reduce jargon by using "Topics" instead of "Enablers" and "Domains" rather than "Application Sectors". Parentheses next to the category are now reserved for category examples, useful to clarify what is meant to be included in some categories. The "Other" category selections must now come with text about the missing category. The existing student seclection is now documented and better defined. The existing primary sector selection is now documented.

The update includes comments from various SE experts across TechOps, INCOSE Board of Directors, Events Committee, Industry Outreach Board and contributors to the previous version. All comments were carefully evaluated by TechOps leadership and balanced against one another. The resulting categories were prototyped in EasyChair to help assure tool compatibility. However, the categories defined in this document are meant to be tool-agnostic.

The following table provides a top-level summary of the changes made:

Modification	Rationale
Retired 3 Topics	Lowest 10% of submissions in last 3 years
Retired 1 Domains	Lowest 10% of submissions in last 3 years
Added 10 Topics	Popular & SE Handbook topics were missing
Added 12 Domains	Popular and emerging domains were missing
Changed 12 Topics	Clarified, updated & separated as needed
Changed 7 Domains	Clarified, updated & separated as needed

B. Submission & Review Categories

Application of Categories

SE domains and SE topics are implemented in EasyChair as submitter & reviewer selections. When submitting a paper, panel or tutorial, submitters are encouraged to pick more than one SE domain but no more than 3 in order to sufficiently categorize the domain of their submission. In the same way, submitters are encouraged to pick more than one SE topic but no more than 3 to sufficiently categorize the topic of the submission. However, reviewers are encouraged to pick all topics and all domains that they have expertise in. The Events Committee then uses these categories in EasyChair to help best match reviewers to submissions. Some manual quality checking is always done after the automatic assignments of reviewers to submissions. While these categories were tested for compatibility to EasyChair, this document is meant to be tool-agnostic in defining the categories.

SE Topics

Between 1 to 3 domains are requested to be selected from the following list:

1. SE Theory
    1.1. Complexity
    1.2. Cybernetics (A.I., machine learning, etc.)
    1.3. Natural Systems
    1.4. Systems Dynamics
    1.5. Systems Science
    1.6. Systems Thinking
2. SE Technical Practice
    2.1. Business or Mission Analysis
    2.2. Manufacturing Systems And Operational Aspects
    2.3. Needs And Requirements Definition

  2.4. System Architecture/Design Definition

  2.5. System Integration

  2.6. Verification/Validation

3. SE Management

  3.1. Acquisition and/or Supply

  3.2. Configuration Management

  3.3. Decision Analysis and/or Decision Management

  3.4. Information Management Process

  3.5. Technical Leadership

  3.6. Measurement & Metrics

  3.7. Project Planning,Project Assessment and/or Project Control

  3.8. Quality Management Process

  3.9. Risk & Opportunity Management

4. SE Specialty Engineering

  4.1. Human-Systems Integration

  4.2. Life-Cycle Costing and/or Economic Evaluation

  4.3. Reliability, Availability, and/or Maintainability

  4.4. Resilience

  4.5. Competency/Resource Management

  4.6. System Safety

  4.7. System Security (cyber-attack, anti-tamper, etc)

5. Cross-Cutting Systems Engineering

  5.1. Agile Systems Engineering

  5.2. Lean Systems Engineering

  5.3. MBSE

  5.4. Modeling/Simulation/Analysis

  5.5. Processes

  5.6. Product Line Engineering

  5.7. Software-Intensive Systems

  5.8. Systems of Systems (IoT, cyber physical systems, etc.)

  5.9. Teaching And Training

  5.10. Diversity (cultural boundaries, diverse engineering teams, training underserved groups, etc.)

6. Other SE Topic

Submitter must enter text to describe which topic is missing for their submission.

Application Domains

Between 1 to 3 domains are requested to be selected from the following list:

1. Academia (curricula, course life cycle, etc.)
2. Aerospace
3. Automotive
4. Biomed/Healthcare/Social Services
5. City Planning (Smart Cities, Urban Planning, etc)
6. Defense
7. Emergency Management Systems
8. Energy (Renewable, Nuclear, etc.)
9. Enterprise SE (Organization, Policies, Knowledge, etc.)
10. Environmental Systems
11. Information Technology/Telecommunication
12. Infrastructure (Construction, Maintenance, etc.)
13. Maritime (Surface & Sub-Surface)
14. Autonomous Systems
15. Oil & Gas
16. Rail
17. Sustainment (Legacy Systems, Re-Engineering, etc.)
18. Service Systems
19. Very Small Enterprises
20. Other Domain
    Submitter must enter text to describe which domain is missing for their submission.

C. Primary Sector of Submitter or Reviewer

Sectors are divided into the 3 pillars of INCOSE, from which the submitter or reviewer primarily associates themselves. Only one can be selected. This categorization is not used in the automatic assignment process but rather used during the manual quality checking to help assure a balanced set of reviewers is selected for each submission.

1. Government
2. Industry
3. Academia

D. Student

In addition, submitters are asked to indicate whether they are a registered student. The definition of student is now aligned to INCOSE student membership, that is, currently enrolled in at least 2/3 full- time undergraduate, graduate or post-graduate program. This submitter attribute is used to help identify

candidates for the Brian Mar Best Student Paper.

E. Way forward

To keep the list of SE domains and SE topics up to date, a yearly review of this document under TechOps leadership will be conducted based on the "Other" categories submitted, activity levels of categories, and anticipated categories. To help assure INCOSE governance alignement, TechOps will ask the Board of Directors and Events Committee to provide a formal review of the subsequent revisions, assuring that key roles in their organization are included in their review as they see fit.