2019
Annual INCOSE
international workshop
Torrance, CA, USA
January 26 - 29, 2019

Enterprise Systems

www.incose.org/iw2019

Enterprise Systems

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INCOSE WEB PAGE

Charter Summary

WG PURPOSE/MISSION

The purpose of the INCOSE Enterprise Systems Working Group (ESWG) is to advance and to promote the application of Systems Thinking, Systems Science and Systems Engineering to understanding and managing the enterprise as a system.

Enterprises are highly complex, sociotechnical systems of systems that depend on the intelligent interaction, creation, management and use of various forms of knowledge throughout their organizational policies, processes and structures. Failure to design, to operate and to remediate enterprises as systems, is the primary underlying cause of the gross inefficiencies, unintended consequences and systemic failures that routinely inflict substantial economic loss and societal harm.

Systems engineering (SE) is an interdisciplinary methodology for understanding, designing and enabling system solutions for complex problems, and as such it is uniquely suited to offer understanding and solutions in the domain of enterprises. However, as applied to sociotechnical systems such as enterprises, SE must include an understanding of basic social sciences, human factors and other “soft” disciplines that may be unfamiliar to systems engineers who are more accustomed to focusing on physical, electronic and technical systems.

WG GOAL(S)

The ESWG will work to build a generic understanding of the elements and sub-systems and their various roles comprising enterprises, and a set of systems engineering methodologies for applying this generic understanding to analyzing specific organizations and their problems. This will involve establishing cross disciplinary teams and consultations involving systems engineers, enterprise architects, people from the life and social sciences, and practitioners in areas such as management consulting, organizational knowledge management, business process reengineering, and change management, amongst others.

Over the short term, the ESWG will seek to assemble existing knowledge and theories relating to the enterprise as a system for inclusion in the SEBOK that is accessible to systems engineers. Over the intermediate term, the WG will collect and assess

methodologies and templates to guide systems engineering approaches for intangible and tacit aspects of the enterprise as a system.

Over the long term, the ESWG will compile a comprehensive Enterprise System Management addition to the INCOSE Handbook and training and certification packages for Enterprise Systems Management.

WG SCOPE

It is the intent of the ESWG to focus narrowly on the enterprise embodiment of SE and to work closely with other WGs that can and will inform this area – System Sciences WG, Complex Systems WG, System of Systems WG, Human Systems WG, Enterprise Architecture WG, and others.

The initial scope of the ESWG will be to survey relevant scientific foundations, to assess and prioritize concepts, and to match them with systems engineering concepts and principles for incorporation in an Enterprise Systems Management Body of Knowledge. Among others, the following scientific domains appear to be directly relevant.

Major disciplines:

- Business Management
- Organizational Behavior
- Psychology, Sociology, Gaming Theory
- Other Social Sciences, more generally
- Systems Engineering

Specialized fields

- Systems Thinking and Systems Analysis
- General systems theory
- Soft Systems Methodology
- Second order cybernetics

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- Social Systems Theory
- Complexity Science

This WG's scope is significant as it attempts to engage with issues from an emergent field of complex (adaptive) systems (social, technical and economic) focusing on the implementation of processes involved in this multi-disciplinary field. The skill set required is considerable due to an approach that includes social science, engineering, processes and management, practical and theoretical comprehension for an applied outcome. These are not commonly combined skills sets and no real formal training exists, yet the need for such combinations is known.

IW Outcomes

An Enterprise System is a conceptual model of any purpose-driven activity (enterprise) of two or more participants: a company, institution, professional society, working group, hospital, NGO; an industry, a government, or a society. Regardless of whether and how it employs systems engineering for its deliverables, an enterprise should be designed, implemented, and operated as a complex, adaptive, sociotechnical system of systems. Engineering such a system of people, process, and technology requires skill-sets beyond the "comfort-zone" of traditional engineering, but it relies heavily upon systems thinking, systems science, and systems engineering for holistic treatment.

Digital Engineering (DE) is a fundamental part of the ongoing Digital Transformation in industry, business, and society. In particular, Model-Based Engineering (MBE) is a key technological enabler for designing complex products and services. INCOSE places high strategic importance on cultivating awareness and actualizing its work-products (such as for MBE) into industrial organizations. Successful implementation of such strategic initiatives typically involves modeling of Enterprise Transformation (ET) outcomes and an Organizational Change Management (OCM) process, both of which are important elements of an enterprise. This was the subject of a joint session between ESWG and the SE Transformation WG.

Accordingly, the Enterprise Systems Working Group (ESWG) can be a strong venue and champion for Enterprise Transformation as a core facilitator of DE and MBE transformation -- within the larger scope and broader context of Enterprise Systems Engineering -- and ET can be an area of initial focus for ESWG.

Planned Work past IW

PLANNED ACTIVITIES

Encouragement of submission of paperless-presentation proposals for IS2019 on subject of Enterprise Systems Engineering;
Outreach to other WGs;
Webinars and virtual conferences
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PLANNED WORK PRODUCTS

Model(s) of INCOSE as an Enterprise System, particularly with respect to facilitating Enterprise Transformation within INCOSE