



INCOSE Digital Engineering Information Exchange Working Group (DEIX WG) Charter

1 PURPOSE

Problem Statement: Despite advances in the digital era, there are significant inefficiencies in cost, schedule, and performance when suppliers and acquirers exchange information following a traditional document-based approach. These same inefficiencies exist within organizations when sharing information across organizational boundaries. This practice of document-based systems information exchange complicates shared understanding and increases technical and programmatic risks.

Opportunity: Leverage new digital technologies, forms of media and means of interaction to provide enriched system representations providing alternative views to visualize, communicate and deliver data, information, and knowledge to stakeholders. Define a set of digital artifacts that improve communication and a shared understanding of essential system information. Identify or provide standard/conventional ways to define, request, offer and exchange information between stakeholders across the full systems life cycle.

DEIX WG aspires to ensure Digital Artifact conventions are transferable between complex systems-based industries such as aerospace and defense, oil & gas, transportation, automotive, medical and utility industries. Finally, the successful fulfillment of this purpose allows the free flow of digital artifacts between buyers and suppliers throughout a global supply chain. Within INCOSE, this DEIX WG supports the strategic objective to accelerate the Transformation of Systems Engineering to a model based discipline.

2 GOAL

The DEIX WG primary goal is to establish a finite set of digital artifacts that acquiring organizations and their global supply chains should use to request an exchange with each other as well as internally between teams/organizational elements. The following goals support this primary goal:

Goal 1 – Define a Finite Set of Digital Artifacts: Define a finite set of digital artifacts that take advantage of digital technology to satisfy stakeholders' information needs as it relates to systems engineering lifecycle standards such as ISO/IEC/IEEE 15288, 15289, 15504-6, 12207, 26531 and 24748.

Goal 2– Develop Constructs for assembling Digital Artifacts: A set of constructs and conventions that define how to select, compile, and analyze digital artifacts to produce digital engineering content for stakeholders.

Goal 3 – Identify, Leverage and Influence Standards to Improve Digital Artifact Exchange: To use the understanding of existing and missing DEIX related standards literature to evolve a consensus-based standards framework for a Digital Engineering Information Exchange Model (DEIXM). To identify existing standards and conventions that apply to Digital Artifacts Exchange, determine the



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needs for digital artifact related standards; and then, determine the gaps. Finally, in coordination with INCOSE Standards Initiative, liaise with foreign and domestic standards organizations to petition for changes or additions based on knowledge gained from DEIXM products.

Goal 4 – Adopt a Common Lexicon: Define concepts, achieve community acceptance, and monitor adoption of the lexicon by the global supply chain as a means to describe digital artifacts.

3 SCOPE

- The WG activities and products span the systems engineering lifecycle as it relates to Digital Engineering information inputs and outputs of ISO 15288 and 15289 digital artifacts.
- The WG will also address the exchange of digital artifacts between various technical disciplines involved in the systems engineering lifecycle.
- The WG covers the presentation of digital engineering information to classes of technical and non-technical stakeholders across the complex global supply chain.
- When appropriate, the WG will adopt previous and evolving knowledge from standards and other sources regarding the exchange of digital engineering information between multiple disciplines, and digital technologies throughout the systems' lifecycle.
- Close collaborations will include the TIMLM WG, MBSE Initiative, AD SE Transformation, AD Technical Information. The WG will also collaborate with the NDIA Modeling and Simulation Division and Systems Engineering Division. When considering changes or additions to standards, the WG will engage the INCOSE Standards Initiative.
- The scope of DEIX includes "**The what?**" or the characterization of the content and relationships, involved in the exchange of digital artifacts. DEIX does not include "**The how?**" or the means and mechanisms for exchanging digital artifacts. The Tool Integration Model Lifecycle Management Working Group (TIMLM WG) defines the means and mechanisms for information exchange

4 DEFINITIONS

Digital Artifacts: A digital form of information content that a digital engineering ecosystem produces and consumes by generally following the systems engineering life cycle's process areas as defined in ISO 15288. Includes all information content shared between stakeholders to execute the total technical and managerial effort required to transform a set of stakeholder needs, expectations, and constraints into a solution and to support that solution throughout its life.

Digital artifacts provide "data for alternative views to visualize, communicate, and deliver data, information, and knowledge to stakeholders. They include model-based representations of "information that originates and terminates in many forms (e.g. audiovisual, textual, graphical, numerical) and mediums (e.g., electronic, printed, magnetic, optical)." Organization constraints, e.g., infrastructure, interorganizational communications, and distributed project workings, are taken into account. Relevant information item standards and conventions are used according to policy, agreements and legislation constraints". Includes include data sheets (electronics), databases (software), documents (operator role), and exportable data files (mechanics) and more. (ISO 15288 NOTE in Information Management Process)



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Digital Engineering Information Exchange (DEIX): The exchange of digital artifacts between system engineering entities (processes, models, and organizational elements).

5 SKILLS AND EXPERTISE REQUIRED

The expertise required to advance the goals for this WG include anyone with expertise in Model-Based Engineering, systems engineers, information scientists & engineers, product engineers from any tier of the A&D industry's global supply chain, or any deep expertise in configuration management/data management across the systems lifecycle process.

6 MEMBERS, ROLES, AND RESPONSIBILITIES

Leadership: The Working Group leadership includes Co-Chairs and Organizational Liaison/Stakeholder Representative positions. These roles make up the WG governing body.

Co-Chairs: These positions are responsible for achieving the WG purpose, goals, and outcomes as well as cross-coordinating and de-conflicting interests with other INCOSE working groups, governing bodies, and support staff. Co-Chairs plan to encourage international, cross-domain participation, to represent the diversity of information exchange in the application of Systems Engineering. Finally, they can ensure the WG's products enable, promote, and advance Systems Engineering and systems approach.

Organizational Liaison/Stakeholder Representatives: The core responsibilities of this role are to report progress to their respective leadership and constituents, solicit feedback and inputs on the WG's interim and final products, and advocate for digital artifacts outcomes that support their organizations' mission.

Current Organizational Liaisons/Stakeholder Representatives/advisors include:

- Philomena Zimmerman: US OSD OUSD Research & Engineering
- Troy Peterson: INCOSE AD Transformation and Pattern WG
- Chris Schreiber: Modeling and Simulation Subcommittee of SE Division of NDIA
- David Allsop: Modeling and Simulation Subcommittee of SE Division of NDIA

Membership: There are three types of membership for the WG.

Core Membership: This type of membership is open to any INCOSE member in good standing.

Invited Membership: This membership includes those that are not members of INCOSE; yet, they possess specialized knowledge that benefits the goals and objectives of the WG. Invited membership may vary based their relevance to digital artifacts goals. Additionally, the Co-Chairs may conduct closed meetings from time to time with the governing body, core membership or others.



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7 OUTCOMES (PRODUCTS/SERVICES)

The desired output for the Working Group is a set of digital artifacts described in a precise format so stakeholders could exchange graphical and non-graphical digital information (refer to previous sections). The WG may specify any outcomes and products in the Technical Project Plan(s) (TPP). The WG can make these available to the INCOSE membership. TPP's shall be developed, submitted and tracked as defined by the applicable Technical Operations procedure.

8 APPROACH

Business Meetings: These meetings are for the governing body and their stakeholders to plan, direct, monitor, and control the activities for the WG. The Co-Chairs can call these meeting as needed.

General Meetings: Unless otherwise noted, the WG general meetings are open to any INCOSE members in good standing and any non-members with formal invitations. Upon opening the floor to the membership, the governing body permits all attendees to express their professional questions, commentary, support, or objections to WG agenda topics in the allotted time. This town-hall meeting approach enables the governing body to assess the will of the community better.

Closed Meetings: The WG Co-Chairs reserve the right to call closed meetings that restrict the meeting to the governing body and their invitees. The Co-Chairs may call the meetings to resolve deadlock decisions, conflicts, or contentious issues that result in alternative proposals, which they put to the general body.

Internal Decision-Making Process: The WG shall use consensus to make decisions at meetings. When the vast majority agrees or abstains, the WG achieves consensus. When WG membership cannot reach consensus during the meeting, or a significant minority of the members object to any proposals; then, the Co-Chairs reserve the right to postpone the decision for a closed meeting session by the governing body. When consensus is not clear, the Co-Chairs may institute polling of the governing body to determine a majority, they may modify the proposal and resubmit for consensus, or they may concede to a deadlock decision.

The Reporting Method: The core team intends to record essential positions, action items, status, and any formal decisions. They intend to post informal meeting minutes to the appropriate websites for review by the WG membership. The Organizational Liaisons will provide updates to their supporting organizations as needed.

9 MEASURES OF SUCCESS

Primary measures of success for this WG include:

- Continual active progress toward goals defined in this charter.
- Positive feedback from Organizational Liaisons/Stakeholder Representatives.



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- Positive feedback from WG members.

10 RESOURCE REQUIREMENTS

This WG plans to assess budget requirements yearly and submit budget requests to INCOSE Technical Operations as deemed appropriate to achieve goals. Effectively enabling and facilitating infrastructure support from INCOSE for WG activities as needed. Access to systems standards may also become necessary.

11 DURATION

This Charter remains in effect until a new version is approved or until the WG is retired by INCOSE due to inactivity.

12 APPROVAL (INCLUDE MEMBER ROLES & RESPONSIBILITIES IN ADDENDUM)

	7/6/2018
DEIX WG Co-Chair	Date:
	7/6/2018
DEIX WG Co-Chair	Date:
	7/6/2018
AD Transformational Enablers	Date:
	7/6/2018
Technical Director, INCOSE	Date:

Revision History

<u>Date</u>	<u>Revision</u>	<u>Description</u>	<u>Author</u>
6/14/2018	1.0	Initial Draft.	John Coleman, Ph.D.