Strength Through Unity

FEATURE ARTICLE

Reflections on IW2025: Advancing Systems Engineering Through Global Collaboration
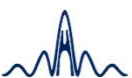
WELCOME

Dear Readers,

Welcome to this edition of the PPI Systems Engineering News Journal (PPI SyEN)! As we navigate the complexities of an ever-evolving technological landscape, our theme for this issue, "**Strength Through Unity**," serves as a powerful reminder of the collaborative spirit that drives progress in systems engineering.

The strength of our discipline lies in its ability to integrate diverse perspectives, methodologies, and expertise to develop robust, innovative solutions. Whether in aerospace, healthcare, digital transformation, or sustainability, systems engineering thrives when professionals come together to solve complex challenges. This issue highlights the power of collaboration, featuring insights from the INCOSE International Workshop 2025, key industry trends, and emerging best practices that reinforce the importance of unity in engineering excellence.

At PPI SyEN, we remain committed to fostering a global community where knowledge sharing, interdisciplinary cooperation, and continuous learning empower engineers at every stage of their careers. By uniting our expertise, we not only strengthen our field but also contribute to a future where systems engineering continues to be a force for innovation and progress.

Thank you for being part of this journey. We encourage you to engage, share, and collaborate—because together, we are stronger.

Enjoy the issue!

Francois

Managing Editor (on behalf of the PPI SyEN Team)

Views expressed in externally authored articles are not necessarily the views of PPI nor its professional staff.

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>
> *It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.*
>
> **Charles Darwin**

PPI Systems Engineering Newsjournal (PPI SyEN) seeks: ➢ To advance the practice and perceived value of systems engineering across a broad range of activities, responsibilities, and job-descriptions ➢ To influence the field of systems engineering from an independent perspective ➢ To provide information, tools, techniques, and other value to a wide spectrum of practitioners, from the experienced, to the newcomer, to the curious ➢ To emphasize that systems engineering exists within the context of (and should be contributory toward) larger social/enterprise systems, not just an end within itself ➢ To give back to the Systems Engineering community	**PPI defines systems engineering as:** *an approach to the engineering of systems, based on systems thinking, that aims to transform a need for a solution into an actual solution that meets imperatives and maximizes effectiveness on a whole-of-life basis, in accordance with the values of the stakeholders whom the solution is to serve. Systems engineering embraces both technical and management dimensions of problem definition and problem solving.*

SYSTEMS ENGINEERING NEWS

Recent events and updates in the field of systems engineering

System Dynamics Society 2025 Leadership News

The System Dynamics Society (SDS) has announced the 2025 updates to the Society's leadership team. Noteworthy changes include:

- Asmeret Bier Naugle takes over as President in 2025 from Allyson Beall King. Asmeret works at Sandia National Laboratories on projects that focus on national security, social science, systems analysis, and trusted AI.
- Jenson Goh is the new Vice President of Professional Practice. As the CEO of Coddiwompling and Associate Professor at the Singapore Institute of Technology, he has led transformative programs and initiatives across academia, industry, and global consulting.

New Policy Council members-at-large include:

- Burcu Tan Erciyes, Associate Professor at The University of New Mexico
- Irene Headen, Assistant Professor of Black Health in the Department of Community Health and Prevention at the Drexel Dornsife School of Public Health
- Oluwabunmi (Bunmi) Falebita, Research Fellow at the Nigerian Institute of Social and Economic Research (NISER)
- Vinícius Picanço Rodrigues, Program Director at Insper, Brazil, and Honorary Research Fellow at the University of Strathclyde, UK.

See the SDS 2025 leadership announcement.
View the complete set of SDS officers and Policy Council members.

PDMA Leadership News

The Product Development Management Association (PDMA) has announced the election of two individuals to the PDMA Board of Directors, with three-year terms commencing in January 2025.

Claudio Dell'Era is a distinguished Professor of Design Thinking for Business at the School of Management, Politecnico di Milano, and co-founder of LEADIN'Lab - the Laboratory of LEAdership, Design, and Innovation.

Michael "Spike" Ross-Corbett is the Product Manager at Portland Marketing Analytics (PortMA), where he leads the development of the RecapIQ platform.

Read the full announcement here.

View photos and bios for the whole board here.

SYSTEMS ENGINEERING NEWS

Intercax Winter News

Intercax, developers of the Syndeia™ Digital Thread platform, has announced the release of Syndeia 3.6 Service Pack 1 (SP1), highlighting new and improved capabilities that include:

- Syndeia cloud infrastructure upgrades that require new versions of infrastructure components (e.g., Java, Cassandra, etc.) for improved feature support and cybersecurity
- Syndeia cloud web dashboard improvements, e.g., pie charts, cross-references, and graph queries
- Integration improvements with numerous applications, e.g., Bitbucket, Confluence, DOORS NG, GENESYS, GitHub, and Jama Connect
- Syndeia client dashboard improvements
- Documentation and usability updates

See more details on Syndeia 3.6 SPI here.

Several blog posts from Intercax elaborate on Syndeia's capabilities and applications:

- AI for Digital Threads and Integrated Digital Engineering
- SysML v2 and Digital Threads with Syndeia
- Digital Thread Conference 2024: A Milestone for Digital Engineering

Learn more about Intercax products and services.

MBSE Tools Market Overview

Business Research Insights has published a report that provides an overview of the global market for MBSE tools. They expect the MBSE tools market to grow from USD 3.3 billion in 2024 to over USD 13 billion by 2033. The anticipated drivers for this growth include:

- Growing interest in digital transformation
- Need for better inter-team collaboration
- Increasing complexity in system design

The report highlights the rising adoption of cloud-based solutions as the most significant trend in this market space.

Additional elements of the report include:

- Market segmentation by type and application
- Market dynamics – driving factors, restraining factors, opportunities, and challenges
- Regional market insights
- Key industry players and developments

View the report summary here.

SYSTEMS ENGINEERING NEWS

System Structure & Parameterization (SSP 2.0) Standard Released

The [Modelica Association](#) is a non-profit organization that develops coordinated, open access standards and open source software in the area of cyber-physical systems. The Association has announced the version 2.0 release of the [System Structure & Parameterization Standard](#) (SSP 2.0). This standard provides a format for the exchange of composite system simulation models and simulation model architectures.

Major advances achieved through SSP 2.0 include:

- Architecture Exchange
- Advanced Co-Simulation
- Broader Component Support
- Virtual Electronic Control Units
- Layered Standards and Meta Data
- Next Generation Digital Twins
- Artificial Intelligence Applications

View the [SSP 2.0 specification changes](#) and [release notes](#).
[View](#) or [download](#) the original press release.

Business Analysis Standard 2.0 Update Released

The [International Institute of Business Analysis (IIBA)](#) has announced the release of the updated (Version 2.0) Business Analysis Standard. The Standard serves as a foundation for professional business analysis, providing guidance to practitioners around the world. Developed in collaboration with an international community of business analysis professionals, the Standard reflects the collective experience and insights of its contributors.

Highlights of Version 2.0 include:

- Emphasis on achieving measurable outcomes
- New insights that address modern organizational complexities
- Streamlined presentation of foundational concepts

The 58-page Business Analysis Standard 2.0 covers topics such as:

- Understanding Business Analysis
- Mindset for Effective Business Analysis
- Implementing Business Analysis
- Applying Business Analysis Tasks

Over half of the document is spent elaborating on thirty Business Analysis tasks. A sample of these tasks includes:

- Plan Business Analysis Approach

- Identify Business Analysis Performance Improvements
- Manage Stakeholder Collaboration
- Trace Requirements and Designs
- Define Future State
- Specify and Model Requirements and Designs
- Verify Requirements and Designs
- Define Design Options
- Analyze Potential Value and Recommend Solution

Each task is presented in a one-page graphics-rich format that summarizes the tasks:

- Purpose or Need
- Stakeholder
- Value
- Task Inputs and Outputs
- Resources (Guidelines and Tools)
- Techniques
- Solution
- Description of Change (from stakeholder perspective)
- Tips to Consider

The Business Analysis Standard is available at no cost. Learn more here.
Download the Standard.

Join the IIBA to gain access to additional business analysis resources, e.g., the KnowledgeHub or Research Reports.

Digital Twin Testbed Initiative

The Digital Twin Consortium (DTC) has announced the Digital Twin Testbed Initiative, a member-driven platform for the development, testing, and validation of digital twin systems and enabling technologies. Through the initiative, DTC members will be able to collaborate with global pioneers in AI-enhanced decision-making, real-time data integration, and predictive modeling.

The initiative will use the DTC's "Composability Framework," which includes the Digital Twin Business Maturity Model, the Platform Stack Architectural Framework, and the Digital Twin Capabilities Periodic Table and Toolkit. The testbed initiative includes a capabilities-focused maturity assessment framework based on quantifiable key performance indicators (KPIs).

Anticipated benefits to participants include:

- Accelerating digital twin innovation and real-world deployment
- Providing a robust environment for development, testing, verification and validation
- Highlighting the main attributes of Digital Engineering
- Fostering collaboration on innovative enabling technologies

Read the Testbed Initiative press release.

Submit a Testbed Initiative interest form.
Join the DTC.

Waters Center For Systems Thinking 2024 Annual Report

The Waters Center for Systems Thinking (WCST) is a non-profit foundation with forty years of delivering systems thinking know-how to a diverse set of communities and individuals (from kindergarten students through Fortune 500 CEOs). The Center has issued its 2024 Annual Report that highlights recent news and accomplishments, including:

- The addition of three new systems thinking specialists
- The retirement of Joan Yates, Senior Vice President, with 35 years of service to the Center and the global systems thinking community
- The addition of almost 1900 new website registrants who may access online systems thinking courses and resources
- Over 900 participants joining 9 systems thinking webinars during 2024
- Multiple cohorts of Advanced Facilitator Credential (AFC) members participating in learning, coaching, and credentialing activities, with 148 cohort members from 16 countries engaged thus far
- Waters Center team participation in eight global conferences during 2024
- Distribution of over 9000 children's books that highlight systems connections

Systems Engineering Tools Database (SETDB) Updates

The Systems Engineering Tools Database (SETDB), developed by PPI in partnership with INCOSE, provides a virtual platform for engineering tool vendors to communicate their latest offerings.

Recent SETDB updates, including both new tools and updates to existing tools, include:

Vendor: Aerospace
- Model-Based Capability Assessment: For organizations to assess their model-based capabilities by noting the current and desired stage of modeling. This information is useful to plan model-based capability evaluation through roadmaps and projects.

Vendor: Altair Engineering Inc.
- RapidMiner® Platform: Scalable, secure enterprise data analytics and AI platform with data fabric products that represents a comprehensive, open-architecture solution for data analytics, simulation, and high-performance computing. Enables anyone to utilize enterprise data, build and deploy models, and build applications.
- AI Studio: Data science tool anyone can use to design and prototype highly explainable AI and machine learning models. It offers a visual drag-and-drop workflow designer, automated machine learning tools, support for generative AI, and interactive data prep capabilities.
- Graph Studio™: Graph Studio is powered by Graph Lakehouse, a high-performance MPP that includes hundreds of data science primitives, traditional online analytical processing

(OLAP) analytics, graph algorithms, and geospatial functions to support a variety of analytics use cases.

- Twin Activate™: An open and flexible integration solution that enables whole system simulation with real-time digital twin deployment through any stage of the product lifecycle.
- SimSolid: Game-changing simulation technology for designers, engineers, and analysts. It eliminates geometry preparation and meshing: the two most time-consuming, expertise-extensive, and error-prone tasks performed in a conventional structural simulation.

Vendor: avolution

- ABACUS: A cloud-based collaborative enterprise architecture tool that connects IT and business strategies; supports over 100 Enterprise Architecture Frameworks, several standard modeling languages, and standards like the ISO/IEC 42010 standard for system and architecture descriptions.

Vendor: IncQuery Group

- IncQuery Validator for Enterprise Architect: Devops-ready solutions that provide automated model quality reports based on a CI/CD pipeline powered by standard and custom rules.
- IncQuery Validator for CATIA Magic: Devops-ready solutions that provide automated model quality reports based on a CI/CD pipeline powered by standard and custom rules.

Vendor: Model Based Innovation LLC

- FMIBench: Lets you effectively link your FMI-based simulation tools through FMU editing, debugging, pre-integration and customization. It is the swiss-army-knife of working with Functional Mockup Units (FMUs), working with all versions of the FMI standard from 1.0 to 3.0.

Vendor: eXXcellent solutions Gmb

- orchideo | easySSP: A powerful platform designed to enable open and credible simulation processes, with a strong focus on simulation architecture design, process documentation and efficient simulation workflows based on open standards like SSP, FMI and SSP Traceability.

Vendor: The REUSE Company

- SES ENGINEERING Studio: Software Tool designed to orchestrate the development of all kinds of systems (hardware, hybrid, software). It allows interoperability between an unlimited number of existing Systems Engineering Tools (RM), MBSE tools, Simulation Tools, Risk Management, RAMS Management, MS Office, etc.).
- SES RAT - AUTHORING Tool: Help authors compose requirement statements or other documentation, improving the project's overall quality. It is available for multiple engineering tools, like PTC Integrity, IBM DOORS and DNG, Microsoft Excel and Word, Capella, and IBM Rhapsody.
- SES Interoperability Hub: Enables an extended digital thread by implementing connectivity to different engineering tools, data conversion, and smart traceability. Acting as a synchronized source of truth, it allows to migrate, synchronize and transform your engineering data between tools.
- SES TRACEABILITY Studio: Allows users to manage traces among work products, check and suggest missing links, visualize the impact analysis, use smart algorithms to highlight suspicious traces, and generate matrices; all this regardless of the connected sources and synchronizing links from/to your tools.

SYSTEMS ENGINEERING NEWS

- **SES RQA - QUALITY Studio®:** A tool to automate the routine quality inspection and analysis of different engineering items, minimizing the cost of quality appraisals while increasing the quality and overall quality of the projects.
- **SES KM - KNOWLEDGE Manager:** allows you to manage knowledge from the systems engineering point of view and to store valuable information from requirements, models, system architectures and other documents in a common System Knowledge Base.

PPI SyEN readers are encouraged to check out these new and updated systems engineering tool offerings.

Access the SETDB website.

Upcoming PPI Live-Online ™ and In-Person Systems Engineering Five-Day Courses

Click here to view the full schedule or register for upcoming courses.

P006-955-1	Asia SGT 5:00 (UTC +8:00) PPI Live-Online™	17 Mar – 21 Mar 2025
P006-955-2	Oceania AEDT 8:00 (UTC +11:00) PPI Live-Online™	17 Mar – 21 Mar 2025
P006-972-1	North America CDT 8:00 (UTC -5:00) PPI Live-Online™	17 Mar – 21 Mar 2025
P006-972-2	South America BRT 10:00 (UTC -3:00) PPI Live-Online™ (Exclusive to South America)	17 Mar – 21 Mar 2025
P006-958-1	Europe CEST 9:00 (UTC +2:00) PPI Live-Online™	07 Apr – 11 Apr 2025
P006-958-2	United Kingdom BST 8:00 (UTC +1:00) PPI Live-Online™	07 Apr – 11 Apr 2025
P006-958-3	South Africa SAST 9:00 (UTC +2:00) PPI Live-Online™ (Exclusive to South Africa)	07 Apr – 11 Apr 2025
P006-958-4	Türkiye TRT 10:00 (UTC +3:00) PPI Live-Online™	07 Apr – 11 Apr 2025
P006-958-5	Saudi Arabia AST 10:00 (UTC +3:00) PPI Live-Online™	07 Apr – 11 Apr 2025
P006-971	Izmir, Türkiye TRT 8:30 (UTC +3:00) In-Person	14 Apr – 18 Apr 2025
P006-959	Eindhoven, the Netherlands CEST 8:30 (UTC +2:00) In-Person	12 May – 16 May 2025
P006-960	Las Vegas, USA PDT 8:00 (UTC -7:00) In-Person	19 May – 23 May 2025
P006-961-1	Asia SGT 6:00 (UTC +8:00) PPI Live-Online™	23 Jun – 27 Jun 2025
P006-961-2	Oceania AEST 8:00 (UTC +10:00) PPI Live-Online™	23 Jun – 27 Jun 2025
P006-962	Eindhoven, the Netherlands CEST 8:30 (UTC +2:00) In-Person	14 Jul – 18 Jul 2025

CONFERENCES, MEETINGS & WEBINARS

Events of relevance to systems engineering

Program Details: NAFEMS ASSESS Summit 2025

Program details are now available for the NAFEMS ASSESS Summit 2025 that will take place on 10-12 March 2025 in Atlanta, Georgia, USA. Keynote speakers for ASSESS Summit 2025 will be:

- Dr. Carmen Torres-Sanchez, Loughborough University: *Multifunctional structures: A journey from Physics-based simulations to Data-driven approaches*
- Jack Castro, Boeing: *Driving Digital/MBE Realization in the Airframe Loads and Dynamics Value Stream with a North Star Strategy*

Recently announced presentation topics include:

- Automating the extraction of engineering simulation metadata
- Certification by Analysis
- Digital Engineering Methods for Architecting Cislunar Ecosystems
- Enabling the Next Big Leap in CAE
- The Business Benefits of Early-stage Digital Twins for RFIs/RFQs in the Automotive Industry
- Understanding the Different Forms of Democratization of Engineering Simulation

The summit will include two breakout sessions during which working groups will explore the conference themes of Business, Certification, Credibility, Democratization, Integration, and Twins.

Learn more about ASSESS Summit 2025 and register here.

Product Development Learning Opportunities in March-April

The Product Development Management Association (PDMA) is offering several learning opportunities in March and April to advance product development and innovation skills.

Building a Validated Design and Development Strategy (13 March)
In this free webinar, Darren Stoddart, founder of The Future Mill LLC, will explore how to build consumer-centric design and development plans for both physical and digital products that incorporate feedback loops throughout the pre-development process to reduce risk and accelerate downstream processes. Key takeaways include:

- Define the core principles of consumer-centric design and development for both physical and digital products.
- Understand how to apply techniques like Minimum Viable Products (MVPs), A/B testing, and iterative design sprints to accelerate learning, reduce risk, and optimize downstream processes.

- Recognize strategies for balancing waterfall/phase-gate processes with agile methodologies

2025 Spring Body of Knowledge Training (Tuesdays – 4 March through 22 April).
The PDMA Pittsburgh chapter is conducting an eight-week professional development training program covers the fundamentals of product management and innovation. During this in-person series hosted at the University of Pittsburgh Big Idea Center, expert product development practitioners, and talented educators will be teaching seven key areas of study, including:

- Strategy
- Market Research
- Portfolio Management
- Product Innovation Process
- Culture, Teams, Leadership
- Product Innovation Management
- Product Design and Development Tools

Program benefits include:

- Learning methods and tools by applying them to your own business challenges during and after class
- Interacting with instructors with various areas of expertise and backgrounds
- Collaborating with participants from diverse industries

Program Details: Conference on Systems Engineering Research (CSER) 2025

Conference details have been announced, and registration is open for the annual Conference on Systems Engineering Research (CSER) that will take place in Long Beach, California, USA, on 18-21 March 2025.

The theme for CSER 2025 is "*Augmented Intelligence in Systems Engineering and Engineered Systems*," highlighting the rapidly evolving impact of AI on the engineering process and on the design of systems that incorporate AI solutions.

Keynote speakers for CSER 2025 include:

- Dr. Judea Pearl, Turing Laureate, UCLA
- Naveed Hussain, Boeing Company
- Jim Davis, Clean Energy Smart Manufacturing Innovation Institute (CESMII), UCLA

In conjunction with CSER 2025, INCOSE will host the Systems Engineering and Architecting Doctoral Student Network (SEANET) 2025 Workshop on 18 March. The purpose of SEANET is to advance systems engineering research by providing a collegial support network, research resources, and contacts that will enable the completion of doctoral dissertations related to systems engineering. The INCOSE SEANET invites current and soon-to-be doctoral students to participate in this one-day workshop. Students will also have the option to exhibit a research poster.

All SEANET participants must register through the CSER site to be included in the workshops. Learn more about CSER 2025. View the program overview.

Register here.

Fundamentals of AI for Simulation Engineers

NAFEMS is hosting an online training course on 17-20 March titled *"Fundamentals of AI for Simulation Engineers."* Consisting of four half-day virtual sessions, this event will equip participants with a good understanding and practical skills in applying Artificial Intelligence (AI) in the field of simulation engineering.

The course is designed to be software-agnostic, prioritizing methodologies and techniques that engineers can apply across various computational platforms. Interactive lecture will introduce the theory and mathematical background behind artificial intelligence. Hands-on exercises will be conducted where participants will learn how to create their own Deep Learning models. Topics include:

- Introductory Example: Modeling Compressor Parameters
- An Overview of Example Applications in Research
- Definitions
- Overview of Machine Learning methods
- Foundations of Deep Learning
- Practical Exercises
- Example project for a deep learning surrogate model for design optimization
- Creating machine learning models from scratch
- Project preparation
- Data preparation
- Sampling
- Measuring model performance and validity
- Consuming the machine learning model
- Limitations of machine learning models

Learn more and register here.

OMG Q1 2025 Technical Meeting: Companion Events

The Object Management Group (OMG) is offering several companion events to be held in conjunction with the OMG's First Quarter 2025 Technical Meeting planned for Reston, Virginia, USA, on 17-21 March. The following learning, networking, and engagement opportunities may be of relevance to PPI SyEN readers and systems engineering practitioners.

Enhanced Consistency and Interoperability: Defense Standards at OMG (18 March)
Attend this complimentary event to discover how OMG is advancing mission-critical innovation through standards in the defense sector. This session highlights key achievements and initiatives, including DevSecOps, MOSA Enabling Environment, Combat Management Services, Data-Centric Security, Digital Engineering Model Interchange (DEMI), Unified Architecture Framework® (UAF®), and other efforts to enhance consistency and interoperability standards within and across defense systems.

CONFERENCES, MEETINGS & WEBINARS

Digital Twin Consortium (DTC) Q1 Member Meeting (18-20 March)
This event features panel discussions and roundtables, technology spotlights, working groups, interactive demonstrations and workshops, focused on Digital Twin technologies and applications.

Business Architecture Innovation Summit™ (18-20 March)
The Business Architecture Guild® and OMG® are hosting the 13th annual Business Architecture Innovation Summit™, a hybrid event, on 18-20 March. Presenters across multiple industries and geographies will share their experiences in leveraging business architecture across a wide range of business scenarios.

Attendees will have the option to attend a pre-Summit, Business Architecture Primer™ free of charge.

See the full Business Architecture Innovation Summit™ agenda.
Register here.

UAF® Summit 2025 (19 March)
The Unified Architecture Framework (UAF®) Summit will be a hybrid event on 19 March that will feature the latest thinking around enterprise and system of systems architecture with examples of UAF development and use.

Q1 AREA Members Meeting (19-20 March)
This gathering of the members of the Augmented Reality for Enterprise Alliance (AREA) hopes to shape the future of Extended Reality (XR) technology. On 20 March, a public event, Evolving Digital Transformation: Engineering the Future Today, will provide an opportunity for participants to experience XR, Digital Twin, and AI demonstrations.

Learn more about OMG.

IEEE SYSCON 2025

IEEE SysCon is an annual gathering of industry leaders, professionals, and experts in Systems Engineering. It serves as a platform for networking, knowledge sharing, and collaboration, attracting a diverse audience from around the world. SysCon offers a comprehensive agenda featuring keynote speeches, panel discussions, and interactive sessions, all focused on the latest trends, innovations, and challenges in our industry.

The 19th Annual IEEE International Systems Conference (SYSCON2025) that will take place on 7-10 April 2025 in Montreal, Quebec, Canada.

The keynote speaker for the conference will be Xiaobo Tan of Michigan State University, presenting the topic, *Stalking vampires of the Great Lakes: A systems engineering solution for monitoring invasive sea lamprey with e-skins*.

SYSCON2025 will feature tutorials on topics such as:

- The Engineering of Simulations: from Simulation Specification to Simulation Validation
- Stochastic Systems, Control and Game Theory with Rosenblatt Noise

- How to Set Up Academic Equivalency for SE Coursework with INCOSE
- Data-Driven Simulation of Wheel Motor E-Bus as a Step Towards Digital Twining

Check back for program details.

Register for SYSCON2025.

prostep ivip Symposium 2025

Program details have been announced for the prostep ivip Symposium 2025 that will take place in Berlin, Germany, on 13-14 May 2025. The theme of the symposium is *"Revolutionizing Industries with Digital Twins and AI"*.

Sample presentation topics include:

- Circular Economy, the Final Frontier – A Strategic Approach to Circular Green PLM
- Code the Car – The Vehicle Development Approach of the Future
- Collaborative Digital Twins
- Digital Twins at Work: Efficiency Gains and New Capabilities in Lifecycle Management
- Generative Design: Shortening the Development Process with AI
- Leveraging Digital Product Passports for Circular Economy: The Critical Role of Traceability
- Revolutionizing Volkswagens Product Development Process (PDP)

See program details here.
Register for the prostep ivip Symposium 2025.

Abstracts Announced: NAFEMS World Congress 2025

NAFEMS, the International Association for the Engineering Modelling, Analysis and Simulation Community, has announced the abstracts that have been accepted for presentation at the NAFEMS World Congress 2023 (NWC25). NWC25 is scheduled for 19-22 May 2025 in Salzburg, Austria.

More than 300 presentations that represent the global diversity of engineering simulation practices have been accepted. Topics span the following areas:

- AI & Machine Learning in Simulation
- CAE in the design process
- Emerging Methods
- Engineering Data Science
- Integration of Simulation and Test
- Model Credibility
- Physics-based Simulation
- Simulation Data Management
- Simulation Supporting Certification
- System-level Simulation
- The Role of Simulation in Sustainability

- Upfront Simulation

View and search the full set of NWC25 abstracts for topics of interest.

Learn more about NWC25. Register here.

ISACA North America Conference 2025

ISACA, a global professional association focused on digital trust, is hosting its North America Conference 2025 on 21-23 May. The in-person portion of this hybrid conference will take place in Orlando, Florida, USA. Keynote speakers for this event include:

- Kevin Slavin, Biosecurity Project Leader at MIT Media Lab
- Ted Harrington, founder of START and author of *Hackable*.
- Catherine Price, award winning science journalist and author

The conference will be preceded by optional workshops on 20 May, including:
- AI Innovation Workshop
- Building an Emerging Risk Program

A sample of topics to be addressed may be found in the evolving conference agenda:

- Adapting to the Speed of Change: Emerging Technology Leadership
- AI Governance 2.0: Navigating the Next Phase of Ethical and Trustworthy AI
- Building and Maintaining Digital Trust in a Data-Driven World
- Building Trust in AI: Key Risks & Controls Considerations
- Crown Jewel Data Management
- Harnessing the Digital Transformation and Enablement Framework (DTEF) for Digital Transformation: A Comprehensive Case Study
- Managing Risks in Digital Transformation: A Comprehensive Approach
- Navigating the New Frontier: Securing Software Supply Chains in an AI World
- Risky Business: Navigating Third-Party Risk Management in Our Interconnected Era
- The Real Threat of Quantum Computing
- Unlocking Cyber Resilience: Harnessing Quantification for Superior Governance

Register here.

Call for Papers: International Society for the Systems Sciences (ISSS) 69th Annual Conference

The 69th Annual Conference of the International Society for the Systems Sciences (ISSS) will take place on 11-15 July, with the in-person portion of this hybrid event to be held in Birmingham, UK. The theme for the conference is *Advancing Together - An Invitation for Systemic Collaboration*.
The Call for Papers for this conference may be downloaded here.

Papers and other contributions are sought on topics such as:

- Theoretical advancements in system science and transdisciplinary integration
- Practical applications of systems thinking in addressing global challenges, including the Anthropocene, regeneration, sustainability, and governance
- Case studies demonstrating collaborative systems approaches across sectors
- Innovative methodologies and tools for system management, design, analysis, and evaluation
- Educational initiatives fostering systems thinking and professional development
- Collaborative frameworks bridging gaps between research, policy, and practice

Application areas should highlight the potential for transdisciplinary, trans-organizational, and trans-regional collaboration across theme areas such as:

Agriculture and food systems	Environment
Augmented intelligence	Energy
Built environment	Healthcare
Climate change	Policy and Governance
Ecology of Humanness	Shared Theoretical Foundations
Economy	Space exploration and development
Education and knowledge sharing	Social-ecological systems

Contributions may take the form of:

- Full papers (4,000–7,000 words)
- Short papers (1,500–3,000 words) or posters
- Interactive workshops or panel proposals

Abstracts are due no later than 15 May.

See the ISSS website for detailed submission requirements.

Call for Presenters: 2025 PDMA Annual Conference

The Product Development & Management Association (PDMA) has issued a Call for Presenters for the 2025 PDMA Annual Conference (Ignite Innovation Summit). This event will be held jointly with the Journal of Product Innovation Management (JPIM) Research Forum on 13-16 September, 2025 in Chicago, Illinois, USA.

The Annual Conference Call for Presenters seeks speakers to deliver engaging and interactive content concerning a project, product innovation, process, tool, or methodology in the form of a 45-minute interactive presentation or case study.

Presentations should address key challenges and problems associated with product innovation and development, including:

- Sustaining growth through a balance of incremental and disruptive innovation
- Preventing disruption by an unknown competitor
- Uncovering the unmet needs in the marketplace
- Generating ideas to solve the toughest innovation challenges

- Reducing ideas to practice and driving them through the full development cycle
- Building the skills necessary to be successful in product development and product management

Case studies are sought in the form of real-world examples that demonstrate how proposed method address these challenges.

Presentation proposals (abstracts required; supplemental materials desired) are due by 21 March using the online submission form. Acceptance letters will be sent in April.

PPI RESOURCES

PPI offers a multitude of resources available to all our clients, associates and friends! Click on any of the links below to access these resources today.

Systems Engineering FAQ: https://www.ppi-int.com/resources/systems-engineering-faq
Industry-related questions answered by PPI Founder and Managing Director Robert Halligan.

Key downloads: https://www.ppi-int.com/keydownloads/
Free downloadable presentations, short papers, specifications and other helpful downloads related to requirements and the field of Systems Engineering.

Conferences: https://www.ppi-int.com/resources/conferences-and-meetings/
Keep track of systems engineering-relevant conferences and meeting dates throughout the year.

Systems Engineering Goldmine: https://www.ppi-int.com/se-goldmine/
A free resource with over 4GB of downloadable information relevant to the Engineering of systems and a searchable database of 7,800+ defined terms. You can expect the content of the SE Goldmine to continue to increase over time.

Systems Engineering Tools Database (requires SEG account to log in from the Systems Engineering Goldmine): https://www.systemsengineeringtools.com/
A resource jointly developed and operated by Project Performance International (PPI) and the International Council on Systems Engineering (INCOSE). The SETDB helps you find appropriate software tools and cloud services that support your systems engineering-related activities. As a PPI SEG account holder, you have ongoing free access to the SETDB.

PPI SyEN Newsjournal (a substantial monthly SE publication): https://www.ppi-int.com/systems-engineering-newsjournal/
You're already reading our monthly newsjournal! However, click on the link to access the history of 100+ monthly newsjournals containing excellent articles, news and other interesting topics summarizing developments in the field of systems engineering.

Reflections on IW2025: Advancing Systems Engineering Through Global Collaboration

by Francois Retief

Project Performance International

Authored for PPI SyEN

Reflections on IW2025: Advancing Systems Engineering through global collaboration

The International Council on Systems Engineering (INCOSE) annually hosts two global flagship events. The first, the International Symposium (IS), is a standard conference with papers presented, panel discussions and tutorial sessions. The second, the International Workshop (IW), is a highly interactive event that allows attendees to spend four days working alongside fellow systems engineers, advancing the field globally. The focus is collaborative workshops—both in-person and virtual—where participants engage in hands-on discussions, problem-solving, and technical development, bringing together thought leaders, industry experts, and academic professionals from around the world, all sharing a common goal: to push the boundaries of systems engineering through structured discussions, research presentations, and interactive sessions.

The 2025 INCOSE International Workshop (IW2025) in Seville, Spain, was the first IW to be held outside the United States. While still very well attended by American delegates, there were significantly more European attendees, providing a noticeably different attendee mix compared to previous events and significant regional pride and appreciation for INCOSE's continued commitment to increasing global accessibility to the organization.

Seville is a beautiful city with an incredibly long and rich history, and the Barceló Sevilla Renacimiento was a fantastic venue for the event, with various open spaces and different-sized venues and meeting rooms accommodating the various activities.

The Role and Structure of INCOSE Working Groups

At the core of the International Workshop is INCOSE's Technical Operations, which was established to advance world-class systems engineering through activities that result in products that enable systems engineering growth and practice. The Technical Operations division includes both project teams and more than 50 working groups (WGs), which operate across four defined technical operation domains:

- **Process Enablers**: These WGs focus on refining and improving the technical and management processes essential for effective systems engineering. This includes areas such as architecture, risk management, requirements, and measurement frameworks.
- **Analytic Enablers**: These WGs address the analytical capabilities for the Systems Engineering Handbook v5 required for systems engineering and specialty engineering activities, covering topics such as decision analysis, system of systems, product line engineering, and complex systems modelling.
- **Transformational Enablers**: Focused on the future evolution of systems engineering, these WGs explore advancements like Model-Based Systems Engineering (MBSE), Digital Engineering Information Exchange (DEIX), and Lean Systems Engineering.
- **Application Enablers**: These WGs tailor systems engineering principles to specific industries and domains, such as healthcare, transportation, space systems, and telecommunications.

The full list of working groups is available on the INCOSE Working Group Initiatives page. All the working groups are open to and composed of INCOSE members who share a common passion for advancing systems engineering. They provide a platform for professionals to collaborate, develop industry standards, share best practices, and create valuable technical products that shape the future of the field.

INCOSE's governance structure ensures that these working groups remain productive and aligned with the organization's broader mission. Assistant Directors oversee specific technical domains, while Working Group Chairs facilitate discussions, set priorities, and drive initiatives forward. These groups regularly update their charters and contribute to INCOSE's strategic initiatives, ensuring that the organization remains at the forefront of systems engineering advancements.

Opening Plenary

The workshop featured several cornerstone events, including the Plenary Sessions, the Energy Transition and Digital Twin Theme Workshops, the MBSE Workshop, and the EMEA Market Place. Right from the start, Juan Llorens, MC and previous INCOSE Spain president did an excellent job of making everyone feel welcome and humorously sharing a little bit of the local culture. This was followed by Steve Records delivering the Executive Directors' Report. Over the past year, INCOSE membership has grown by almost 15%, totaling 26 567 members. Also of note is the 91.1% retention rate. With 15 new companies, the Corporate Advisory Board is now 145 companies strong. The certification program also continues to grow, with nearly 5000 active certified members. 2024 was a record year in terms of attendees, with the IS having 1058 attendees and the IW having 783 attendees, including virtual attendees. The 2025 IW was attended by about 360 people in person and another 200 online delegates, exceeding all expectations.

INCOSE President Ralf Hartmann and President-Elect Mike Watson presented the following awards during the opening plenary:

Outstanding service awards:

- Kirsten Helle: NORSEC Chapter President & Past President, Deputy Assistant EMEA director
- Satya Kokkula: NORSEC Chapter President, Associate Professor, University of Southeastern Norway
- Anne Sigogne: Active Contributor, AFIS, Events and SESE Tours, EMEA sector
- Frederic Autran: Associate Director, INCOSE Certification in AFIS Chair, INCOSE Certification Advisory Board
- Odile Mornas: Associate Director, INCOSE Certification in AFIS Member, INCOSE Certification Advisory Board Group, SE Handbook V5 Editorial Team

The following Dedicated Service awards were also presented by Ralf Hartmann:

- Carl Landrum: Assistant Director, Application Domains 2016-2024
- Jimmy McEver: Assistant Director, Analytical Enablers 2019-2024
- William "Bill" Scheible: Assistant Director, Internal Operations, 2020-2024
- Tony Williams: Assistant Director, Process Enablers, 2023-2024
- Christina Saprunenko: Assistant Director, EMEA Outreach, 2023-2024
- Jean-Claude Roussel: Chair, Nominations and Elections, 2024
- Donna Long: Associate Director for Events, 2021-2024
- Olivier Dessoude: Technical Director, 2023-2024

An important part of IW is the installation of new leaders, with Stueti Gupta, Tami Katz, and Renee Steinwand formally presented and accepted by members present as the new board members. The INCOSE Board of Directors list is available on the INCOSE Leadership Page.

In the President's Remarks section, INCOSE President Ralf Hartmann commented on 2024 being a year of global, political and natural disasters, highlighting the catastrophic flooding in Spain in 2024 and, since the start of 2025, the disastrous wildfires in California in which over 10,000 homes were destroyed and more than 150 000 people displaced. He remarked that this includes INCOSE members and friends and expressed his sympathy and hope for receiving the means to sustain themselves through this difficult time. He commented on how this clearly shows, in a global context, the challenges faced by the United Nations sustainability objectives. All of these are systems problems and, unfortunately, to the knowledge of INCOSE, are barely addressed from a systems mindset.

He then reflected on the growth and success of INCOSE in the past year, highlighting increased collaboration with other organizations on a global scale, including becoming an international member of the World Federation of Engineering Organizations, operating under the auspices of UNESCO, and the acceptance of the proposal to establish a WFEO working group focused on empowering engineering disciplines through systems engineering. He also highlighted the INCOSE Smart Cities initiative participating at the 2024 Smart Cities Expo and World Congress.

He then pulled the presentation back to the INCOSE 2035 vision, revisiting the 12 tactical items identified by the board at the end of last year and highlighting 3 of them:

- Determining INCOSE's role in the education and training ecosystem and developing corresponding scope/path for professional development,
- Defining INCOSE's position in standards development in terms of the role INCOSE is playing and can play in future standards definition, as well as the challenges such as lack of recognition for contributions and the cost of then accessing those standards.
- Advancing organizational evolution which was further expanded to in the Town Hall meeting the following day.

Tami Katz, the new director of Technical Operations, presented the next part of the keynote, presenting new TechOps leadership, discussing strategic changes such as integrating Future of Systems Engineering (FuSE) and TechOps for improved integration, the formation of project teams for projects that do not justify the overhead of creating a working group, as well as improvements to the Technical Product Development Process.

Tami also highlighted new technical products such as *The guide to Security Needs and Requirements* and the new *Systems Engineering Agility primer*. These and other products are available from the INCOSE

member's store both in free electronic and paid hard copy format.

Town Hall Meeting

During the Town Hall meeting on the morning of the second day Ralf Hartmann reiterated that change is necessary to achieve the INCOSE vision, to remain relevant and to continue to grow. INCOSE remains at its heart a volunteer organization with the challenges this presents in terms of divided focus. Benchmarking against other organizations, Ralf highlighted that INCOSE is a global organization in a fast and adaptive space with volunteers working for the good of the body of professionals that they represent. He expressed the goal of leadership to use strategic thinking and systems thinking to guide evolution, building a sustainable operational model for the future with membership input remaining paramount and with values and principles that remain unchanged.

Before referring to the 4 strategic objectives of INCOSE, and how operational excellence is a foundational component for the others, he took a moment to acknowledge Dr. Don Gelosh, who accidentally was not recognized for his contributions on the first day.

He then presented several proposed changes to the INCOSE structure: Currently, a couple of board members serve as roaming members, but a number are also heads of committees and key functions. The plan is, over the next 5 years, to decouple board members with dual responsibility and have dedicated committee chairs. There are also additional reporting and feedback functions to the board, and each board member will have an assigned committee to act as board liaison. The Academic Council has also been moved out of the Corporate Advisory Board (CAB) to be an independent group. A new events strategy and portfolio committee will also be formed with specific focus on non-IS and IW events including at regional level in including domain specific events for much richer local events.

In the next part of the Town Hall meeting Steve Records reiterated the aim of building a staff organization for INCOSE to create more value for the members and volunteers by taking over administrative functions and providing domain expertise, for instance in marketing or IT infrastructure functions. INCOSE staff have grown over the last 2 years to almost 20 people with the aim of continuing to grow it to meet the organizational requirements, including staff from different countries, cultures, and time zones for more international support.

In the final part of the session Steve re-iterated the importance of getting more involved in INCOSE, be that through a committee, a working group or even just in the leadership of their local chapter.

Amongst the number of practical questions asked during the Q&A section a noteworthy one was from Professor Fei-Yue Wang, founder of the Beijing INCOSE chapter asking about the INCOSE's policy towards China in the changing political landscape. Ralf Hartmann welcomed the question as an opportunity to emphasize that that INCOSE is and remains an unpolitical, global organization embracing every member from every country, irrespective of current political system or situation in that country. He reminded everyone that this is part of their values and code of ethics and while INCOSE is not yet where they want to be on global inclusiveness it is something they are committed to continue working towards.

Other Sessions

One of the most notable aspects of IW2025 was the emphasis on emerging challenges and future directions for systems engineering.

The Working Group Marketplace showcased the INCOSE working groups, their charters, and various activities. Monitors were available throughout the event, and several working group leaders were present during breaks and lunches to engage in conversations about different working group efforts and initiatives.

Theme workshops such as Energy Transition, Digital Twins and Model Based Systems Engineering included multiple sessions covering various aspects of the disciplines.

In total, nearly 170 different sessions were held in the 4 days including topics like Systems Thinking, Architecture, Natural Systems, Critical Infrastructure Protection and Recovery, HSI Architecting for Human-Advanced Automation, Agile Systems and Systems Engineering, Outcome Driven Development, Decision Analysis, the integration of AI into various Systems Engineering Aspects, Biological Ecosystems as Quantitative System Design Inspiration for Resilient and Sustainable Human Networks and various other topics.

Collaborative Engagement and Networking

IW2025 facilitated several networking opportunities, including receptions, interactive presentations, cultural walks in the mornings and informal discussions during coffee breaks and meals. The First-Time Attendees Welcome Reception provided a valuable orientation for new participants. The MBSE social with the Propeller Hat awards inducted Hans Peter de Koning and Tim Weilkiens into the hall of propeller heads, recognizing outstanding contributions to the field,

Continuing the Momentum

During the Closing Plenary several working groups presented feedback on work done during the IW for example, the Digital Twins group expanding on definitions and working on how to more easily apply digital twins to other domains. Among other things the Energy Transition Team worked on how to sell Systems Engineering in a non-SE-minded energy sector. The MBSE workshop had many meetings focusing among others on adoption of MBSE in organizations, the coupling between Systems Engineering and MBSE, an overview of SysMLv2 that is being submitted to the Object Management Group (OMG) this month for final adoption, transitioning to V2, vendor presentations and roadmaps and other topics. Ralf Hartmann closed the proceedings highlighting IW2025 as a fantastic example of the One INCOSE vision, encouraging members to remain in contact and active and thanking everyone that helped made the event possible.

Future events

The IW closed with a preview of the next major INCOSE event, the International Symposium which will be held in Ottawa between 26 and 31 July 2025. The 2026 IW will be in Los Angeles, and 2026 IS in Tokyo.

INCOSE members are encouraged to stay engaged by joining working groups, contributing to technical products, and participating in governance activities.

To facilitate ongoing engagement, INCOSE will continue to provide virtual collaboration opportunities and host follow-up discussions to build on the progress made at IW2025.

For more information on INCOSE technical operations, working groups, and future events, visit the [INCOSE Technical Operations webpage.](#)

About the Author

Francois Retief is General Manager, Principal Consultant & Trainer for Certification Training International and also Principal Consultant and Course Presenter for Project Performance International. He brings nearly three decades of systems engineering experience to PPI and CTI. In 2010 Francois achieved Certified Professional Systems Engineer (CSEP) status and developed the CTI INCOSE SEP Exam Preparation (ISEP) Course shortly after.

Francois worked as Senior Systems Engineer, Project Manager and Systems Engineering Manager on various fleet management and vehicle tracking systems including the Thales Telematics system, the Singapore HazMat Tracking System developed by Astrata Systems and the Mix Telematics system. His areas of responsibility spanned Acquisition and Supply, Technical Management Aspects, Project Management, Business Analysis, Requirements Analysis and Definition, Integration, Verification and Validation, Transition as well as Operations, Maintenance and Disposal. He also managed military PCB production and played a major role in organizations adopting agile development methodologies and achieving ISO9001 certification. At the moment, he is the COO and one of the founders of iono.fm, one of Africa's largest digital audio hosting platforms, and works with PPI and CTI, both as a trainer and consultant.

INCOSE INSIGHT Practitioners Magazine: Uncertainty in the Engineering of Systems

The [December 2024 edition (Volume 27, Issue 6)](#) of INSIGHT, INCOSE's Practitioner Magazine published by Wiley, has been released. Electronic subscriptions to INSIGHT are available as a member benefit to INCOSE members. Hard-copy subscriptions to INSIGHT are available for purchase by INCOSE members for one membership year, and to the public.

The seven articles in this 60-page edition address the theme of *Uncertainty in the Engineering of Systems*.

[Uncertainty Quantification (UQ) in Complex System of Systems (SoS) Modeling and Simulation (M&S) Environments](#)
Authors: Joseph Marvin, Thomas Whalen, Brad Morantz, Ray Deiotte, and Robert K. Garrett Jr.

Prevailing modeling and simulation (M&S) techniques have struggled to provide meaningful quantitative results in M&S of complex system of systems (SoSs) in the face of an environment filled with complex interacting uncertainties. This paper reports on systems thinking applied to "how" M&S techniques should shift to allow a next generation of quantitative tools and techniques. The imperative is to provide quantitative performance results across the constituent interfaces in a modeled architecture. A five-step statistical and parametric algorithm tool that addresses uncertainty quantification (UQ) is presented. [Improving the utility of UQ data evaluation] A quantitative approach to managing complex uncertainties across modeled interfaces using graph theory is proposed. A future vision for SoS engineering (SoSE) that uses graph theory-based modeling is suggested to improve the utility of tools such as UQ is suggested.

[Measuring the Uncertainty Impacts During the Systems Engineering Lifecycle](#)
Authors: David Flanigan and Jeffery Dixon

Uncertainty is a large part of the systems engineering development process. Particularly absent is the quantification of uncertainty of the threat, operating environment, and friendly force factors at each step of this lifecycle. This paper will explore a methodology to quantify the amount of uncertainty and the interdependencies of the uncertainty factors during the development. Included for consideration are internal and external factors and their contribution to the overall system uncertainty. An illustrative example is provided to exercise this methodology.

[The ValXplore Method: Exploring Desirability, Feasibility and Viability of Business and System Design Under Uncertainty](#)
Authors: Sonia Ben Hamida, Marija Jankovic, Alain Huet, and Jean-Claude Bocquet

In early design stages, business developers and systems engineers deal with uncertainties on the business problem, in line with the company's strategy. Before designing the system, the business

developers need to set the boundaries of the business problem: What are the values to deliver to which stakeholders? What are their preferences? What are the future trends or the evolution of the markets and the external context? These questions regarding the uncertainties on the definition of the problem may not have answers and need to be investigated to assess the value robustness of the possible design alternatives. The aim of this work is to support decision-making in business and system design thanks to a broad and rapid analysis of a large amount of business design alternatives under uncertainty. We introduce a decision-making support method, called ValXplore, based on visual analysis and data analytics to explore the uncertainties on and in the business problem. The method was tested and validated on an industrial case study to assess the benefits and limits of the semi-reusability of a launch vehicle. Both business developers and systems engineers can rapidly explore a broad space of alternatives to increase the value to the stakeholders, by performing sensitivity and uncertainty analyses.

[Informing the Delineation of Input Uncertainty Space in Exploratory Modelling Using a Heuristic Approach](#)
Authors: Enayat A. Moallemi, Sondoss Elsawah, Michael J. Ryan

Exploratory modelling is an emerging approach which can address the challenge of model-based decision making in dealing with input model uncertainties. Exploratory modelling samples from an input uncertainty space and generates extensive computational experiments to analyze possible model behaviors in an output solution space. The way that the input uncertainty space is delineated influences the results of exploratory modelling and its computational cost. In this article, we show the statistical significance of the implication of the size of an input uncertainty space on the resulted output solution space. We also propose a heuristic approach which informs the delineation of input uncertainties by screening the relevant model behavior in the solution space. An illustrative example of an aircraft fleet management system is used to demonstrate the implementation of our approach in practice. We conclude that the delineation of input uncertainty space can be a way to control simulations in exploratory modelling and to enhance the efficiency of the exploration process and the confidence of the final results.

[Assessing the Impacts of Uncertainty Propagation to System Requirements by Evaluating Requirement Connectivity](#)
Authors: Alejandro Salado and Roshanak Nilchiani

Although theoretically independent, requirements within a decomposition level of a system architecture are not isolated elements. For an existing design, a change of a requirement may endanger or facilitate fulfillment of other requirements within the same level of the decomposition. The present research suggests a requirement connectivity metric to evaluate the potential consequences that changing a requirement may have on a system with respect to fulfillment of other requirements. A particular aspect of the present research is the assumption that connectivity accounts only for requirements within the same decomposition level of an architecture, not for those flowing up or down the decomposition. The metric is used to evaluate different cases in which requirements are changed due to triggering of uncertain events during a project life cycle.

[Applying Bayesian Networks to TRL Assessments – Innovation in Systems Engineering](#)
Authors: Marc F. Austin, Virginia Ahalt, Erin Doolittle, Cheyne Homberger, George A. Polacek, and Donal M. York
Currently, technology readiness assessments (TRAs) are used in determining the maturity of the critical technology elements (CTEs) of a system as it moves forward in the system development life

cycle. The TRA method uses technology readiness levels (TRLs) as the decision metric. TRL values are assessed and determined by subject matter experts (SMEs). Since expert evaluators often differ in their judgment when scoring a system element against the TRL scale criteria, this paper argues for the use of a Bayesian network model to provide a mathematical method to consistently combine and validate the judgment of these SMEs and increase the confidence in the determination of the readiness of system components and their technologies.

A Bayesian Approach for Estimating Complex System Reliability
Authors: Ozge Doguc and Jose Emmanuel Ramirez-Marquez

Although a number of recent studies on using Bayesian Networks (BN) for system reliability estimation have been proposed, these studies are based on the assumption that a pre-built BN was designed to represent the system. In these studies, the task of building the BN is typically left to a group of specialists who are BN and domain experts. However, the process of building a system-specific BN is generally very time consuming and may lead to incorrect deductions. As there are no existing studies to eliminate the need for a human expert in the process of system reliability estimation, this paper introduces a holistic method that uses historical data about the system to be modeled as a BN and provides efficient techniques for automated construction of the BN model and estimation of the system reliability. Moreover, very limited human intervention is sufficient for the process of BN construction and reliability estimation.

Download INSIGHT Volume 27, Issue 6 from the INCOSE iNet.
View this issue in the Wiley online library.

Recommended Product Development and Innovation Resources

The Product Development Management Association (PDMA) hosts a Knowledge Hub (kHUB) that offers a wide variety of product development and innovation management resources in the form of blogs, podcasts, videos, conference presentations, feature articles and whitepapers.

Recent recommendations include:

- Building Sustainability into Your Product Innovation Process (article)
- Deliberate Differentiation (article)
- Developing a Product Innovation Strategy (article)
- Four Steps to Product Management Excellence for B2B Companies (article)
- Ideation and the Designer's Mindset – TEDTalks with Practitioner Insights (multiple talks)
- Introduction to Exploratory Product Development (article)
- Leadership TEDTalks with Practitioner Insights (multiple talks)
- STAR, a Universal, Repeatable, Strategic Model of Corporate Innovation for Industry Domination (article)
- Ten Tips to Create a Product Community of Practice (article) (recording)
- The Best vs. the Rest (article)
- The Coming AI Tsunami in New Product Development – Are You Ready? (article)
- Understanding and Anticipating Your Competitor's Moves (webcast)
- What Is AI and What Can It Do in NPD for You and Your Business? (article)

Access to kHUB is free and open to the public.

Create a guest account or join PDMA here.

Global Business Analysis Day: Top Ten Session Recordings

The International Institute of Business Analysis (IIBA) conducted a virtual Global Business Analysis Day in December 2024 and has published recordings (plus slides in most cases) for the Top Ten Sessions during that event. The following topics may be of interest to PPI SyEN readers who want to leverage the best of business analysis thinking on their current projects.

Act Before You Overthink
Lison Mage explores the common issue of overthinking and its impact on well-being and decision-making. Through interactive games and personal stories, she defines overthinking and addresses misconceptions. She emphasizes the importance of self-awareness and critical thinking, contrasting it with harmful repetitive thoughts. She discusses the psychological need for closure and its effects, while also suggesting strategies like delegation to combat micromanagement and perfectionism.

Beyond Requirements: Bridging Business Analysis and System Design
Dr. Ashley Aiken shares insights from his 25 years of experience as a business analyst and software engineer. He emphasizes the importance of understanding both form and function in design, using chairs as a metaphor. In this talk, he discusses the critical role of business analysts in delivering solutions that provide value, the significance of agile frameworks, and the need for effective user feedback. Download slides.

Enabling Your Analysis Process With AI
Angela Wick and Tim Coventry, authors of "Futureproof: Amplifying Agility with AI and Insightful Business Analysis," discuss the importance of AI in enhancing business analysis skills and fostering innovation. They celebrate Global Business Analysis Day in this talk by envisioning a future where AI aids analysts in rapid decision-making. The conversation addresses audience reactions to AI, highlighting the need for critical evaluation of information. Analysts must develop strong skills and learn to effectively prompt AI to transform business processes and drive continuous learning. Download slides.

Give Your Product a High Five: Five Business Analysis Essential Steps and Tools
Tomette Kirk shares the five essential components of business analysis, which can be summed up in these steps:

1. Stakeholder Analysis,
2. Current State Analysis,
3. Future State Analysis,
4. Gap Analysis, and
5. Requirements Management.

Master these, and the rest is gravy. The session will focus on these five areas and corresponding tools that can be implemented at your desk tomorrow. Surprisingly, some of these areas are often overlooked leaving holes in a project. Download slides.

SYSTEMS ENGINEERING RESOURCES

How to Have Valuable Conversations at Work
Patty Danda shares insights on the power of storytelling to engage stakeholders effectively. She discusses the human aspect of connections in a tech-driven world and addresses public speaking challenges, including managing discomfort. Positive self-talk and reframing mistakes are emphasized as key strategies. Additionally, she offers tips for starting engaging conversations and suggests using humor and pets, especially dogs, to foster connections. Download slides.

How to Shape Your Career with Hybrid Roles
In this talk, Laura Brandenburg highlights the value of hybrid roles for career advancement and introduces a framework for progression from novice to expert. She discusses managing responsibilities, leveraging AI for productivity, and effective interviewing strategies, emphasizing transferable skills and relevant experiences. Download slides.

Impact of Business Analysis on Strategic Planning
In this talk Doha Shawki shares her experience throughout the years on how Business Analysis is more than just a function, it is the foundation upon which strategic planning is built. Organizations are continually striving to gain a competitive edge. They seek to innovate, optimize, and position themselves effectively in the market. At the heart of this pursuit lies a vital component that often doesn't receive the spotlight it deserves: business analysis. In my speech I will highlight how business analysis can drive innovation and provide the ability for informed decision making. I will mention a couple of examples from my experience to showcase my points. Download slides.

Managing Technical Debt, Leveraging Artificial Intelligence, and Leading Digital Transformation
Ahmed Maddi shares insights on the vital role of business analysis in tackling technical debt and driving digital transformation. He explains technical debt as the compromises made to meet deadlines, which can escalate costs and stifle innovation. Through a case study of Code Crafters, he illustrates the impact of technical debt and the benefits of a cleanup sprint. Ahmed also highlights AI's role in automating tasks and enhancing decision-making, emphasizing the need for alignment between strategy and execution. Download slides.

The Cognitive Revolution: Forging the AI-Empowered Business Analyst of Tomorrow
Generative AI significantly impacts business analysis, highlighting the importance of tech-savvy analysts who can drive innovation. Critical thinking is an essential skill in this AI-driven environment. Mathieu Gouanou discusses advanced techniques that improve requirement gathering and stakeholder analysis, while highlighting ethical considerations that focus on fairness and data security. In this talk the future role of business analysts is explored, concluding with audience engagement on practical applications of AI in their work. Download slides.

Value Proposition Canvas
The session introduces the value proposition canvas, focusing on understanding customer needs and values. It highlights the importance of viewing value from the customer's perspective, identifying pain points, and using empathy maps and personas. The discussion includes customer jobs, pains, and desired gains, along with the value map framework for developing solutions. Feedback and iterative processes in product development are emphasized to ensure alignment with customer needs. Download slides.
Learn more about IIBA.

Business Analysis (BA) Digest Q1 2025 Edition

Blackmetric. BUSINESS SOLUTIONS

[Blackmetric Business Solutions](#), a UK-based training and consulting firm, publishes a quarterly [Business Analysis (BA) Digest](#). In keeping with its theme as *your regular round of useful BA content*, the 67-page [Q1 2025 edition](#) addresses topics such as:

- AI Integration in Business Analysis to Accelerate Transformation
- Application Portfolio Management With TIME
- Breaking Down Silos – Driving Change As a Business Analyst
- Bringing Structure to Chaos - the Added Value of a Business Analyst
- Business Analysis and Cybersecurity – What Can (or Should) a BA Do?
- Data Cleansing for BAs in the Age of AI
- Definition of Ready
- If Data Is the New Currency, Why Do People Treat It Like Monopoly Money?
- The Minimalist Analyst: No More Gas!
- The Balancing Act: Ensuring Just Enough Details for Successful Requirements
- Using Group Construct Analysis to Understand Stakeholder Worldviews in Ambiguous Situations, Part 15: Good Vibrations
- What Documentation Still Adds Value in Agile Projects?
- Why Software Needs to Adopt Green NFRs to Realise a Sustainable Future

Typical articles are a quick read at 2-4 pages in length.

Download PDF versions of prior editions of the BA Digest (back through 2020) and a previous newsletter (through 2016) [here](#). Other 2024 editions include:
- [BA Digest Q4 2024](#)
- [BA Digest Q3 2024](#)
- [BA Digest Q2 2024](#)
- [BA Digest Q1 2024](#)

Subscribe to the BA Digest [here](#).

OMG Journal of Innovation: Shaping the Future in a Data-centric Connected World

OMG Object Management Group. **Journal of Innovation**

The Object Management Group (OMG) published the [26th edition of its Journal of Innovation](#) in February 2025. The theme of this edition is "*Shaping the Future in a Data-centric Connected World*".

Articles to consider include:

[Applying Standards to Information Centric Operations](#)
We live in a world of information. From the moment we are born we are surrounded by shapes and sounds and color, and we spend the next few years figuring out what it all means.

This article explores the case for standards to support data-centricity, both for current uses in data centric operations and digital twins, and for future uses that may only become clear under a more ubiquitously information-centric way of working.

SYSTEMS ENGINEERING RESOURCES

Leveraging the Potentials of Data Sharing - Insights from a Transportation Testbed

Seamlessly sharing data across organizational boundaries is one of the most pressing challenges facing businesses today. For digital twins to deliver actionable insights and meaningful value, they rely on data that is often outside of an organization's domain and control. Effective data sharing is the key to unlocking near real-time insights, improving decision-making, and increasing operational efficiency. However, achieving this level of collaboration often requires organizations to overcome complex technical and organizational barriers. Addressing these barriers is critical to driving innovation and maintaining competitiveness in a rapidly evolving landscape.

Navigating Contextual Complexity with Graph Visualization

Graph-based data structures provide the flexibility required to encode and analyze the increasingly vast, complex, and connected data spaces we are faced with in modern systems. The use cases for graph visualization appear in many disciplines. This paper will focus on use cases relevant to human understanding and analysis of systems-of-systems models and knowledge graphs.

Context is the source of meaning in a data-centric world. For each data content element there may be many legitimate contexts described by unique meta-data. Managing the coherence of those connected contexts within a system of systems is a critical factor impacting the integrity of every potential use case for each piece of managed data.

The Data Centric Architecture of a Factory Digital Twin

This paper presents a framework for implementing factory digital twins (FDTs), focusing on four applications: (1) debottlenecking, (2) engineering design/retrofit analysis, (3) facility fit, (4) scheduling/planning. These provide substantial value for FDT implementation. The ability to "test-before-invest" fixes mistakes in the virtual realm before committing capital, significantly reducing risks and costs associated with real-world trials.

The Role of Data Centricity in Smart, Connected Systems

This article discusses how data centricity, enabled by core connectivity standards, enables real-time communications for advanced AI and autonomous systems. Data-centricity is the underlying mechanism for developing a data-centric architecture. This approach emphasizes the central role of data in designing, implementing, and managing distributed systems. While there are a few different architectural approaches that use data centricity, this paper will focus on the Object Management Group® (OMG®) Data Distribution Service™ (DDS) protocol.

Readers will learn how DDS decouples data from the application, which enables real-time, scalable data exchange for complex, high-performance systems.

Unlocking The Full Potential of Enterprise Data - Managing Valuable Data Assets Through Their Lifecycle

This article is about unlocking the value of enterprise data in industries and aims at prompting discussions within the C-suite about the criticality of this important issue. The article takes a data-centric perspective and focuses on the necessity of managing enterprise data assets through:

- The different stages of Digital Transformation,
- The different lifecycle tracks: transactional, operational, business, compliance, legal, and archival,
- The migration of these data assets across dataspaces and systems.

SYSTEMS ENGINEERING RESOURCES

Join the OMG mailing list.

System Dynamics Resources

The System Dynamics Society (SDS) hosts or recommends a variety of system dynamics resources in the form of books, videos, blogs, webinars and papers. Here are some recent recommendations for your consideration.

Modeling with Soft Variables and Limited Data (webinar recording)
This webinar explored innovative approaches to handling data scarcity and quantifying intangible variables within System Dynamics modeling. Led by professors from the University College London (UCL), this session highlighted methodologies designed to enable robust decision-making processes, even when traditional data sources are limited. The discussion revolved around:

- Addressing challenges of quantifying intangible variables.
- Designing models with limited or non-existent data.
- Introducing a participatory quantification framework.

The session included examples from a regeneration project in Thamesmead, London, showcasing the practical application of the framework.

Introduction to Dynamic Modeling 1 (online course)
This free online 4-session course teaches you how to start building a model. Dr. Karim Chichakly guides you, step by step, through some of the key components in the process of effective model creation. During each 55-minute class, you'll learn the ins and outs of model creation as he shares his personal workflow and additional tips and tricks that he's learned in more than 20 years of experience in the field. Sessions topics include:

- Introduction to Models
- Stocks and Flows
- Behavior Over Time
- Feedback

Each of the four classes is followed with a question and answer session with Dr. Chichakly. Online access to these class recordings, sample models, handouts, and homework assignments are included to cement your learning.

The Systems Thinking Approach to Strategic Management (*Systems* journal)
This special issue of the *Systems* journal highlights the significant contribution of systems thinking to strategic management and proposes new avenues for research into its integration. Thirteen open access papers address diverse aspects of this topic, including:

- A Dynamic Analysis to Examine Regional Development in the Context of a Digitally Enabled Regional Innovation System
- A Multi-Methodological Conceptual Framework to Explore Systemic Interventions
- Applying Integrative Systems Methodology: The Case of Health Care Organizations
- Critical Thinking Skills Enhancement through System Dynamics-Based Games: Insights from the Project Management Board Game Project

- [Evolutionary Game Analysis on Operation Mode Selection of Big-Science Infrastructures](#)
- [Fostering the "Performativity" of Performance Information Use by Decision-Makers through Dynamic Performance Management](#)
- [Prioritizing Factors to Foster Improvement of Sales Operations in Small- and Medium-Sized Industrial Organizations](#)
- [Soft Systems Methodology in Standardizing the Method for Applying Dolphin-Assisted Therapies in Neurodivergent Patients](#)
- [System Dynamics Modeling: Technological Solution to Evaluating Cold-Chain Meat Packaging Scenarios](#)
- [Systems Approach for the Adoption of New Technologies in Enterprises](#)
- [Systems Thinking Principles for Making Change](#)
- [The Systems Thinking Approach to Strategic Management](#)
- [Why Do Key Decision-Makers Fail to Foresee Extreme 'Black Swan' Events?](#)

Additional recommended open-access resources on system dynamics include:

- [Which is the Best Artificial Intelligence? A Test on Nine of Them](#) (article)
- [ChatPySD: Embedding and Simulating System Dynamics Models in ChatGPT-4](#) (System Dynamics Review paper)
- [Incorporating Deep Learning Into System Dynamics](#) (System Dynamics Review paper)

AI for Requirements Engineering

The INCOSE Requirements Working Group (RWG) has posted on the [RWG YouTube Channel](#) a three-part series of presentations by [Sarah Vasquez](#) on the use of AI for performing requirements engineering (AI4RE).

The first presentation summarized 11 primary AI4RE use cases, highlighted 9 current limitations of AI in these contexts and explored 7 elements of a balanced approach toward exploiting AI's growing capabilities while performing appropriate due diligence to ensure the quality of results. Parts 2 and 3 captured RWG practitioner discussions concerning the Part 1 presentation.

Access the AI4RE videos:

- [AI for RE Part 1](#)
- [AI for RE Part 2](#)
- [AI for RE Part 3](#)

Learn more about the [RWG](#) and its many resources.

AI Assistants in Requirements Engineering: Part 2

The [Requirements Engineering (RE) Magazine](#) is published by the [International Requirements Engineering Board (IREB)](#) multiple times per year. Articles are welcome from Business Analysis and Requirements Engineering professionals, regardless of IREB membership status. Publication is free of charge for the authors.

SYSTEMS ENGINEERING RESOURCES

In the January 2024 edition, Michael Mey, Managing Consultant at Obvious Works, authored his second AI-focused article titled *"AI Assistants in Requirements Engineering – Part 2*.

Topics addressed include:

- Recap of Part 1: The value of AI assistants
- Deep Dive into CustomGPTs
- Market Overview – Technology comparisons
- Future Trends

Read the full article here. Review Part 1.

View the other 100+ RE Magazine articles.

Sign up to be notified about new issues of the Requirements Engineering Magazine.

See guidelines for contributing to the RE Magazine as an author.

> **"**
>
> *Engineering management is management - planning, organizing, allocating resources, directing and controlling - performed where engineering is the primary activity which is being managed.*
>
> **Robert Halligan**

FINAL THOUGHTS FROM SYENNA

Givens, Assumptions, and Gobbledy-Gook

Folks that handle large volumes of complex and critical information often speak these days of an elusive quantity called "*trust*". Though trust is defined (I trust or at least passionately believe) in a multitude of ways by a multitude of organizations, each seeking to be the trusted source of its carefully crafted standardized, copyrighted definition, most of us working engineers get lost after 3 or 4 links in a trust certification chain.

We all want confidence that the information that we are using to DEFINE the problem and DESIGN its solution is appropriately worthy of our confidence. But we don't have time (oops, see last month's Final Thoughts exposition on *iteration*) to confirm each microbit or nanochunk of relevant knowledge, so we fall back to sorting our information into a few simple bins.

Givens

Most engineering practitioners completed a bit of mandatory science coursework while pursuing their degrees and logically concluded that some very smart people a few decades or centuries ago accurately modeled the workings of the physical universe and reduced their understanding to a set of mathematical equations. A few zealous professors as old as the Manhattan Project attempted to teach us something called "proofs" that gave us confidence that the math actually made sense. Although 98.494 percent of engineers couldn't reproduce those proofs today, the distant memory of seeing 19 steps in one textbook (or on one chalkboard in my generation) suffices to assuage our fears that this house of cards that we call a career isn't built on quicksand. Although none of us have thoughtfully pondered, read or even skimmed the 52 scientific papers that are referenced and provide context and support for each equation or empirically created curve, we lump such information into a category called **Givens** and thereafter block out any concerns as we climb further out on the branch, limb and then twig that is holding us up.

However, given the exponentially increasing volume of the cumulative sphere of human knowledge, where do we draw the line and determine which equations both fit our problem situation and are dependable enough to use in our engineering?

And in the fog of war or pressure-cooker of a critical project that is already late and over budget, don't we also throw a lot of other "facts" into the givens bucket? We think that we know why a prior design is a good starting point for the current problem and how a reused component will perform when combined for the first time with 5 other parts in a new physical configuration. The data sheet says A in = B out; good enough for me.

And my buddy who is an expert in _____ says _____ worked the last time.

And thinking about emergent properties gives me a headache.

Where do we mere mortals draw the line on the really reliable stuff?

Assumptions

Outside of the realm of science, engineers must deal with a myriad of enticing thoughts that give us a sense of security that "We can do this!". Our minds crave simplicity, so as a mental energy-saving shortcut we create a knowledge bin labeled **Assumptions**. Into that barrel goes just about everything that we think we know about:

- Our stakeholders – who they are or will be across the in-service life of the system that we are conceiving
- What these fuzzy personas or market-representing avatars will need from our system to be satisfied or even happy that we came along and provided a solution for them
- How the world and its minions will change and in doing so reshape the context in which our system will operate
- The pace of technological breakthroughs and maturation on which our solution will depend
- The malevolent acts and exploits of our competitors or adversaries
- The replacement or revised versions of any mis-labeled Givens that fall out of favor as our project proceeds

And these are the carefully recorded assumptions, published from a repository and made available frequently to the development team members such that they can influence design decisions.
What about the implicit half-formed thoughts that comprise the mental models of our diverse engineering team members?

Gobbledy-Gook

Add to our scenario that overwhelming volume of noise coming from stakeholders in the form of discordant opinions and irrelevant ideas, and we have a confidence-killing conundrum.
Syenna muses:

> *Might there be a need for a systematic approach to the engineering of systems?*

Regards,
Syenna

> "
>
> *There are two ways of constructing a software design; one way is to make it so simple that there are obviously no deficiencies, and the other way is to make it so complicated that there are no obvious deficiencies. The first method is far more difficult.*
>
> **C. A. R. Hoare**