

EMEA Workshop 2019 Utrecht, the Netherlands 10-11 October 2019



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How to simulate real-world behavior? Systems Modeling & Simulation Working Group (SMSWG)

Chair: Kirsten Helle, TechnipFMC, President NORSEC

Facilitator: Michiel Prins

Simulation Game



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Agenda

- 14:30 Overview Status quo SMSWG
- 14:45 Break-out session
 →Mini-break during break-out
- 16:00 Concluding session
- 16:30 End of workshop



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SMSWG mission:

Support activities that bridge engineering analysis and systems engineering to provide digital solutions to represent real life experiences

■Optimize the integration of systems engineering and simulation solutions for both OEM and supplier; including education, communication, promotion of standards, and development of requirements that will have general benefits to the simulation and analysis community with the identification of benchmarks and major strategic issues (grand challenges)



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Purpose of Workshop

Increase and exchange knowledge to the WG from the industry and identify needs

ightarrow Expand knowledge of the topic «Digital Twin»

Recommended future research topics listed in the paper:

«DIGITAL TWIN, Its Role and Structure within a Modern Systems Engineering Approach" by Edward A. Ladzinski, Frank W. Popielas & Donald Tolle

- 1. Digital Twin: Its Maturity Levels and Impact on Business Maturity and Competitive Positioning A Deep Dive
- 2. Digital Twin: Foundational Elements that Enable the Necessary Infrastructure and Ecosystem







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Figure from : «DIGITAL TWIN, Its Role and Structure within a Modern Systems Engineering Approach" by Edward A. Ladzinski, Frank W. Popielas & Donald Tolle



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Figure from: «An Alternate View of the Systems Engineering "V" in a Model-Based Engineering Environment»

By S. Jason Hatakeyama Chief Architect and Director, Product Lifecycle Management and AIAA Associate Fellow. Boeing Defense, Space & Security, El Segundo, CA, 90245, USA, Daniel W. Seal Senior Manager, Product Lifecycle Management, and AIAA Member. Boeing Defense, Space & Security, Berkeley, MO, 63134, USA, Don Farr Senior Technical Fellow, Systems, Support and Analytics Technology, and AIAA Senior Member. Boeing Research & Technology, Huntsville, AL, 35808, USA and Scott C. Haase Senior Engineering, New Mid-Market Airplane Model Based Engineering. Boeing Commercial Airplanes, Seattle, WA, 98108, USA

Break-out topics

Common question for ALL groups: Digital Twin

- A. What does the term "Digital Twin" means to you? Define it.
- B. Is it a technology, capability or culture?
- 1. Digital Twin Maturity

Question: What is the maturity level of the Digital Twin, what is missing? How can we be capable of making use of information and data to make proper decisions? What is the need for the business or organization to get ready for or implement the Digital Twin? **Keywords:** Benefit, Piloting or Company-wide usage, Areas/Domains used

2. Digital Twin + IIoT & IoT

Question: Define or discuss what is the untapped business potential for a product and its related Intellectual Property(IP) while in service? **Keywords:** Services, Connectivity, Maintenance, Predictive functionality/operation, Autonomy, AI

3. Digital Thread - Basis for the Digital Twin

Question: What is missing to ensure the Digital Thread forms the platform for the Digital Twin in different industries? **Keywords:** Platform, Compute capabilities, System Architecture

- Collaboration/Infrastructure The Digital Twin claims to be dependent of the application streams Product, Process and Society Question: How to bridge these multiple disciplines?
 Keywords: Digital linkage, Traceability, Real-time capabilities
- 5. Foundation of/for the Digital Twin

Question: What can be or define the <u>Foundational Elements</u> that enables the <u>Necessary</u> Infrastructure and <u>Eco</u> system? **Keywords:** Process, Organization, Tools in place

6. Digital Twin - Management & Knowledge

Question: How to support middle and upper management to understand the digital needs? Do you have a clear vision or strategy in place? **Keywords:** Buzzword?, Knowledge, Vision, Smart Systems,



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Concluding session

What to show the «World»?



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