jotne

2024 DIGITAL TWIN CONFERENCE

25 JUNE
08:30-13:00

SPEAKER'S KNOWLEDGE

DEFENCE

SPACE

MANUFACTURING

AI AND IOT

At Oslo Military Society
Myntgaten 3, Oslo, Norway

PRESENTATIONS AND INSIGHTS

LEARN FROM THE EXPERTS

Supported by experts from Lockheed Martin, Airbus, and team members contributing at European Space Agency (ESA), European Defense Funds (EDF), and EU Horizon Europe programs.

FOCUS AREAS

Digital transformation (DX) of engineering data consists of capabilities related to Digital Twin, Digital Thread and application areas like PLM, TDP, Simulation, and IoT connectivity for AI. All using Open Standards for improved data exchange, sharing and archiving.

WHO SHOULD ATTEND

CIO, CxO IT Architects, CAD and CAE users, PLM/ERP managers, AI/ML developers and project managers in the ASD field.

Register now - www.event.jotne.com
helpdesk@jotne.com

# Exploring the Digital Twin by using Open Standards

ISO 10303 (STEP)

ISO 10303, also known as STEP (Standard for the Exchange of Product model data), is an international standard that plays a crucial role in supporting various industries. It provides a standardized approach for representing and exchanging product data, enabling interoperability, collaboration, and efficiency across different stages of the product lifecycle. ISO 10303's wide adoption and support have made it an essential tool for industry players worldwide.

One of the key benefits of ISO 10303 is its ability to facilitate seamless data exchange and integration between different software applications and systems. In industries where multiple software tools and platforms are used, such as manufacturing, engineering, supply chain management, and maintenance, ISO 10303 ensures that data can be accurately and consistently shared, interpreted, and utilized. This eliminates the need for manual data translation or conversion, reducing errors, time, and costs associated with data interoperability when it comes to Digital Twin that uses information from CAD, PLM, Technical Data Packages, Simulation, Test, Manufacturing, and Operational data.

Digital Twin

The Digital Twin concept has emerged as a powerful approach to optimize the design, development, operation, and maintenance of complex systems. It involves creating a virtual replica or digital representation of a physical asset, such as an aircraft, spacecraft, or defense system, and using it to gain insights, monitor performance, and simulate scenarios throughout its entire lifecycle. Open standards like ISO 10303 play a crucial role in enabling the implementation of Digital Twins in industries such as aeronautics, space, and defense, where long lifespans and complex requirements are prevalent.

Digital Twins enable real-time monitoring and predictive maintenance. By continuously collecting and analyzing data from the physical asset and comparing it to the digital representation, organizations can detect anomalies, predict failures, and plan maintenance activities more efficiently. This proactive approach minimizes downtime, optimizes asset utilization, and improves safety and reliability. These insights empower stakeholders to make informed decisions, optimize resource allocation, and enhance operational efficiency.
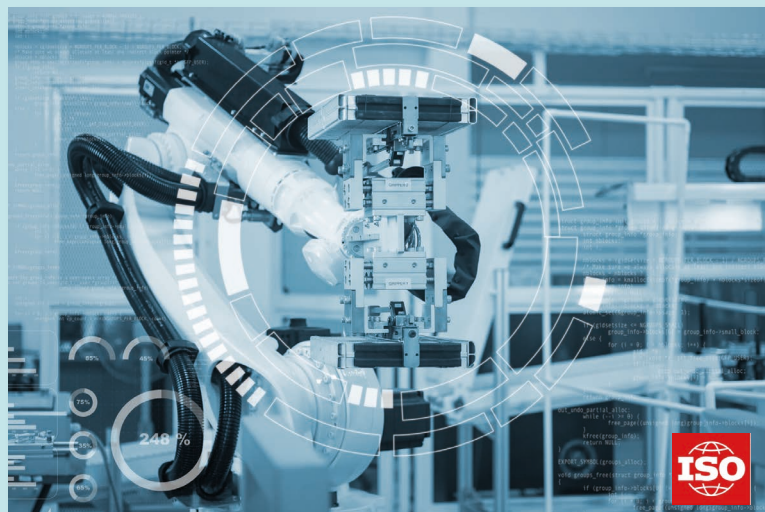
Condference Agenda

08:30-09:00	**Registration**	<u>**Speaker**</u>
09:00-09:10	**Welcome**	**Vilde Sørensen Jotne**
09:10-09:30	**Keynote and setting the scene for engineering excellence: Mission Driven Transformation**	**Dr. Michael Jahadi Lockheed Martin**
09:30-10:00	**Model based Technical Data Packages (TDP)**	**Jeff Holmlund Lockheed Martin**
10:00-10:30	**Digital Twin – Status, and emerging Use Cases for Space applications**	**Harald Eisenmann Airbus**
10:30-10:45	**Coffee**	
10:45-11:15	**Digital Twin for Naval Ships (EDF-dTHOR)**	**Prof. Terje Rølvåg SINTEF**
11:15-11:45	**EU-DAIS showcase: AI in process industry and heavy rotating machinery**	**Marius Slagsvold Step Solutions**
11:45-12:15	**Digital Twin for Space sub systems (ESA project)**	**Dr. Gunnar Mæhlum IDEAS**
12:15:12:30	**Questions and summary**	
12:30-13:00	**Coffee and Sandwiches**	

The Presenters

BIO: Vilde Marie Sørensen, CEO at Jotne Connect, completed her MSc in Geographical Information Systems (GIS) at the NMBU University. She started her career at Terratec, now Field, and interoperability was an important aspect of her contributions. As GIS is related to Building infrastructure, the Open BIM formats like IFC (ISO 16739) was deployed, which has its roots from ISO 10303 building blocks. Vilde's leadership is poised to further Jotne Connect's mission in advancing digital twin technologies and interoperability solutions across critical industries.

ABSTRACT: Welcoming our distinguished presenters and attendees to the 2024 Digital Twin conference. This event will delve into the optimization of complex systems across aerospace, defense, and space, highlighting their significance in enhancing lifecycle management, operational efficiency, and predictive maintenance. With insights from leading experts at Lockheed Martin, Airbus, and major European programs, the conference promises a rich exchange of knowledge and practices for professionals in engineering, IT, and project management, aiming to unlock new dimensions of innovation and efficiency in product development and beyond.

BIO: Dr. Mike Jahadi has more than 38 years of experience in identification, and deployment of new technologies in support of product design manufacturing & CAD/CAM/CAE related activities within LM Aeronautics. In 2008 Mike was selected as Lockheed Martin Technical Fellow, prior to this, he was Senior Manager over the CAD/CAM Integration & Strategic Planning at LM Aero. Dr. Jahadi has been the President and Chairman of the PDES, Inc. Executive Board since 2006. In addition, he is Associate Fellow member of AIAA.

ABSTRACT: Through the 1LMX project, Lockheed Martin is transforming the end-to-end business processes and systems of the company. The corporate-wide effort is creating a model-based enterprise with a fully integrated digital thread throughout the design, build and sustain product lifecycle. Through new innovations and partnerships, Lockheed Martin will accelerate 21st Century Security capabilities to support customers' national security missions.

The Presenters

BIO: Jeff Holmlund has been the CAD/CAM Operations & Support Lead for LM Aeronautics enterprise for the last 17 years with responsibility of managing a technical team providing user and operational support for a large, global user base of CAD/CAM solutions - primarily CATIA V5, 3D Experience, TeamCenter and Fibersim. Jeff has also worked as LM Aeronautics' Digital Data Exchange and Digital Data Delivery Subject Matter Expert for 25 years supporting digital data requirements related to Technical Data Packages for contract deliverables and supplier data exchange. Jeff has been an active member in the PDES, Inc and ISO 10303 (STEP) community since 1999 and acts as the Americas' project coordinator for the LOTAR International project.

ABSTRACT: With the advent of Model Based Engineering definition of products, the content and complexity of a technical data package has expanded to where new approaches and solutions are warranted to better address the requirements for effective data exchange and interoperability. LM Aeronautics is working with their customers and suppliers to develop new solutions for preparing, packaging and delivering model based TDP's as well as addressing legacy, drawing based programs whose authoring and storage solutions are reaching their end of life. The REPLAY project was initiated to address the requirements for both drawing and model based TDPs leveraging standards for multiple LM Aeronautics production programs.

BIO: Harald, a senior staff member at Airbus Defense and Space and located at the Friedrichshafen facility, has over 25+ years of experience at the boundary of application processes in engineering, manufacturing, testing and service - and the understanding of the virtual aspects in information models. This includes simulation models for space payload and system verification, databases / modelling tools for core data, but also the capture of the master data in data models / ontologies.

ABSTRACT: Digital Twin is currently being used as a holistic consideration of End-to-End digitalization along the entire system life cycle. Digital Twin is not entirely new, rather builds on top of the existing engineering capabilities. New to digital twin is a systematic consideration of new type of data coming from the physical world, which enables improved representation of models, trend and forecast analysis and more globally also supporting new business cases. This presentation will focus of status and current developments around digital twin for Space applications.

The Presenters

BIO: Terje Rølvåg is a Professor and Senior Research Scientist in modeling and dynamic simulation of electromechanical products like radars, space mechanisms and weapons systems. The simulation techniques are based on reduced order non-linear Finite Element formulations and control science (FEDEM) applied in active damping of flexible structures and mechanisms. Since 2017, Rølvåg has developed and applied this technology in real time Digital Twin implementations for Condition (CM) and Structural Health Monitoring (SHM) of machinery, drivelines, bridges, windmills, radar, weapon, and robot systems. Rølvåg is in charge of digital twin modeling and dynamic simulation of dTHOR effectors and radars.

ABSTRACT: The EU-EDF project "Digital Ship Structural Health Monitoring" (dTHOR) will develop a digital framework using large amounts of load and response measurements from physical and virtual sensors to predict battle damage and structural integrity of naval ships, radars, and effectors. The framework will integrate recognized open standards for data exchange, digital twin modeling and hybrid analysis combining physics-based and data-driven AI models. dTHOR will consolidate end-user's military operational requirements based on improved, reduced hydro-acoustic signatures, and more accurate operations of weapon systems.

BIO: Marius Slagsvold is CTO and founder of Step Solutions, bringing with him 25 years of extensive experience in the digitalization of processes and machines spanning diverse sectors: Oil & gas, maritime, energy management, power (hydrogen, solar, hydropower), process industry and food & beverage. He has also been responsible for developing Step Solutions to be a leading provider of OT/IT solutions specializing in data capture and driving the integration of AI into industrial processes..

ABSTRACT: DAIS (Distributed Artificial Intelligent System) is a pan-European project focused on advancing data processing with faster, more secure, and energy-efficient solutions via edge AI software and hardware. Step Solutions, in collaboration with Jotne and Expert Analytics, has developed solutions deployed and demonstrated in a plasterboard factory. This showcases AI applications in process industries and heavy rotating machinery, with a goal to create an anomaly detection system for production environments. The project aims to improve production quality, output, and reduce energy consumption.
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The Presenters

BIO: Dr. Gunnar Maehlum is the of CEO Integrated Detector Electronics (IDEAS), that delivers radiation detection and imaging systems with proprietary readout technology. He holds a Ph.D. in Particle Physics from the University of Oslo and has a broad background from positions at CERN, the University of Karlsruhe, and the University of Perugia. He joined IDEAS in 1997 where he worked in technical, scientific, and managerial positions. Prior to his current role, he has been Vice President of Research at Gamma Medica Inc. and General Manager of Gamma Medica-Ideas (Norway) AS. He has more than 35 years' experience in radiation detection technologies and applications.

ABSTRACT: Almost all radiation detection systems are modelled in software prior to construction or manufacture. The interactions of radiations with matter are complex processes spanning an enormous energy and wavelength range. From CERN there is more than 50 years heritage in modelling these processes. These methods were for a long time only in the realm of fundamental research but has during the last decades also found applications in industry to model the performance of products. Such models constitute a digital twin regarding the response of radiation detection systems.

Empowering Your Business with Cutting-Edge Interoperability Solutions

Jotne is a leading provider of advanced engineering software solutions for the Aerospace, Defence, and Space industries. The company's applications offer a comprehensive suite of tools for managing the entire product lifecycle, from concept design to product retirement and it help organizations optimize their product development processes and increase efficiency.

A Legacy of Innovation and Excellence

Grown up in the ISO 10303 standards, Jotne has been a pioneer in the product lifecycle management (PLM) industry for over 25 years. Our mission is to empower businesses with innovative and robust interoperability solutions that streamline product development processes, enhance collaboration, and improve overall efficiency. At Jotne, we understand the critical importance of staying ahead of the curve. Our dedicated research and development team is constantly exploring new technologies, methodologies, and industry best practices to ensure that our software remains the gold standard in the industry solutions. By investing in the future, we're able to provide our customers with unparalleled performance, scalability, and adaptability.

Trusted by Industry Leaders Worldwide

Jotne software is trusted by a diverse range of industry leaders, spanning sectors such as aerospace, automotive, manufacturing and more. Our client list includes globally renowned organizations like Lockheed Martin, Airbus, European Space Agency, Leonardo, BAE Systems, all of whom have experienced the transformative impact of our cutting-edge interoperability solutions.
Jotne software has revolutionized the way customers manage their product development processes, helping them achieving faster time-to-market and reduced costs.

The TruePLM Application

TruePLM is Jotne's flagship product lifecycle management (PLM) application. TruePLM offers a comprehensive set of tools for managing the entire product lifecycle, from concept design to product retirement. The application is designed to help organizations optimize their engineering processes and increase efficiency by providing a centralized platform for managing data, processes, and workflows.
One of the key benefits of TruePLM is its ability to facilitate data exchange, sharing, and archiving. In the ASD industries, data exchange is a critical component of product development processes. Organizations need to be able to share data quickly and efficiently between different teams and departments, while also ensuring that data is secure and protected.

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