What Are the New Requirements for IT Standards to Enable Smart Manufacturing?

The manufacturing industry is being challenged by digital transformation. The Internet of Things (IoT) and Model-Based Engineering (MBE) will play a crucial role in the design, fabrication and maintenance of complex products. MBE will be critical in understanding the underlying systems’ complexity and connecting the required modeling methodologies and tools.

The OMG Information Day on "Internet of Things and Model Based Engineering in Manufacturing" will focus on the requirements for standards that Industrie 4.0 and Smart Manufacturing strategies bring to the data infrastructure as manufacturing transforms from building complex products to complete systems.

The concepts of Industrie 4.0 and Smart Manufacturing will enable the development and production of complex systems (sometimes called cyber-physical systems). They will also raise new challenges for interoperability of the IT infrastructure needed to support this evolution. The added complexity will increasingly require the use of Model-Based Engineering (MBE) methods and technologies to design, build and manage the interconnected systems. The specification of IT standards and the development of MBE tools and methodologies is a kind of pre-competitive grease to support manufacturing collaboration and coopetition.

The role of Object Management Group® (OMG®), and specifically the Manufacturing Technology and Industrial Systems Domain Task Force (ManTIS DTF), is to foster the development of technologies and standards in support of interoperability of manufacturing systems. ManTIS closely cooperates in this regard with the International Council on Systems Engineering (INCOSE), GfSE (the German chapter of INCOSE), and the Systems Engineering Domain Special Interest Group (SE DSIG) of the OMG.

The objective of this full-day event is to discuss joint interests between formerly disconnected organizations in this area and to initiate activities to solve our common problems. Attendees will learn about developments and strategies in support of complex system manufacturing and will help formulate requirements in conjunction with key industrial players, organizations and consortia such as the Industrial Internet Consortium® (IIC™), GfSE, prostep ivip, and the Plattform Industrie 4.0 (PI40). In a concluding panel we will discuss the need for action and joint activities.

Throughout this day-long event you will find ample opportunities to meet and network with speakers, panelists, task force chairs and your fellow attendees during refreshment breaks, luncheon and an evening cocktail reception at the hotel, all included in the registration fee.

Reserve your place today for this OMG special event. Register today!

AGENDA

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| 0900 - 0910 | Welcome and Overview  
Claude Baudoin, Owner and Principal Consultant for cebé IT and Knowledge Management  
Bio: Claude Baudoin is the owner and principal consultant for cebé IT and Knowledge Management, a strategy consulting firm based in Austin, Texas. Claude is a proven leader and visionary in Information Technology and Knowledge Management, with extensive experience working in a global environment. Capable of sorting out the important guidance from masses of information and research, and of aligning it with the goals of the enterprise, he delivers pragmatic recommendations. In addition to consulting in the Oil & Gas and government sectors, Claude is the energy domain advisor to the Object Management Group and the Industrial Internet Consortium. |
| 0910 - 0935 | Moving Smart Manufacturing Forward: IIC Testbeds and OMG Standards  
Dr. Richard Soley, Chairman & CEO, Object Management Group  
VIEW PDF |
### 0935 - 1000
**OMG - A Brief Introduction**  
Andrew Watson, Vice President & Technical Director, Object Management Group

Abstract: Products implementing OMG standards are at the heart of many of the Industrial Internet of Things (IIoT) systems, from controlling hydro-electric power generation to integrated logistics fleet management systems. Relevant OMG standards include: Data-Distribution Service for Real-Time Systems™ (DDS™), the premier open middleware standard directly addressing publish-subscribe communications for real-time and embedded systems; Interaction Flow Modeling Language™ (IFML™), a relatively new standard, designed to design viable user interfaces with the IIoT System Assurance (SysA) and Software Quality specifications which are critical to building secure and dependable multi-platform systems. Systems Modeling Language™ (SysML™), which provides the tools and notations for designing complex interdisciplinary systems and systems-of-systems that incorporate multiple components at large scale. Information modeling and interoperability standards like the Ontology Definition MetaModel™ (ODM™) and Model Driven Message Interoperability™ (MDMI™) specifications, which designers can use to ensure that they are ascribing consistent semantics to the information flowing across IIoT applications. This overview puts DDS, IFML, SysA, SysML, ODM, MDMI and OMG’s other IIoT work in context, describing the areas where OMG standards provide a foundation for IIoT deployments around the globe.

Bio: Andrew has overall responsibility for the OMG’s technology adoption process, and also chairs the Architecture Board, the group of distinguished technical contributors from OMG member organizations, which oversees the technical consistency of the OMG’s specifications. Andrew is always happy to answer questions about OMG’s specifications or process.

### 1000 - 1030
**Morning Refreshments**

### 1030 - 1100
**Strategy and Roadmap of Industrie 4.0 for International Standardization**  
Alexander Bentkus, Project Manager Standardization Council Industrie 4.0, VDE Association for Electrical, Electronic and Information Technologies

Abstract: Industrie 4.0 stands for a complete accessibility from the real world of an industrial plant to the digital image and vice versa. With digitization, this creates new opportunities for value creation for industrial suppliers and industrial operators worldwide. For this reason, international standardization is of crucial importance for the successful implementation of the German Industrie 4.0 activities. For the implementation of a digitized industry, cross-linked standards between the industries, like IEC/ISO with those from the digital industry are required. Therefore a new approach by launching the Standardization Council Industrie 4.0 was established by the associations bitkom, VDMA, ZVEI, the standardization organizations DIN & DKE and the Plattform Industrie 4.0. Core tasks are to initiate, coordinate and implement international Industrie 4.0 standardization activities.

Bio: Alexander Bentkus works at DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE and in this role at the newly founded Standardization Council Industrie 4.0. He looks back over 20 years industrial work experience within Development, Manufacturing and Product Marketing and holds a Diploma of Engineering.

### 1100 - 1130
**The Industrial Internet Consortium's Smart Factory Task Group: Driving Manufacturing IIoT Standards, Adoption and Best Practices**  
John Kowal, Director, Business Development, B&R Industrial Automation Corp., Industrial Internet Consortium, Smart Factory Task Group

Abstract: The Smart Factory Task Group was formed in 2016 to promote collaboration, education and standards specific to IIoT in manufacturing. The Smart Factory group highlights the progress of IIC testbeds, task groups, allied industry organizations such as Industrie 4.0, to help business and technology leaders in the discrete manufacturing and process industries understand and adopt evolving IIoT best practices.

Bio: John Kowal is responsible for B&R’s business development and marketing of industrial automation technologies in North America. Leadership role in B&R’s Global Packaging Solutions Group. Member of OMAC and PMMI Boards of Directors, PMMI trade show strategy and global marketing committees, Purdue Calumet dean’s executive council, ISA, IoPP, Automation Conference advisory board.

### 1130 - 1200
**AutomationML - Industrie 4.0 Candidate Standard for Asset Model Engineering and Plug & Work**  
Dr. Kym Watson, Deputy Head of Information Management and Production Control Department  
Dr. Thomas Usiländer, Fraunhofer IOSB, Head of Information Management and Production Control Department

Abstract: According to the Reference Architecture Model Industrie 4.0 (RAMI4.0; recently published as IEC PAS 63088 Ed1: Smart Manufacturing), assets of all layers of the automation pyramid from the field up to the enterprise levels including the products being produced, shall be modelled in a unified way. The so-called I4.0 component provides the asset modelling concepts including meta-data about the asset (topology, properties, capabilities, functionalities,…) to be made accessible via a uniform interface. Hence there is a need to provide a common modelling language that is, on the one hand, flexible enough to basically encompass all asset descriptions, and on the other hand, is already accepted in the industrial community. The presentation explains how the standard IEC 62714 AutomationML fulfills these requirements. Furthermore, it illustrates how AutomationML, when applied in combination with the IEC 62541 communication architecture...
OPC-UA, may also contribute to solve the needs for plug-and-work in industrial plants. Plug-and-work is designed to adapt or even replace plant assets efficiently with a minimum of engineering effort.

Bio: Kym Watson received an Honours Degree in Sciences (1974) and a PhD in mathematics (1978) from the Flinders University of South Australia. He has been a scientist at Fraunhofer IOSB, Karlsruhe since 1982 and is currently deputy head of the department "Information Management and Process Control". His expertise includes modeling and performance evaluation of computer networks, information management systems with geospatial data based on sensor networks, as well as development of technology roadmaps for Industrial Internet of Things and automation systems. He leads the IIC Smart Factory Web Testbed project at Fraunhofer IOSB in which architectures for Industrial Internet of Things are investigated and tested.

Bio: Thomas Usländer holds a degree in Computer Science from the University of Karlsruhe, Germany, and a PhD in Engineering of the Karlsruhe Institute of Technology (KIT), Germany. He is head of the department "Information Management and Production Control" and speaker of the business unit "Automation" at Fraunhofer IOSB. His research interests include service engineering and open architectures for the Industrial Internet of Things. He contributes to several Industrie 4.0 working groups, is member of the expert panel of the Standardization Council Industrie 4.0 (SC4i4.0) , got the OMG Application Award 2000 and the DIN Innovation Award 2017.

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<td>Digital transformation and the need for Model-Based Engineering</td>
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<td>From Concept to Manufacturing: Transforming Product Creation in the Connected and Cognitive Era</td>
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<td>16:00 - 16:30</td>
<td>Bridging the Digital &amp; Physical Worlds: IoT &amp; Model-based Approaches in Manufacturing</td>
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### Hedley Apperly, PTC VP Solution Management (MBSE), OMG Board of Directors

**Abstract:** This session introduces PTC's IoT solution and supporting capabilities for digital engineering and manufacturing. Following an introduction, the first half of the presentation focuses on the engineering of IoT systems and products, particularly the model-driven IoT software engineering and bridging the gap between physical products and digital design. The second section looks at PTC's IoT manufacturing solution, based on its ThingWorx technology stack.

**Bio:** Hedley Apperly BSc (Hons) MA, is a VP of Solution Management at PTC, responsible for Model-based Systems Engineering. He has graduate and postgraduate qualifications in engineering, computing & strategic marketing, backed up with 20 years of senior product management experience in the modeling tools domain. Hedley is an author and visionary on methodologies, modeling and reuse. He is also a member of the OMG Board of Director and has been actively involved in defining industry standards such as UML, SysML and ReqIF. He was involved in writing Component Based Development for Enterprise Systems (1998 Cambridge University Press). Hedley also co-authored Component Based Software Engineering; Putting the Pieces Together (1999, Addison-Wesley) and Service- and Component-based Development; Using the Select Perspective and UML (2002, Addison Wesley.)

### 1630 - 1700
**OMG Manufacturing Technology and Information Systems (ManTIS) Task Force perspectives on Smart Manufacturing**

**Uwe Kaufmann, CEO ModelAlchemy Consulting, Co-Chair of the OMG ManTIS Domain Task Force**

**Michael Pfennig, PLM Consultant at XPLM Co-Chair of the OMG ManTIS Domain Task Force**

**Abstract:** ManTIS' work is currently focusing on the integration of Model-Based Systems Engineering (MBSE) and Product Lifecycle Management (PLM). The presenters want to discuss the issues related to this integration issue and give an outlook on the potentials of holistic product development to Smart Manufacturing.

**Bio:** Uwe Kaufmann works as an independent consultant for interoperability and enterprise integration in the area of PLM, software- and systems-engineering. Since 2003 Uwe co-chairs OMG's Manufacturing Technology and Industrial Systems DTF and co-chairs the INCOSE/GfSE PLM4MBSE WG. Before starting a business as an independent consultant, he worked as a senior researcher for Fraunhofer IPK. Uwe received a diploma in Mathematics from Humboldt University.

### 1700 - 1745
**Panel Discussion - What Standards Specifications Do We Need?**

**Moderator:** Claude Baudoin, Owner and Principal Consultant for cebé IT and Knowledge Management

**Panelists:**
- Hedley Apperly, PTC VP Solution Management (MBSE), OMG Board of Directors
- Alexander Bentkus, Project Manager Standardization Council Industrie 4.0, VDE Association for Electrical, Electronic and Information Technologies
- Dr. Kym Watson, Deputy Head of Information Management and Production Control Department
- Graham Bleakley, IBM IoT Watson, OMG UAF Co-Chair
- Uwe Kaufmann, CEO ModelAlchemy Consulting, Co-Chair of the OMG ManTIS Domain Task Force
- Larry Johnson, Vice President & Technical Director, Object Management Group

### 1745 - 1800
**Wrap up and next steps**

### 1800 - 2000
**Networking Cocktail Reception**

**NOTE:** If you register for the Technical Meeting Week, you do not have to pay the additional fee(s) to attend any or all of the special events. If you register only for special events, the special fees apply.