2:00pm – 2:10pm Welcome and Overview

Claude Baudoin, Owner and Principal Consultant for cébé IT and Knowledge Management

2:10pm – 2:30pm The Industrial Internet: Opportunities, Disruptions and Standards

Dr. Richard Soley, Chairman & CEO, Object Management Group (OMG), Executive Director of the Industrial Internet Consortium (IIC)

The ideas behind the Internet of Things (or Cyber-Physical Systems, or Machine-to-Machine Interoperability, Industrie 4.0, or several other names) are not particularly new; indeed, what has happened is really a convergence of existing technologies and corporate strategies. As the number of sensors in the world rapidly outpaces the world population and concepts of Big Data for real-time, predictive analytics comes to the fore, new market opportunities appear. In fact, the world will see major disruptions in transportation, financial management, medical devices and other markets as "Internet thinking" moves into the industrial domain.

2:30pm – 2:50pm Object Management Overview

Larry Johnson, Vice President and Technical Director, Object Management Group

Products implementing OMG standards are at the heart of many 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, used 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 modelling 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.

2:50pm - 3:30pm KEYNOTE: Upstream Oil & Gas and the industrial internet: laissez les bon temps rouler

David R Feineman, Senior Advisor on Production Systems, Upstream Technology, BP America, Inc.

The drive for accelerating the breadth and pace of digital transformation is impacting the Upstream Oil and Gas business: at BP, we refer to that vision as an organizational imperative to create the Connected Upstream. The

industrial internet of things is key enabler for that vision, and is evolving much more rapidly than earlier waves of digitization: it is driven on by low cost sensors, broadband field communications networks, the ability to create and manage data lakes as big data repositories, and deploy cloud hosted applications to analyze and draw insights from operational data. At BP, we have been working for the last two years on implementing a large-scale solution which tests the current industrial internet capabilities to deliver both organizational efficiency and drive proactive operational decisions. While there may be early mover challenges in areas like performance, reliability, security, & cross vendor compatibility of the solutions- the business imperative to transform and innovate has raised the game on delivering successful industrial internet based solutions which makes this a great time to be looking at how standards can enable interoperability across platforms and computing environments, and accelerate incorporation of legacy infrastructure into a big data digital twin. There are huge opportunities for integrating these digital advancements into the upstream value chain: what is truly exciting is that the industrial internet gives us the ability to transform operational activity across a global enterprise- and we have already started on that journey.

3:30pm – 3:45pm Refreshment Break

3:45pm – 4:15pm The Oil and Gas Digital Engineering Journey

Matthew Hause, GTM Technical Specialist, Engineering Fellow, PTC, OMG UPDM Co-Chair

Model-based systems engineering (MBSE) is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases. The Systems Modeling Language (SysML) is the central hub of an MBSE integrated development environment. Apps for 3D CAD, parametric feature solid modeling, 3D direct modeling, 2D orthographic views, etc. provide the physical view. Internet of Things (IoT) technologies enable companies to capture and leverage information about a product's performance during operation – with the potential to dramatically improve existing and future products. Service Lifecycle Management (SLM) solutions combine IoT platform technology with service solutions. This integrated closed loop systems engineering toolset applied to the Oil and Gas Industry will ensure success on the Digital Engineering Journey. This presentation will demonstrate this Digital Engineering Journey using an Oil and Gas example.

4:15pm – 4:45pm Industrial IoT Evolution, Use Cases and Framework in the Oil & Gas Industry

*Dr. Claudio Lima, co-chair of the Industrial Internet Consortium (**IIC**)/Energy Utility Working Group*

After recent market shifts of failing crude prices and greater demand for climate change accountability, the O&G industry is about to redefine its boundaries using the Industrial Internet of Things (IIoT) as part of their evolution strategy towards a complete digital transformation. New processes, technologies and frameworks need to be introduced based on IIoT technologies. The talk will address frameworks, use cases and the evolution of the O&G industry towards an Integrated Edge-Core, Real Time Digital Platform that meet today's and future's requirements of mission critical data driven O&G applications. New IIoT system architectures and technologies will be presented, aligned with O&G operation efficiency and production optimization use cases.

4:45pm – 5:05pm Industrial Internet Connectivity Framework, DDS and the Impact on Oil and Gas applications

Dr. Gerardo Pardo, CTO Real-Time Innovations and co-chair OMG DDS PSIG

The Industrial Internet of Things (IIoT) landscape today is a confusing mix of proprietary connectivity technologies and standards. Some are general purpose, some appropriate for enterprise applications and others optimized for narrow application domains. This confusion hinders the ability to integrate systems that are robust, secure, and cost-effective.

The Industrial Internet Consortium (IIC) just released the Industrial Internet Connectivity Framework (IICF). It is the result of years of work by many experts in different companies. It provides high-level design recommendations as well as practical guidance on selecting connectivity standards to integrate IIOT systems. It recommends the Data-Distribution Service (DDS) and OPC-UA for most industrial control systems. This presentation will offer an overview of DDS and the Industrial Internet Connectivity Framework. Through relevant application scenarios, we will describe the impact and benefits to Oil and Gas applications.

5:05pm – 5:45pm **Panel Discussion: Disruptive Technologies, Adoption Trends and Future Challenges in the Oil and Gas Industry**

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

Panel: **Jay Hollingsworth**, Chief Technology Officer, Energistics
Matthew Hause, GTM Technical Specialist, Engineering Fellow, PTC, OMG UPDM Co-Chair
David R Feineman, Senior Advisor on Production Systems, Upstream Technology, BP America, Inc.
Dr. Claudio Lima, co-chair of the Industrial Internet Consortium (IIC)/Energy Utility Working Group
Dr. Gerardo Pardo, CTO Real-Time Innovations and co-chair OMG DDS PSIG

5:45pm – 6:00pm **Wrap Up and Next Steps**

6:00pm – 8:00pm **Networking Cocktail Reception**

August 8, 2017. Agenda and speakers subject to change with or without notice.