

Optimizing efficiency through digitalization in chemicals, petrochemicals and refining
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Speaker Interview



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1. Please introduce your role at Hexagon PPM

I lead the global business development for our information management solutions which involves communication of our solution business value and capabilities to customers both directly and through our regional teams. This communication is a two-way process in that I also feed back to our product owners the need for enhancements to our products that customers and our regional teams identify to help prioritize our development backlog.

2. What does the subject of digital transformation and IoT mean to you?

Digital transformation achieves step changes in business efficiencies through fundamental improvements in the way business is done across the value chain, involving people, processes and technology. It requires us to break down the traditional walls that exist both between and within organizations so that collaboration can occur across all stakeholders.

Digital transformation and IoT has increased the awareness of the importance of the digital twin of process facilities that our solutions create and maintain. The digital twin comprises the data and documentation that describe the detailed facility configuration and is the cornerstone for digital transformation and the implementation of efficient, data centric work processes. We are now extending our digital twin to include data from other systems in the operations landscape such as data historians and maintenance systems through interoperability. This enables us to provide access to uses

to all the information they need in the context of the work they perform whether that is in the office or the plant floor.

3. What's the greatest impact IoT, data analytics and AI will have on the industry? What lies ahead of operators and how will they adapt?

Advanced analytics including AI, machine learning, predictive analytics etc. will enable us to reveal new insights into the way that facilities perform; provide us new, automated ways of executing work, removing the drudgery of manual tasks; and optimize how work is performed. These advances represent both an opportunity and a challenge for operators. An opportunity to greatly improve their efficiency but a challenge to see beyond the hype and identify what are the right work processes to focus on and technologies to adopt to bring real business value. The challenge goes beyond technology as facility owners need to evaluate the impact of new work processes, manage governance and evaluate skills required in the workforce.

4. How do you see the role of the Industrial Internet of Things in refining, petrochemicals & chemicals? What are the key benefits and opportunities of using IIoT solutions in downstream operations?

IIoT has many applications in downstream operations a few examples include:

Enabling OEMs to remotely monitor their equipment, diagnose issues and recommend adjustments. It can also provide a basis for new Machine-as-a-service commercial models.

Making better use of scarce skilled resources where experts can remotely monitor facilities and provide advice and guidance to field personnel.

Condition based maintenance alerts based on real-time monitoring of equipment to optimize maintenance activities.

Monitoring worker performance to identify where work is performed incorrectly and where there may be a need for additional training, identify worker fatigue to reduce the risk of accidents and improve safety.

5. How will this paradigm shift affect talent in manufacturing & downstream industry overall?

We are currently amid the “big shift handover” where many experienced workers in the downstream workforce are approaching retirement age. Their “Millennial” replacements have very different expectations of how to work should be performed, access to data and where mobile connectivity and real-time access to data is the expectation. As such this paradigm shift is coming in line with the generational shift of the workforce, but there will still be a need to retrain many experienced workers. Some organizations are pairing new recruits with older experienced workers to facilitate two-way learning.

6. What does workplace innovation look like at your organization?

As a software vendor we are also undergoing our own digital transformation. For example, we have been using automated testing of our software for many years and now automating the build process system. We have started to use our own solutions to locate documents, implementing more advanced CRM and sales management tools, digital expense claims systems and many more to improve the efficiency of our development process and support tasks.

7. How does this impact your customers?

It means that our software is more robust and better tested than ever before and that we can deliver more frequent releases and respond more quickly to user requests. We are implementing telemetry within our systems so that we can monitor how our systems are being used and identify proactively where improvements can be made even before a customer reports these to us.

8. What are the latest technology adoptions by downstream operators in Asia? Are there any success stories that other operators can learn from?

We see operators being more proactive in setting standards for digital data and document handover within their EPC contracts and incrementally building their digital twin during the project for a seamless handover to operations. For brownfield facilities owners are starting to initiate the retrospective capture of the digital twin by extracting data from existing sources, validating and consolidating this to create a basic digital twin including laser scans to provide for 3D viewing and navigation. Many of our customers understand the value of maintaining the digital twin of their facilities once created and implementing electronic management of change to ensure complete auditable traceability and demonstrate compliance.

The digital twin is increasingly being leveraged by value added work processes such as management of change, process safety information management, equipment inspection etc. Interoperability with other systems in the operations landscape include integration with maintenance systems such as SAP and data historians such as OSI PI both to exchange data and ensure data consistency and to provide links to ensure information can be provided to users where they work and in the context of the work they perform. The other initiative is in relation to IoT, where companies have started to explore possibilities with sensor technologies and data analytics to improve overall productivity and minimise unpredicted downtime of assets

9. What does Industrie 4.0 mean for your company?

With the challenge of Industry 4.0 our customers increasingly see us not as just a software vendor but as a trusted advisor and partner in the digital transformation journey that we are both undertaking together. We typically work much closer with our customers in developing business cases to be presented to the customer board and then implementing new data centric work processes and solutions to achieve the benefits promised.

10. Will Artificial Intelligence replace humans working in oil and gas?

No, but AI will eliminate or reduce the effort of many laborious tasks undertaken by workers today, it will increase efficiency and guide human workers to work safer and reduce risk. Processes and equipment can be monitored remotely and safely with AI bringing to the attention of a human controller events that may need intervention.

11. Are manufacturers concerned about cybersecurity in their organization?

Yes, but we increasingly are seeing an acceptance of the security of cloud computing and even public cloud which was not the case only a few years ago. This is an indication of the maturing of understanding of cybersecurity within owners.

12. What impact does Big Data have on operational efficiency and how is Big Data changing the industry?

Big Data takes many forms within the industry. Detailed 3D models and 3D laser scans describe the detailed geometry of the facility configuration are many gigabytes in size. Data historians capture enormous numbers of records over time from the facility DCS system and increasingly additional sensors feedback information. The volume of information generated in the field is now so great that edge computing to process the data at the “edge” is required and only the processed results fed back centrally. Analysing this information using advanced analytics can help identify patterns that no human can detect to reduce operational risks e.g. scheduling activities to reduce overall risk, optimize turnaround schedules whilst considering constraints on material and equipment, identify potential equipment failures to proactively schedule maintenance activates etc.

13. What are your views on Asia’s downstream industries rate of digitalisation as compared to counterparts in other regions i.e. America, Europe and the Middle East markets?

We see that there is considerable variation within the level of digitalization within all regions between operators. Leading operators in Asia are on at least a par with their counterparts in America and Europe. We do see that Germany, the originator of Industry 4.0, there is a wide spread take-up of digital transformation initiatives spilling over from discrete manufacturing into downstream oil, gas and chemicals. Asia in general we see is quick to take on new technologies given the large pool of younger generation work force in the market. The younger generation (millennials) embraces technology at a much faster rate and uses it as a means to enhance their decision-making process. They see digitalisation as an essential foundation step

14. With these radical changes looming what opportunities lie ahead for manufacturers?

Opportunities exist through digital transformation to make step changes in business efficiencies with the introduction of data centric working practices. For example, enterprise workforce mobility providing access to current data and documents in the field in the context of the work performed will increase wrench time and reduce the risk from working with out of date information. Field data capture and collaboration between the field and control room and remote experts provide a major opportunity for rapidly solving issues and reducing risk. Digitalization enables better oversight and monitoring and provides auditable traceability with demonstrable compliance. Digital manufacturers are able to respond more quickly to changes in the regulatory and commercial environment and a competitive advantage.

15. What will the future workforce look like in the digital age?

The workforce of the future will have greater skills in working with digital information. Remote operation of facilities will reduce the need for physical presence on the plant floor, but not eliminate it. Mobile applications will provide access to information needed on the plant floor through pervasive Wi-Fi though offline access will be needed when working in areas without Wi-Fi access such as within tanks and vessels. Real-time communication between the plant floor worker, control room and remote experts will provide improved efficiency and reduce risk. Extended reality (Augmented and Virtual Reality) will become sufficiently robust and mature to be used practically on the plant floor and provide guidance to locate equipment in the field and augmented visualization of technical information, real time and trend information from data historians and maintenance/inspection history as required. Routine inspection rounds will probably be covered by robotic inspectors/drones.

16. What will be the highlight of your presentation at Asian Downstream Summit 2018?

My presentation is going to highlight how a high-quality description of the facility design and configuration and associated information, the “digital twin” provides a cornerstone for Industry 4.0 based digital transformation and the introduction of data centric, new ways of working. I will be looking at how this can be provided for brownfield facilities that might be 10, 20 or even older and have little structured data by capturing information from existing documents and data sources. For new projects I will be looking at international standardization efforts and best practices to establish a cloud-based, digital twin from day one on projects that can be used by operations and eliminate the costly handover process. I will be looking at how the digital twin can be augmented through interoperability with other systems such as CMMS, data historians etc. can promote Operational Excellence, reduce errors and enable better and faster decision making by providing the correct information in context to enable improved ways of working to improve efficiency and reduce risk. I will also look at how cloud based orchestration and mobility platforms can enable plant floor workers to undertake work efficiently with cross-application compound applications. I will also examine how maturing and convergence of many technologies such as Artificial Intelligence (including Machine Learning, Data Mining and Digital Neural Networks), Augmented Connectivity, Sensor & Data Fusion, Image and Video Analytics, Visualization, Robotics and Drones, Edge Computing, Blockchain and many more are enablers for radical change to the way work is performed on operating assets.