



INDUSTRY X: DIGITAL TWIN

VIDEO TRANSCRIPT

My name's Jonathan Parr. I lead our production operations practice in Industry X for UK and Ireland, and I'll be taking you through the first of our core themes. Production Optimization enabled by Digital Twin. I'm sure many of you are aware of the term digital twin, you've perhaps developed digital twins in your organizations already, or indeed you might be experts. But specifically in this topic, we're going to cover what we mean by digital twin, the TWIN IQ solution and how we're supporting some of our clients in a collaboration with Microsoft and the Marsden Group to deliver value in weeks and not months. And then finally, we'll do a demo of TWIN IQ and see how it's supporting some of our clients today.

So with technological advancement changing business dynamics, and of course the COVID pandemic impact, the need for autonomous plants has been at the forefront of many business leaders. The desire to run plants with minimal human intervention and still achieve the highest level of effectiveness and efficiency has only expedited the adoption of digital twin in critical part operations. Most people are intuitively aware of some of those use cases enabled by a digital twin, but the ones that we see most frequently, the optimization of quality and waste reduction through root cause analysis, the reducing of product giveaway through predictive analytics and optimizing process control. Cost reduction through dynamically adapting work orders, based on real-time insights.

The optimization of energy usage, through greater visibility of machine operations, and of course maintenance and throughput optimization through downtime prediction.

So what is a digital twin and why should we care about it? So a digital twin is a virtual representation of a physical object or a system across its life cycle. It uses real time data, as well as historical sources to enable learning, reasoning and dynamic recalibration for improved decision-making. And this means creating a virtual representation. That's a mirror counterpart or twin of a physical thing or process. And the manufacturing twin is the cornerstone of this digital continuity and it's the foundation of what we call a digital plant. In addition to manufacturing twins, there are of course other use cases. So in this case, it may manifest itself as a design twin, and this enables the sharing and analysis of yet unbuilt products or services. Or indeed a service twin and this can capture and share the in use data, which might improve operations or future design.

For the purposes of today, we're going to be focusing on the manufacturing twin. And as I say, that's the foundation of all high-value digital plant use cases and a precondition for at-scale deployment. So I'm confident that within your organizations, your manufacturing engineers are currently wrestling with challenges like, "How do I reduce my cost of non-quality, or how do I increase equipment uptime to ensure that I meet the throughput needs? Or how do I reduce the demand on factory operators?" And the



answers to these questions are often hidden amongst disbursed datasets and anecdotally, we hear from manufacturing engineers that they spend 50% of their time trying to find the right data they need. And once they found it, they don't necessarily have the right system to analyze it.

The scaling digital plant and realizing value across the manufacturing portfolio, we believe is impossible without a robust digital twin. And historically as each use case was addressed, additional data silos will be created with whatever solution is created. And what a true digital twin is form all of these use cases into one location with a shared data pool. And this means that each use case creates a more powerful, a more intelligent twin. So rather than creating further silos effectively, each use case reduces the data complexity because you're able to reuse contextual data from other use cases.

So when we talk about digital twins, we mean a solution that can enable a physical view. And this is the model of the physical structure, the equipment, piping, the environment which makes up the physical assets itself. The operational view and this is comprises of the plant context, it's operational status, temperature, liquid flow rates, other information gathered by sensors and really relates to the digital twin. It provides an as-built operational process model, and also includes tolerances for as designed.

The behavioral view comprises those standard procedures, the formulas, the knowledge, the interactive behaviors, which make up the plants and the way it behaves. It includes some of those analytical models and algorithms, which describe its past behavior, but also the expected future behavior and importantly, the standard operating procedures or actions that should be taken upon a specific event occurring within the plant.

And all this would be useless without the final and most important part, which is a user-friendly and role relevant interface, so that individuals can take advantage of the data that's being captured and the insight generated by these digital twins.

I'm now going to talk about one example of a market leading digital twin solution. So TWIN IQ by the Marsden Group is a set of accelerators that enables enterprises to create digital twins of manufacturing processes rapidly and at scale. So built on top of the Microsoft Azure platform, it enables enterprise grade connectivity and security.

So as you can see on the next slide, this extends and integrates with the existing IT/OT architecture to become one true source of contextual data across your entire organization. And this empowers the clarity of decision-making at all levels. It allows users to gain and apply intelligent insights across their operational assets faster than ever before. And essentially it's compatible with any system or machinery within your company that you've already got in place. And because it's focus is on speed to value it's about reducing the heavy lifting with production critical systems. The idea is that it fits alongside those and enhances your business capabilities, allowing you to test new methods and approaches without effecting the line itself.

So at present, the data is dispersed across multiple IT and OT systems. And the twin brings all of those together into a unified model that can be queried. In effect, this is that missing link between the disparate sources of data and the kind of issues I was relating to earlier on that manufacturing engineers are trying to address. The intention of TWIN IQ is this speed to value. And that's done through optimizers, which are specific AI simulations that are created for a focused piece of equipment or an operating process. And they can be real-time recommendation engines or a full closed-loop automation process. And they can focus on areas like planning or logistics, processing, packing, energy, or maintenance.



reason is when we look at the margin. So if I move the needle on availability in oil and gas or process control and get just a little bit more through a process facility in the fixed assets, it is a massive dollar amount, that exists within that facility. Whereas in discrete manufacturing, there's a lot more focus around making sure that the value is there and that you can justify that investment. And I think particularly in consumer goods we've seen that historically, right there's been some underinvestment around the manufacturing modernization agenda.

The scalability of the solution comes from the fact it's based on Azure IoT and allows the data acquisition from additional sources, essentially, meaning it becomes the innovation engine for engineers and business leaders to focus on the new use cases and on those value opportunity areas. And it provides the openness to allow us to break out to those previous OT data silos.

So the solution that we're going to see shortly in the demo is built up of three main areas. Firstly, the onsite elements contains data acquisition through sensors or existing systems and connectivity to the Azure IoT edge. The second is the Cloud portion and this takes that near real time, data feed of the equipment and feeds it into the Azure digital twin. And finally the user interface. And this is not only the 3D visualization of contextual data. There's also the Teams integration you can share and communicate decisions, insights, power BI, to generate the deep insights and finally Digital Twin Explorer for the interrogation of that data.

The real power from these twins comes into effect when you not only stream and identify anomalies, but when the twin starts to run simulations and identify new opportunities for optimizations that were previously unknown or undiscoverable.

This combined solution can lay a foundation for a flexible and scalable innovation that can support you and your business unlocking value across your operations. So as we heard in the keynote, a challenge that many consumer goods companies and indeed clients in other industries, are facing is around pilot purgatory.

And one way we're supporting our clients in the development of scalable solutions that deliver value in weeks, not months, is through our joint initiative with Microsoft and the Marsden Group. And this is not just another pilot, this is the first step to scaling. And the openness the platform allows us to develop new use cases being built on Azure IoT to have a look at scaled solution from the start. And in this construct within 12 weeks, we light up one line, one site focusing on one use case. And that proves the value to not only that site, but importantly showcasing the ability to scale a solution across lines, sites and ultimately to build future use cases.

So in this period, we take a high res scan to enable that virtualization, if necessary, we deploy new sensors to gather additional data. We install an edge gateway with TWIN IQ to aggregate all these new data sources. And then we preprocess data at the edge to push AZURE in real time to feed the TWIN IQ solution.



This approach enables greater speed to value on a clear path to scaling because ultimately the realization of that value is it only comes when we start to scale. And the partnership between Accenture, Microsoft and Marsden Group brings a number of key benefits. So the Accenture Industry X Group brings the experts for boots on the ground and drive that velocity and scale of manufacturing innovation across a global platform. With over 3000 experts globally and 15 acquisitions in the last three years. As your Cloud partner, Microsoft enables a digital differentiation using AZURE platform and the Marsden Groups helps us to drive that rapid innovation.

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