

# Technology Record

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 The best of enterprise solutions from the Microsoft partner ecosystem

## New heights for the cloud

Microsoft's Kees Hertogh explains how the new Industry Cloud platforms can help deliver real digital transformation



PETRONAS saves \$17.4 million by deploying AVEVA Predictive Analytics



Microsoft's Rodney Clark discusses taking on his dream role

### PLUS:

Traditional banking providers must embrace the changing payments landscape

Automotive, mobility and transportation are converging around mobility solutions

PTC and Microsoft are working to address the issue of data silos and disparate systems

# Objective: sustainability

Manufacturers are using cloud-enabled tools to put sustainability at the heart of efficient, collaborative operations. Microsoft's Colin Masson tells us more

BY JACQUI GRIFFITHS

Resilience and sustainability are two concepts that go hand-in-hand to define the new era of manufacturing. Sustainability is, after all, built on efficient use and reuse of resources across the product life cycle, from materials and processes to equipment and skills. And those same efficiencies are essential for manufacturers to respond quickly to changes in customer demand, inventory availability and regulatory requirements. This synergy between operational efficiency and environmental, social and governance agendas – which were once seen as separate issues – was brought home in the early days of the pandemic as supply chains faltered and market needs veered rapidly from seasonal expectations.

In the new reality that is emerging after more than a year of global disruptions, resilience and sustainability remain top of mind, says Colin Masson, global industry marketing director of manufacturing at Microsoft. “Digital transformation rapidly accelerated during the pandemic as manufacturers sought to work around the restrictions and meet changing demands,” he says. “Now, that ongoing transformation is structurally changing industries from retail to healthcare and manufacturing, all of which have

had to find ways to ensure continued productivity that would support the economy and society.”

Across the industry, Microsoft's collaboration with key manufacturers has resulted in outstanding sustainability outcomes. “A group of ‘lighthouse’ manufacturing companies, identified by the World Economic Forum (WEF), in collaboration with McKinsey & Company, are leading the way here,” says Masson. “For example, at one WEF Lighthouse Schneider Electric has reduced as much as 78 per cent of its carbon footprint using Industry 4.0 technologies and Microsoft Azure. And we have helped stainless steel manufacturer Outokumpu leverage artificial intelligence and Azure to increase output by 15 per cent while reducing quality defects by 40 per cent and cutting emissions. Customers have also showcased their ability to drive new product-as-a-service opportunities while addressing sustainability, such as Buhler Group with its food safety initiatives and Ecolab which is solving the world's water challenges with Microsoft's cloud technologies.”

A recent WEF report found that despite the disruption caused by the pandemic, 93 per cent of lighthouse sites increased their product output and found new revenue streams. For many, environmental sustainability was integral to that





growth: 53 per cent are seeing ‘measurable and marked’ environmental sustainability benefits. “Measures yielding productivity improvements are actually driving resource efficiency gains tied to environmentally conscious impact,” the report notes. “Companies discovering this compatibility and making the most of it are realising dual benefits simultaneously: cost reduction and increased sustainability.”

Johnson & Johnson, a global manufacturer of medical devices, pharmaceutical products and consumer packaged goods, currently has more WEF Lighthouse factories than any other company. It recently achieved its first ever carbon dioxide-neutral facility by using smart energy management, automated systems and green technology installations at one of its biggest self-care product plants. At the same time, overall equipment effectiveness increased by 14 per cent thanks to the use of robotic apps, while using digital twins for product development simplified the supply chain, reducing the cost of goods by 20 per cent.

Having a real-time digital backbone that supports fast, connected data flow through

**“Microsoft and our partners can help manufacturers connect the dots across their operations, workforce, design and engineering processes, customer engagements, and the end-to-end value chain”**

everything the company does also meant that, as the pandemic hit, Johnson & Johnson’s pharmaceutical arm was able to develop, test and scale up its Covid-19 vaccine from zero manufacturing to 100 million doses in the space of a quarter.

“If we’re not creating a cleaner environment, an environment that is more sustainable, then we’re not fulfilling our mission about improving healthcare and people’s lives around the world,” Alex Gorsky, CEO of Johnson & Johnson, told Microsoft CEO Satya Nadella in a recent interview. “It takes a holistic approach, fundamentally

from the product's design. At the very beginning, how are you thinking about the innovation for the product itself? How are you thinking about the packaging, about the distribution? Once it actually gets into the manufacturing facility – how are you thinking about resource utilisation, about the footprint, about the way it's connected? What about the external suppliers that you're connected to? How can you be working with them to create a much cleaner, a much greener entire ecosystem? And how can you do this in a way that's not just looking at the next 10 weeks or 10 months, but in a way that is going to create a better 10 years or 10 decades?"

Microsoft is walking this path alongside its manufacturing customers, and its launch of the Microsoft Cloud for Manufacturing is the latest step on this shared journey. "As a manufacturer ourselves, Microsoft is on a mission to be carbon neutral and water positive by 2030 and erase our carbon footprint by 2050," says Masson. "But we will only find success by partnering with others to amplify awareness and develop joint solutions that benefit both the business and the environment."

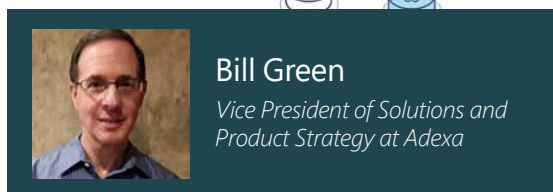
Microsoft Cloud for Manufacturing provides industry-focused solutions to seamlessly con-

## Partner perspectives

Leading manufacturers are deploying Industry 4.0 technologies to support sustainable innovation and growth. We asked selected Microsoft partners how they are using Microsoft products and services to help manufacturers ensure a sustainable future



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nect people, assets, workflow and business processes, supporting resilience, innovation and sustainability. “Bringing together released and new manufacturing capabilities on Microsoft Azure, Microsoft 365, Microsoft Dynamics 365 and Microsoft Power Platform, the Microsoft Cloud for Manufacturing will empower manufacturing firms to accelerate pandemic recovery and create operational resiliency,” says Masson. “These are areas where we believe Microsoft and our partners can help manufacturers connect the dots across their operations, workforce, design and engineering processes, customer engagements, and the end-to-end value chain.” ■

“Every manufacturing company's growth and future depends highly on a sustainable and resilient supply chain. By leveraging Microsoft Azure cloud services, Adexa delivers hosted sales & operations planning and sales and operations execution solutions to plan for sustainability. Adexa's planning solutions on Microsoft's cloud enable on-going measurement and trend analysis of companies' supply chain carbon footprint using Adexa's attribute-based planning (ABP) technology. Azure Machine Learning services combined with Adexa's proprietary AI technology provide the intelligent infrastructure needed in order to monitor on-going changes in the carbon footprint of a supply chain and find emerging patterns every time a plan is generated. To this end, companies can measure their overall green strategy on an on-going basis and see the trends as their demand, customers, suppliers and methods of manufacturing change. Adexa's supply chain solutions, with embedded intelligence and advanced analytics, provide turnkey supply chain visibility, monitoring and dashboards leveraging Azure Synapse, SQL Server, Analytic Services and Power BI.”

# AI and supply chain planning



CYRUS HADAVI: ADEXA

Self-improving supply chain planning systems can enable organisations to do business faster and with better service

With all the constant changes in organisational priorities, product mix and manufacturing processes, supply chain planning systems need to continuously adapt and improve autonomously. Just like an autonomous vehicle, they need to plan, sense and respond in real time with little user intervention.

Systems increase the velocity of doing business by having the ability to optimise millions of variables in balancing demand and supply. This requires an accurate representation of the supply chain, namely a digital twin. More importantly, systems need to have the ability to learn and improve themselves. This is accomplished by having self-correcting models, self-improving processes and self-optimising algorithms.

Supply chains are constantly changing. For example, supplier lead times can change over time or equipment efficiencies may change depending on the season. A self-correcting system detects such underlying trends and keeps updating the model, always maintaining a true digital twin.

Having an accurate model is essential but not sufficient. Domain expertise is also needed, making it possible to create optimal plans and respond well to disruptions. Therefore, systems need to self-improve to be able to optimise policies and procedures, such as deciding the best safety stock levels due to seasonal variations, product mix changes or product life cycle.

Lastly, self-optimising algorithms work on improving their own efficiency to provide better results faster. In planning, there are many

interactable problems, such that as the problem size grows the run-time for the prescriptive algorithm increases exponentially. By learning from past searches, they can quickly arrive at the result for a new search avoiding the dead ends that were discovered previously.

In general, a supply chain planning system needs to be adaptable to changes in the physical model and changes in the business and its priorities and policies. An initial model becomes irrelevant unless it can constantly adapt itself and learn. To do so, techniques such as deep neural nets and pattern recognition are used to detect trends in demand as well as supply and operations, ensuring that more accurate decisions are made. The older generations of sales and operations planning (S&OP) solutions fail to do this. As a result, they require intervention and adjustments by humans, resulting in sub-optimal plans and inaccurate financial projections.

The two essential elements needed, therefore, are model accuracy and intelligence. Model accuracy requires S&OE solutions. Intelligence comes from a system's ability to improve itself using artificial intelligence and machine learning. These two ingredients enable manufacturing companies to take a quantum leap ahead of their competition by providing faster and better service at much lower cost. ■

*Cyrus Hadavi is  
CEO of Adexa*



# Autonomous planning

Seagate Technology used Adexa's combined S&OP and S&OE solution to autonomously produce more accurate plans for its supply chain



Seagate Technology is a provider of electronic data storage technology and solutions. The company's principal products are hard disk drives (HDDs), along with a range of electronic data storage products.

Seagate has a vertically oriented supply chain with 575 sites for raw materials, work in progress and finished goods. It has three main business units, namely Seagate Silicon, E2E and Consumer. Although the business ran Oracle ERP, there was no effective system in place to optimise supply chain plans and align the company from top to bottom. With over 3,000 identifying part numbers and more than 190,000 substitution options as well as millions of work orders on a daily basis, the management needed better visibility as to what to make, where and when. The business also needed a better way to deal with supply chain risk by proactively identifying bottleneck resources, material shortages and orders deviating from forecasted demand.

Adexa's combined sales and operations planning and execution solution produces executable plans autonomously without manual intervention, optimises sourcing, provides visibility of the end-to-end supply chain, and proactively identifies

potential problem areas. It also provides predictive analytics to determine trends and identifies risks.

Optimised solutions were provided by Adexa for each of the Seagate businesses which, due to a common data model, can link together to provide full supply chain planning capability. Integrated to Oracle ERP system for transaction data, the system runs daily. By performing continuous planning, it adjusts the plan based on changing demand data, both short term and long term. Adexa also optimises the consumer business network for both the maximum use of available inventory and sub-contractor sourcing. The result is used to provide definite promise dates for customers and the build requirement for the factories.

With the Adexa solution, Seagate now generates plans autonomously, considering all the possible constraints, that are immediately executable. This has reduced the time taken in the planning process by up to 50 per cent. Misplaced inventory can be immediately identified, the root cause of any delay that could impact delivery can be more easily pinpointed and capturing 50 per cent more demand upsides. As a result, Seagate can respond faster to changing issues and demands, increasing the speed at which they do business. ■