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IMPROVING RESILIENCE IN MANUFACTURING WITH MODERN CLOUD ANALYTICS

NIKOMSOLFTWAER/ADOBE

RESILIENCE IN MANUFACTURING

In an increasingly challenging operating environment, manufacturers must be able to react swiftly to change in order to remain competitive. By using modern cloud analytics, they can harness the power of their vast quantities of data to make better, faster decisions

Manufacturers are facing a time of unprecedented challenges. Global supply chains are being stressed by rapidly shifting political and macro-economic environments. Customer expectations are rising and loyalty is waning. And the pace of digital transformation is putting growing pressure on organisations that are often still dependent on legacy systems.

It's becoming harder and harder to remain competitive, but the impact of a failure to adapt is well known.

According to a study by Nielsen Research, the average manufacturer incurs 800 hours of equipment downtime a year – more than 15 hours a week. When you consider that the average automotive manufacturer loses $22,000 every minute when the production line halts, costs will quickly rack up. Unplanned downtime costs industrial manufacturers as much as $50bn a year, according to Deloitte research.

More recently, Covid-19 and economic shocks such as the conflict in Ukraine are adding further costs and complications: a 31% increase in food commodity prices; shipping fees from China to Europe up sixfold; and growing complexity and bureaucracy for UK/EU logistics as a result of Brexit.

In such difficult trading and operating conditions, manufacturers need to react quickly to change and enhance their decision-making

"Manufacturers need to make better decisions, faster, and increasingly drive the point of action or resolution closer to the process"

Fiona Armada, senior solution architect, AWS

capabilities. Many organisations are realising that the key to meeting these challenges comes in making better use of data.

The data challenge for manufacturers

Manufacturers must focus on making better, faster decisions. In the past, it was normal to use data to analyse events on a historical basis, such as last quarter or last month, using dashboards to report on insights.

"Now data is required on a daily, even hourly basis to give insight and make decisions," says James Smith, area vice-president at Tableau Software. "The speed has increased exponentially with the shocks to businesses."

Manufacturers need to be empowered to ask new and varied questions to understand how best to respond to strategic challenges such as re-engineering the supply chain, as much as tactical considerations, for example, how to get goods out of politically difficult regions such as Ukraine and China.

"What we're seeing is manufacturers trying to diversify the supply chain and ask questions about its resilience. They need more intelligence around the supply chain to put mitigation strategies in place because of extreme market volatility," says Sam Needs, enterprise account manager at Tableau.

The data opportunity

Manufacturing companies generate more than 1800PB of data a year – twice as much as the next closest industry, according to Morgan Stanley.

"Manufacturers have been capturing data for many years, so there is a huge opportunity to gain even more insight," says Needs.

In fact, the digital transformation goals of Industry 4.0 – using cloud, internet of things (IoT), machine learning (ML) and data analytics for automation and AI-based decision-making – are achievable in a matter of weeks with modern cloud analytics from Tableau and Amazon Web Services (AWS).

"Many manufacturers talk about being light years away from Industry 4.0 aims to transform production levels and efficiencies of manufacturing. But if they store data on AWS and use Tableau to capture insights, this can be delivered much sooner. There is a lot of data out there, but they must get it into the hands of the right people to make better decisions," says Smith.

"Tableau on AWS fosters an open and transparent culture of data sharing and storytelling at scale"

James Smith, area vice-president, Tableau Software

So, the opportunity of modern cloud analytics is clear, but for many organisations, the challenges of getting there remain.

Fiona Armada, senior solution architect at AWS, highlights how data access is particularly challenging in legacy environments where machines and processes are not connected. Integrating data from new and legacy equipment that use a wide variety of industrial communication protocols is a significant hurdle to overcome.

But once data is accessible, organising and securely storing large amounts of structured, semi-structured and unstructured data gives rise to a further problem.

"Disparate machine data needs to be organised into hierarchies and a unified namespace across the enterprise so that teams can find the data they need and put it to use," explains Armada.

Working together, Tableau and AWS can help manufacturers to overcome these challenges and exploit the enormous opportunities presented by modern cloud analytics.

"Manufacturers have a wealth of data that can be used to drive profitable growth through new capabilities in digitally executed manufacturing, connected products and services, supply chain management and sustainability," says Armada.

AWS and Tableau collaborate

Achieving scale is core to effective data management. Fine-tuning manufacturing processes requires operating at the edge with minimal latency – having real-time data for real-time decision-making is vital.

"Manufacturers need to make better decisions, faster, and increasingly drive the point of action or resolution closer to the process," says Armada.

The combination of Tableau and AWS unlocks the possibilities of data and enables a mindset where manufacturers can interrogate data at scale to meet their biggest operational and competitive challenges.

"If business intelligence is reduced to just a dashboard tool about an event that has happened in the past, then there is not going to be any great return," says Needs.

"Tableau and AWS together allow anyone to use data to ideate and constantly test hypotheses. If something doesn't work out, it is not catastrophic. This empowerment causes a cultural shift within the organisation because fear of failure is thrown out of the window. The capability of ideation means people can ask and test hypotheses on data as much as they like, and the organisation then becomes data-driven."

Data silos are broken down with the combination of Tableau and AWS, making data connected

and visualised so executives can get the answers they need to act quickly.

"People can spot the potential of data in front of them. The software is incredibly easy to use. Our mission is to help people to see and understand data. Every single person should be able to ask questions freely of data. Tableau on AWS fosters an open and transparent culture of data sharing and storytelling at scale," says Smith.

"Using data just to report on events is no longer viable. By using data to share insights, break down silos between teams, determine

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"You can reduce hundreds of manual procedures to just a few steps so that you can build and start using your Tableau environment within minutes"
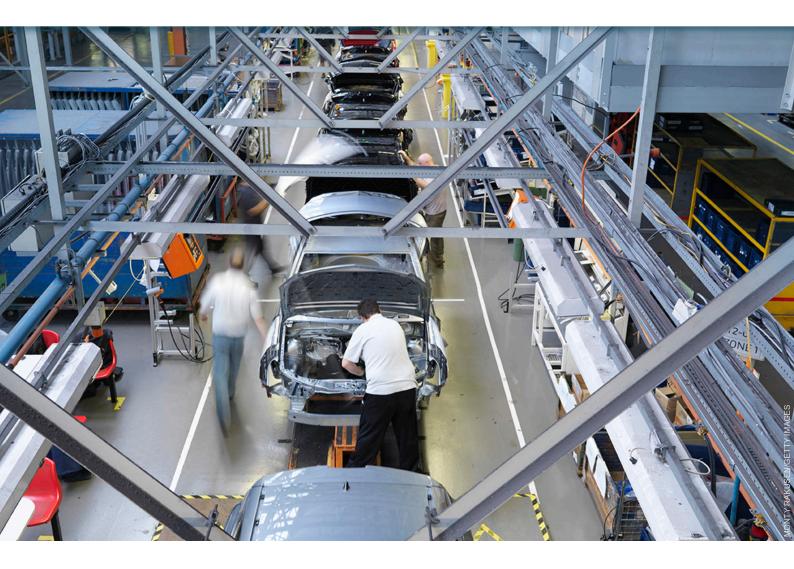
Fiona Armada, senior solution architect, AWS

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the optimal business decision and see what is coming down the road – rather than looking in the rear-view mirror – manufacturers are poised for success. They need to know what the next shock will be," he adds.

Security and automation

Security is an ever-present concern when it comes to analysing huge quantities of business-critical data. The depth and breadth of AWS security services means manufacturers will be able to meet or exceed their current security needs.

"Manufacturers need to improve the security and reliability of their critical systems. Additionally, change management and risk mitigation of any implementation is critical

to preventing production disruptions and downtime," says Armada.

"AWS is architected to be the most flexible and secure cloud computing environment available today. Our core infrastructure is built to satisfy the security requirements for the military, global banks, manufacturers or customers running mission-critical workloads."

AWS is backed by a deep set of cloud security tools, with more than 300 security, compliance and governance services and features. In addition, AWS supports 98 security standards and compliance certifications, including: PCI-DSS, HIPAA/HITECH, FedRAMP, GDPR, FIPS 140-2 and NIST 800-171.

"AWS helps satisfy compliance requirements for virtually every regulatory agency around the globe," says Armada.

AWS automation tools assist in getting up to speed and in delivering ongoing value from data and analytics.

The technology barrier to entry is low and employees do not need coding skills to gain insight out of the data. With easy-to-deploy QuickStart integration, the power of self-service analytics is put in the hands of business analysts with no data science experience. The only thing required is the raw data.

Amazon SageMaker for Tableau, for example, enhances the power of machine learning. Using QuickStart – automated reference deployments built by AWS – allows manufacturers to integrate Amazon SageMaker ML models into Tableau's calculated fields.

Armada highlights how the serverless application AWS deploys is based on Tableau's

analytics extension framework. With this, customers can connect SageMaker ML models to Tableau workbooks in both Tableau Desktop and Tableau Server.

"You can reduce hundreds of manual procedures to just a few steps so that you can build and start using your Tableau environment within minutes," says Armada.

Striving for sustainability

Sustainability is another significant imperative for manufacturers. Smith highlights that as well as being data-driven, it becomes a matter of survival if contracts depend on a manufacturer's sustainable credentials – and consumers increasingly prefer to buy from sustainable companies.

"Tableau and AWS believe that the sustainability challenge is a data challenge. Suppliers and production data from varied sources must be captured to give visibility about where sustainability is lacking; and where manufacturers can make the most impact to reduce emissions and make the magic happen," he says.

Needs adds that manufacturers without sustainability remits are under increasing scrutiny.

"Many investors will only back businesses that demonstrate a commitment to carbon neutrality and sustainability. There is a whole investment piece as well as a responsibility to the best interests of the planet. Some manufacturers that rely on government grants must not only demonstrate they are sustainable but that they drive sustainability through their suppliers. If they don't demonstrate a commitment to sustainability, they will lose business," he says.

Armada says AWS enables manufacturers to run their businesses in an environmentally friendly way.

"Our scale allows higher resource utilisation and energy efficiency than the typical on-premises datacentre," she says.

A study by analyst 451 Research found that AWS infrastructure is 3.6 times more energy efficient than the median of surveyed enterprise datacentres, with more than two-thirds of this advantage due to a more energy-efficient server population and higher server utilisation. The 451 Research study found that compared with an enterprise site, AWS performs the same task with an 88% lower carbon footprint.

An additional bonus of working with AWS and Tableau is that manufacturers can share data across the supply chain on sustainability metrics and are able to package and share the information to help partners become more sustainable.

"They can monetise communication with the supply chain; they have the insights and tools to become more sustainable," says Needs.

Tableau and AWS help manufacturers become more efficient; understand sustainability metrics; take measures to tackle carbon emissions; and give the market full-level reporting.

The way forward

The democratisation of data improves performance, efficiencies and innovation.

"Unless there is a real reason not to share data – for example, access to salary details in HR – data should be accessible. If you sit in procurement, for example, then it is good to understand the pipeline and demand and where there might be a shortage of assets," says Needs.

A lack of real-time visibility into operations and numerous data silos where key data gets stranded are at the root of much downtime for manufacturers. Downtime decreases dramatically with data analytics to help foresee trouble spots and take mitigating steps.

Needs points to "digital-first" manufacturers that rely on a services model, such as one customer that runs a subscription-based food business. The firm must be agile so production

can respond dynamically to demand. By capturing data, putting it on AWS and analysing it in Tableau, the company has become incredibly efficient.

"In response to Brexit, they had to set up a new factory in Amsterdam and were able to do so in a few weeks, with all the insights and intelligence they achieved in the UK with AWS and Tableau transferred to Amsterdam," says Needs.

Conclusions

The gateway to seizing these opportunities is modern cloud analytics, which combines flexible cloud infrastructure with adaptive services and self-service analytics that are available to the entire manufacturing organisation.

Modern cloud analytics enables manufacturers to take proactive steps at a fast pace to

mitigate global economic shocks at a time when the world appears to lurch from one crisis to another.

Not only can manufacturers thrive with Tableau and AWS, they can improve sustainability and efficiency, empower their workforce with business analytics, and are in the best position to prepare for future change and future-proof the business.

Amazon Web Services and Tableau equip customers with more analytical possibilities and more value than anyone else – driving data accessibility today, for impactful decision-making tomorrow.

Together, AWS and Tableau drive secure and rapid analytics across the organisation, resulting in richer, faster, smarter insights for better decision-making.

CASE STUDY – JAGUAR LAND ROVER

A data-first mindset is at the heart of Jaguar Land Rover's digital strategy, and it has been working with Tableau to democratise data and analytics to create momentum, encourage innovation and drive continual improvement.

Data analytics is not confined to a central, corporate data analytics team – it is put in the hands of anyone who needs it. Some 1,300 employees are actively creating dashboards and analyses, and more than 5,000 are exploring this data and discovering insights to drive the business.

By switching to a software-as-a-service (SaaS) model with Tableau Cloud – which runs on AWS – Jaguar Land Rover can scale without restriction, with employees able to explore and analyse their data securely from anywhere.

Just one example of the effectiveness of this strategy is the insight that an employee working on prototype batteries gained by delving into data on scrap levels, where a product is junked because it does not meet the manufacturer's requirements.

"One employee helped Jaguar Land Rover to save £20,000 a week by asking the right questions in Tableau, which led to re-engineering the design process and reducing the amount of product chucked away. Imagine the impact 20,000 such employees would have on the business. Give us the challenge and we will show you how straightforward it is to make savings across your business by putting data into the hands of people," says Smith.