

Digital passports for a digital future. Grasp the opportunity

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Two major developments are about to reshape how products are designed, manufactured, sold and supported across Europe. Although these changes – a new mandatory regulation and a new industry standard – require OEMs to take direct action, they also present Europe's machine builders and automation users with an opportunity to make notable competitive gains.

So, what are these new developments? Well, the first is the Digital Product Passport (DPP), a requirement emerging from the EU's Ecodesign for Sustainable Products Regulation (ESPR), and the second is the Asset Administration Shell (AAS), an industry-led standard that's fast-becoming the foundation for digital twins and Industry 4.0.

At first glance, these may seem like separate initiatives, but in reality, they're closely intertwined. Together they accelerate a shift towards a more transparent, joined-up and data-driven industry.

The question is no longer whether digitalisation is coming, it's whether you're ready to benefit from it.

From paper to digital intelligence

The DPP is designed to provide a machine-readable digital identity for products sold within the European market. Over the coming years, OEMs will increasingly need to provide details about their products, including materials, environmental impact and end-of-life recycling considerations.

Instead of searching through multiple systems and documents, the DPP makes it possible to access structured product information digitally and automatically. This data will ultimately flow into customer systems, enabling faster reporting and improved transparency, as well as simplified compliance.

For manufacturers, however, there's an obvious challenge. How to manage and distribute vast quantities of product data across global operations? This is where the AAS becomes pivotal.

Single source of truth

The challenge with Industry 4.0 has never been collecting data; it's been making sure everybody speaks the same language. Different suppliers, software platforms and data formats often create barriers that prevent information from moving smoothly through the value chain.

Developed by the Industrial Digital Twin Association (IDTA), the AAS provides a standardised digital representation of an asset, be it a valve, actuator, machine or whatever. Data exchange can take place using simple, machine-readable formats such as JSON and XML, creating a common framework for digital communication. Think of it as a universal translator for industrial information.

Once data is structured in a standardised way, it becomes significantly easier to exchange between suppliers, machine builders and end users. Just as importantly, it provides the ideal foundation for generating DPPs efficiently and accurately. In many respects, the AAS is becoming the practical enabler that makes DPPs achievable at scale.

Global commitment

As these developments originate from Europe, largely from Germany, some might think they're primarily a concern for European businesses. Think again.

At Japan-headquartered SMC, digitalisation is addressed as a global priority. The company is actively implementing both DPP and AAS principles across its products and operations, ensuring customers can operate seamlessly within increasingly digital supply chains. With more than 880,000 product variants and a global customer base, this is far more than a compliance exercise. It's a fundamental change in information creation, management and sharing.

Working alongside Zurich University of Applied Sciences (ZHAW) and specialist partners in disciplines like IT, SMC is an active participant in Smart Assets (E!4720), a EUREKA Eurostars-funded project focused on bringing standardised digital twins (namely DPPs) to industrial assets.

The objective is straightforward: facilitate reliable and accessible information throughout the entire value chain. For customers, it means fewer manual processes and reduced risk of data errors. Simple integration into existing ERP systems is a further benefit.

Compliance is only the start

Although meeting regulatory requirements is important, the real value of digitalisation lies in what you do with the data once it becomes available. This is where SMC sees an opportunity to move beyond compliance and deliver practical benefits for customers, as highlighted by four pertinent use cases.

SMC's DPP use case is about way more than simplified compliance. It's about reducing manual administration and improving data accuracy across the supply chain. Instead of spending time collecting information, you can focus on using it.

This use case also demonstrates SMC's ambition to support you beyond product supply alone, combining automation expertise with digital services that help improve operational efficiency and long-term asset management.

Understand your carbon footprint

Digitalisation is also helping manufacturers tackle growing sustainability requirements. SMC's product carbon footprint use case uses a bottom-up methodology to calculate environmental impact, combining data that extends from raw materials to deliver transportation. As additional information becomes available, calculations become increasingly precise.

The result is greater visibility into product-level carbon emissions and easier access to data needed for sustainability initiatives and future reporting obligations.

Smarter troubleshooting

Digital twins can transform maintenance and technical support. SMC's Dr Chiller use case combines mobile connectivity, augmented reality, digital asset information and more to provide operators with direct access to documentation and live operating data. It can also guide troubleshooting procedures.

End users are able to diagnose issues faster and reduce downtime. In addition, they can access support information exactly when needed.

Early warning signs

A fourth use case focuses on anomaly detection (AD). Using machine learning techniques within a standardised digital framework, the system learns normal operating behaviour and compares it continuously against live operating data. When unusual conditions arise, you receive early warnings that help prevent minor issues from developing into major failures. This approach provides a practical and cost-effective stepping stone towards predictive maintenance while helping improve reliability and machine availability.

Combined with SMC's reputation for product reliability and extensive automation expertise, this creates further opportunities to improve machine availability and operational performance.

Practical digitalisation

While the DPP creates the requirement, the AAS provides a framework for value. However, manufacturers still need practical guidance to navigate the transition.

Over many decades, SMC has supported machine builders and end users not just with automation solutions, but with application expertise and technical advice. That same philosophy now extends into digitalisation. The company's objective is not simply to provide compliant products, it's to help customers ease the integration of digital data into their operations and unlock tangible gains.

The future of manufacturing will be increasingly connected and data-driven. It will also be transparent. DPPs and digital twins are important parts of that journey. With the right support and the right expertise, digitalisation becomes far less about compliance and far more about an opportunity to advance.

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