A step closer to Industry 4.0

Why standardization is key to advancing operational performance

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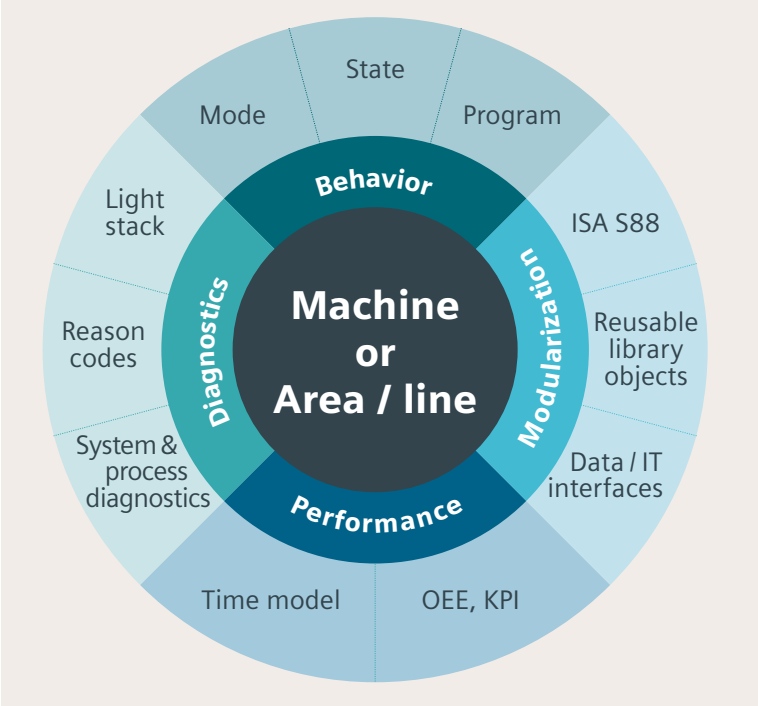
Standardization of production machines offers multiple benefits. A uniform architecture with consistent interfaces for both data and user interaction saves time during commissioning, systems integration, training and maintenance. The improved data integration will also support both basic and advanced data analysis to optimize processes and operations, enable seamless tracking and tracing of products, and facilitate assessment of process performance and quality. However, standardization initiatives in the tire industry are still in their infancy compared with practices in other industries.

Standardization as a tool for efficient line integration is far from new. Similar concepts have been present for quite some time in other industries – among the first were the food and beverage and packaging industries, which pioneered standards for machine-to-IT and machine-to-machine communication. Standards for machine and line automation and communication are also widely used in the automotive industry – for example, the VASS (Volkswagen Audi SEAT Škoda) standard includes automation solutions for hardware, software and visualization, as well as resources for application training and upskilling.

Standardization offers multiple benefits, including the ability to uniformly control the operating parameters of production machines as well as seamless communication between machines, with the ultimate goal of boosting productivity and efficiency in production.

These benefits are also increasingly recognized by tire manufacturers, as evidenced by the China Tire Intelligent Manufacturing and Standardization Alliance, initiated in 2017. However, many tire manufacturers and suppliers are still hesitating to apply standardization in their plants and solutions due to concerns about the costs and risks associated with standardization. OEMs in particular often supply their machines to several industries and are not particularly excited about managing another industry-specific standard.



The graphic shows the basic components of standardization. To facilitate standardization of machines and lines for tire manufacturing, Siemens presented the technological details and some examples of implementation best practices in a webinar that is available on the supplier's website

The core components of standardization

To address these concerns, Siemens has developed an approach that is based on well-established standards such as ISA-88 and Weihenstephan. This enables standardization to be independent of the OEM and machine solution. It can cover all four areas of standardization in a machine or line: behavior, modularization, performance and diagnostics (see graphic above). By focusing on these four areas, it is possible to develop a technological structure for a machine or line that supports modularization and will streamline both machine design (through reusable modules) and line integration (through well-defined units).

Siemens also supports standardization by providing a basic library for its automation and control products that includes a predefined user interface, and by providing standard interfaces for data exchange. Using the library modules, users can map the behavior model of their machines to the ISA-88-based mode/state model. This facilitates smooth and effective integration into an existing user application.

With this set of tools and solutions, tire manufacturers and OEMs alike can reduce the risks and costs associated with reengineering their processes and machines while enjoying the benefits of having a uniform architecture and a clear technological structure in their solutions. Moreover, the improved data integration will also support advanced data-based applications in the context of Industry 4.0 – which will ultimately contribute to improving overall production performance and efficiency in tire manufacturing. **tire**