

Interoperability is key: Optimizing pharmaceutical plant maintenance through digital twins

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Digital twins, the digital representations of industrial assets, are an essential building block in the digital transformation of Industry 4.0 and Pharma 4.0, and the business models based on it. Rapid technological progress offers many positive changes and opportunities for societally relevant issues such as sustainability. At the same time, however, many challenges arise and have to be addressed, such as data exchange in heterogeneous system landscapes and the associated multi-vendor interoperability.

This becomes particularly evident in application scenarios where interconnection across different players is required to provide all relevant data. One such scenario is plant maintenance: The data needed to provide the best possible support to maintenance personnel in the field and to optimize plant maintenance is spread across many companies in the value chain. This starts with the manufacturers of the components to be maintained (specifications for maintenance intervals, maintenance instructions, etc.), continues with system integrators (3D models, P&IDs of the plant, etc.) and ends with the plant operators (live data, SOPs, etc.). Although all this data is often provided in digital form by the respective companies, it is currently still lacking a common standard. This results in recurring and high integration efforts and hinders the economic use of the data, for example for optimized forecasting.

The goal of the presented project is to adopt the concept of the Asset Administration Shell (AAS), a standardized information model for the creation of digital twins, and to demonstrate its practicability through a real-world, cross-company maintenance use case in the pharmaceutical industry. The results show that the AAS standard can already make a significant contribution to addressing the challenges outlined above, and that we as a community must continue to promote digitalization and interoperability so that all players can benefit from existing and future innovations.

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