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Use Case

Digital Connectivity – the decisive factor for crisis-proof production

What does it take to respond quickly to changes in the market?

What does it take to be successful in times of rapid change, uncertainty, and crisis? The answer: adaptivity and resilience. Adaptive companies can quickly adapt to new market conditions, which requires something else than deliberate and controlled flexibility. Resilient companies can overcome critical disruptions in their own value creation considerably faster, for example, if suppliers are unavailable or trade routes are blocked.

The idea:
An important catalyst for the development of adaptivity and resilience is the digital transformation of the value creation. On the one hand, this digitalization consists of corresponding data and processing models ("Digital Twin"), and on the other hand, of comprehensive connectivity. Both elements require each other: digital models are created to make decisions without prior programming – but need quasi-real-time data in order to respond. Pure connectivity in the sense of an "Internet of Things" is pointless if the platforms and algorithms required for the processing are missing.

On the part of communication technologies, there are different concepts that complement each other. For instance, identification and locating systems are required at the field level to synchronize all material movements with the Digital Twin. To make a supply chain resilient, the digital system needs precise inventory and location information for each individual material as well as across company boundaries. At the same time, a real-time locating system (RTLS) – such as SIMATIC RTLS – can assist the in-house production in optimizing the use of automated guided vehicles (AGVs). If, for example, an additional machine is procured or the production layout is changed to maintain Corona-related safety distances, RTLS helps to quickly and dynamically adapt the AGV routes.

When it comes to networking, different approaches must also be combined. The increasing use of mobile production equipment (besides AGVs, collaborative robots, for example) and end devices (industrial tablets) necessitates wireless communication technologies. Industrial WLAN is currently the first response to meet the requirements in industrial applications. In the future, local 5G campus networks will play an essential role – bringing a high data rate, low latency, and high device density. But wired networks, too, are in demand to ensure the connection to the corporate IT.

However, all communication technologies require a common "language" for data modeling – from the sensor to the cloud-to-cloud communication. OPC UA is already widely in use here with a number of organizations such as the identification association AIM or the mechanical engineering industry association VDMA working on suitable specializations (companion specs) for special technologies or sectors.

Ultimately, a new type of production control emerges thanks to the Digital Twin and Digital Connectivity. While today's concepts instruct the various systems based on a plan, the digital factory of tomorrow responds in a dynamic and self-optimizing manner to the various input information which is fed practically in real-time from customers, suppliers, and the own production (real-time factory).
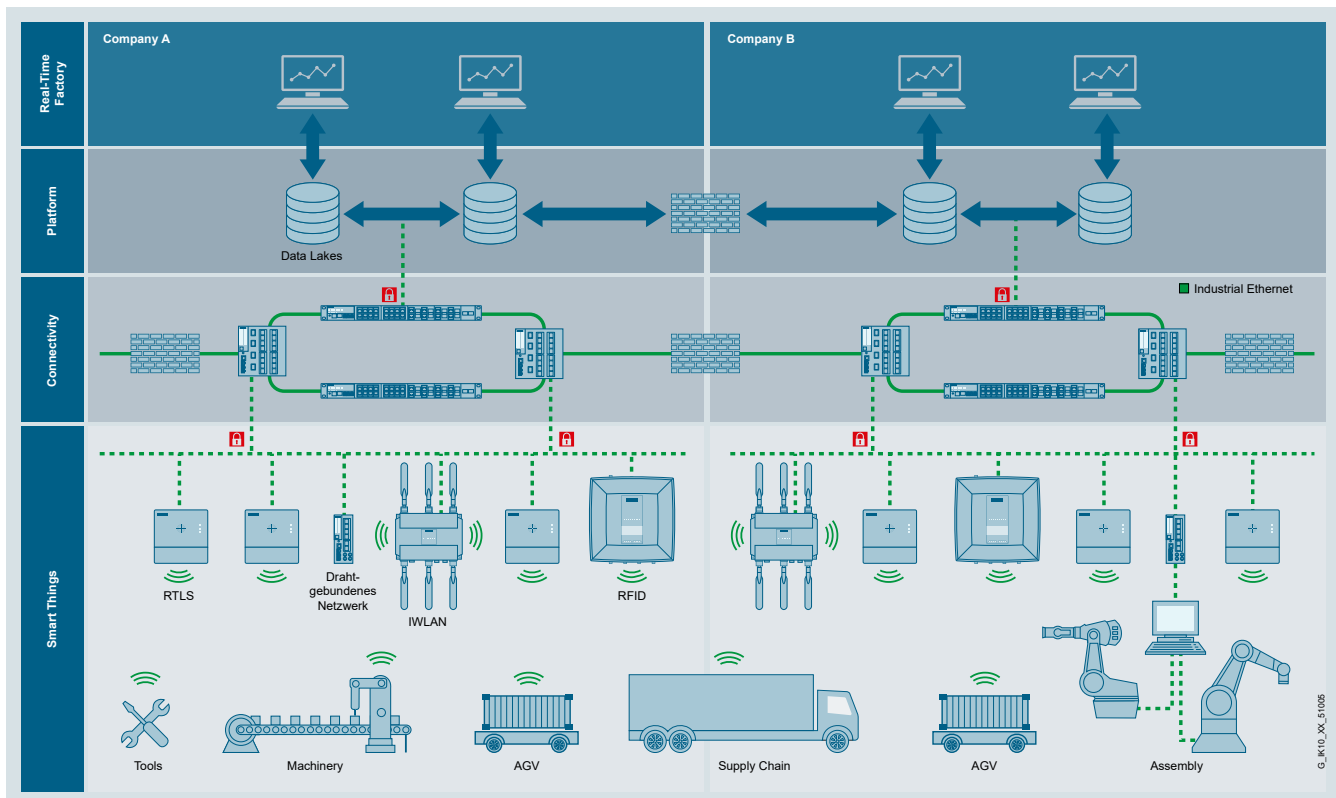
**Digital Connectivity –
the decisive factor for crisis-proof production**

- End-to-end connectivity of all levels and units – even across company boundaries
- Continuous feeding of the Digital Twin with information from the field level
- Wireless technologies for maximum flexibility in the factory layout
- Protection against cyberattacks thanks to a comprehensive security concept

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