Digital twins speed up the commissioning process
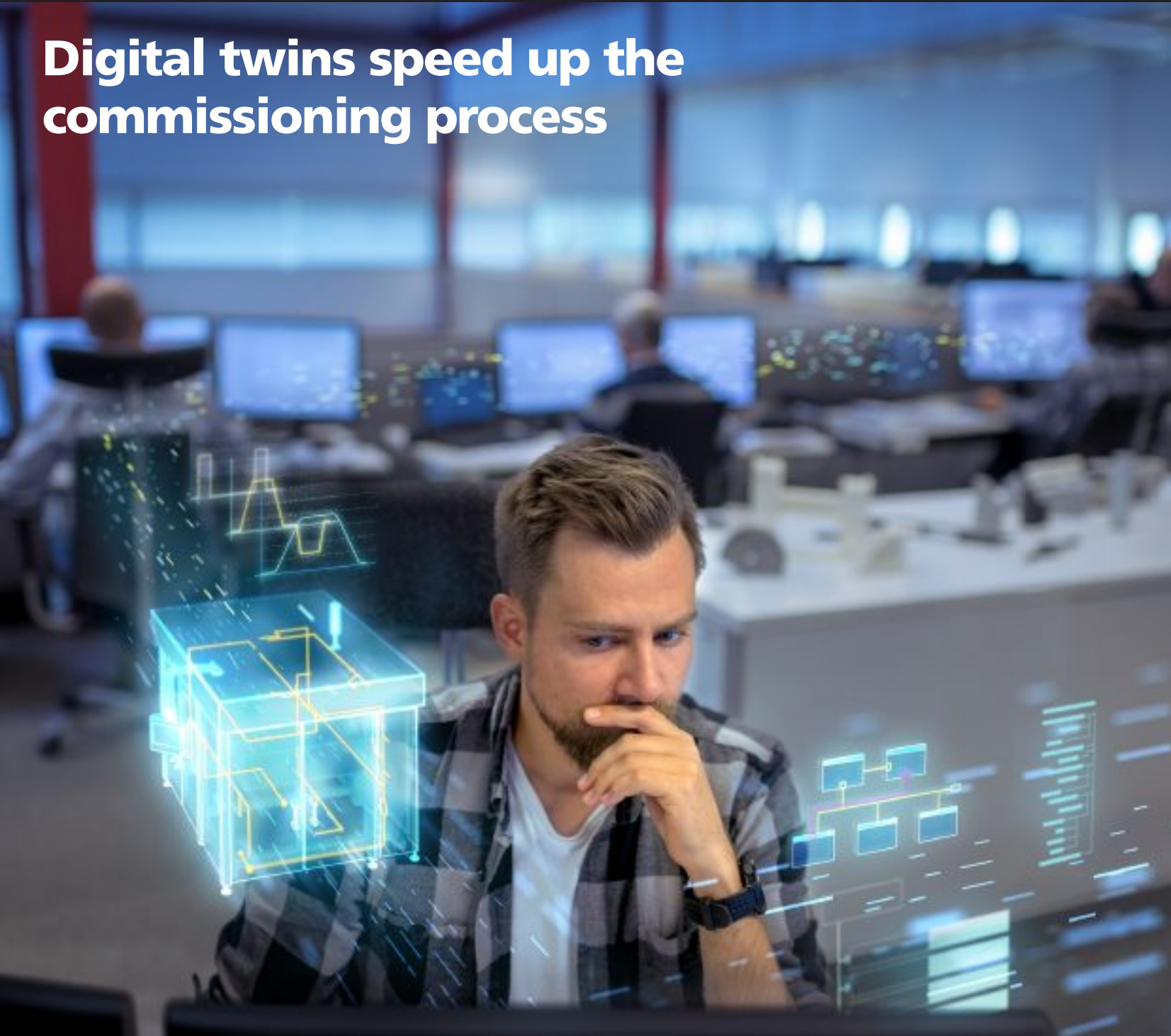
Edge devices as a key to Industry 4.0

GigE Vision and beyond

The role of robotics in flexible production

EDGE COMPUTING AND EMBEDDED IOT

Cloud computing has three main limits – latency, connection and cost. Find out how this can be overcome by processing data at the edge.

Technology advances have enabled embedded devices to communicate with sensors and other assets in a simple, effective and cost-effective way. Thanks to embedded software platforms, these devices can collect data and transfer them via the Internet. These are now typical functions of IoT gateways.

The role of cloud computing and cloud-based data centers is crucial here as they provide remote connectivity to, and remote management of, OT infrastructures and a place for data storage and analytics to trigger important business decisions. Nonetheless, cloud computing has three main limits – latency, connection and costs.

Mission-critical applications require hundreds or thousands of parameters to be constantly monitored, generating increasingly larger data flows to be sent to the cloud. While response time from data centers has been reduced it could still not be sufficient for some applications that require immediate feedback.

Connection issues may arise in some IoT applications. Imagine, for example, that you have to manage a fleet of locomotives equipped with sensors and intelligent devices that constantly send data about the vehicle status and position. During the journey, vehicles can travel across mountain or remote areas where Internet connection is bad, or even areas without Internet. Devices must keep managing those insights and provide response to trigger critical issues or malfunctions even without remote support.

The number of intelligent devices and smart sensors is constantly increasing so maintaining such device infrastructures is becoming more expensive due to the fact that huge amounts of data have to be transferred to a central data center via the Internet. Bandwidth-related costs can be even higher in cellular networks. Moreover, data coming from the field could have not been filtered at the source, thus loading data centers with unnecessary and redundant information.

Edge computing gives the ability to provide secure computing and storage capabilities along with data analytics, filtering, aggregation, routing and device management in the field. It provides advanced management functionalities where data is produced helping to reduce latency, connection issues and infrastructure costs. Integration with cloud platforms becomes an additional feature for a more complete, end-to-end infrastructure management.

Edge-to-cloud infrastructure

Under the brand name of Everyware IoT Eurotech is able to provide an integrated hardware and software edge-to-cloud IoT infrastructure enabling edge and cloud computing. Its capabilities go from advanced analytics and device management at the edge to seamless and secure integration with enterprise data centers and IT applications for remote infrastructure management and further analytics.

The company's Multi-service IoT Edge Gateways provides native support for industrial protocols and are said to

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be powerful enough to enable data processing, logging and management: they come pre-configured with Everyware Software Framework (ESF), an IoT Edge Framework which provides a web-based development environment for edge computing and IoT applications. ESF bridges the real and the digital world. Digital twins allow easy asset and device management and configuration without the need to write thousands of lines of code. ESF also offers data management functionality and analytics in the field and connectivity to cloud platforms such as Everyware Cloud (EC) for remote data and device management and integration with IT applications.

Edge computing as a concept has been around for many years. However, today's applications require huge amounts of data to be quickly and reliably processed in a secure way, resulting in the need for more computing, storage and analytics capabilities at the edge. More powerful and intelligent devices mean more value can be extrapolated from data, leading to more efficient operations and cost-effective business decisions. ⊕