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Tobacco Machine Communication (TMC)

Implementation of a **TMC pilot system** for a customer in the tobacco industry for vertical data transmission to a business intelligence system (BI)

Over the years, many production lines have formed a heterogeneous machine landscape of different suppliers. The individual plant components often consist of controllers from different suppliers and generations, which can be integrated without changing their programming in the best case.

The **TMC Companion Specification**, which contains the OPC UA information model for the tobacco processing industry, is the platform for the communication to the realized pilot system. This means that all data accumulated on the shop floor can be semantically processed in the same way to collect and analyse it centrally.

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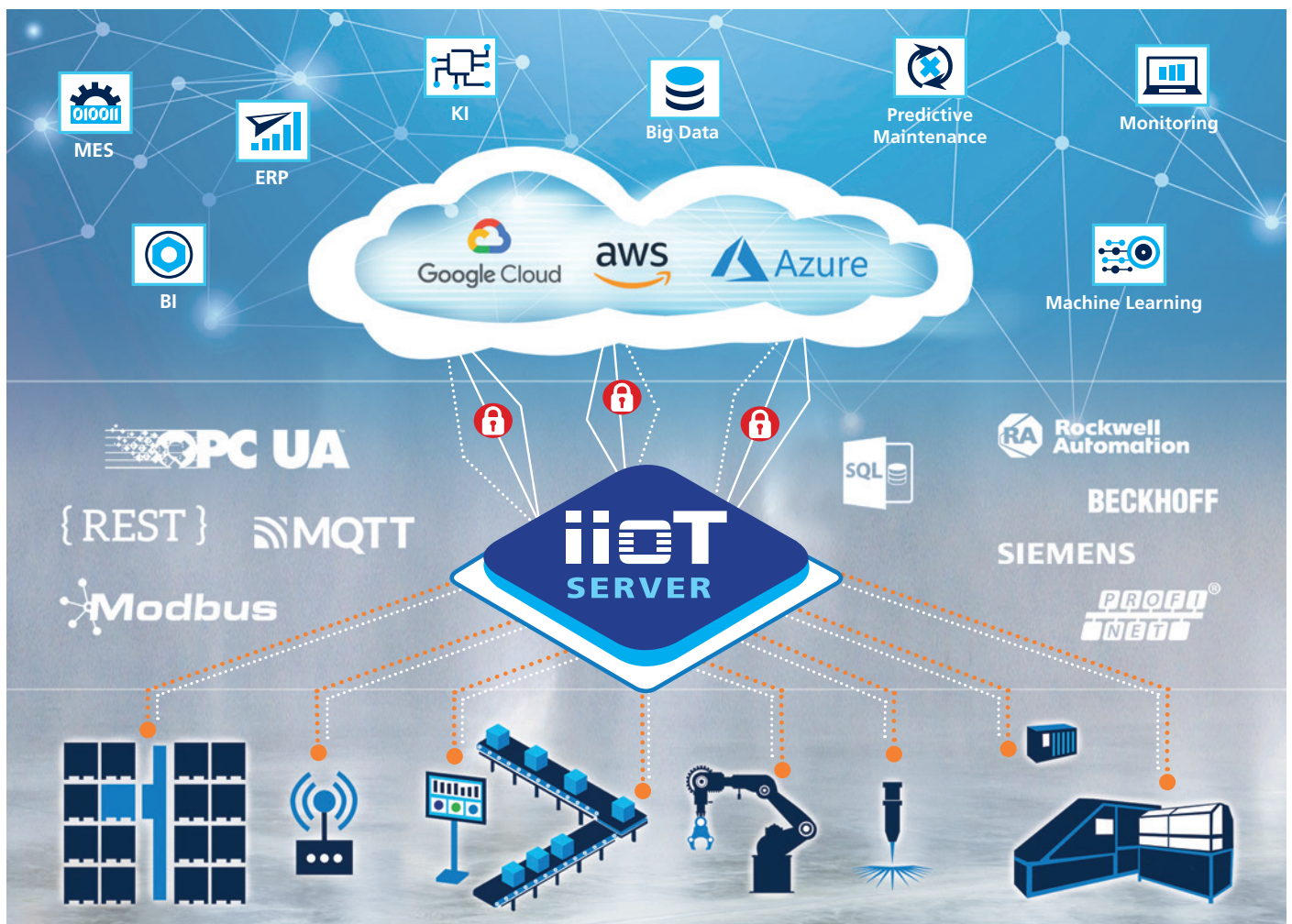
OPC UA is an open and licence free communication platform. The service-oriented architecture contains a series of standards for secure and reliable interoperability within industrial automation and other fields.

The OPC Foundation is responsible for the development and maintenance of these standards. In close cooperation with various organisations, it develops and approves OPC UA-compliant information models from a large variety of fields.

The Tobacco Machine Communication (TMC) Working Group

was founded to describe general requirements for manufacturers for primary and secondary machines, which apply to both machine-to-machine communication and machine-to-business communication.

The TMC Companion Specification contains these requirements and extends the OPC UA standard by semantic modelling of data and processes of industrial tobacco processing, considering conventional products as well as products in the heat-not-burn environment.



Industrial Internet of Things & Industry 4.0

The Industrial Internet of Things (IIoT) is an important milestone on the road to Industry 4.0. The digital mapping of production plants and their connection to systems for collecting and evaluating production data is the foundation for smart analysis methods to optimize production processes. This generates an increase in efficiency and a reduction in costs.

Production processes change only very rarely, which is why production plants are designed for a long lifetime. To keep up with the rapid speed at which the fourth industrial revolution is generating

ideas and new concepts is a major technical challenge for machine suppliers. Manufacturing companies are faced with the difficult task of driving their digital transformation.

A cost-effective solution capable of integrating even older production equipment into an Industry 4.0 ecosystem and adapting its interoperability to the latest requirements is needed.

KÖHL IIoT Server

The **KÖHL IIoT Server** is a communication platform that connects the field level with the cloud. It is able to access, transform, collect and archive data from different PLCs. In addition to support the most common IIoT and cloud platforms, communication protocols

and PLCs, the **KÖHL IIoT Server** can publish the fetched data in a TMC-compliant manner via OPC UA. **This allows us to raise your production to a future-proof level.**

In addition to the individual conception and implementation, you will benefit from further advantages:

FLEXIBLE

- Data of all machines can be collected, old as well as new system components
- OEM independent
- No modification of existing programmes necessary
- Direct cloud or Fog connection possible
- Support of OPC UA Companion specifications, such as PackML, TMC
- Configuration via web interface
- Central configuration of all instances

RELIABLE

- Tailor-made solutions for plants that do not come off the shelf
- Expert know-how in automation for integrating old systems
- Warranty & support

SCALABLE

- Minimal hardware requirements
- Integration into preferred software or virtualisation environment
- Centralised & decentralised integration

KÖHL TMC pilot system System design & smart solution for M2B (Machine to Business) interoperability

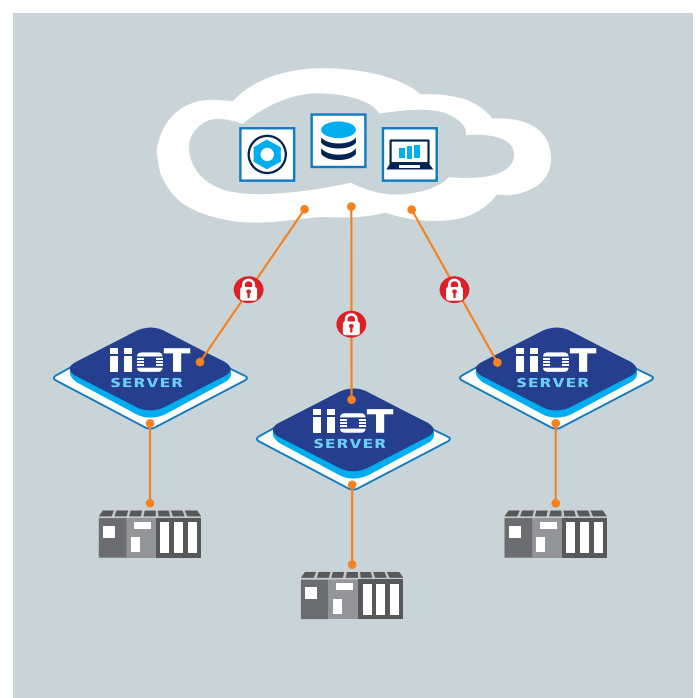
From a line with several PLCs, 3 pilot plants were selected for connection to the cloud-based customer BI system via the **TMC** standard. For each system, an industrial IPC was placed in the respective control cabinet.

Due to the fact that these have a second network adapter, it is not necessary to take the PLCs out of the production network. The PLCs are therefore accessed via a different network than the data collected there.

In order to be able to compensate failures of the higher-level system, the **IIoT-Server** also allows the archiving of data movements and changes over a longer period of time.

The following data was collected across machines and can be accessed by the BI system via OPC UA (TMC):

- Machine running time, downtime and root cause analysis
- Material rejects and production defects
- Material turnover and machine efficiency
- Machine configuration changes



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