BASF
We create chemistry

BASF Connects Disparate Industrial Data Sources to Improve Operations

"**Employing digitization and data, the new data platform is helping us increase the efficiency and effectiveness of our processes while creating additional value for our customers.**"

– Dr. Michael Krauss, Senior Automation Manager, BASF SE

BASF uses AspenTech Inmation™ across:

- **Four continents**
- **Dozens of facilities**
- **Hundreds of different distributed data sources**

CHALLENGE

BASF's plans to implement an industrial data platform had to meet multiple requirements, including:

- Connectivity and Integration
- Smart Data and Common Language
- Transport and Integration
- Visualization
- Ability to Scale

SOLUTION

AspenTech Inmation real-time data platform

VALUE CREATED

AspenTech Inmation has helped BASF:

- Connect information from different data sources, including legacy historians, spreadsheets and new sensors
- Analyze data and provide users with much-needed information

Overview

BASF, a large global chemical producer with headquarters in Germany, has operations in more than 80 countries. The company's manufacturing fleet includes six highly integrated "Verbund" production sites and 350 other sites around the world. Its goal is to "create chemistry for a sustainable future," with economic success and environmental and social responsibility .

BASF's Reliability Center employs manufacturing intelligence to provide expert support to sites to ensure reliable operation. The Center accesses industrial data from different sources at multiple BASF sites and analyzes it to support production sites with recommendations and troubleshooting. While sharing a bit about the company's digital transformation with ARC Advisory Group, Dr. Michael Krauss, Senior Automation Manager at BASF SE, said, "Employing digitization and data, the new data platform is helping us increase the efficiency and effectiveness of our processes while creating additional value for our customers."
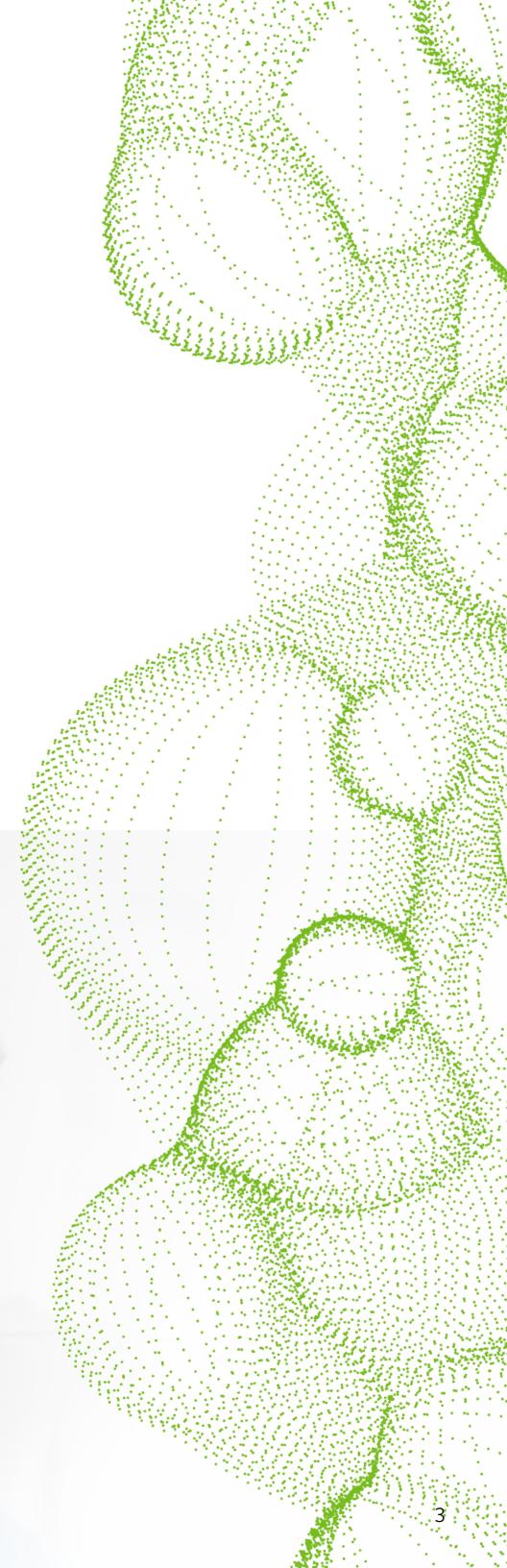
Requirements for an Industrial Data Platform

Dr. Krauss described several common barriers that BASF encountered when implementing these types of manufacturing intelligence applications. These challenges all had to be resolved before deploying AspenTech Inmation. The platform replaced the many point-to-point integrations that were being used by BASF, with functionality similar to middleware typically used to connect business and operations management applications.

Connectivity and Integration

One of the biggest challenges chemical plants face is integrating operational data with other systems. For example, a plant might have a hard-wired physical layer (such as an intrinsically safe barrier) that makes it difficult to get the data from across the plant.

Smart Data and Common Language

Data must have context to be useful. A coded tag name might have meaning for on-site personnel but not for a remote expert. Instead, a descriptive tag name with location, plant, equipment and process function can make it easier and more efficient for remote personnel to identify the various assets and apply analytics. In cases where different naming conventions are used, a data platform that can connect to multiple data sources and map the data to a uniform, enterprise-wide naming convention can be helpful. This is one of the functions of an information broker. Often, these conventions are structured in a hierarchical manner similar to the physical assets and called a data model.

Transport and Integration

Once data repositories are connected and tag names standardized, the data must be made available globally. When a user searches for information, the source should be transparent. Data brokers must identify and retrieve data from the location or application where it resides. For assets that are geographically dispersed over large distances, regional replication of the data can speed up these name-and-retrieve searches.

Visualization

Using native visualization from smart sensors, devices and applications can lead to having multiple digital screens and dashboards. Ideally, the data platform should provide visualization using standardized dashboards and screens to reduce the learning curve and cognitive load.

Scale-Up

Deploying the data platform on a global scale presents additional challenges. These might include cyber security issues such as endpoint security, user authentication and compliance with any applicable country regulations. Large-scale global deployments are also likely to present challenges relative to application performance, availability and reliability of data for demanding real-time applications, high initial costs, high lifecycle and maintenance costs. The ability to design and implement global standards for different business units with disparate needs could also be impacted.

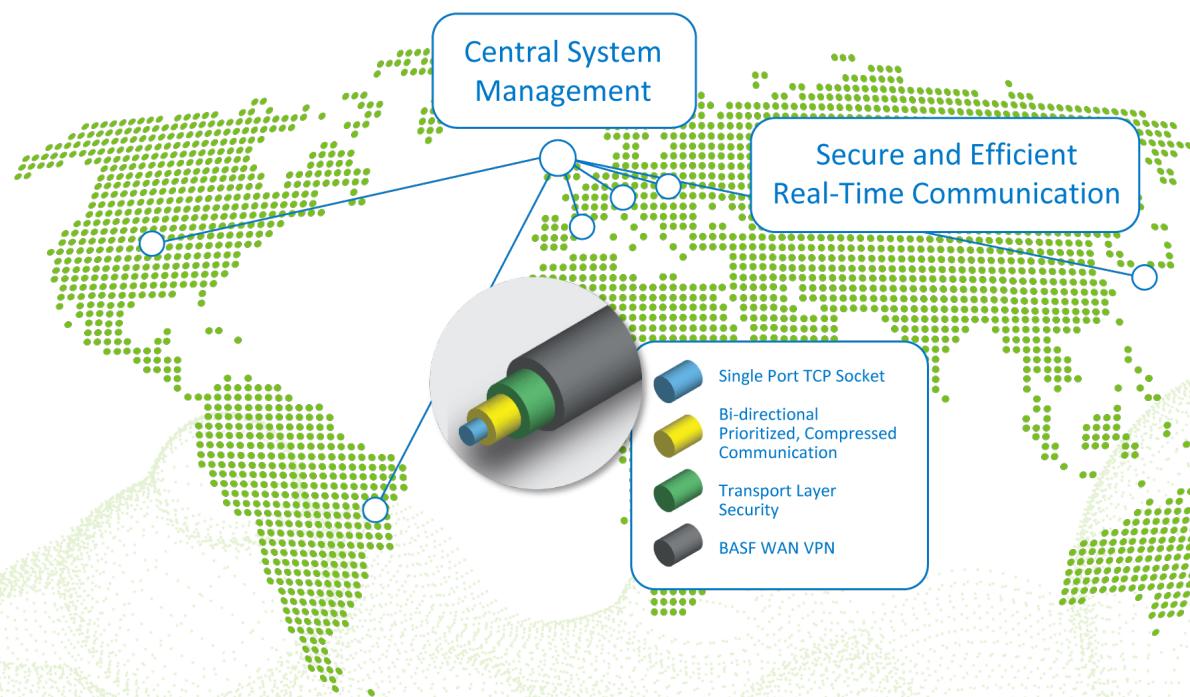# Remote Integration and Central System Management

With AspenTech Inmation, BASF is now able to connect information from different data sources, including legacy historians, spreadsheets and new sensors. AspenTech Inmation helps the team at BASF analyze data and provide users with valuable information.

Dr. Krauss shared the observation that when selecting the platform for BASF, he found that IT providers often lacked manufacturing domain knowledge. At the same time, manufacturing suppliers often appeared to lack adequate IT competency.

BASF has been utilizing AspenTech Inmation technology to create new and innovative data management capabilities in support of asset lifecycle management. The solution provides real-time, bi-directional connections using single-port TCP/IP, which aligns well with BASF's IT organization and its system integration standards. It also prioritizes the transport of compressed and encrypted data to run over BASF's WAN VPN in near real time, providing a multi-layered information broker to decouple BASF's multitude of data sources from a range of data-consuming applications. The company's solutions for infrastructure and enterprise-wide deployments such as data-driven dashboards are based on the NoSQL MongoDB database. BASF is able to manage a wide range of data types (i.e., time series, text information, alarms or events, etc.) and scale very quickly in different world regions, resulting in faster access for local users.

The AspenTech Inmation solution is currently installed and working at BASF sites on four continents, distributed over 50 computers, servicing dozens of facilities worldwide and connecting with hundreds of different distributed BASF data sources.

Central System Management

Secure and Efficient Real-Time Communication

Single Port TCP Socket

Bi-directional Prioritized, Compressed Communication

Transport Layer Security

BASF WAN VPN

Recommendations

An effective data platform like AspenTech Inmation helps streamline digital transformation for manufacturing companies. For smart manufacturing, smart factory, Industry 4.0 and similar initiatives, people, machinery, plants, logistics and products all need to communicate and cooperate easily. To connect these diverse data sources, a unified, flexible, high-performance system is needed to provide company-wide, real-time data and information flow.

Based on BASF's experience, globally networked solutions for manufacturing require both advanced manufacturing and deep IT know-how. The quality of the outcomes from using industrial analytics applications strongly depends on the availability of data and the context. AspenTech Inmation is an industrial data platform that makes operational data available throughout the enterprise.

Other benefits include:

- Enable Industry 4.0, Open Group Automation and Smart Manufacturing initiatives and similar standards, potentially impacting the industrial data platform market

- Support OPC Unified Architecture, XML, structured and unstructured data

- Connect with a wide range of applications and equipment

- Guarantee high availability and interpretation of data via a broker and model

- Provide excellent process visualization and digital dashboards in real-time

- Easily connect legacy systems and other data sources

- Offer scalability across the enterprise

aspentech
DATAWORKS

About AspenTech

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in capital-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

aspentech.com/dataworks