

Deloitte.



THE POWER OF THREE

Smart Factory Data Platform

The Data & Analytics Platform for Smart Manufacturing
powered by the Snowflake Data Cloud



Table of Contents

- 01**

Data-driven Potentials for Manufacturing Processes
- 02**

Data Ingestion Patterns enabling IT/ OT Convergence
- 03**

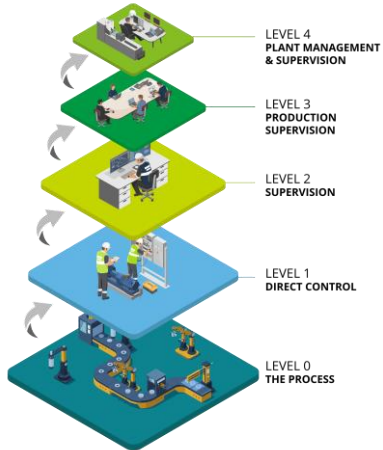
Smart Factory Data Platform Architecture & Capabilities
- 04**

Understanding Production Anomalies with an AI Co-Pilot

Manufacturing processes bear business potentials by data utilization...

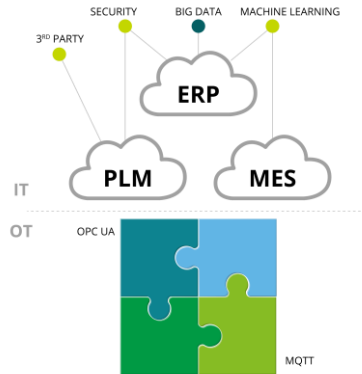
TRADITIONAL

Monolithic pyramid



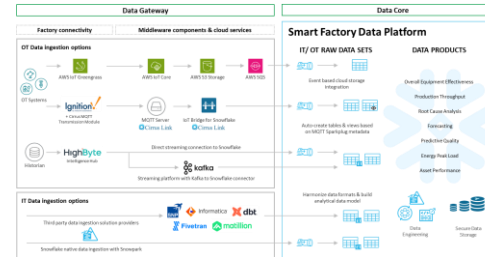
TODAY/TOMORROW

Converging IT and OT using a hybrid edge-to-cloud architecture



CENTRALIZED DATA

Unified access to manufacturing data



VALUE OF DATA INSIGHTS

Enhanced GenAI-driven manufacturing processes

Understanding Production Anomalies with an AI Co-Pilot
Streamlit Data Application for OT data visualization and GenAI interactions

PLM Data Product Sharing
BI/Visual Analytics Queries
Streamlit Data Applications
Cortex GenAI/LLM Services
Document AI Content Extraction
Data Science Notebooks

Cortex GenAI/ LLM services to co-pilot the root cause analysis for production anomalies

...but face challenges

Data acquisition and management

Manufacturing data sets are often poorly utilized and inconsistent

Data product management

Interoperability between IT and OT data sets is difficult to achieve

Access to requisite skills

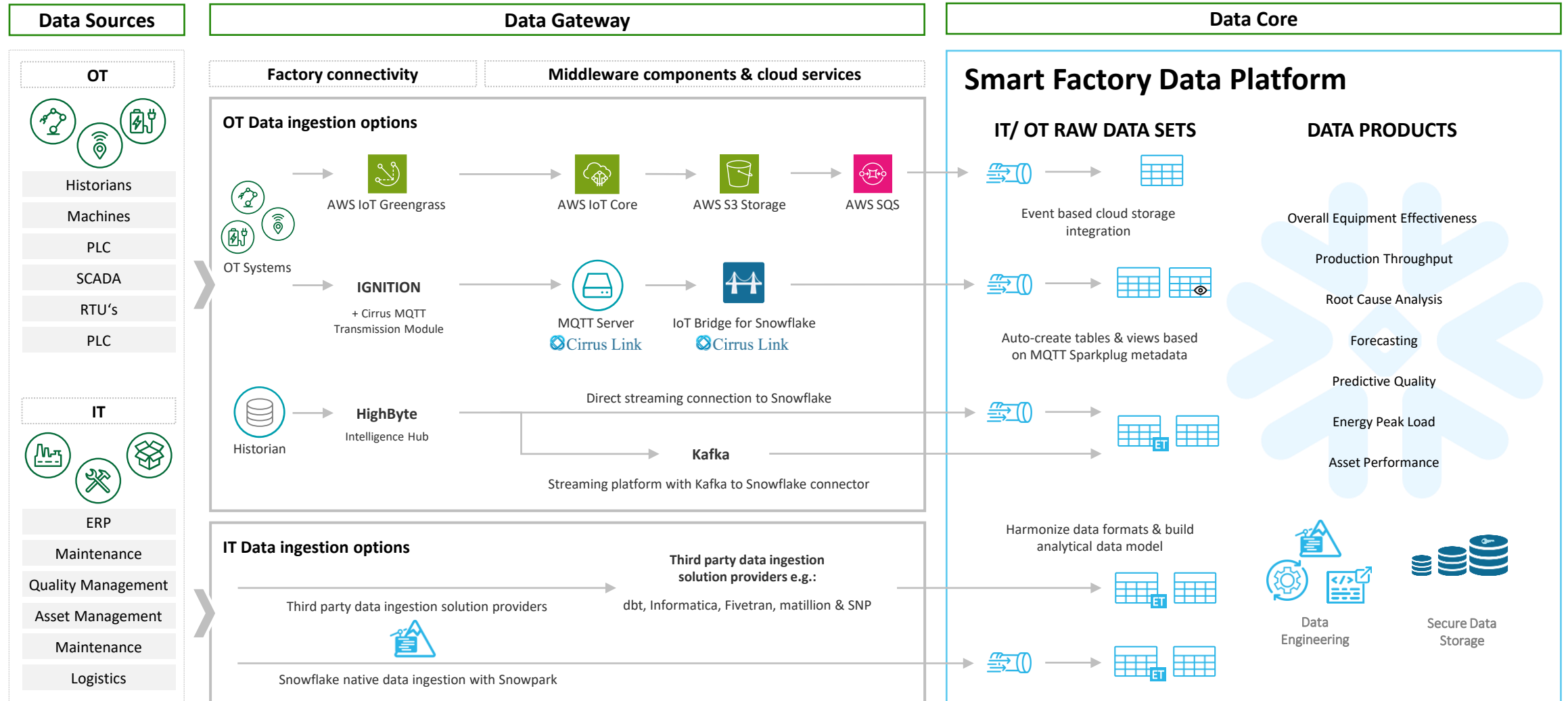
Required services that build the foundation for data & analytics

Time to value

Executives often struggle with realizing ROI on smart manufacturing initiatives

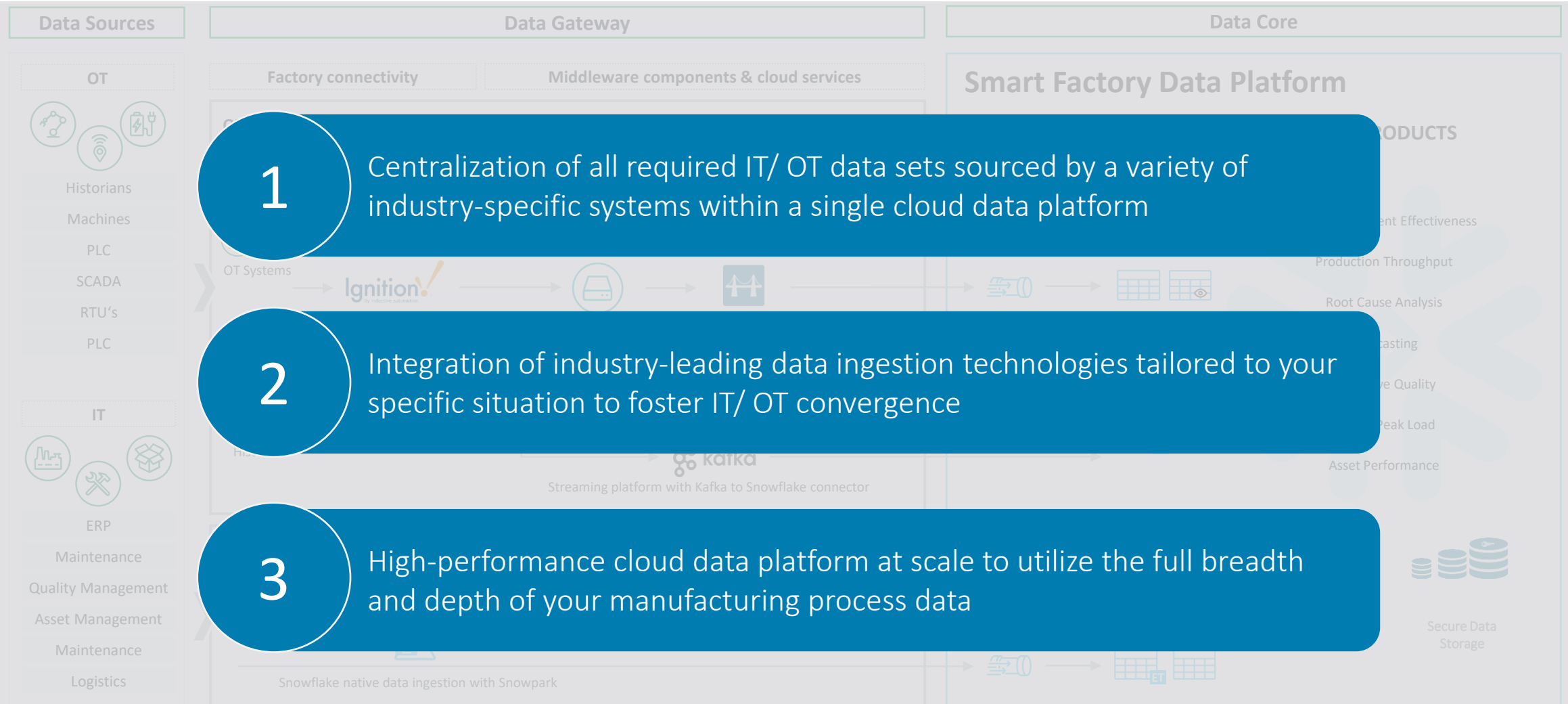
Smart Factory IT/ OT data ingestion options

Snowflake and its' ecosystem partners offer comprehensive options for IT/ OT data ingestion into a single cloud data platform



Smart Factory IT/ OT data ingestion options

Our approach utilizes the best of breed set of technologies to foster the IT/ OT convergence towards a centralized data platform



Smart Factory Data Applications

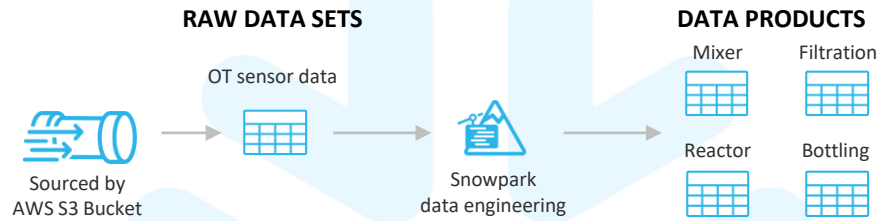
Based on Snowflake's advanced analytics capabilities we utilize GenAI/ LLM services to understand production anomalies in our use case demonstration

Data Core

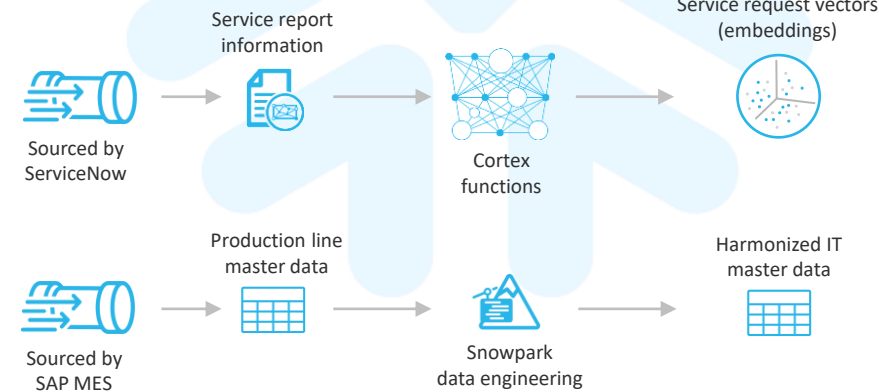
Advanced Analytics

Smart Factory Data Platform

OT Data Ingestion



IT Data ingestion



Understanding Production Anomalies with an AI Co-Pilot

Streamlit Data Application for OT data visualization and GenAI interactions



ERRID_CODE	STATE_REASON	ERRID	Machine_Stopped	Start_Time
ERR-01	MATERIAL EMPTY	1		2023-09-28 07:08:30
ERR-02	EMERGENCY SHUT DOWN	1		2023-09-28 09:00:15
ERR-03	OVERFLOW	1		2023-09-28 11:05:15

AI Copilot

how did ERR-02 happen? Do you know the reason?

Hello! I'm Deloitte AI Copilot, working in the Deloitte Smart Factory, assisting with the Fests sanitizer bottle production line. My focus is on the Reactor Machine, and I'm here to help diagnose production anomalies.

Regarding ERR-02, the emergency shutdown of the machine, the reason for this anomaly is likely due to an overheating issue. The temperature sensor BT1_TEMP indicates that the machine's temperature exceeded the acceptable limit, which triggered the emergency shutdown.

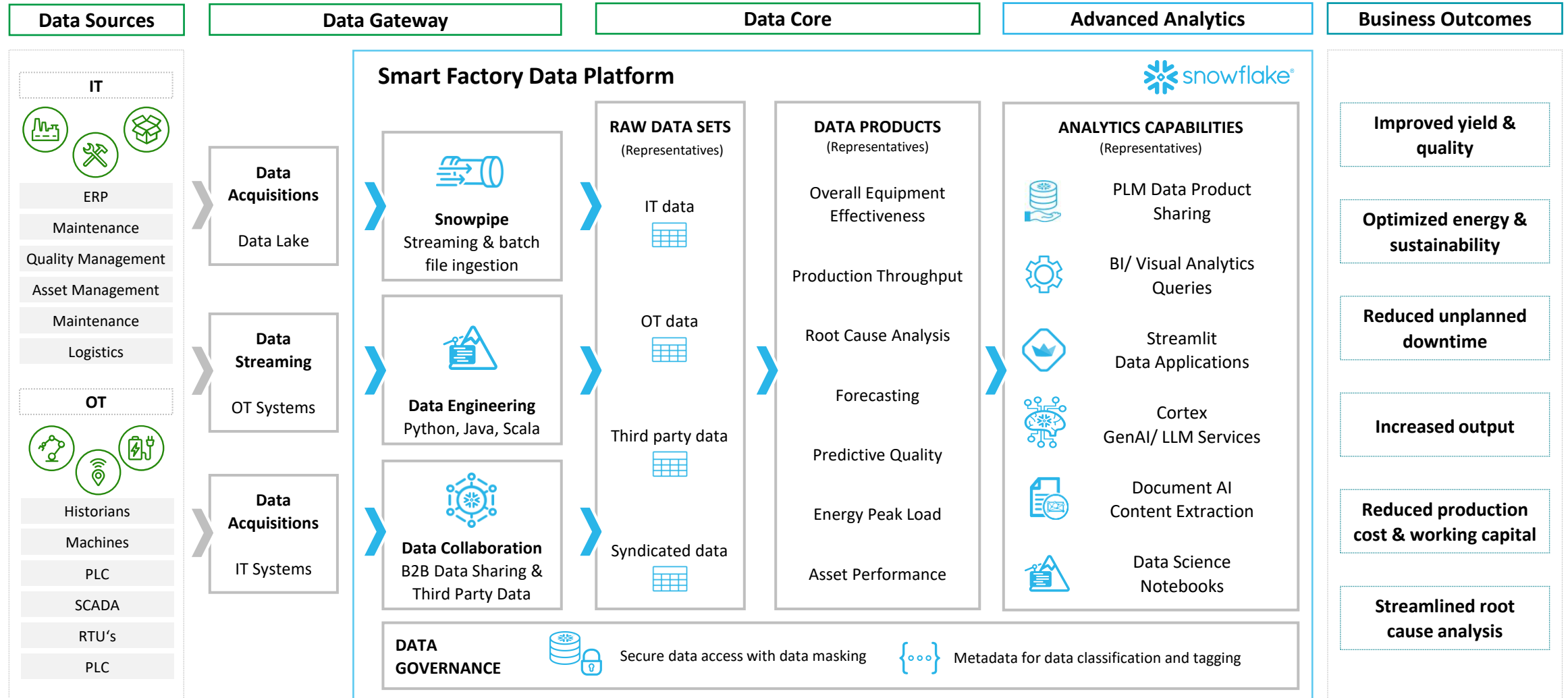
- PLM Data Product Sharing
- BI/ Visual Analytics Queries
- Streamlit Data Applications
- Cortex GenAI/ LLM Services
- DocumentAI Content Extraction
- Data Science Notebooks



Cortex GenAI/ LLM services to co-pilot the root cause analysis for production anomalies

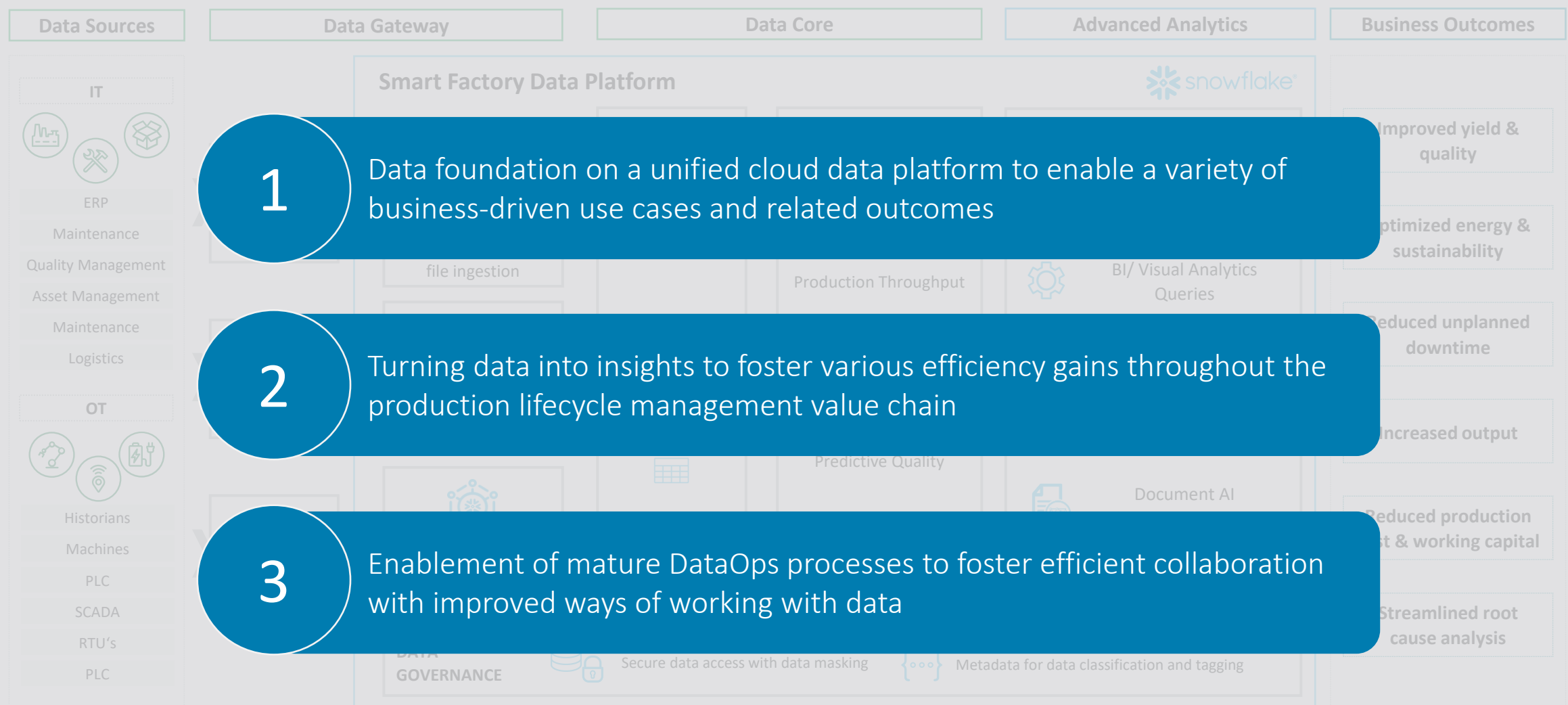
Solution architecture Smart Factory Data Platform

Centralized IT/ OT data in Snowflake's data cloud drive smart factory and manufacturing business outcomes enabled by advanced analytics capability



Solution architecture Smart Factory Data Platform

Our platform approach enables a variety of data-driven value-adds for business throughout the production lifecycle management value chain



Understanding Production Anomalies with an AI Co-Pilot

01

PROBLEM

Data is kept in silos across plants and manufacturing facilities which limits innovation and analytical capabilities.

02

CHALLENGE

Variety of IT/ OT data sources with a need for different integration scenarios for the generation of data insights at scale.

03

SOLUTION

Data Gateway

- Cloud connectivity to enable access to production data sets

Data Core

- Unified data model for IT & OT driven data product creation and utilization

Advanced Analytics

- Standardized solutions on a single platform insights generation

USE CASE DESCRIPTION

For the digitalization of industrial processes, the access to data from various departments contributing to the entire product lifecycle is crucial to realize the digital thread and to raise potentials for cost reduction and operational efficiency. An integrated data platform supporting the convergence of IT/ OT data builds the foundation for further insights generation. Our use case provides an overview for monitoring manufacturing machines and enables the automated detection of production anomalies. Generative AI capabilities act as a copilot for a guided research of historic incident data to resolve the issue in operations.

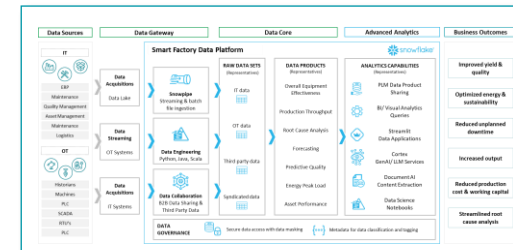
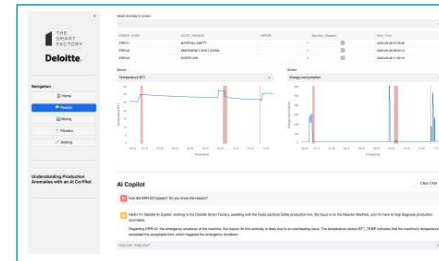
TECHNOLOGY HIGHLIGHTS

AWS cloud hyperscaler specific capabilities

- AWS IoT Core to enable factory connectivity
 - AWS S3 for raw data set storage
- (Portable approach based on Azure or GCP possible)

Snowflake data platform capabilities

- Snowflake Snowpipe Streaming to gain near real-time data availability within a unified IT/OT data model
- Snowflake Data Cloud as single data platform for all manufacturing data products
- Snowflake Streamlit for easy to use and scalable standard data applications
- Snowflake Cortex to enable GenAI driven forecasting, anomaly detection & LLM service integration



IMPACT



(Near) real-time data availability of integrated IT/OT data



Scalable platform for a variety of data & analytics use cases



Standardized visualizations for fast data insights



AI assisted data analysis including GenAI enablement

Start generating sustained value today

Smart Manufacturing transformations are about more than adding new technology. Organizations must integrate solutions into their daily operations while driving user adoption, ensuring change management, and gaining workforce buy-in.

Deloitte's value-add supporting your journey

- Manufacturing professionals and industry experts
- Proven methodology and innovative thinking
- People-first, user-centric mindset
- Scalable AI+Data solutions that fit with your existing technology, powered by our **Smart Factory Data Platform**

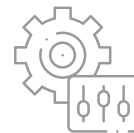
Our **Smart Factory Data Platform** accelerates the deployment of smart manufacturing solutions, leveraging your existing technology landscape and growing with you as your organization transforms



Our **Smart Factory Data Platform** offering provides:

- Analytics foundation to realize production operations efficiency and cost saving potentials based on any major cloud hyperscaler AWS, Azure or GCP
- Real-time and historical data-driven actionable insights to produce measurable results
- Extendable hyperscale agnostic platform for user-focused data visualizations & applications
- IT/OT data integration solutions to drive advanced analytics creating intelligent insights
- Integration with industry-leading technologies and subject matter expertise

We offer a growing library of ready-to-deploy use cases



OEE



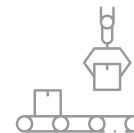
Production Monitoring



Loss Reasons



Equipment Fault Code



Line Balance Monitoring

Please approach your **Deloitte.** contacts for more insights



Christian Roese

AI+Data Specialist Director
Lead Alliance Partner Snowflake
croese@deloitte.de



Lars Marek

Ecosystems & Alliances
Business Development Manager Snowflake
lamarek@deloitte.de

