



NOBIAN

AI and process analytics

Salt | Essential Chemicals | Energy | Storage Caverns



1. Introduction

- ◆ Who is Nobian?
- ◆ Who is Ruud?

2. TrendMiner AI early involvement program

- ◆ Why participate?
- ◆ Use cases
- ◆ What have we done so far?

3. Next steps

- ◆ This year
- ◆ Next year





Introduction

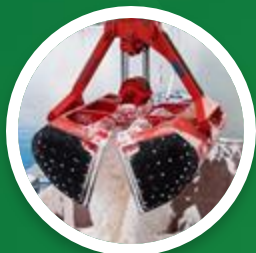
Key facts

~1,600
People

 1040
 450
 100

7
Manufacturing
sites, 1 R&D
centre

€ 1.4
bln
Revenue



Salt

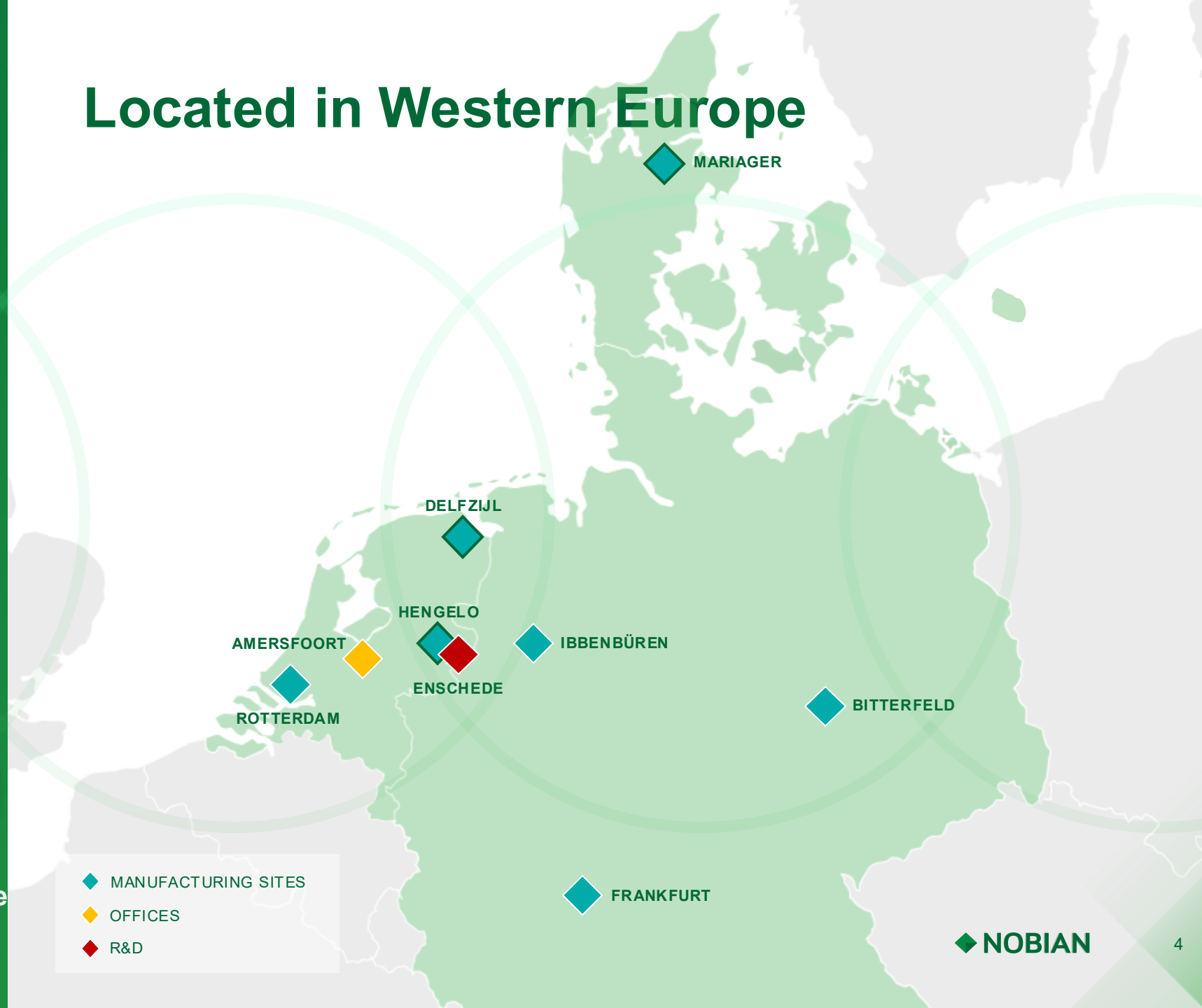


Chemicals



Energy storage

Located in Western Europe



Ruud Timmermans

MES Architect – Nobian



Ruud Timmermans

- ◆ Chemical engineer with affinity for IT
- ◆ 25 years in process automation (OT), 7 years in IT
- ◆ ISA member and standards advocate
- ◆ Fond of field hockey and road cycling
- ◆ Joined Nobian in 2022
 - OT – IT integration
 - Production information systems (historian, MES)
 - Analytics (TrendMiner)

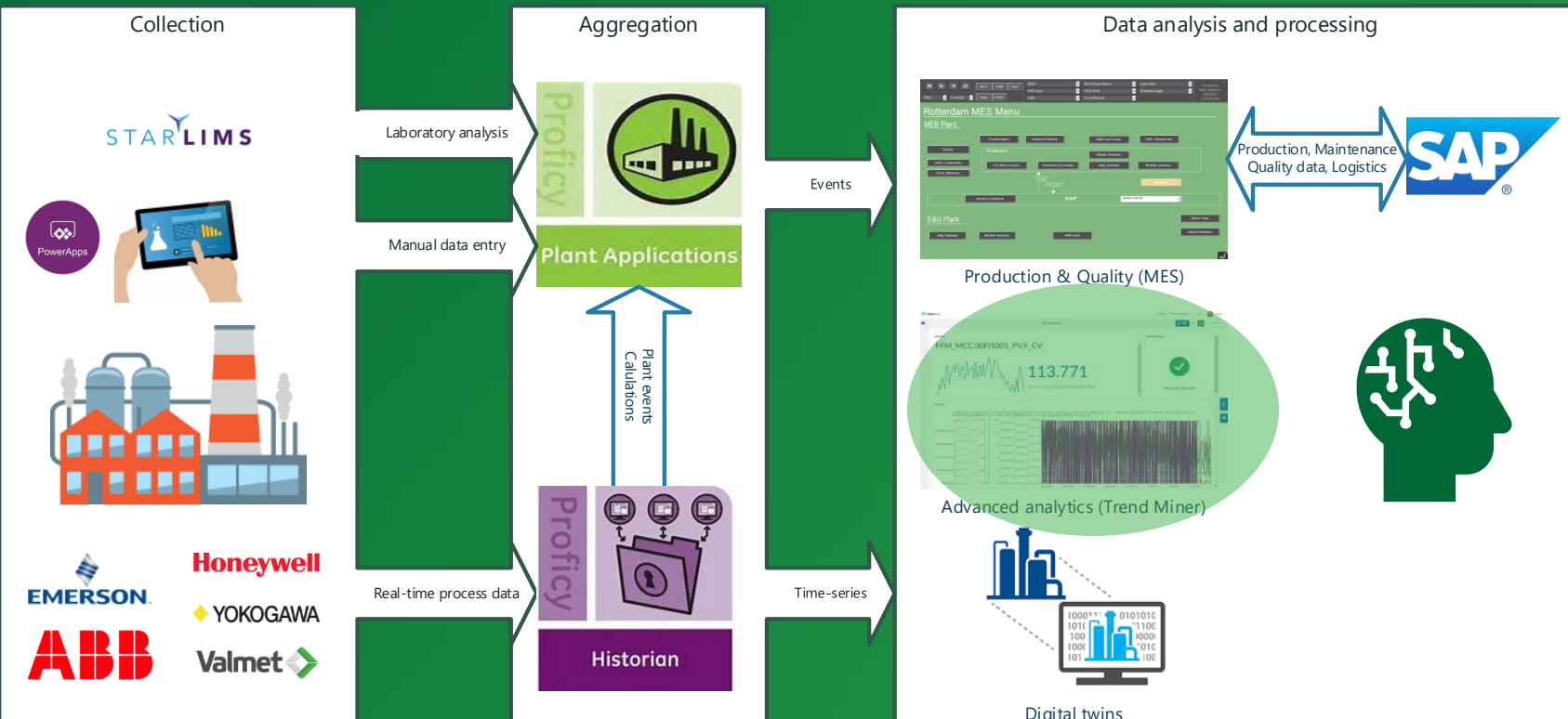




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TrendMiner AI early involvement program

Nobian Plant Information System



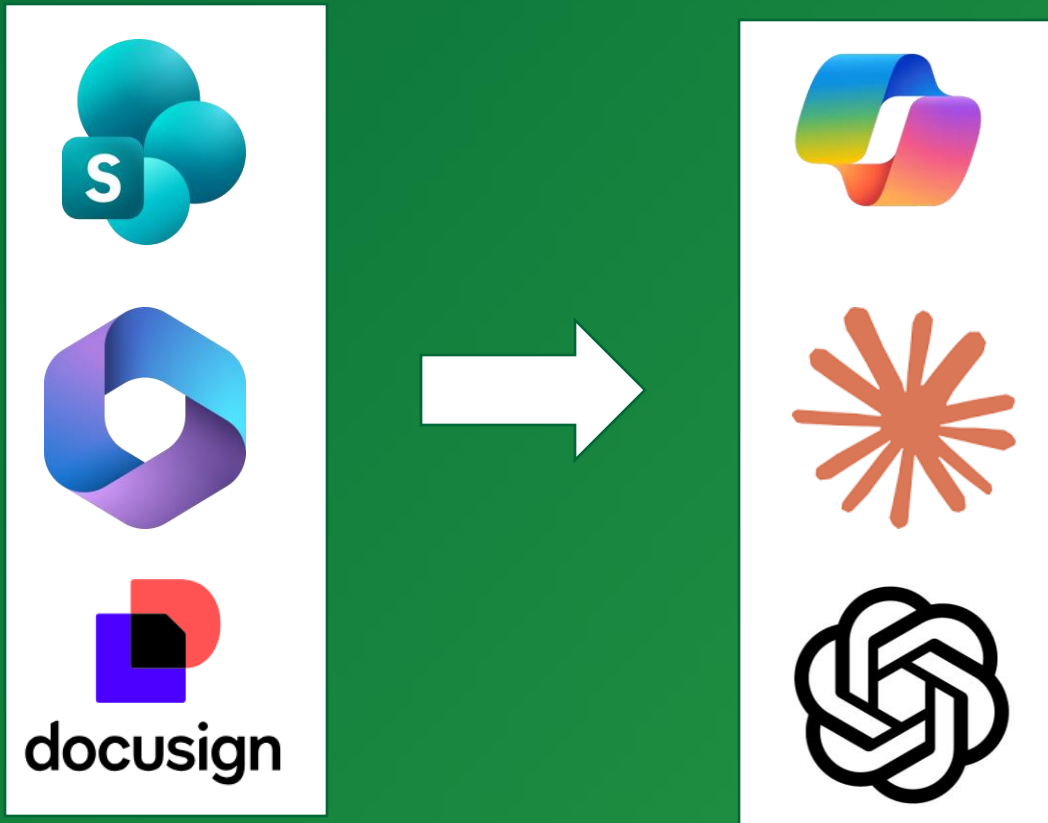
High-level view

- ◆ **Source:**
 - Control systems
 - Lab and manual inputs
- ◆ **Destinations**
 - Production: SAP
 - Optimization: Digital twins
 - Reporting: SSRS, Power BI
- ◆ **TrendMiner for analysis**
 - Root cause problem solving
 - Monitors
 - Data quality check

None of these systems have Artificial Intelligence on board

Where are we now?

- ◆ 300+ users
- ◆ Personal productivity
- ◆ Experimental phase
- ◆ Mostly “office” data

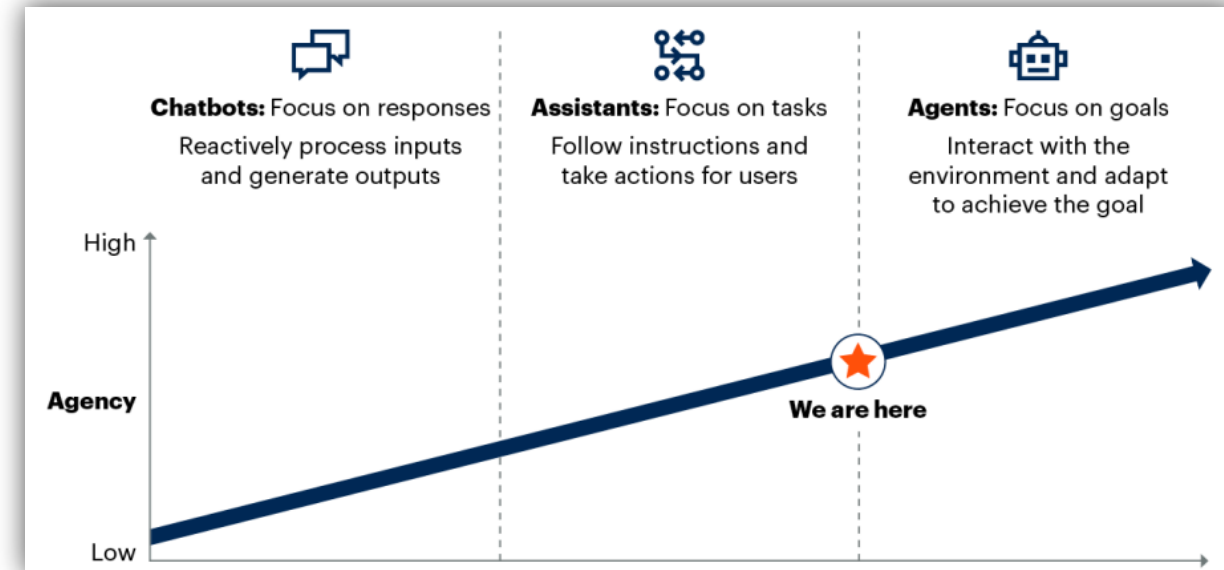


Where do we want to be?

- ◆ Deeper data integration
 - **real-time production** information
 - true enterprise information
- ◆ Automatic workflows



AI Agent evolution



TrendMiner

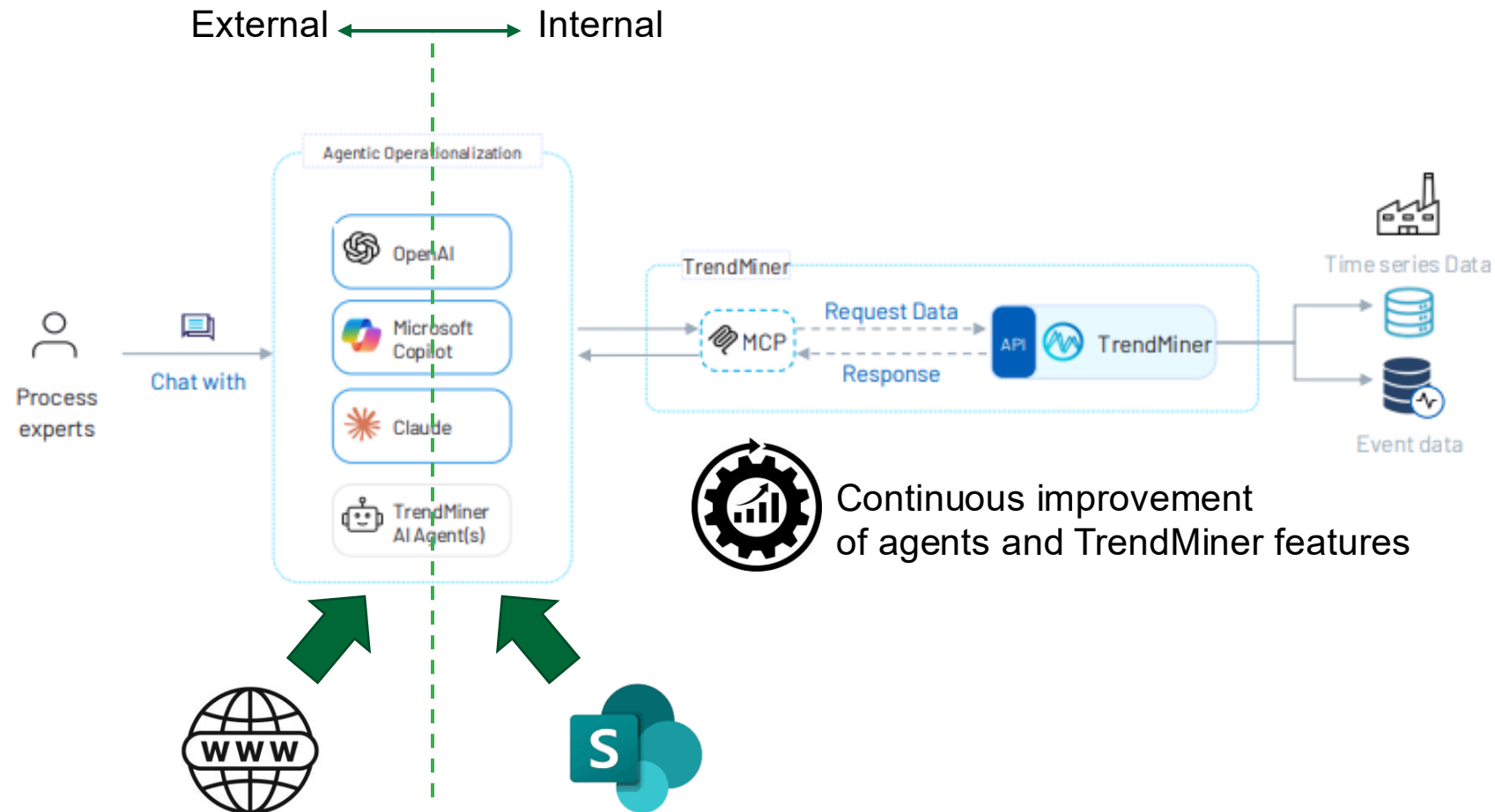
Considerations / benefits

- ◆ Experiment fast
- ◆ Benchmark AI/ML solutions
- ◆ Participants in chemical industry & energy → knowledge sharing

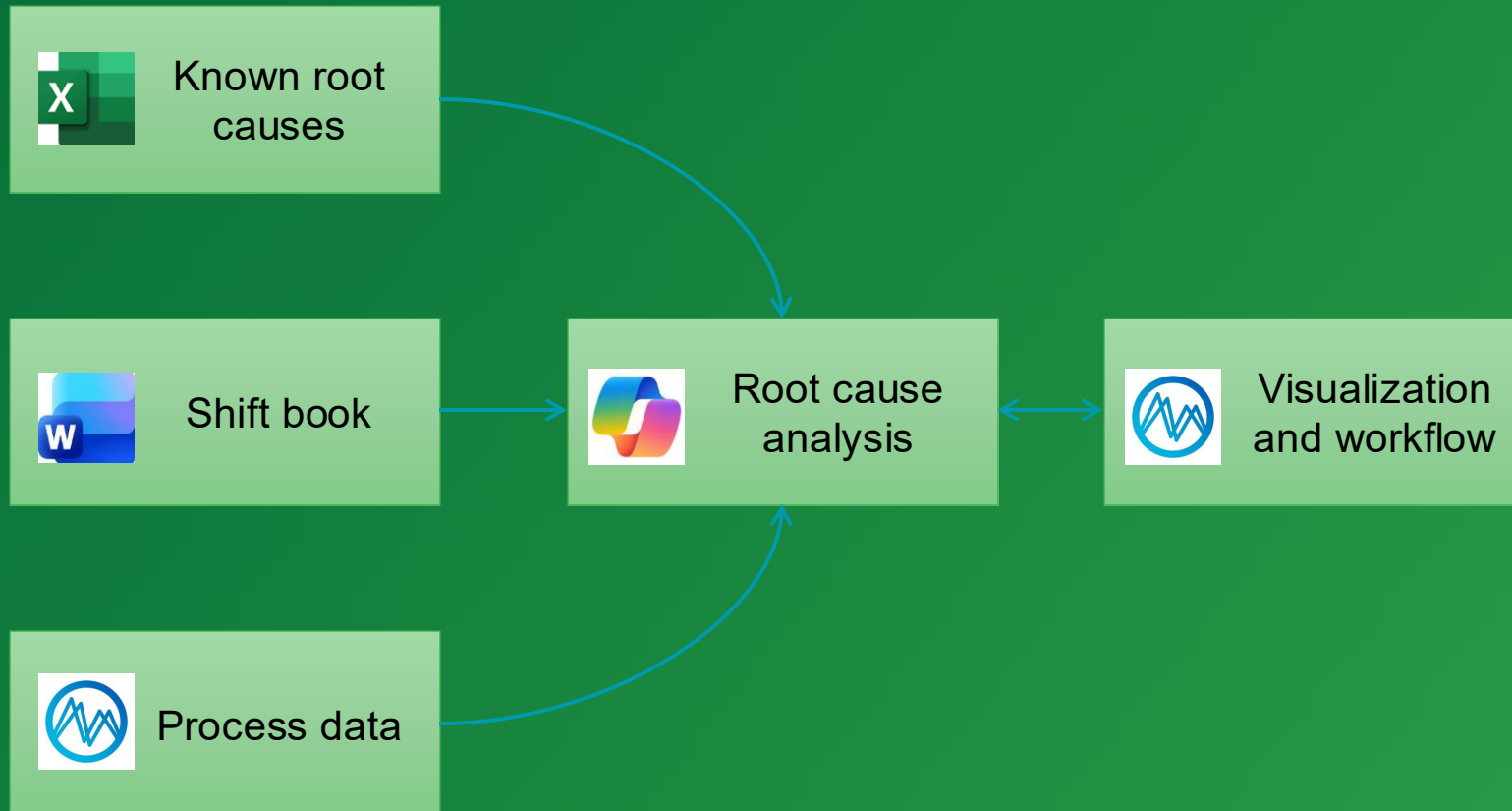
Requirements

- ◆ MCP server in private cloud
- ◆ Participation fee
- ◆ 3-5 use cases
- ◆ people working the use cases

AI early involvement program



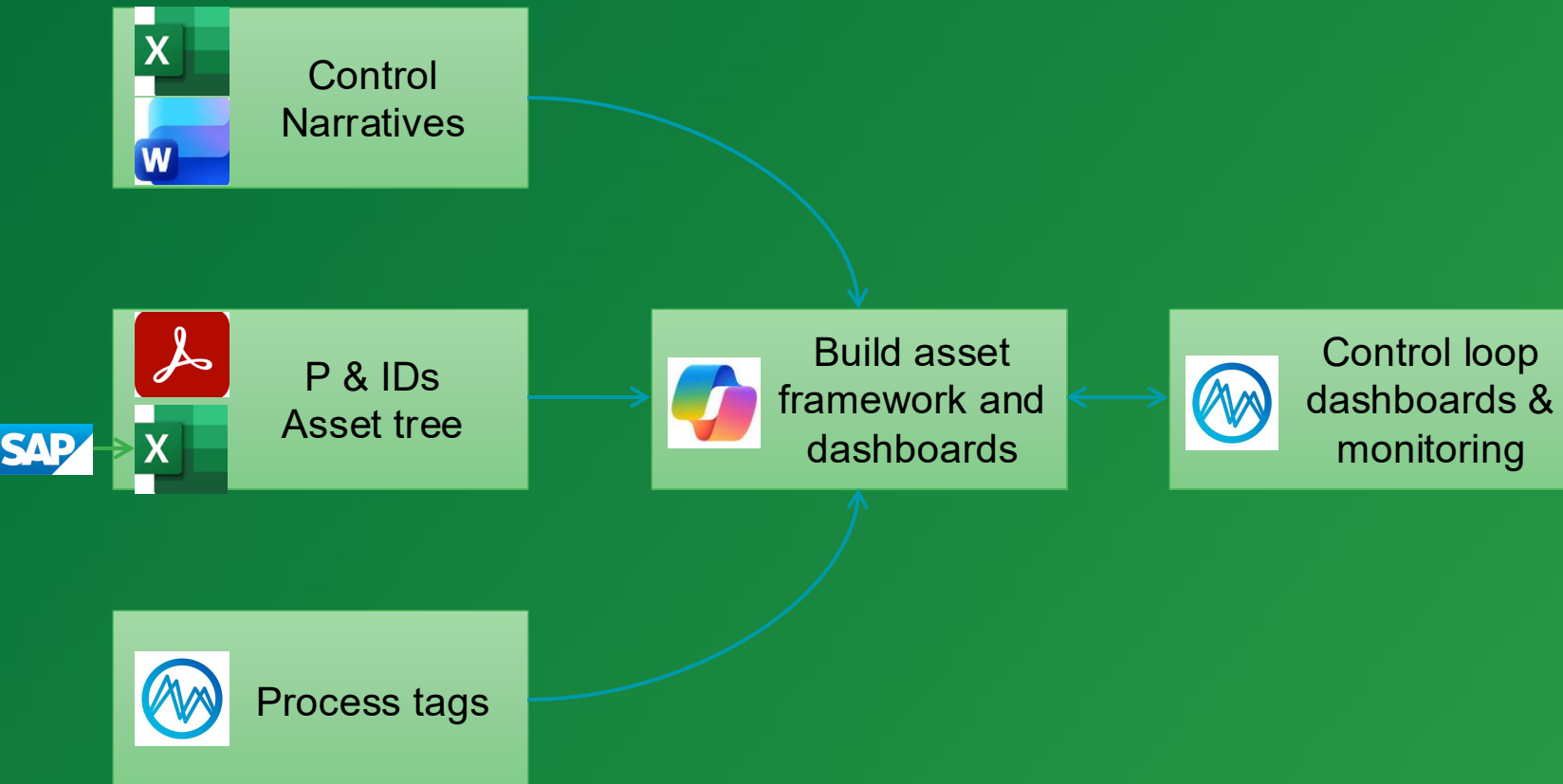
Root cause analysis off-spec salt



Site Hengelo

- ◆ **What**
Prevent too high calcium concentration in salt.
- ◆ **Why**
Off-spec salt can't be sold to our customers and rework is costly.
- ◆ **How**
Combine process knowledge with process data to quickly assess the root cause and minimize off-spec losses
- ◆ **Who**
Process engineer

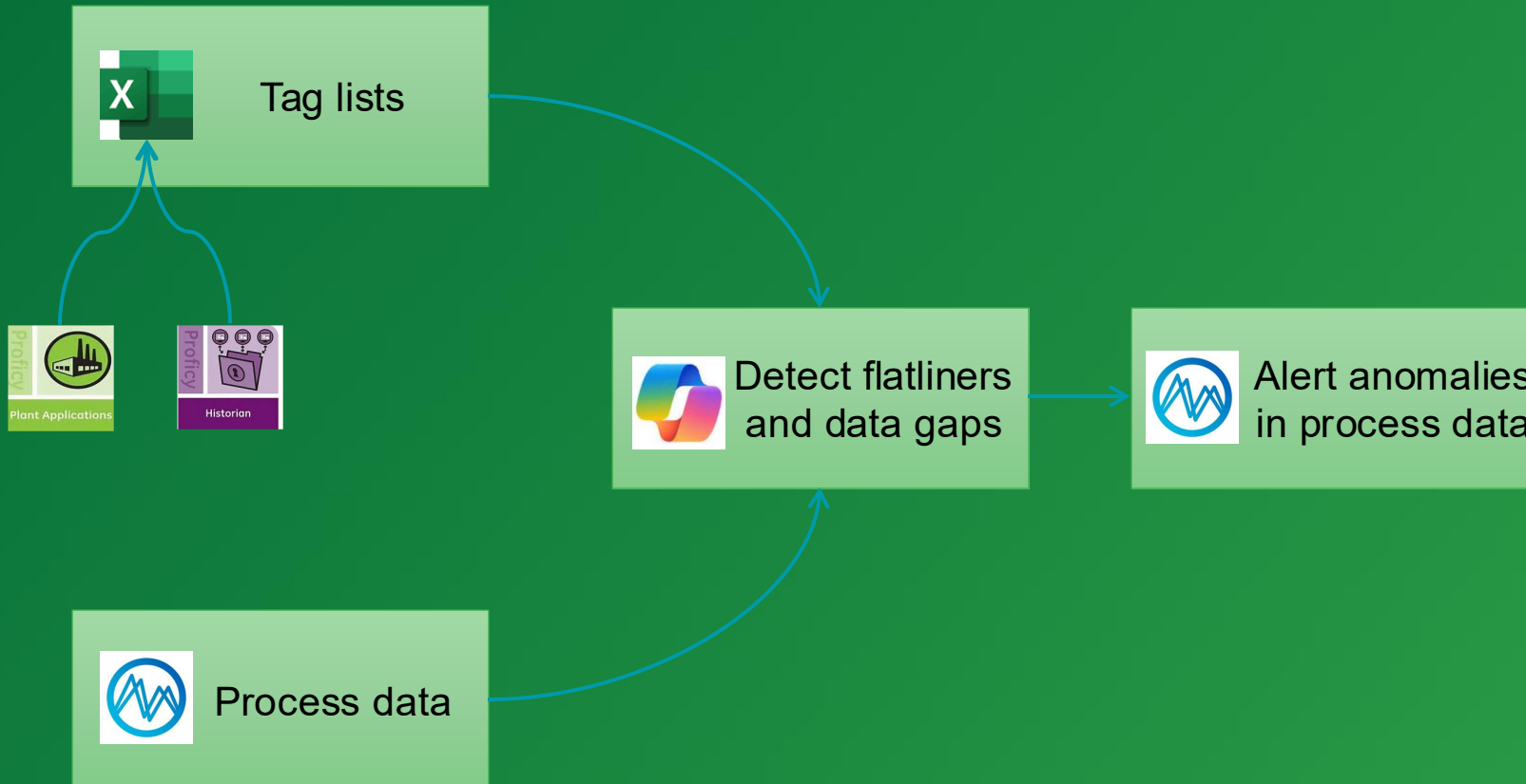
Control loop monitoring



Multiple sites

- ◆ **What**
Monitor critical control loops
- ◆ **Why**
Energy savings and energy flexibility
- ◆ **How**
Create context/metadata with AI to relate process data to control loop behaviour for:
 - basic PID control loops
 - advanced control loops (feed-forward, cascade)
- ◆ **Who**
Control engineer

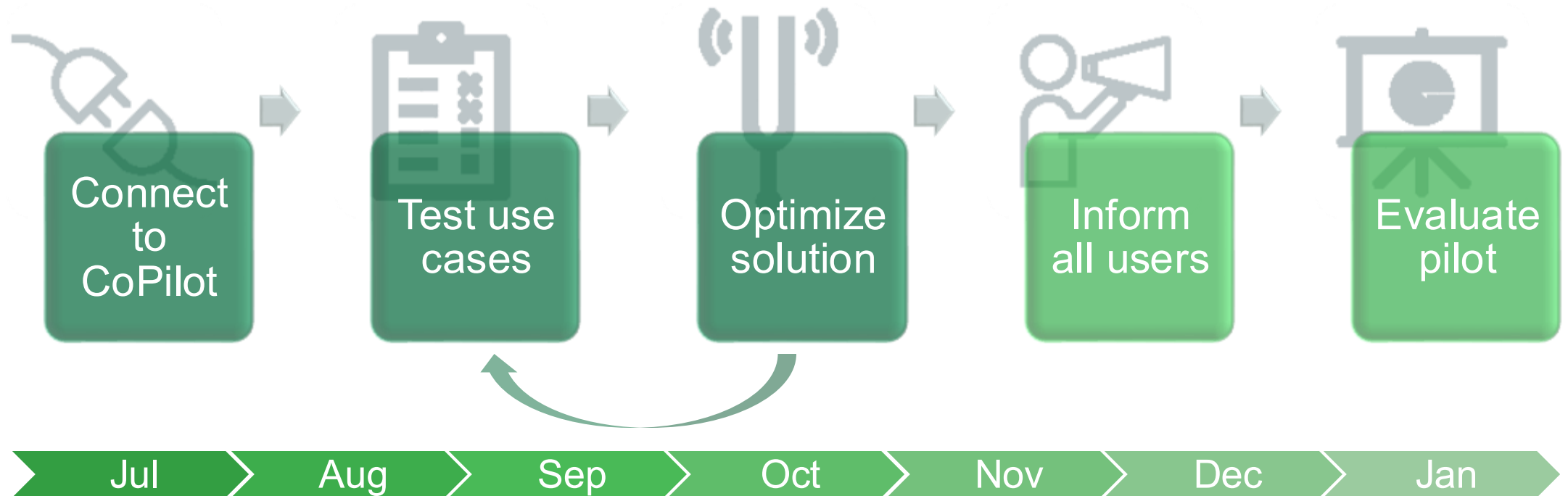
Detect bad process data



Enterprise

- ◆ **What**
Detect bad process measurements (flatliners, data gaps)
- ◆ **Why**
Without accurate data, reporting requires a lot of manual rework.
- ◆ **How**
Let AI agent search for anomalies in the TrendMiner data.
- ◆ **Who**
Data engineer

How is the AI pilot progressing?



Positives

- ◆ User are enthusiastic
- ◆ Biweekly “sprint” → fast development
- ◆ CoPilot can interact with TrendMiner
- ◆ TrendMiner is 20x faster than Historian

Issues / findings

- ◆ Cyber security slows down rapid development
- ◆ AI subscriptions/tokens are quite expensive
- ◆ Large language models are developing rapidly



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Next steps

What will Nobian do this and next year

TrendMiner early involvement program

- ◆ Connect TrendMiner to Claude and Chat GPT
- ◆ Continue with use cases
- ◆ Benchmark data sources, analysis tools and AI agents
- ◆ Share findings with other companies participating in the program

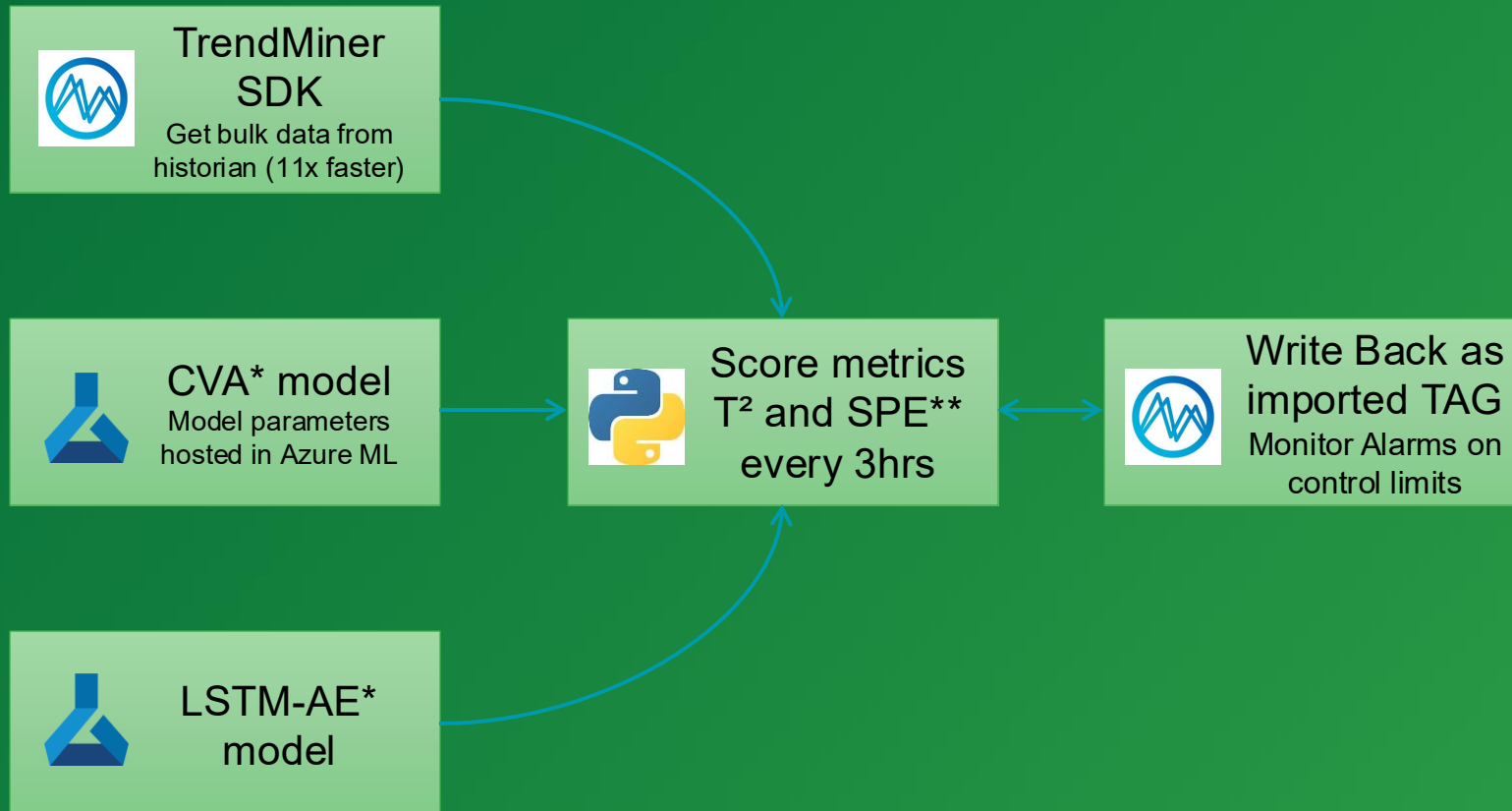


Open question to all:
How shall we organize this?

Digital initiatives based on plant/production data

- ◆ Select and test data platform to combine multiple sources (e.g. Data Bricks)
 - Integrated operator cockpit
- ◆ Find easier ways to collect data (unified namespace, IIoT sensors)
- ◆ Keep using existing (deterministic) models, use AI to enhance
 - Compressors early warning monitors

Early-warning monitoring on TrendMiner



*CVA — Canonical Variate Analysis; LSTM-AE — Long Short-Term Memory Autoencoder

** T² detects deviations within the known pattern; SPE detects deviations from the pattern itself, together, they cover both 'abnormal operations within the expected range' and 'something structurally new'.

Site Frankfurt

◆ What

Two models — CVA + LSTM-AE watching two chlorine compressors live

◆ Why

Catch developing failures early while cutting false alarms — safer, more reliable operation.

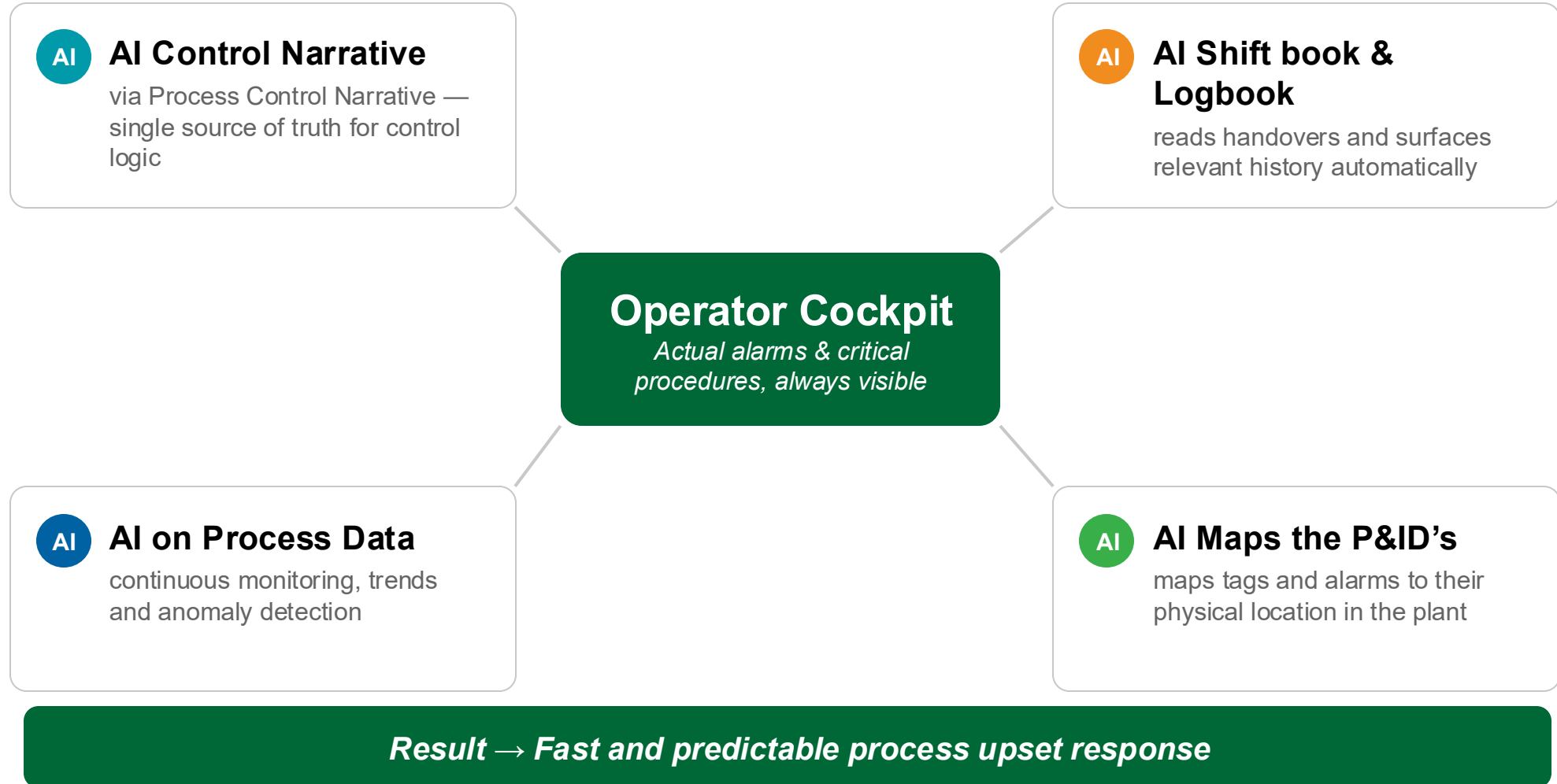
◆ How

Pull tags via the TrendMiner SDK, score both models, write results back via the API.

◆ Who

Process analytics engineer

Integrated operator cockpit





Want to exchange ideas with me? Call or e-mail me

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