



Moving Forward, by Your Side

Can AI Run a Blow Molding Machine?

Opportunities and Limits of AI in Plastic Processing



A few words about ourselves



ST BlowMoulding

- Manufactures large Blow Molding equipment since 1980
- Experts in accumulator head technologies, and continuous extrusion for industrial packaging
- More than 500 machines installed around the world

Aleksandr Kharazov

- 6 years in plastics industry
- Working with ST since 2022
- Covers US and Canada markets



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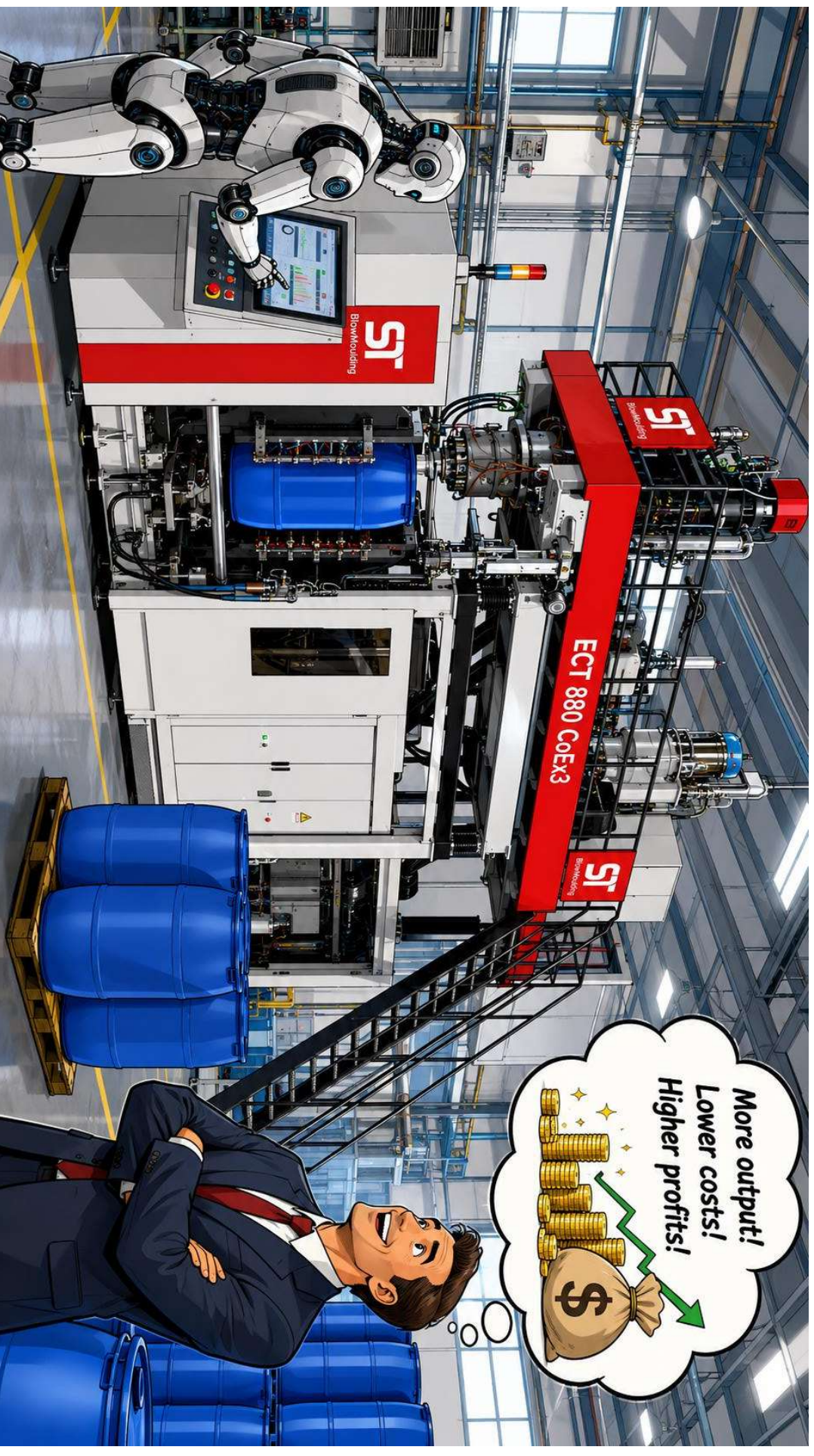


01 AI Hype

Expectations vs Reality

AI Hype

How they sell it



AI Hype

Expectations

“AI can already do all of the jobs that we, as humans, do”
— Sebastian Siemiatkowski, Klarna CEO (after laying off 4000 workers since 2022)

“In a benign scenario, probably none of us will have a job”
— Elon Musk, VivaTech 2024 speech



AI Hype Reality

Here are some tips to help cheese stick to pizza:

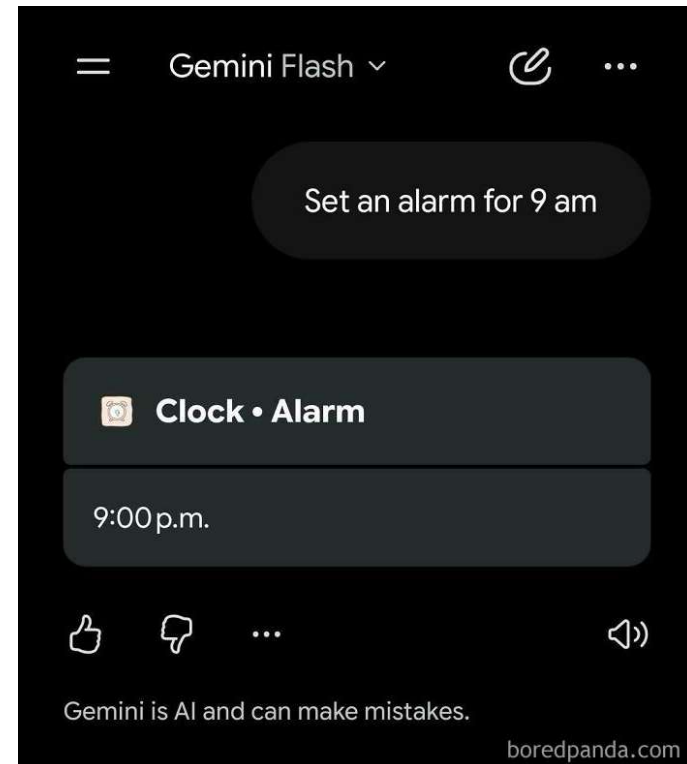
- Add glue to the sauce: Mix about 1/8 cup of non-toxic glue into the sauce to make it tackier



What is this specifically

It's a **tabby kitten** — specifically a young domestic cat with a **brown/black mackerel tabby pattern** (those narrow, tiger-like stripes along the body).

The little teal arm above it looks like a **toy excavator**, not related to the cat itself — just sitting over it while it naps 😊



AI Hype Reality



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AI Hype

Conclusions



AI is a very young technology, yet to be solidified

We must be very careful in choosing what information we give to AI.



Very solid frames must be put in place to limit AI's creativity

AI is not a magic tool to solve issues. It learns from your actions





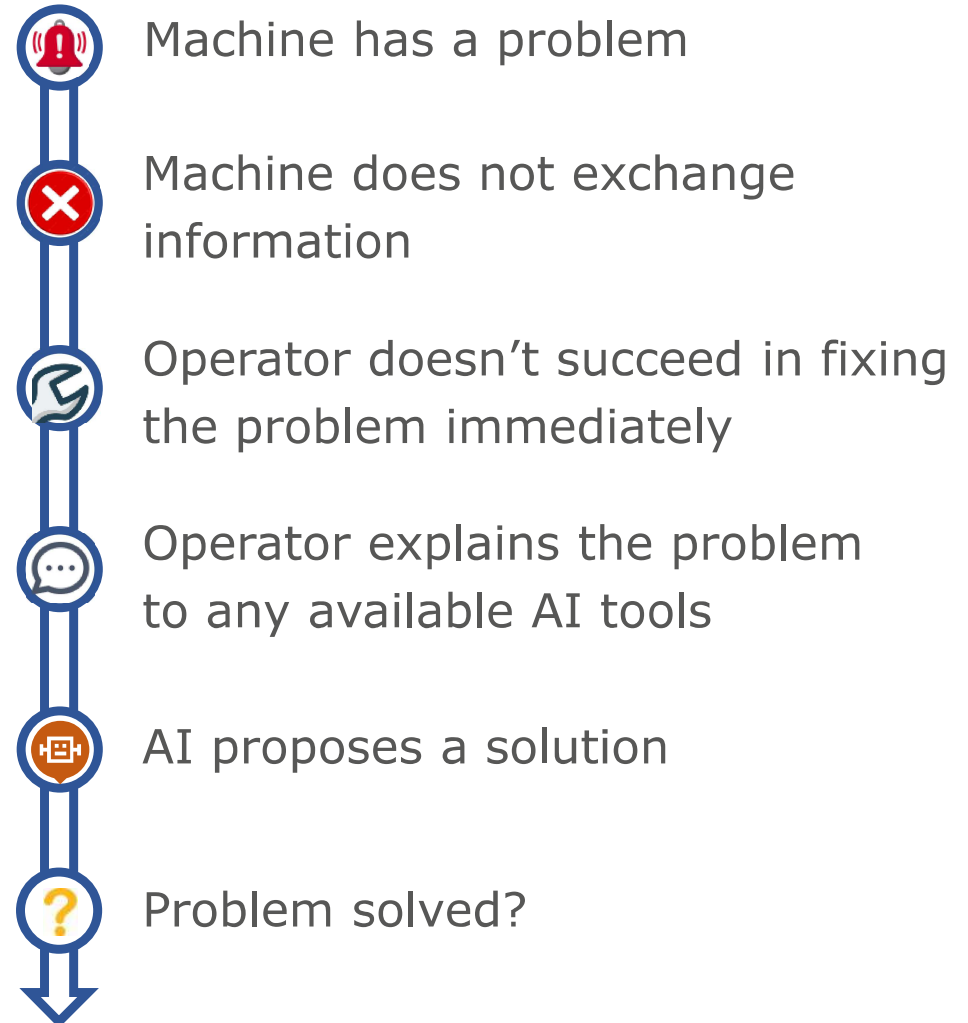
02

Understanding AI

What is needed to make AI actually helpful

Understanding AI

Scenario 1: non-collaborative approach



Understanding AI

Scenario 2: machine collaborates with integrated AI tools

Machine has a problem



Machine constantly exchanges information with the AI platform



The AI platform analyses all data provided by the machine



Virtual AI agent reviews the data and proposes the solution



Problem solved!



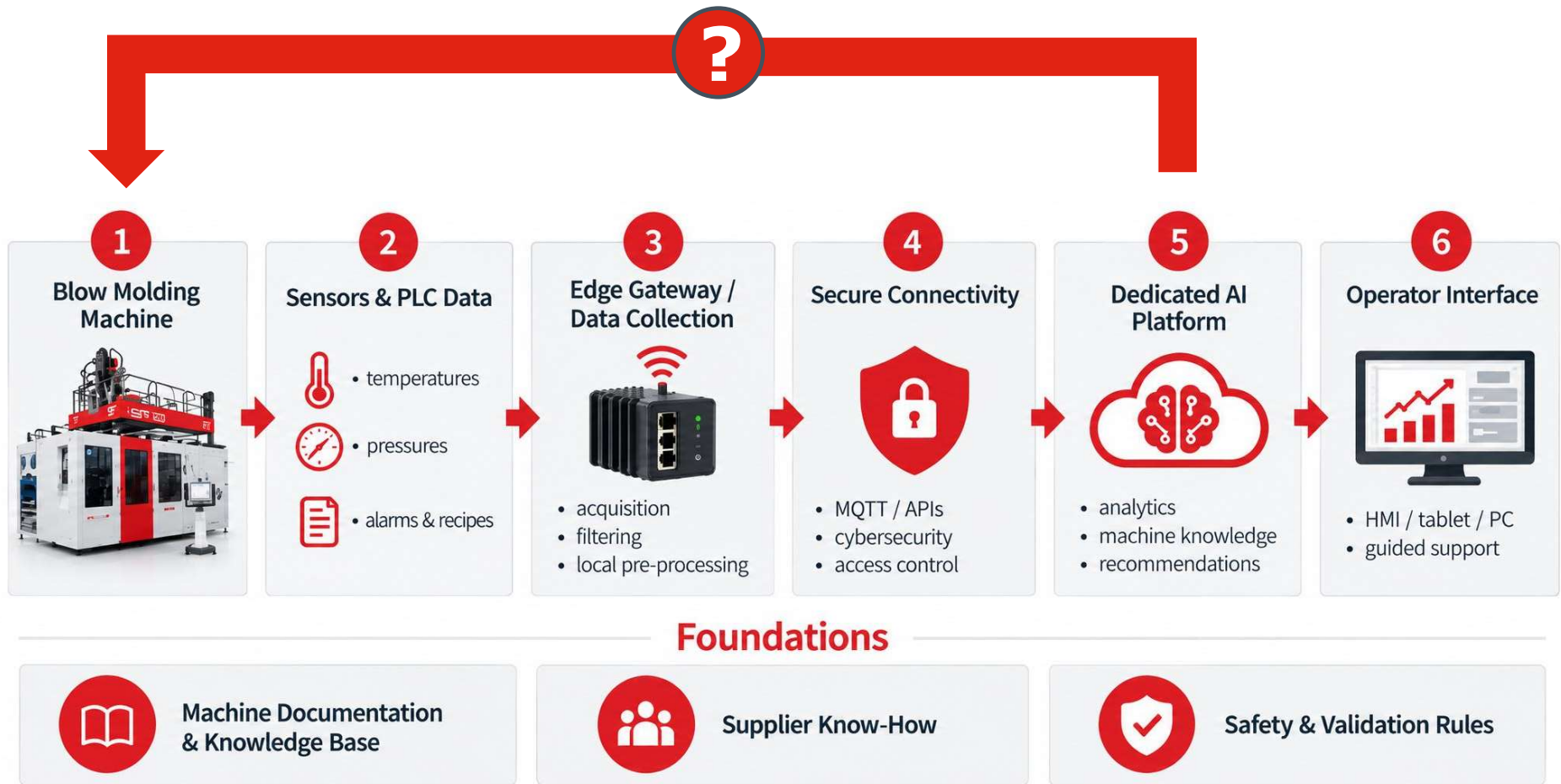
Understanding AI

Scenario comparison

Roles / Scenarios	Scenario 1: Open AI tools / general LLMs	Scenario 2: Dedicated machine AI platform
Operator	Must have good prompt engineering skills, interpret the answers, and validate the suggestions. Requires some familiarity with AI tools.	Does not require specific AI knowledge.
AI platform	Must be updated manually with manuals, process information, service notes, and machine-specific data. No connection with real machine status.	Automatically collects all available data. Provides machine-specific analysis, recommendations, and guided actions.
Machine	No integration required.	Requires sensors, data collection, and connectivity.
Machine supplier	No direct involvement.	Provides machine knowledge, process logic, and validation.

Understanding AI

What is needed to make AI actually helpful



Understanding AI

Limitations of the backwards process



Process stability

One parameter change can affect the whole process



Quality trade-offs

Faster cycle or lower energy can reduce part quality



Data & Sensors

Poor, missing or delayed data can mislead the AI



Safety & responsibility

Automatic actions require clear limits



Operator Dependence

Too much automation can reduce process awareness



Cybersecurity

Connected control must be secured and validated

Best practice: AI should suggest first, and act only within validated boundaries

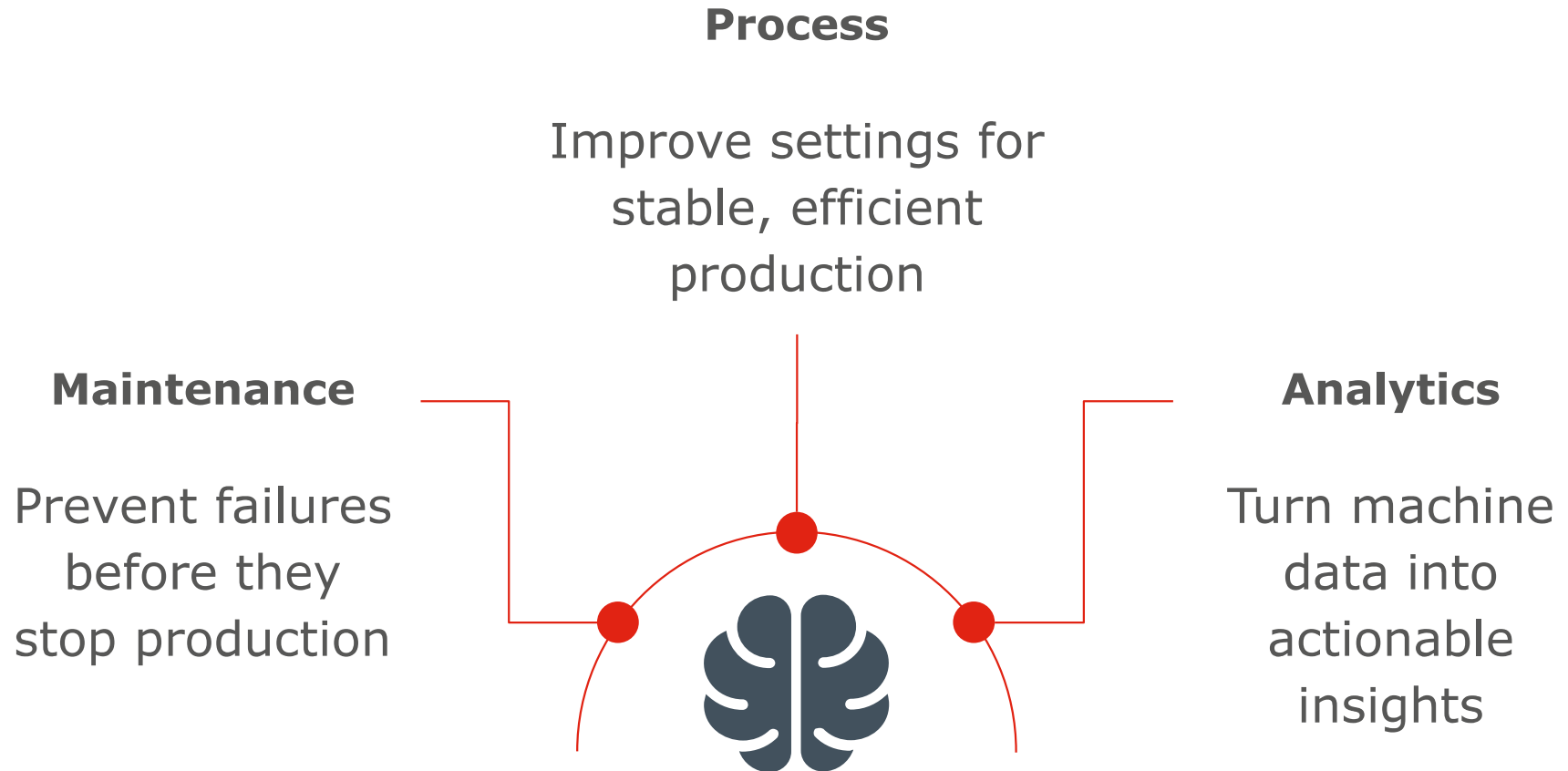


03 Opportunities for Plastic Processing

What companies can achieve today

Opportunities for Plastic Processing

Areas of expertise

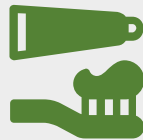


Opportunities for Plastic Processing Maintenance



Predict Component wear

trends in pressure, temperature, cycle stability, motor load, oil temperature, vibration, air consumption, and alarm frequency



Prioritize maintenance

Distinguish urgent issues, planned service, and minor warnings



Explain alarm root causes

Go beyond the alarm code and identify the likely cause



Recommend spare parts

Prepare the right parts before failure and reduce downtime



Compare similar machines

Use machine history and similar cases to suggest the most probable cause of recurring problems



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Opportunities for Plastic Processing

Analytics



Identify recurring causes of downtime

Analyze machine data to find the real reasons behind downtime shifts, products, mold or machines



Analyze productivity losses

Separate cycle time inefficiency, micro-stops, alarms, setup time, maintenance stops and operator interventions



Highlight abnormal trends

Spot longer cycles, unusual spikes, or repeated manual corrections



Generate automatic production summaries

Provide operators and management with clear, production insights



Connect quality events with process data

Help understand which machine conditions were present when defects occurred



Create knowledge from historical data

Turn past data into valuable guidance for future production and decision making

Opportunities for Plastic Processing

Process knowledge assistant

Machine-side instability detection

Even without automatic quality measurement, the AI can detect instability in machine behavior.

Examples:

- Cycle time becomes irregular.
- Extrusion pressure fluctuates more than usual.
- Hydraulic pressure becomes unstable.
- Air pressure drops during blowing.
- Cooling temperature changes from the normal trend.
- Parison control movement differs from the reference profile.

Opportunities for Plastic Processing

Process knowledge assistant

Parameter change tracking

The AI can record what was changed, when, by whom, and what happened afterward.

- **Example:**

“Extrusion temperature was increased by 5°C after shift change. After that, cycle interruptions increased.”

- **Added value:**

The machine records values, but the AI can create a practical process history that helps understand cause and effect.

Opportunities for Plastic Processing

Process knowledge assistant

Shift-to-shift knowledge transfer

The AI can summarize the process situation for the next shift.

- **Example:**

“During the previous shift, operators reduced cooling time twice, but deformation increased. Current stable condition was restored at 14:20.”

- **Added value:**

This prevents knowledge from staying only in the head of the previous operator.



04

“AURA” case study

Practical example



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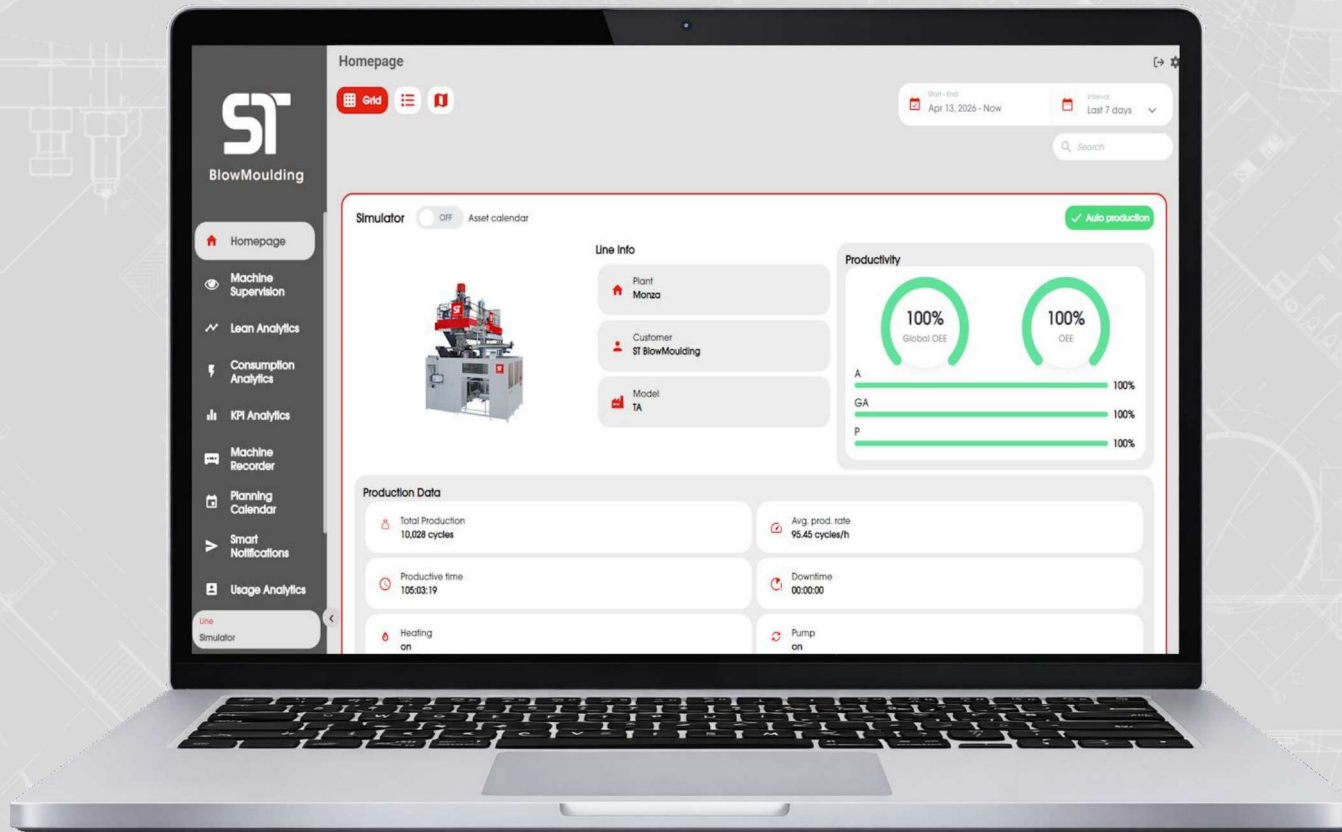
"AURA"

Advanced **U**ptime & **R**eliability **A**ssistant

New AI based platform for your blow moulding operations developed
by
ST BlowMoulding

AURA case study

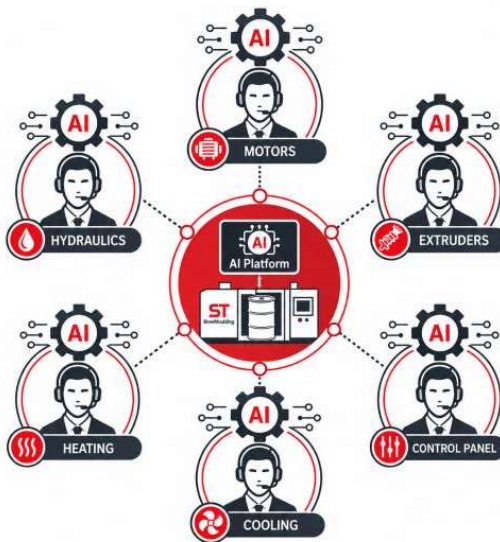
- Prototype version is under testing in real manufacturing conditions
- Targeted for market release: early 2027



AURA case study

Virtual agents — the basis of successful machine monitoring

By combining ST expertise with artificial intelligence, dedicated agents can continuously monitor machine status, interpret behaviors, and propose actions.



Each AI Agent is assigned to supervise a specific part of the machine. Together, they work like a team of virtual operators, constantly connected and monitoring every critical function in real time.

AURA case study

Workflow example

1 Observe

AI agent monitors cycle time to identify inconsistencies.



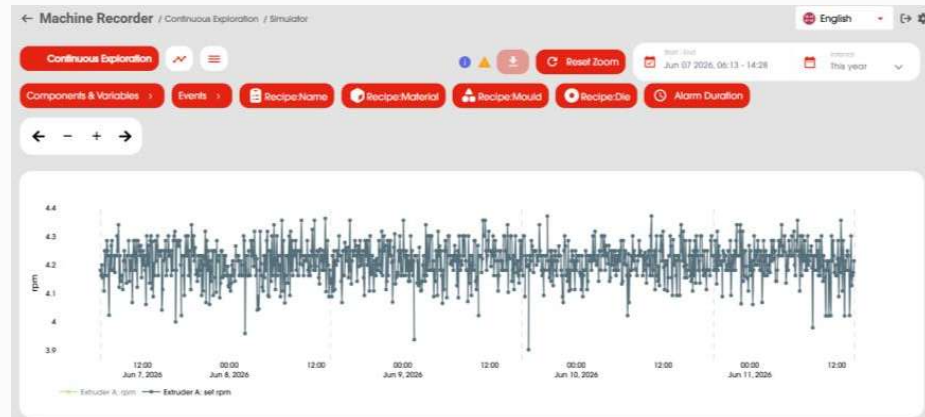
2 Detect inconsistency

>21 s difference over 120 cycles



3 Analyze underlying parameters

- **Accumulator head charging time** also varies and correlates with cycle time.



- **Actual extruder speed** differs from the setpoint
- **Exclusion** of other processes influencing the issue



4 Possible causes

Extruder drive

Extruder motor

Process condition

AURA case study

Our ultimate goal

An AI platform that brings machine data together and supports your team like an experienced process engineer—24/7, with more accessible and affordable expertise.





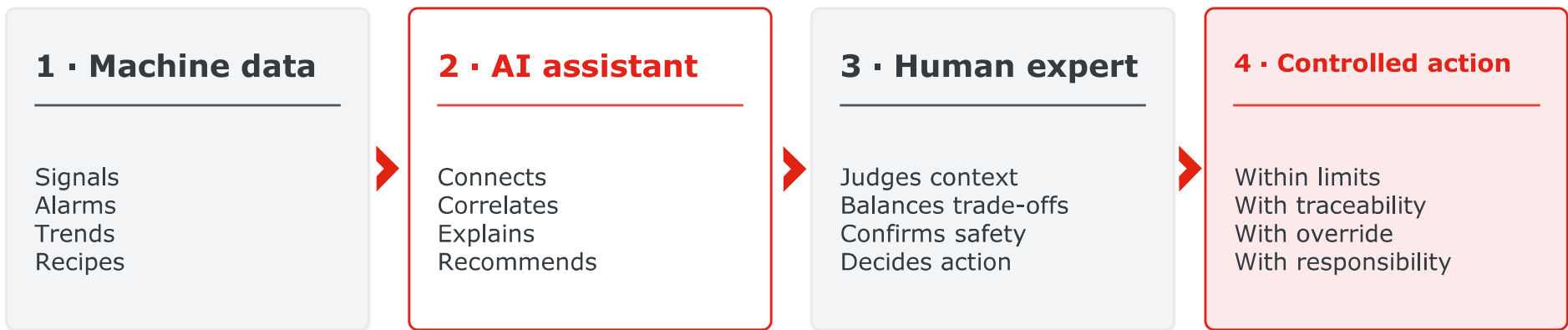
05 Looking ahead

Limits, Safety and the Road Ahead

Looking ahead

Keep the human in the loop

AI is strongest when it works beside the operator — reading the data, explaining the behavior, and supporting the decision.



What AI brings

- 24/7 attention to machine behavior
- Fast correlation across many parameters
- Consistent explanation and knowledge transfer

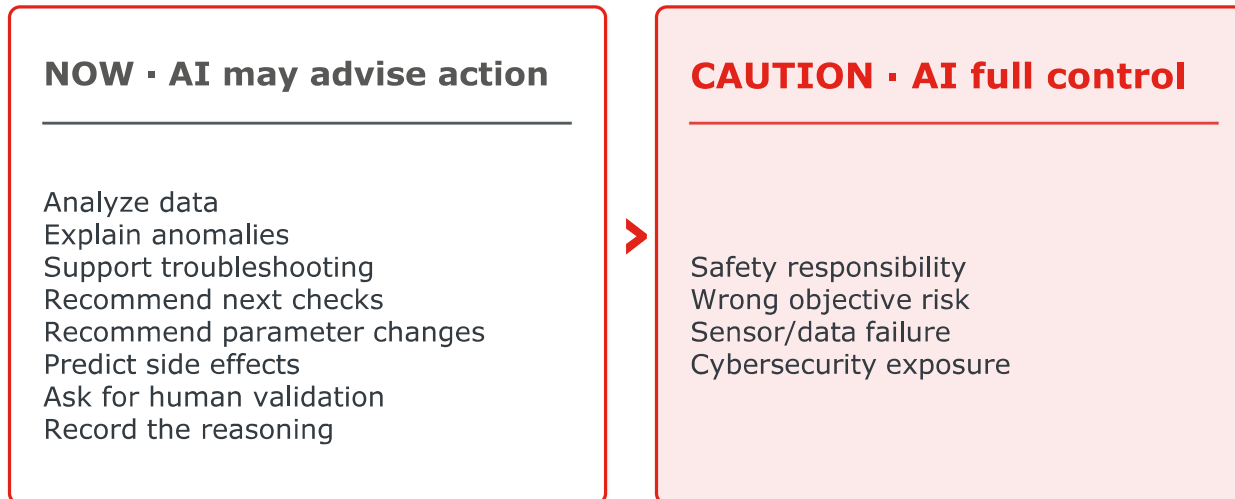
What humans keep

- Final responsibility for the process
- Judgment when conditions are not measured
- Authority to accept, reject or stop action

Looking ahead

Can AI control a blow moulding machine?

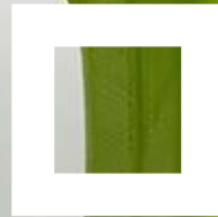
Maybe one day. But first we must decide the boundaries, the responsibility, and the safety logic.



Practical position: keep AI where it creates value today — assistant and advisor — while every step toward direct control is tested, validated and earned.

"There's nothing artificial about AI. It's inspired by people, it's created by people, and—most importantly—it impacts people."

— Fei-Fei Li



**Made
by ST
People**



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