



Elevating Operational  
Excellence at Bayer:

*Learn how Bayer  
increased capacity  
and efficiency  
without any  
investments*



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# Bayer at a glance



*Health for all,  
Hunger for none*

**3** divisions

- // Crop Science
- // Pharmaceuticals
- // Consumer Health

Represented by  
**354 consolidated companies** in

**83**  
countries

**99.7k**  
employees worldwide  
in 2023\*

**€5.4bn**

investment in R&D  
in 2023

**€47.6bn**

sales  
in FY2023



Tackling two of the most pressing challenges of our time:  
**health & nutrition**



Diverse, international focus  
with cross-border and cross-division  
**people development**

\* As of December 31, 2023; employees in full-time equivalents



# Uncover hidden potential to initiate process improvements directly on site

## Situation in Crop Science 2020

- // Many sites / plants have data historians
- // Large amount of data available
- // Most sites / plants use data descriptively only
- // Strong pull from some sites to engage in data analytics

## Benefits & business impact

- // Increase process understanding
- // Support data driven decision making
- // Value through data driven process optimization
- // Create tangible process improvements like:

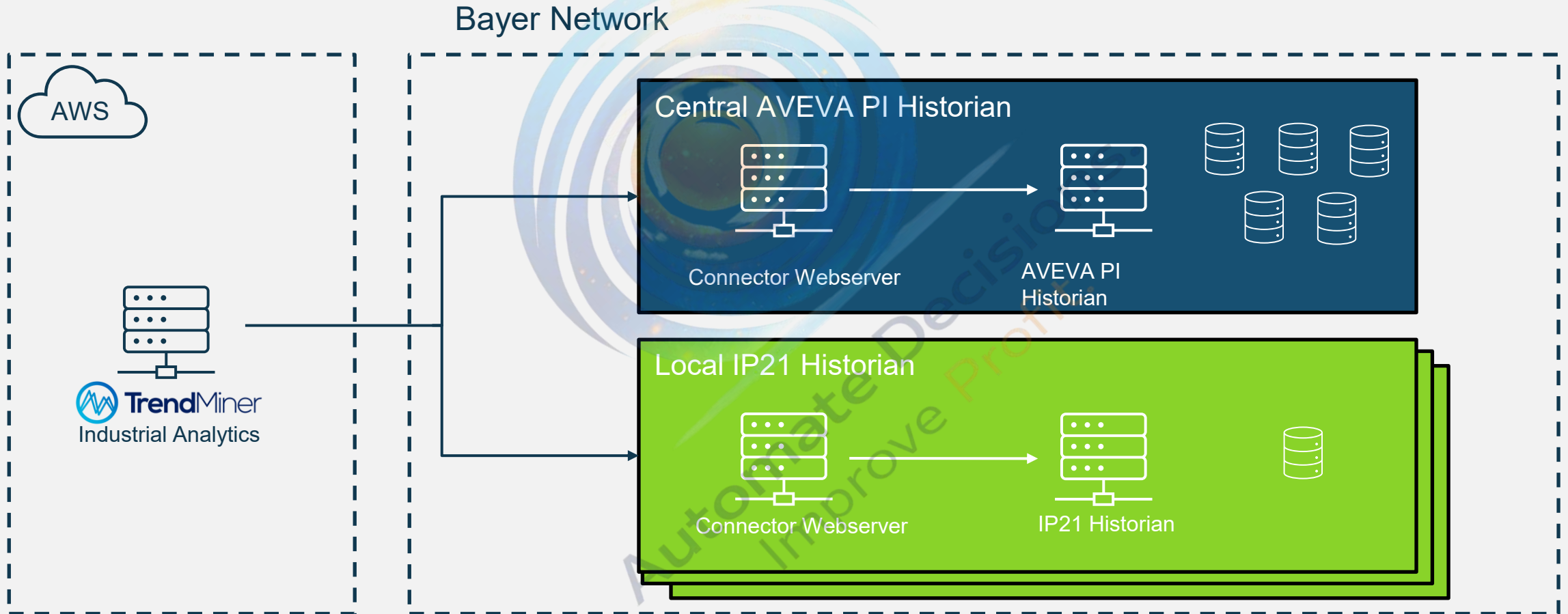
**COGS** ↓ **Yield** ↑ **Quality** ↑ **Cycle time** ↓

→ Based on a market research, Crop Science decided to implement TrendMiner on top of the existing AVEVA™ PI System™



# Connecting the dots: data infrastructure from site to cloud

Scalable data infrastructure ensures fast roll-out





# Successful global roll-out of TrendMiner confirmed by multiple use cases realizing process optimizations and cost reduction





# High-value generating use cases were achieved across all regions, encompassing both active ingredient and seed production.

Example of two recent use cases that were fully implemented

## Knapsack – Active Ingredients (Germany)

- // Increasing demand of a fungicide
- // Established process
- // Process optimization required

## Uberlândia – Seeds (Brazil)

- // Corn seed production
- // High additive consumption for treatment
- // Scaled to further corn seed sites in Brazil

# Optimizing a continuous distillation

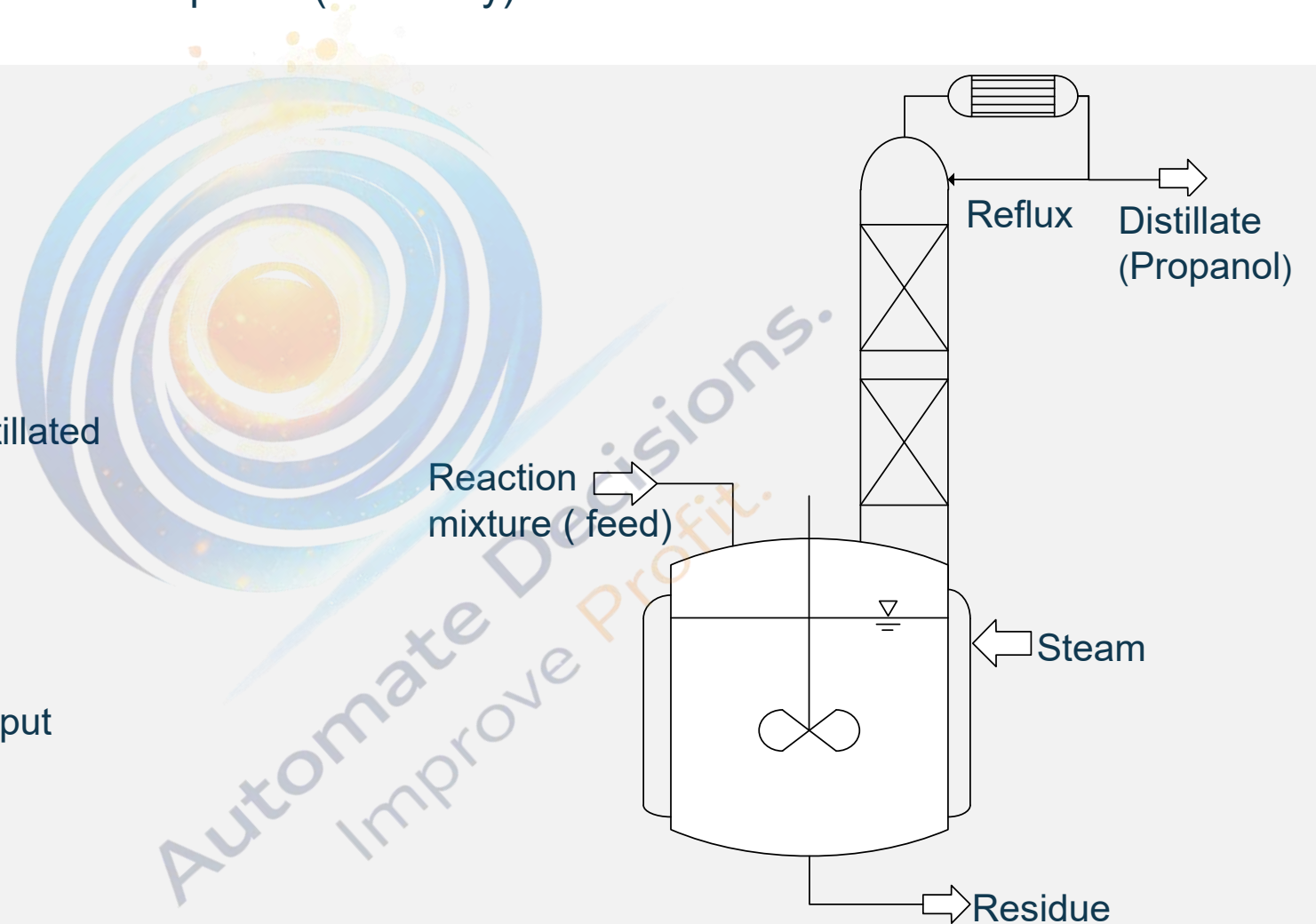
Example No. 1: Process optimization in Knapsack (Germany)

## Starting conditions

- // Batch distillation with Propanol
- // Cycle time correlated to distillation
- // Reflux ratio to control quality of distilled propanol

## Challenge

- // Reduce steam consumption
- // Minimize cycle time to increase output





# Analyzing 2000+ batches to enhance efficiency and identify root causes

## Analysis Phase

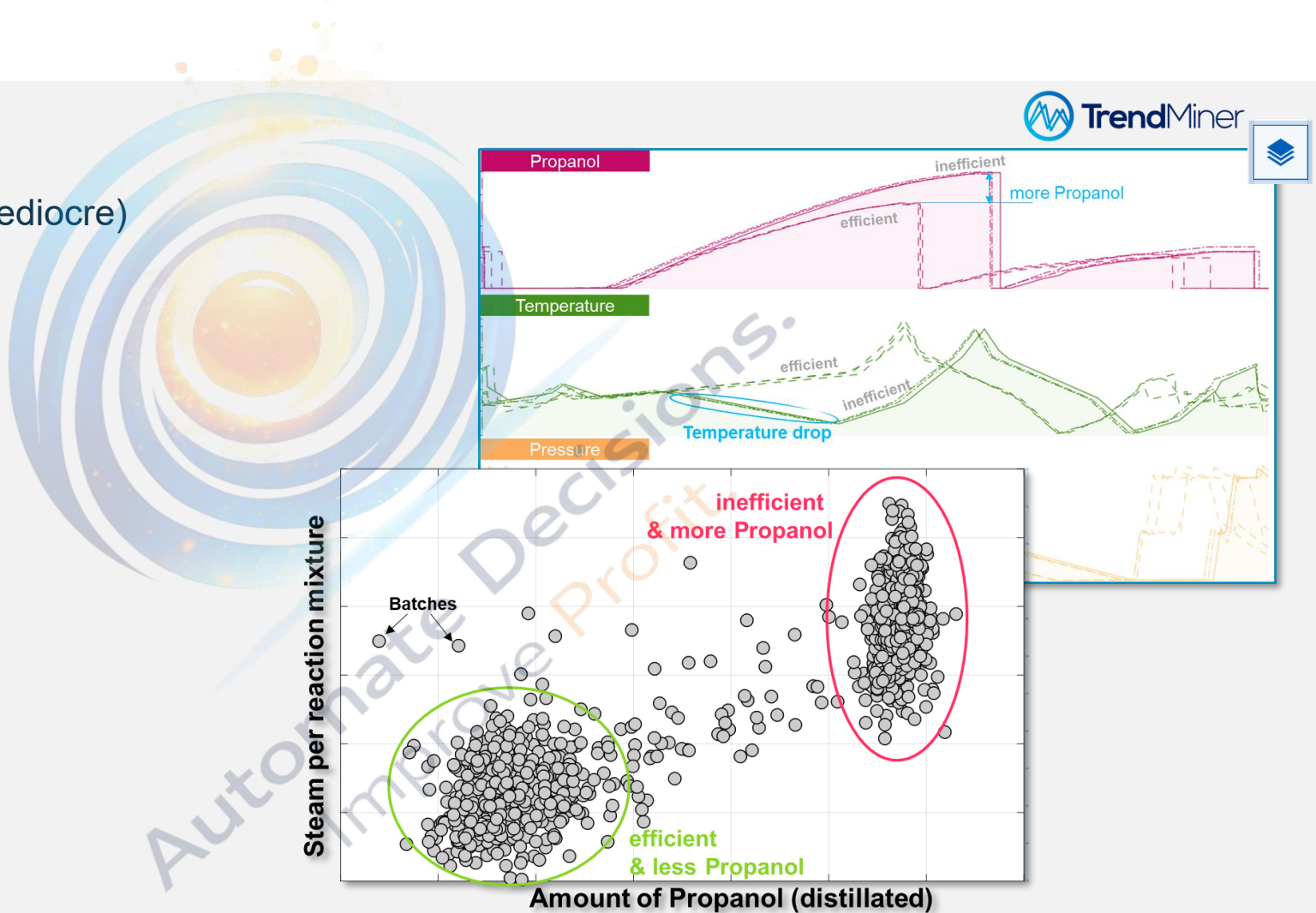
- // Analysis of > 2000 batches (good & mediocre)
- // Statistical data analytics to understand correlation and various states

## Observations

- // Process varies significantly between different batches
- // Two distinct states identified

## Possible root causes

- // Amount of propanol in reaction mixture too high
- // Incorrect measurement of distillate



# Modifying process control to optimize steam quantity

## Process Optimization

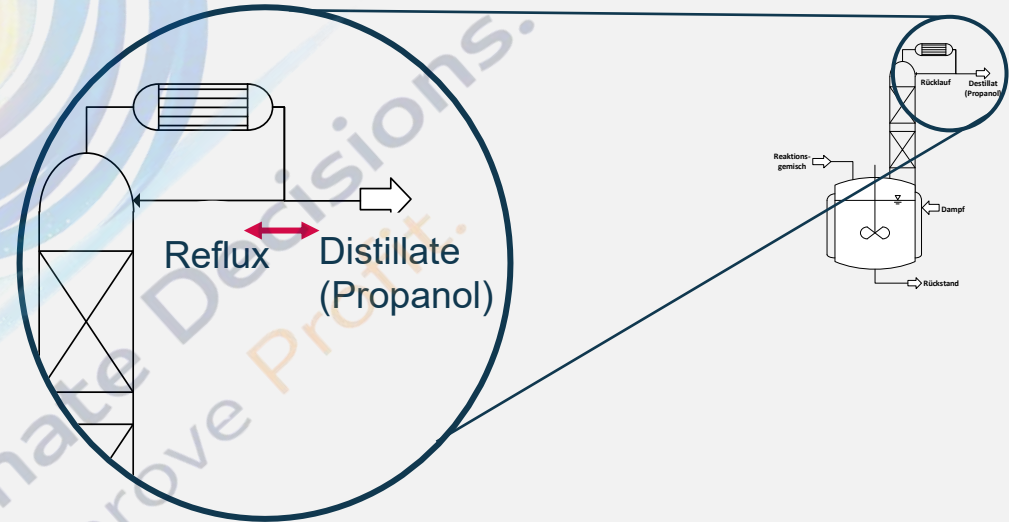
- // Independent process control
  - // decoupling the process control from the measurement of distillate
- // Reflux regulation based on steam quantity

## Monitoring

- // Definition of Golden Batch
- // Set up dashboards to monitor at a glance
- // Set up monitors to for alerts in case of deviations

## Improvements

- // Capacity increase by **36 %**
- // Energy efficiency increase by **26 %**





# Monitoring additive consumption in corn seed production

Example No. 2: Uberlândia (Brazil)

## Corn Seed Production

- // Corn seeds are coated with an additive to ensure adhesion of subsequent treatment with actives (e.g. fouling, color, insecticide)
- // Little monitoring on operational level
- // High additive consumption led to supply shortage, high costs and unnecessary product discard

## Approach

- // Comparison of 100+ batches
- // Calculation of polymer dosage (Tag-Builder)
- // Dashboards to monitor on operational level



# Transferring success to other sites

## Implementation

- // Project started in Uberlândia
- // Scaled to all corn sites in Brazil within three weeks

## Improvement

- // Significant reduction of additive resulting in cost reduction and more robust supply chain
- // Better process understanding on operational level
- // Enhanced seeds coating
- // Waste reduction towards sustainability goals



Bad treatment



Good treatment

Automate Decisions  
Improve Profit.



# Continue to provide our production workers with the right tools to augment domain knowledge with data driven decision making

High adoption rate ensures discovery of further optimization use cases

## Next Steps



// Integrating additional data sources for a comprehensive 360° view of operations.



// Enhancing skills through advanced training to expedite data-driven decision making.





# Bayer maximizes production efficiency without capital investment

## Challenge

- Demand exceeding production, increase needed while remaining compliant
- Globally located and remote sites
- Production data often used in a descriptive manner

## Solution

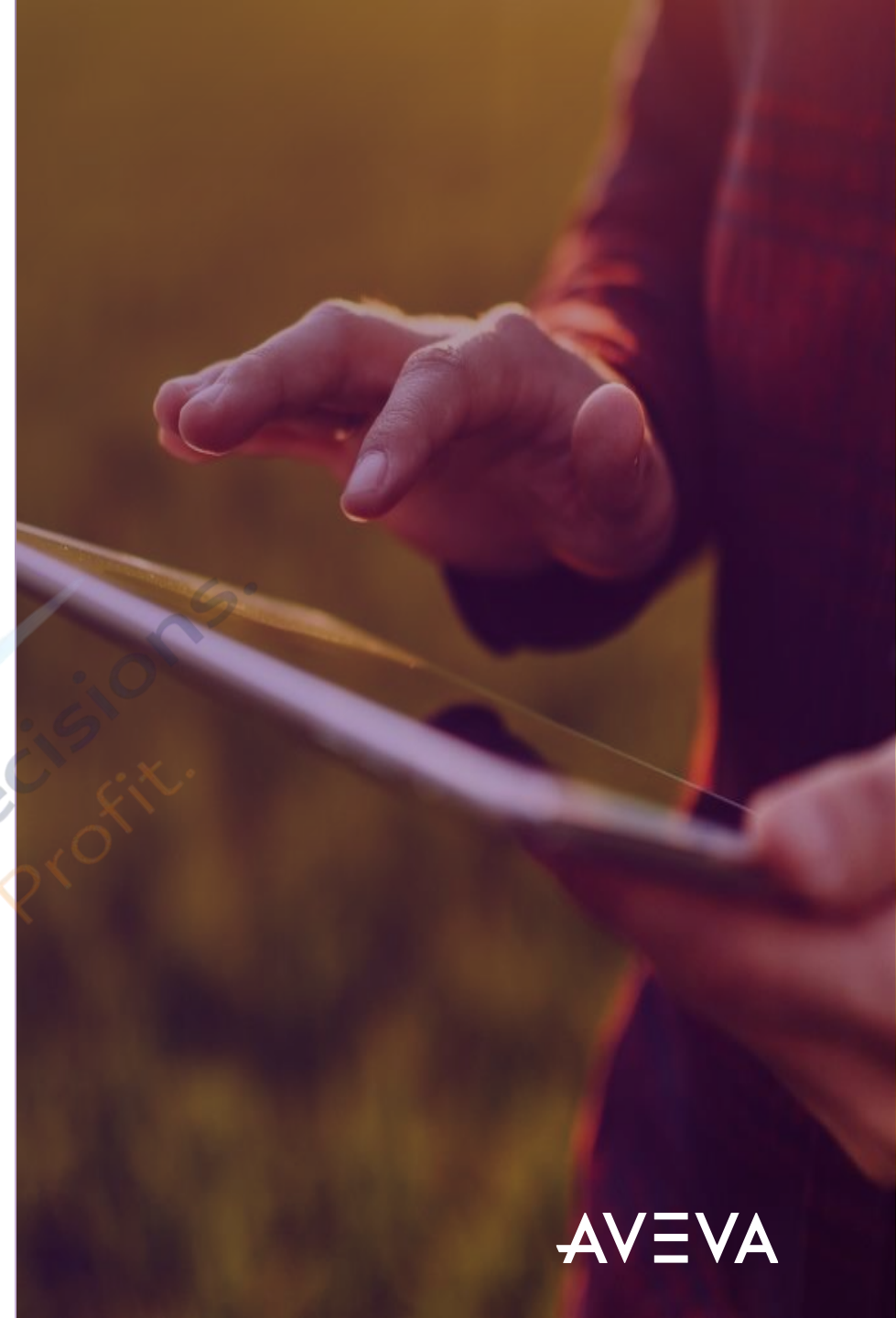
- Global data management with AVEVA™ PI System™, combined with TrendMiner industrial analytics to drive data driven decision-making for everyone in operations.

## Results

- **Unlocking better process understanding at operational level and driving data driven decision-making**
- **Increased production capacity by 36% and improved energy efficiency by 26% (Germany)**
- **Substantial decrease in additives leading to an enhanced seeds coating and more reliable supply chain Brazil).**



Automate Decisions  
Improve Profit.





*Thank you!*



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# Abstract

For Aveva Website

This presentation outlines Bayer' strategic implementation of TrendMiner, a powerful digital analytics tool, to elevate operational excellence within its Crop Science division. By focusing on two specific use cases—active ingredient manufacturing and corn seed production—Bayer has achieved remarkable results, increasing production capacity and enhancing efficiency without any capital expenditures. The presentation details the structured roll-out approach, emphasizing initial training, use case identification, and ongoing community support. Key examples illustrate how data-driven insights facilitated process optimizations in active ingredient production and corn seed manufacturing, leading to significant reductions in resource consumption and operational costs. This case study not only demonstrates the effectiveness of TrendMiner in addressing critical challenges in health and nutrition but also highlights Bayer's commitment to sustainable practices and innovation in agricultural science.

Automate Decisions  
Improve Profit.