

Personal Bio

Lucas Celoto is a chemical engineer graduated from the Federal University of Triângulo Mineiro (UFTM) and has been working as a Process Engineer at **Indorama Ventures – Indovinya since 2024**. His work focuses on process optimization and operational support, with experience in process modeling and simulation, covering both computational model development using code and classical chemical engineering unit operations. With a strong analytical foundation, Lucas applies data-driven and simulation-based approaches to support operational performance, reliability, and continuous improvement in industrial processes.



Lucas Celoto

Indorama Ventures PLC | Suzano
Site (Indovinya Segment)



Title: From Analytics to Advantage: Digital Culture and Empowerment Boosting Productivity

While Suzano's unit optimization delivered measurable performance gains, its lasting impact was cultural.

At Indorama Ventures – Indovinya, transformation was driven as a people-first journey through the VALUE Program, embedding analytics into daily operations, decision-making, and frontline routines—not just as a tool, but as a way of working.

By the end of 2025, ~70% of employees were actively using Seeq, with 95% of frontline teams integrating it into daily activities.

Suzano now stands as a leading example of how leadership alignment, culture, and frontline ownership can scale analytics into a sustainable management system and competitive advantage.



From Analytics to Advantage: Digital Culture & Empowerment Boosting Productivity

Indorama Ventures PLC | Suzano Site (Indovinya Segment)

By Lucas Celoto

Indorama Ventures: Who we are

OUR PURPOSE

Reimagining chemistry together to create a better world.

OUR VISION

To be a world-class sustainable chemical company producing indispensable chemistry that touches billions of lives every day.



Presence in
32 countries



Consolidated revenues of
\$15.6 billion
(FY2023)



Manufacturing facilities
114



Employees
25,000

Business segments



Combined PET
(CPET)



Indovinya



Fibers



#1

rPET producer globally



#1

ethoxylation
company globally



#1

in PET staple fiber
production in ASEAN



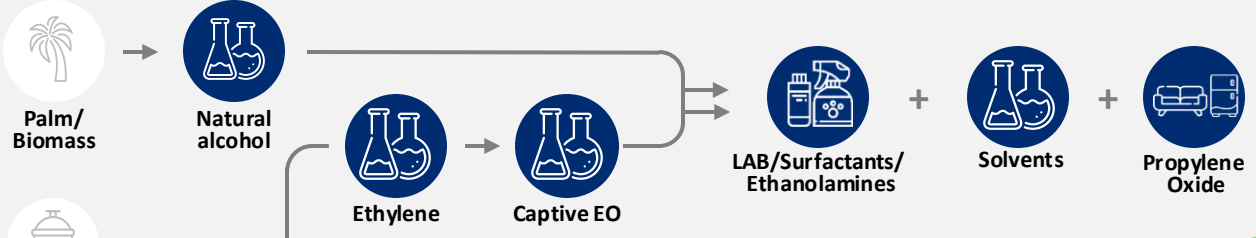
#2

in airbag yarn

Integrated value chain



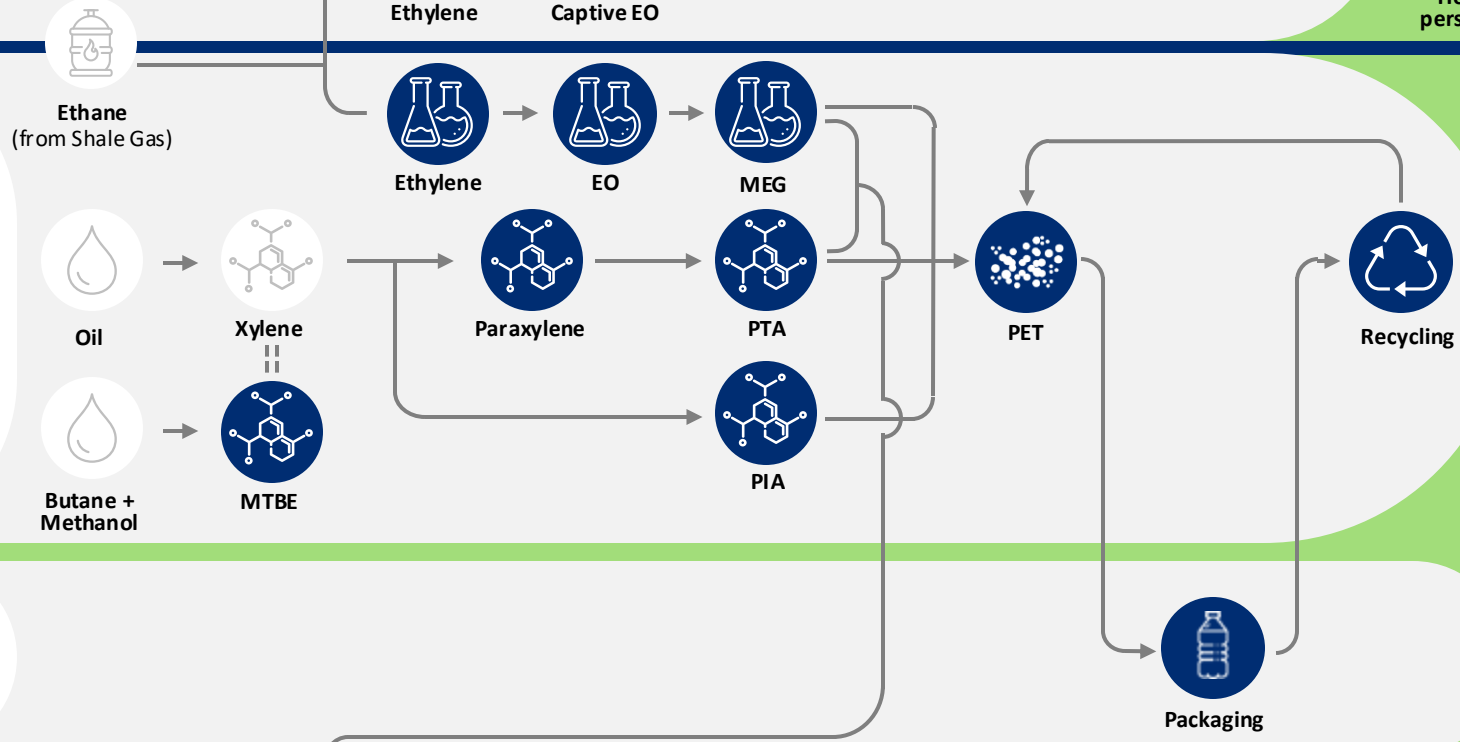
Indovina



Example end markets



CPET



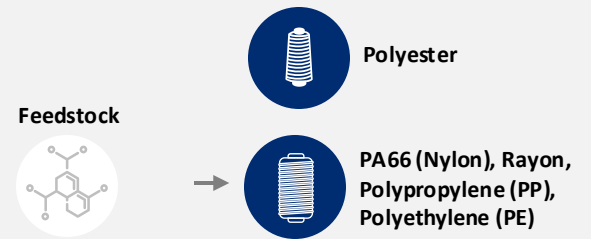
Example end markets



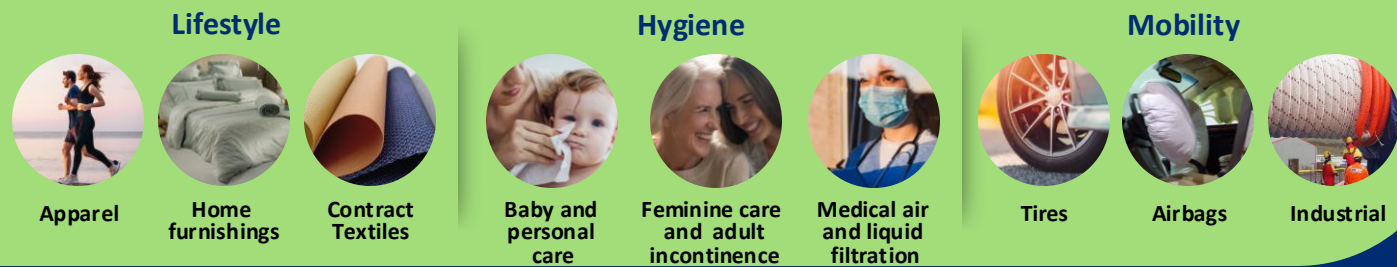
Indovida



Fibers



Example end markets



Indovinya Company snapshot



Presence in

10

countries



15

manufacturing locations



3000

employees



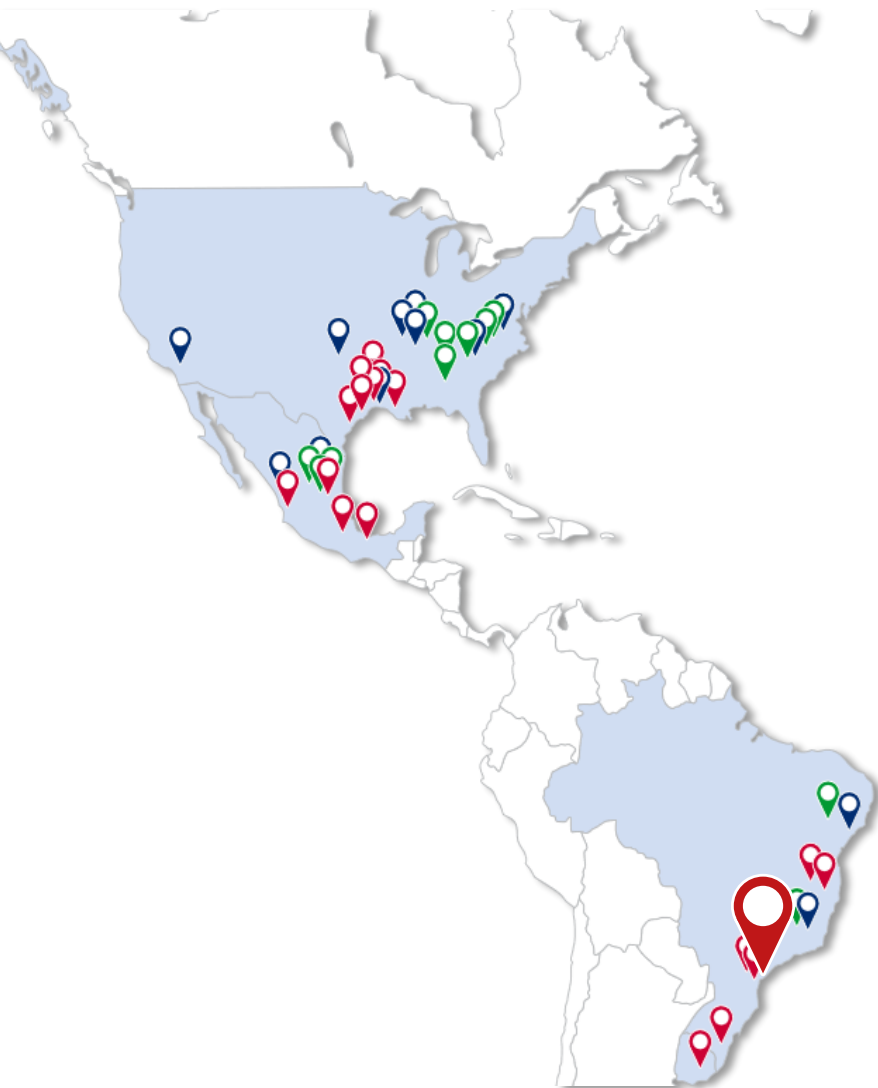
10

R&D centers



INDORAMA VENTURES - INDOVINYA

Suzano, Brazil



A specialty chemicals manufacturing site producing surfactants and derivatives for Home & Personal Care, Industrial Applications, and Crop Solutions. The Suzano supports reliable regional supply, formulation flexibility, and portfolio innovation across Latin America.

Indorama Ventures | Deployment Model

Global to Frontline: Where Analytics Becomes Value



Connected to Frontline
Where **Decisions** Become **Dollars**

Highlights



Chemical
Engineering



Undergraduate
Research Fellow in
Modeling and
Simulation



Digital &
Process
Engineer

Experience – 2 Years

Chemical Engineering,
Continuous Improvement Leader – Suzano Site (2 years)
Digital & Automation Leader – Suzano Site (1 year)
Process Engineer (2 years)

Advanced Industrial Analytics (Or AIA) For Everyone



Industrial
analytics early
adopter

*2 years as a champion
Seeq user, driving AI
prompt adoption and
setting the benchmark
at SAR*



Visionary
leader

Turning vision into
execution by connecting
people, analytics, and
business priorities while
accelerating value through
shared successes.



Tech. Anchor
to scale
capabilities

Anchoring scalable
analytics capabilities
and supporting the
global expansion of AIA
adoption across IVL
sites.

Lucas Celoto

I'm driven by data analytics and emerging technologies, and I strongly believe that transformation happens when people are engaged, connected, and empowered through shared knowledge.

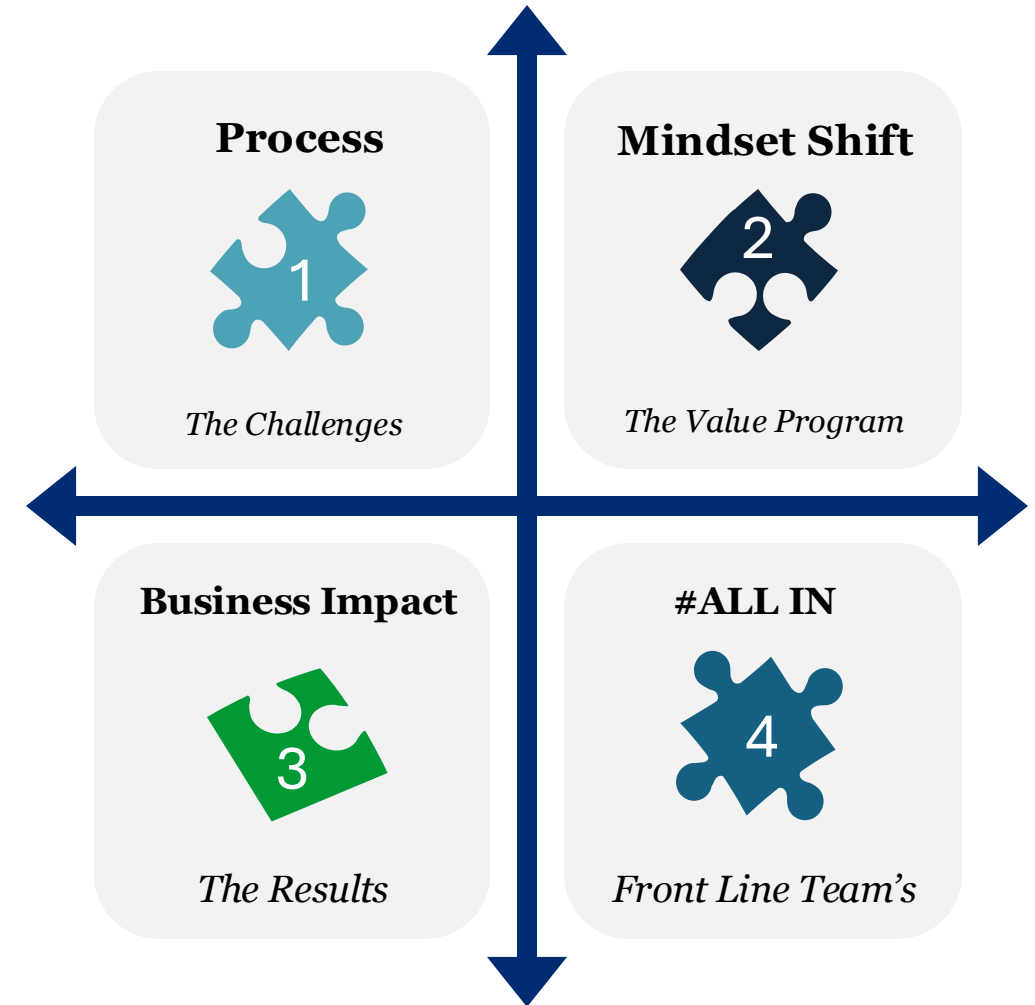
Culture Eats Strategy for Breakfast - Shaping the Future Together

Turning analytics into daily behavior

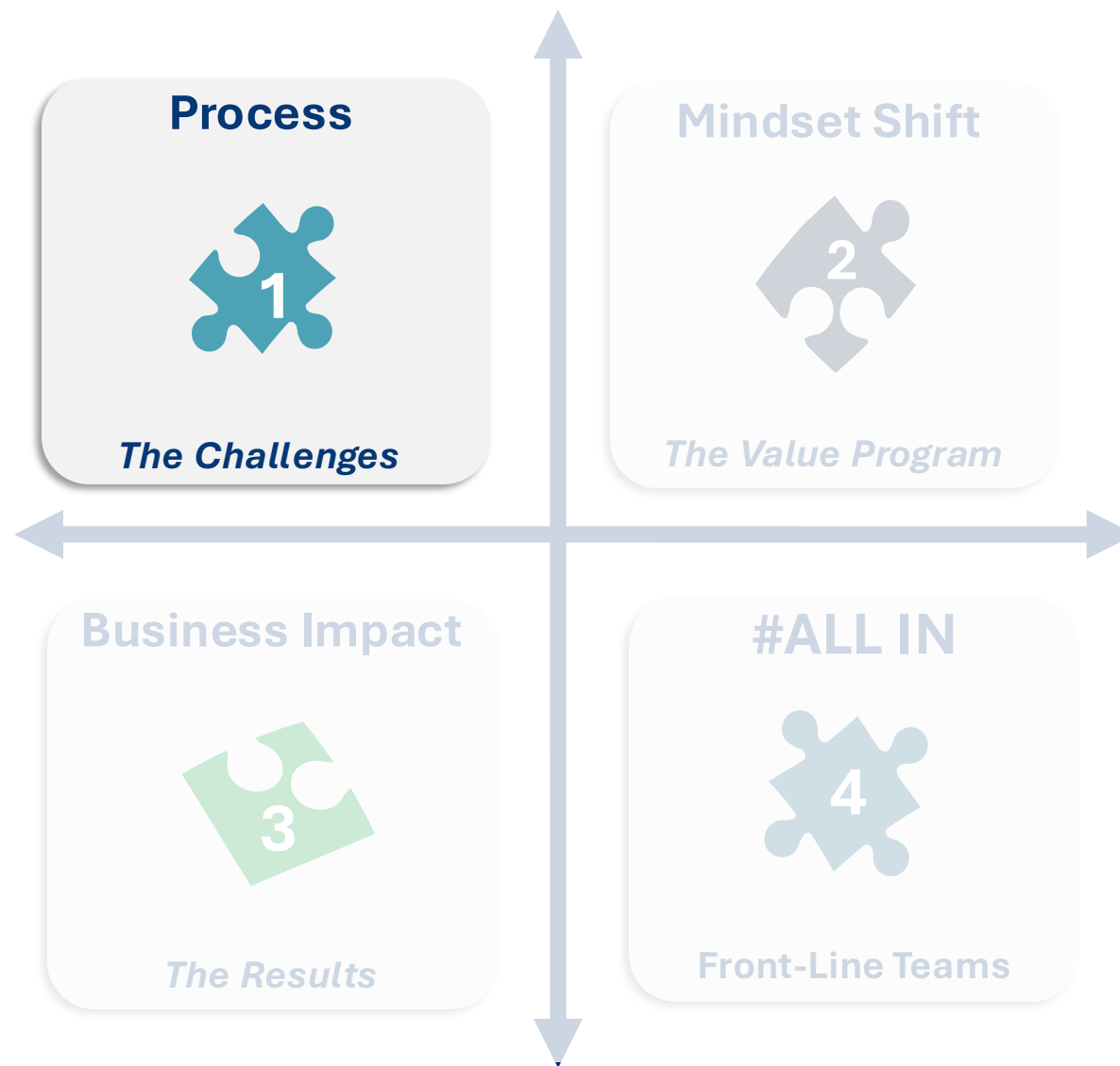


Transformation

Creating Value
Through Cultural
Transformation



“Culture Eats Strategy for Breakfast” – Peter Drucker



Scaling Demand Requires Scalable Ways of Working

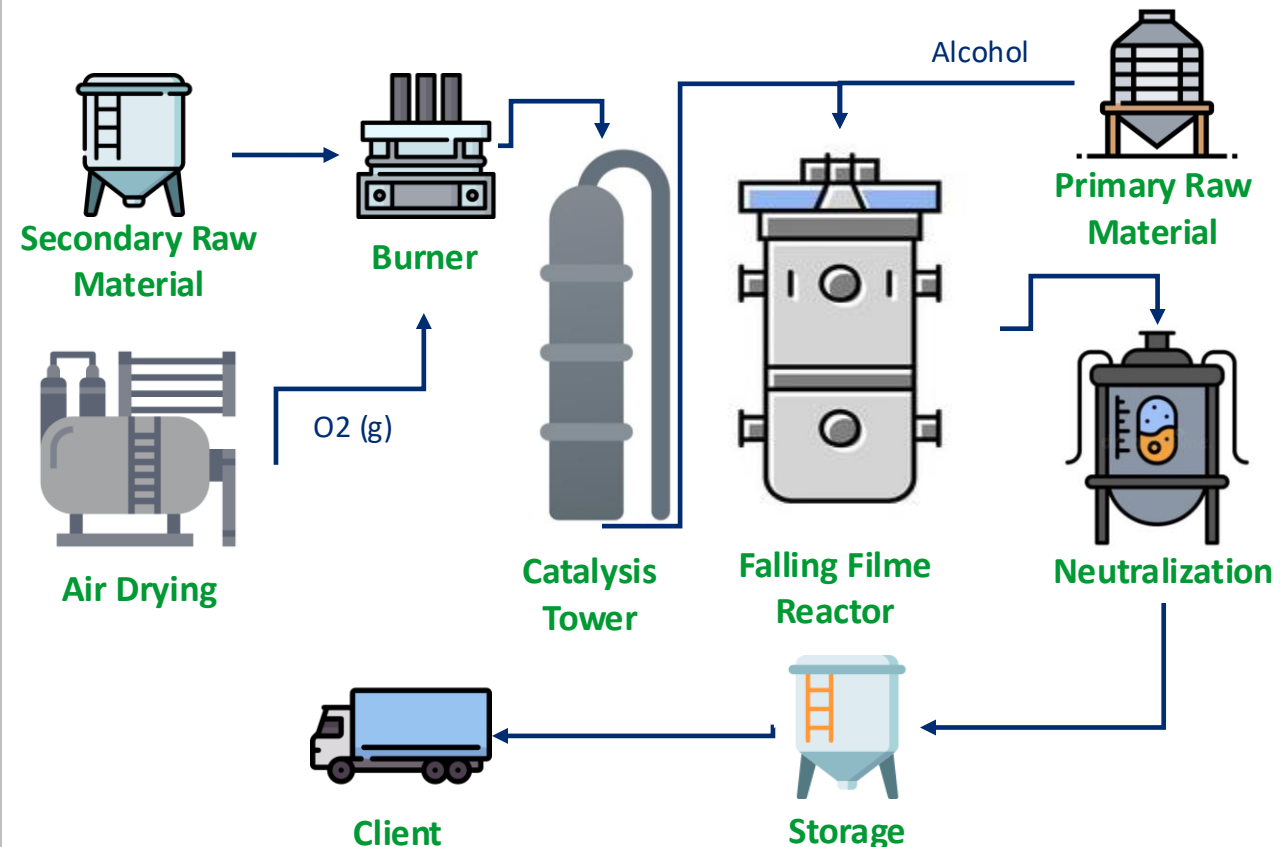
Rising Home & Personal Care demand required a step-change in efficiency and decision-making

Process



The Challenges

Sulfation – End-to-End Process Overview



Background: Growth Enabled by Analytics and Trust

The Suzano sulfation unit is a **continuous operation** and a strategic manufacturing asset, serving approximately **30% of the Home and Personal Care customers across South America**.

Business & Operational Challenges

- **Rapid increase in Home & Personal Care demand** – 18% growth in volume requirements
- **Need to produce more without additional assets** - More output, same assets
- **Higher operational complexity and variability** - increased impact on stability and performance
- **Decisions needed to be faster, aligned and data-driven** - enabling proactive operations

Problem Statement:

Cross-functional collaboration, supported by Seeq and driven by trust in analytics, enabled teams to operate with **greater productivity**, shift from corrective actions to **predictive and preventive practices**, and sustain performance at scale.

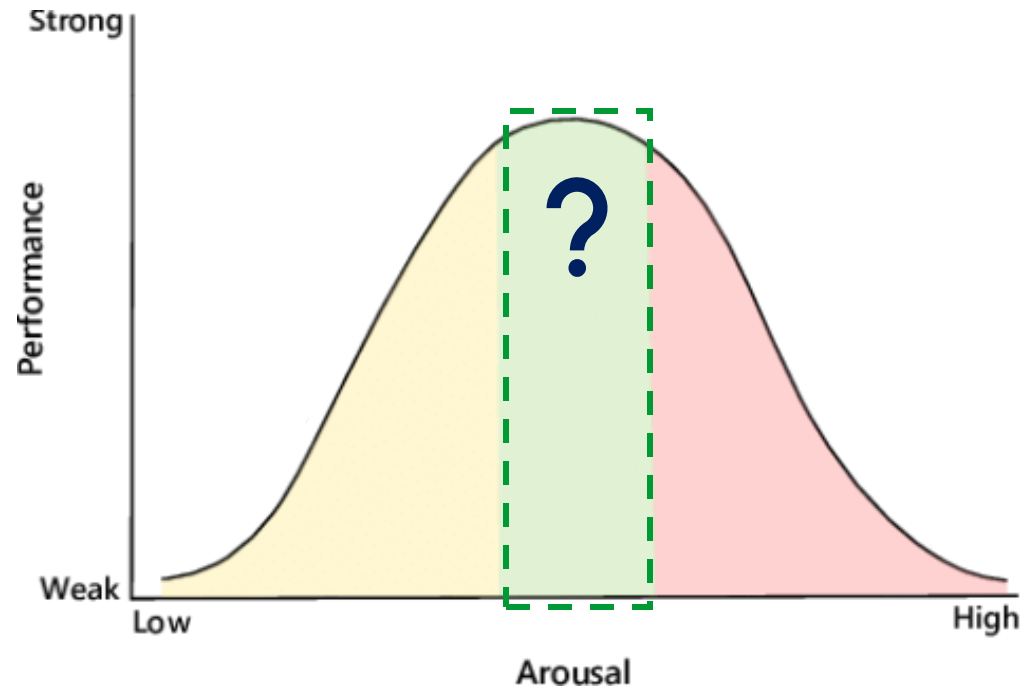
So, How Do We Make It Happen?

Doing more with the same assets by aligning people, processes, and analytics.



How do we move forward?

Yerkes-Dodson law



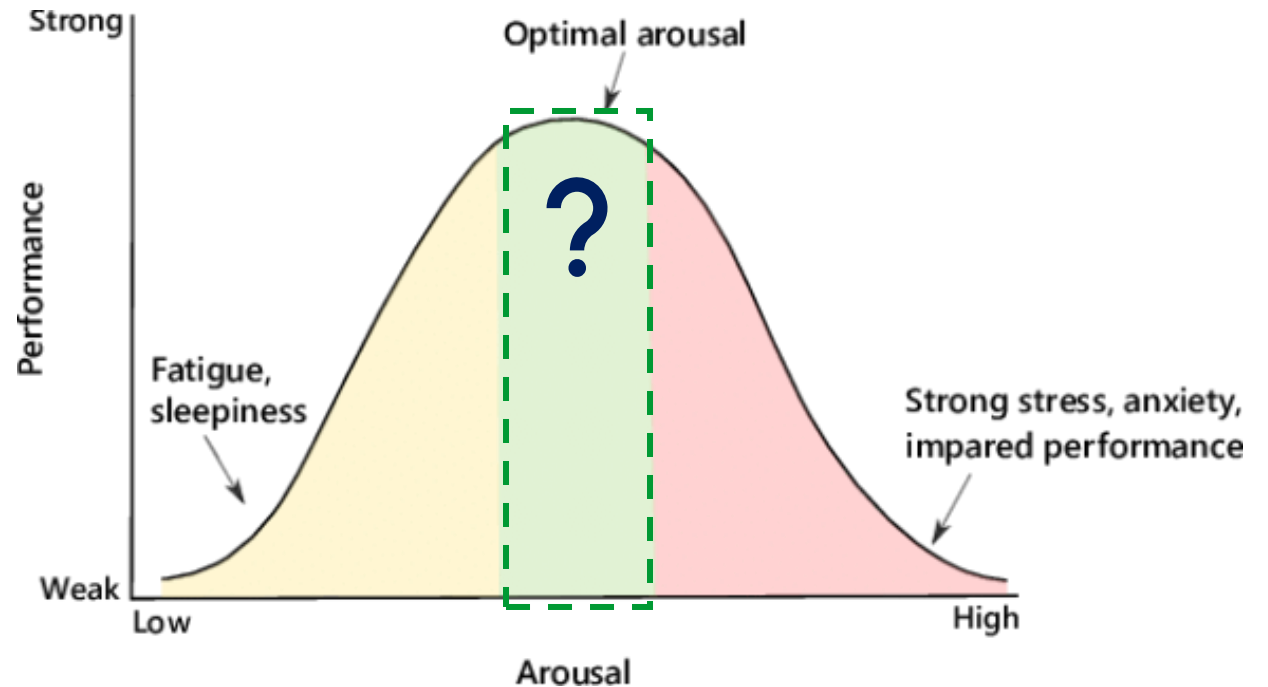
"Performance increases with arousal but only to a certain point: when levels of arousal become too high, performance will decrease."

So, How Do We Make It Happen?

Doing more with the same assets by aligning people, processes, and analytics.

SeeQ®

Yerkes-Dodson law



"Performance increases with arousal but only to a certain point: when levels of arousal become too high, performance will decrease."

So, How Do We Make It Happen?

Doing more with the same assets by aligning people, processes, and analytics.

SeeQ®

Trust

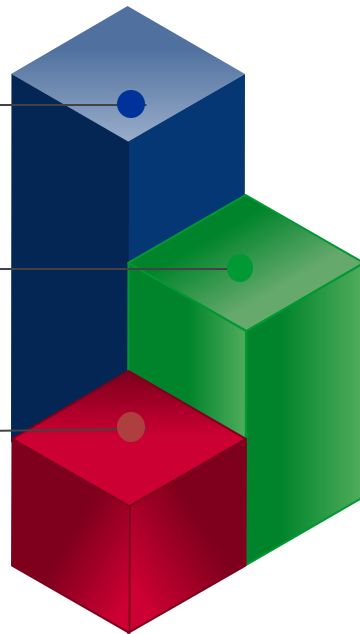
Confidence in data, process, and analytics.(SeeQ Tool)

Alignment

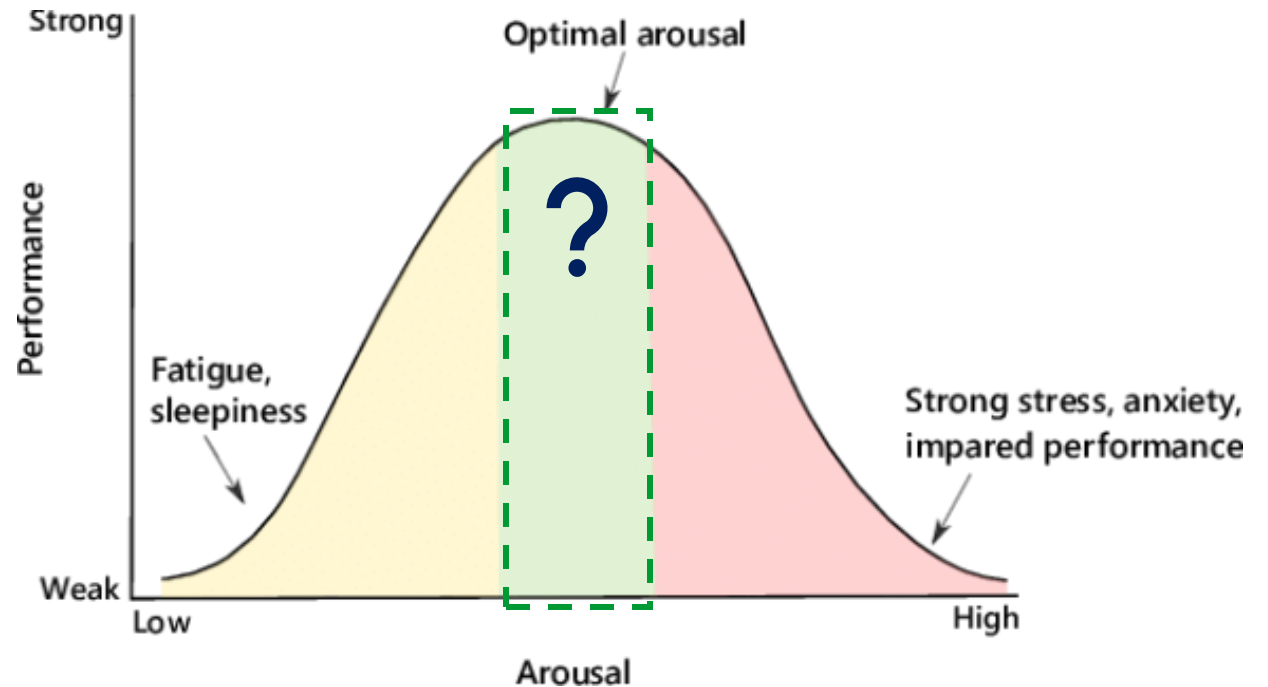
Everyone moving in the same direction.

Engagement

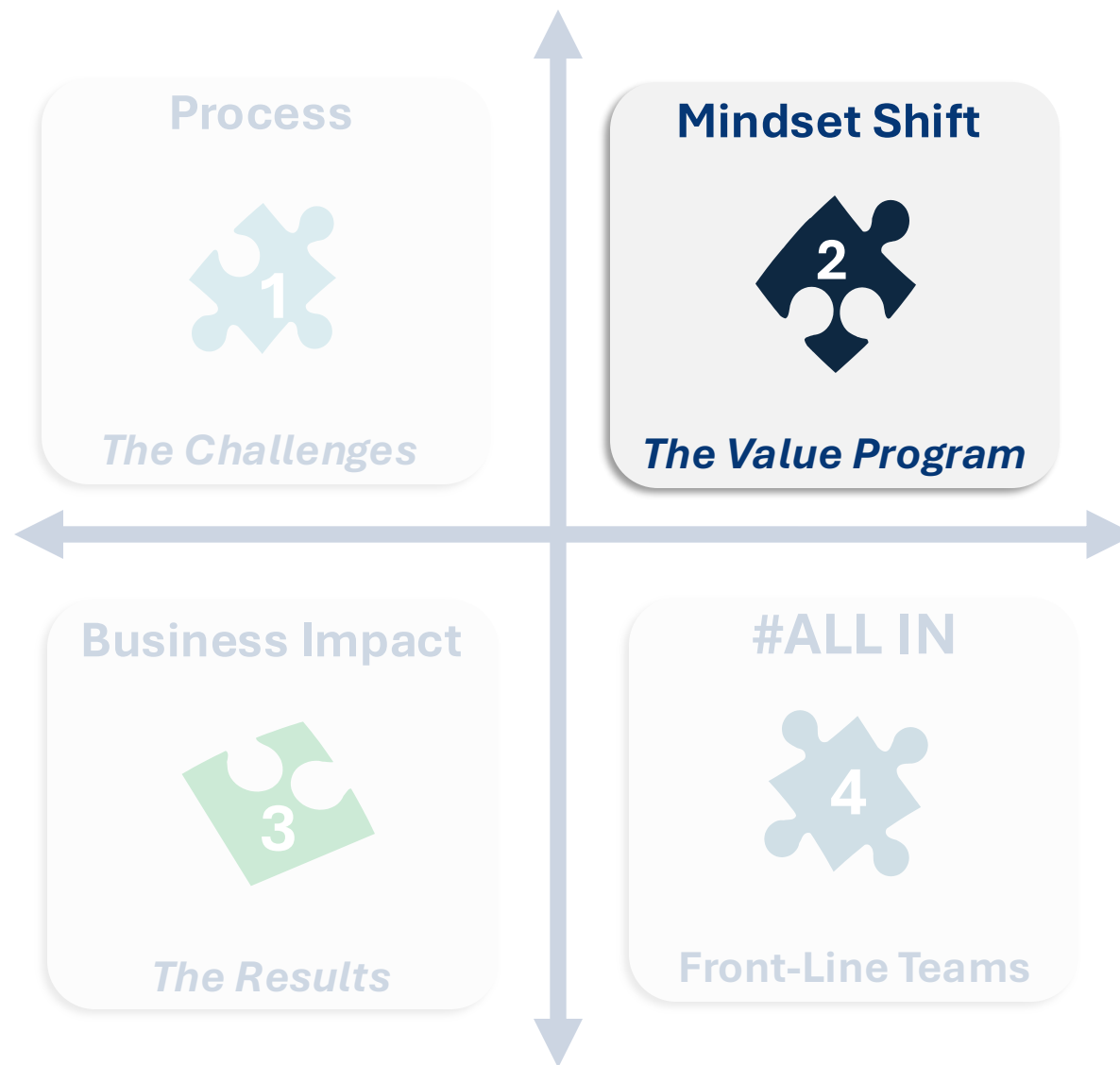
People actively involved in daily decisions.



Yerkes-Dodson law



"Performance increases with arousal but only to a certain point: when levels of arousal become too high, performance will decrease."



Building the Foundation for Sustainable Digital Adoption – V.A.L.U.E

Incorporating the Value Delivery of 1 2 3 Process + Empowering/Engaging our Great Assets, Our People

Mindset Shift



The Value Program

Maximize engagement and drive impactful results with
clear communication, inspired teamwork, commitment
and a clear path to success

V

Site Seeq Kick-off

"Seeq Day | Welcome + AIA
Champion Program"

A

Seeq Ideation Workshop

Define "Seeq Wallet"

L

Project Prioritization

Kick-off High-Priority Projects

U

Value Delivery

Execution + Follow-up +
Exchange of Experience

E

Post-Audit

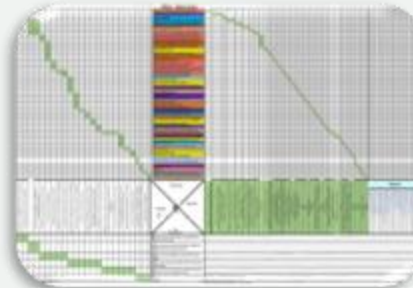
KEY + More Value Sharing



Driving early engagement and
establishing a clear starting
point for digital adoption.



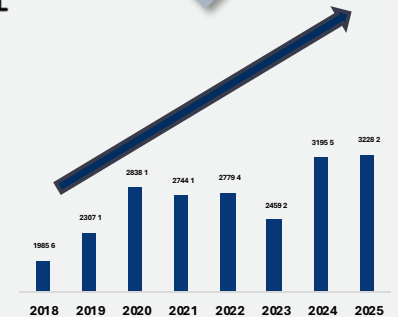
Collaborative ideation to define
meaningful use cases and build
shared ownership.



The X-Matrix ensured value-based
prioritization aligned with our
strategy and governance.



Biweekly follow-ups monitored
deadlines, owners, and progress to
ensure consistent value delivery.



Sustained productivity gains
demonstrate how cultural adoption
converts analytics into long-term value

Diversity of Thought Drives Performance – Ideation WS

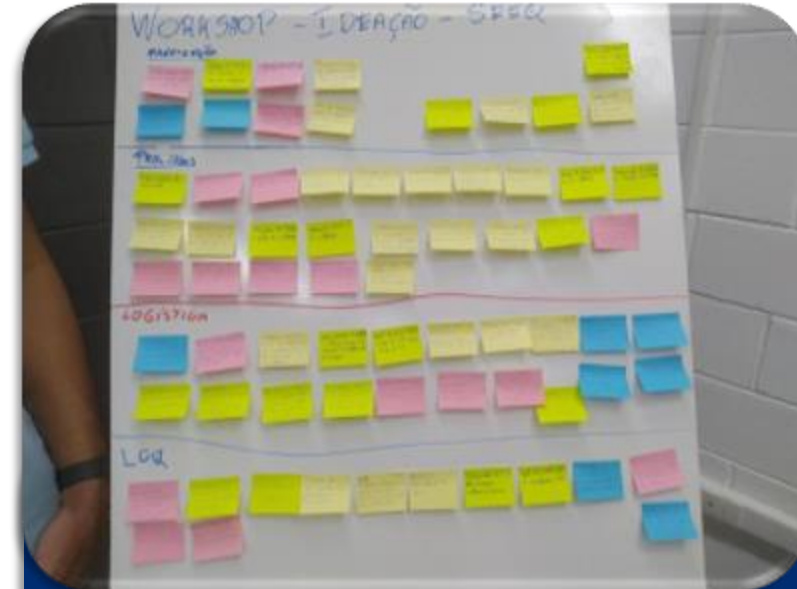
Cross-functional alignment to turnkey pain points into high-impact use cases



On-site “Seeq Day”



Diverse Collaboration Team



Creating the Seeq Wallet

45

Identified
Initiatives

22

Potential
Projects

20

Completed
Projects

From Many to Most Effective | Operational Prioritization & Execution

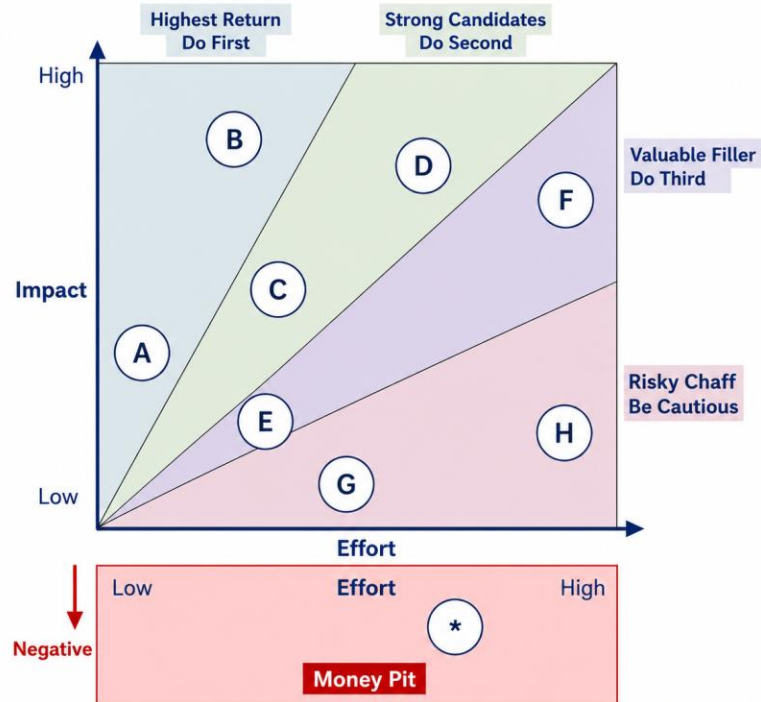
Cross-functional alignment transforming pain points into high-impact use cases

Mindset Shift



The Value Program

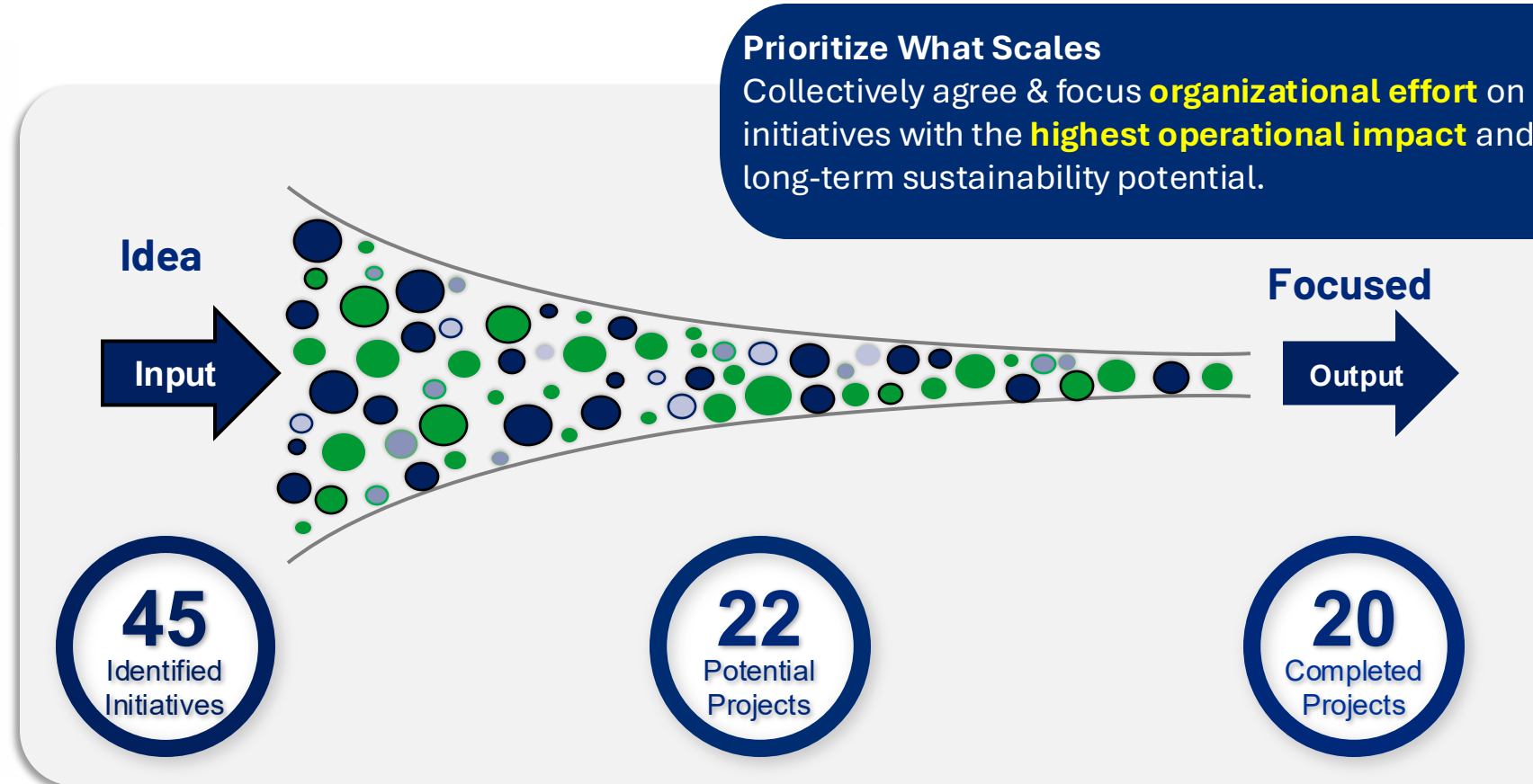
R.I.C.E Score Method



ClaytonKjos.com

Prioritize What Scales

Collectively agree & focus **organizational effort** on initiatives with the **highest operational impact** and long-term sustainability potential.



Where Diverse Expertise Meets Digital Transformation

Enabling plant-wide operational excellence through cross-functional analytics collaboration



Internal Logistics

Connecting material flow and data to ensure operational continuity and efficiency.



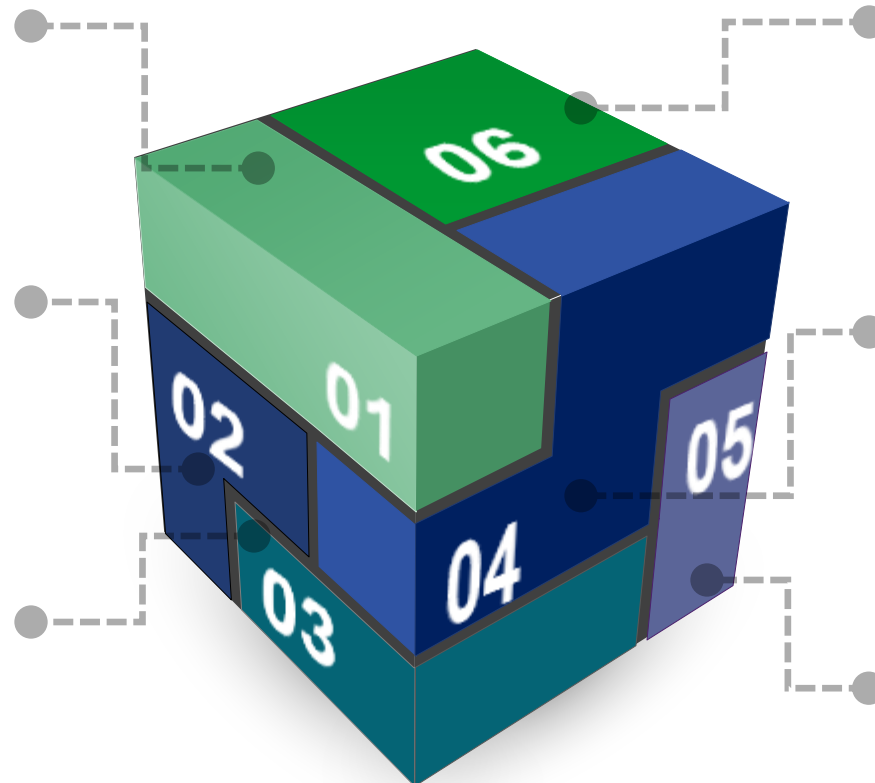
Maintenance

Anticipating failures and improving reliability through data-driven decisions.



Process Eng.

Optimizing processes by turning analytics into actionable insights.



Production

Embedding analytics into daily routines to drive performance and stability.



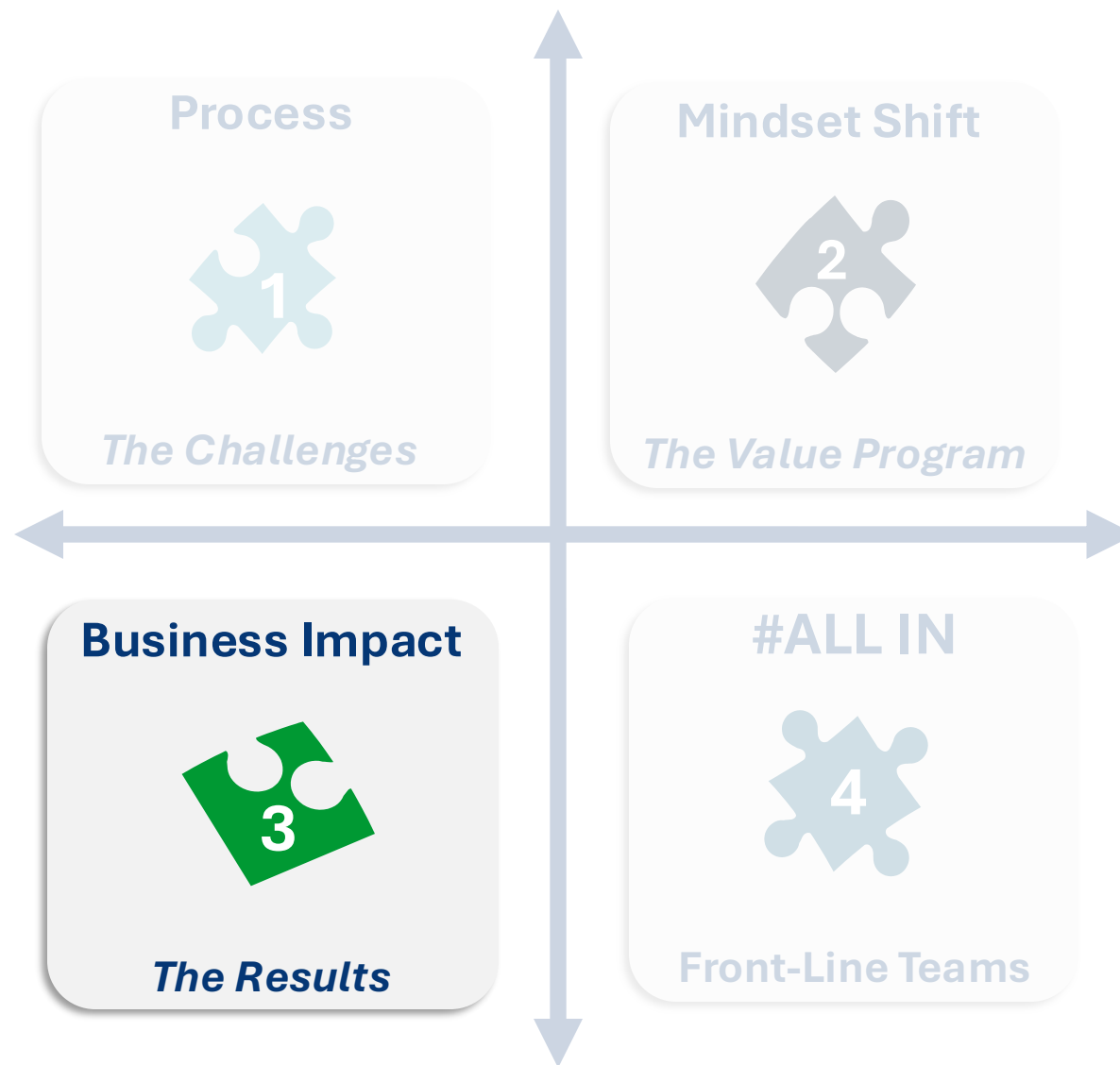
EHS

Aligning planning and control through shared data and integrated decisions.



QC Laboratory

Ensuring product quality by integrating analytics into testing and validation.



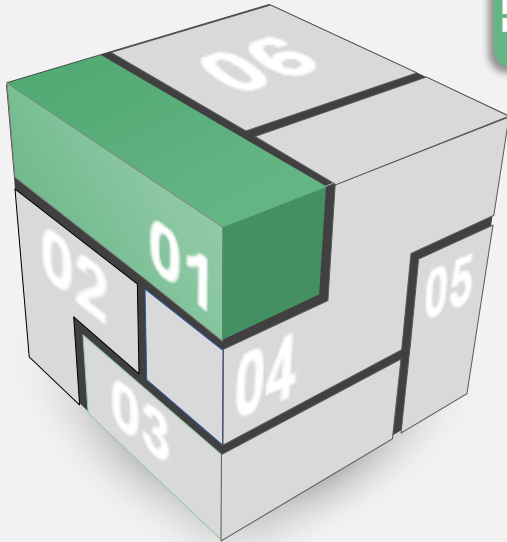
The Hidden Engine of Operations | Logistics

Standardized automated loading profile & accelerating truck throughput.

Business Impact

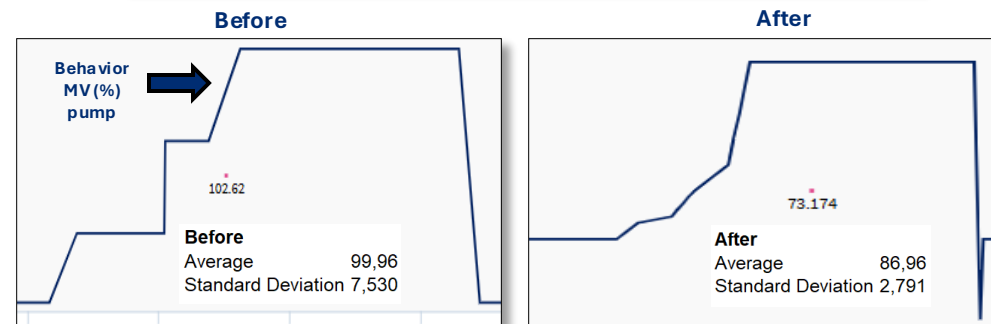
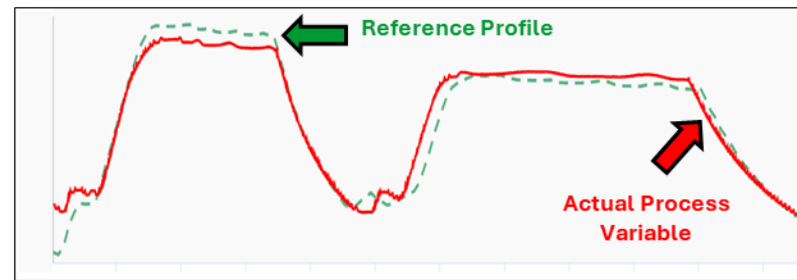


The Results



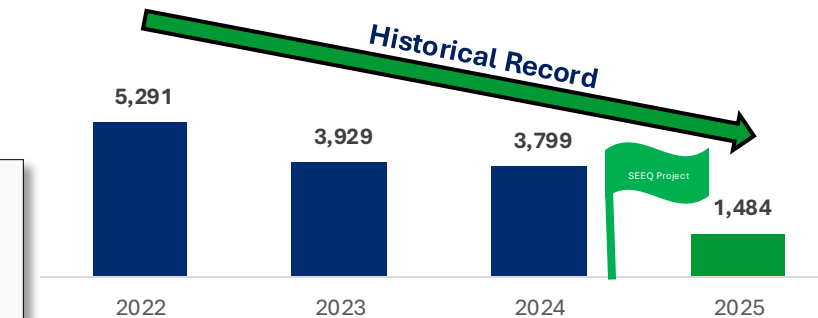
Internal Logistics

Project: Automated Pump Ramp-Up for Optimized Sulfonation Loading



Automation of a sulfonation product loading ramp to standardize and optimize bulk loading. Due to foaming behavior, a **controlled start-up profile** was required. Seeq was used to define the **“golden” ramp**, enabling automation and supporting safer, more efficient daily operations.

Historical – Truck dwell time Suzano



Tools used

Identify value
Reference profile
Signal smoothing
Formula

Operational Impact

60%
Reduction
time

Automation standardized loading execution, reduced dwell time variability, and improved daily logistics performance.

16 min
MH per
truck



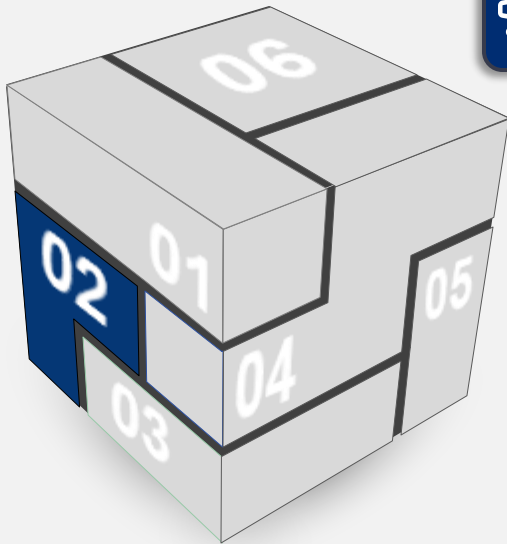
Transforming Maintenance Through Predictive Analytics

Shifting from reactive response to proactive reliability

Business Impact



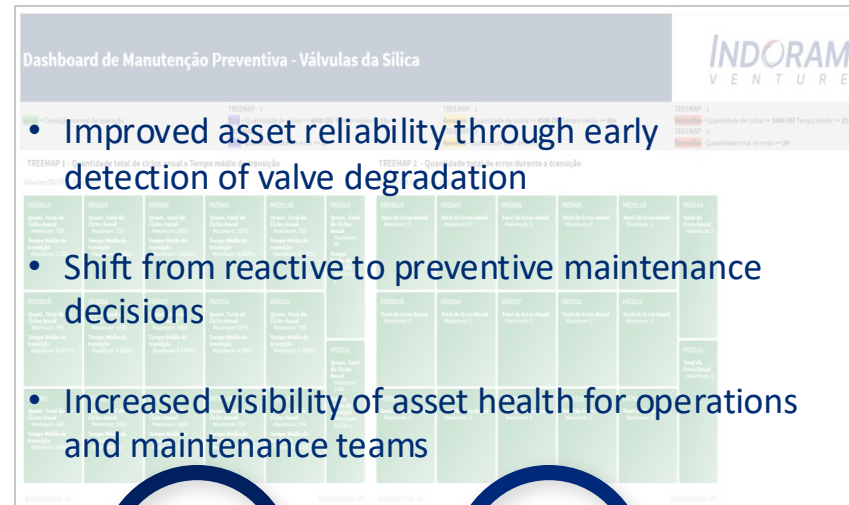
The Results



Maintenance

Projects: Predictive maintenance for valves and assets.

Monitoring ON/OFF valves Silica



49 h

Reduction
downtime

11 %

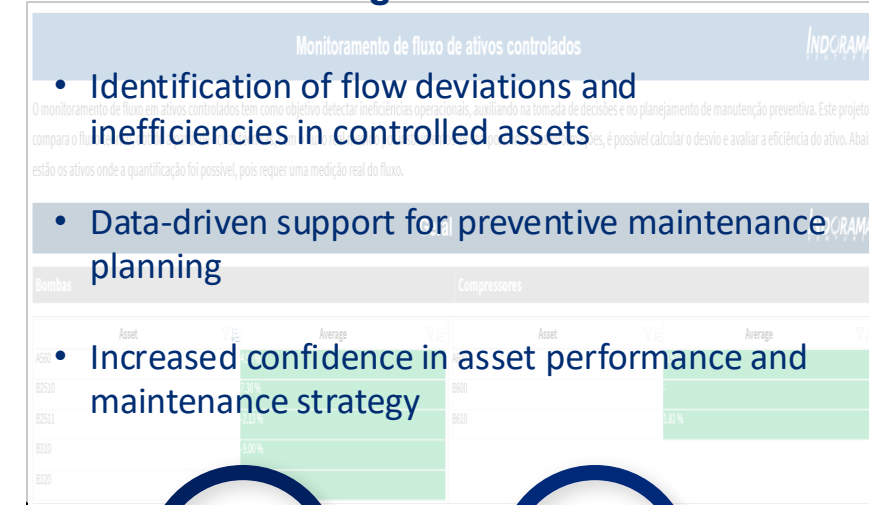
+ preventive
maintenance

Turning Data Into Maintenance Decisions

Enabled **proactive maintenance** decision-making through **analytics-driven monitoring** of critical valve behavior.

Improved operational reliability by **identifying deviations** between **expected & actual** process performance.

Flow monitoring of controlled assets



132 h

Reduction
downtime

29 %

+ preventive
maintenance



Tools used

Identify value
Tree Map
Asset Tree
Scorecard Metric
Formula

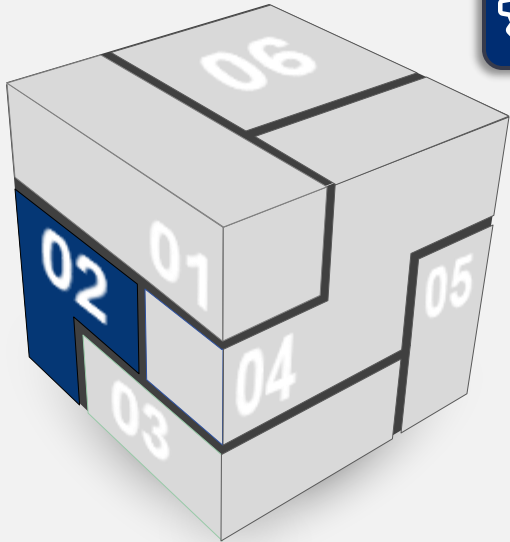
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YOUR NEEDS, OUR CHEMISTRY

The Result | Transforming Maintenance Through Predictive Analytics

Shifting from reactive response to proactive reliability



Maintenance

Project: Predictive maintenance for valves and assets.



Tools used

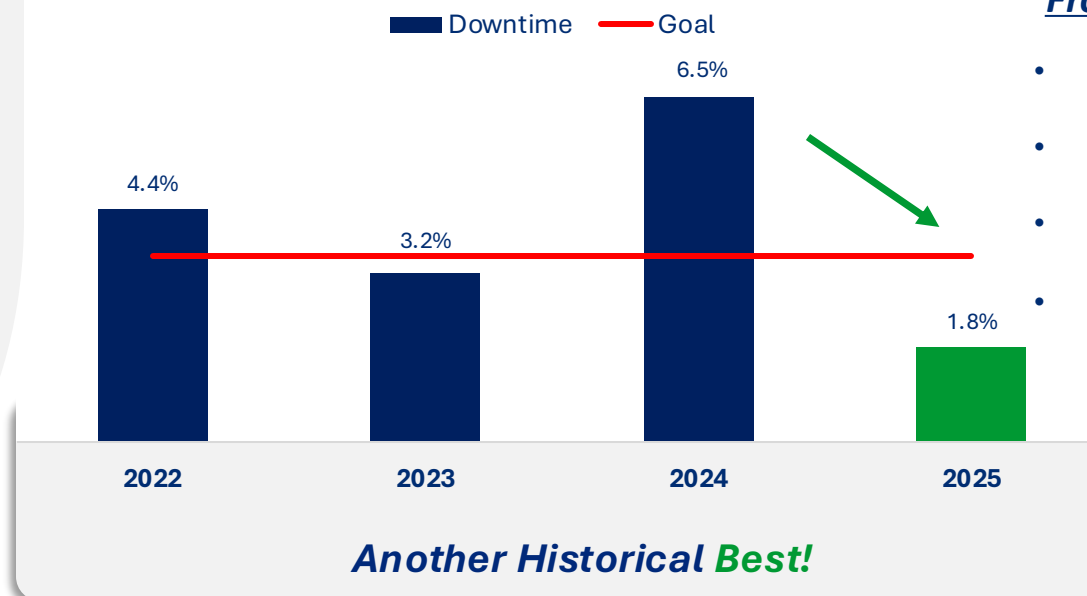
Identify value
Tree Map
Asset Tree
Scorecard Metric
Formula

Turning Data Into Maintenance Decisions

Enabled **proactive maintenance** decision-making through **analytics-driven monitoring** of critical valve behavior.

Improved operational reliability by **identifying deviations** between **expected & actual** process performance.

Downtime due to corrective maintenance



From Detection to Proactive Action

- Lowest Corrective Maintenance Downtime on **Record**
- Downtime Reduced **Well Below Target**
- Clear Break from **Historical Volatility**
- Sustained Improvement in **Asset Availability**

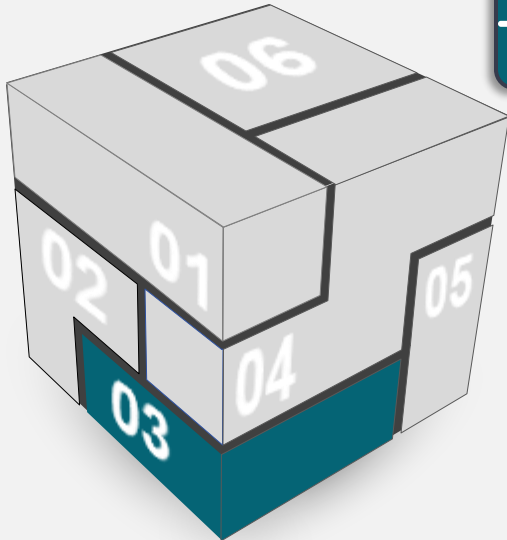
Turning Process Data into Operational Action | *Process Engineering*

Enabling process stability, efficiency, and cost reduction through analytics-driven optimization

Business Impact



The Results



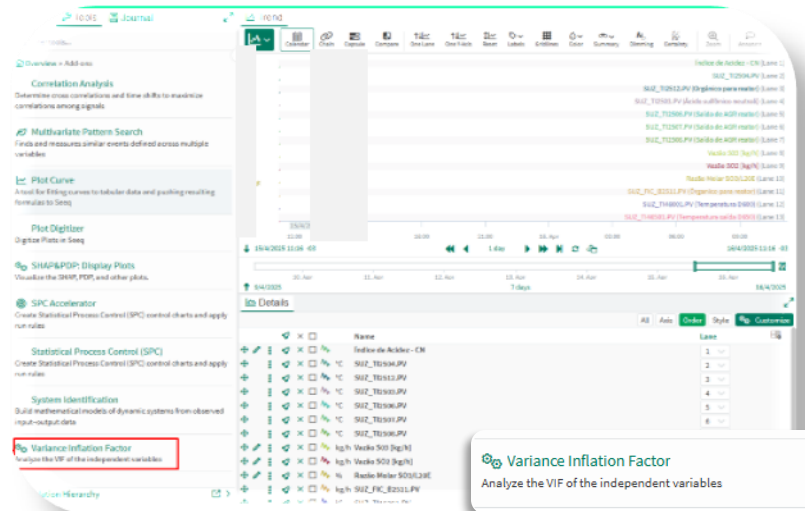
Process Eng.

Project: Sulfation Optimization Key Process Parameters



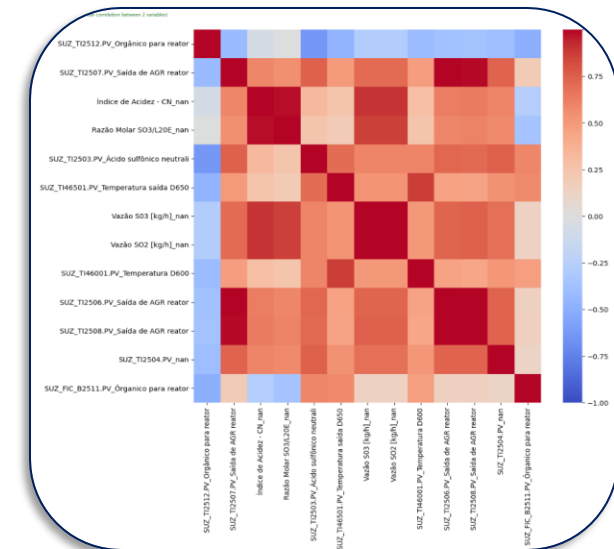
Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric
Add-ons
Tree Map
Asset Tree
Formula



Selected Variables & Using Variance Inflation Factor
Tool based on “Sulphonation Technology” by Hernan de Groot and Plant Knowledge & Experience

Defining **optimal operating parameters** for the sulfation process using DMAIC methodology. By leveraging real-time mass balance and **process correlations**, it **reduced alcohol consumption** while **maintaining product quality** and **improving reactor efficiency**



The result shows a **heat map** between all variables and the **strength of their correlations**, also allowing **conditions for Filtering**.

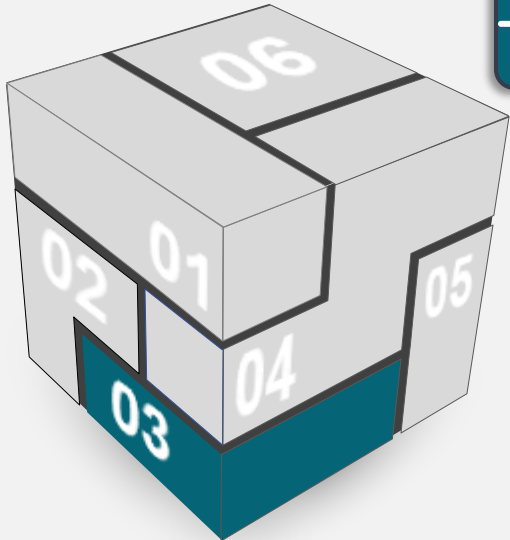
Turning Process Data into Operational Action | Operational Excellence

Transforming Operational Insights into Frontline Decisions

Business Impact



The Results



Process Eng.

Project: Sulfation Optimization Key Process Parameters

Defining **optimal operating parameters** for the sulfation process using DMAIC methodology. By leveraging real-time mass balance and **process correlations**, it **reduced alcohol consumption** while **maintaining** product **quality** and **improving reactor efficiency**

From Analytical Insights...



Based on the results, variables that achieved a correlation greater than 0.70 were selected, which were:

- Temperature of the top of the Falling Film Reactor
- Temperature of the alcohol inlet into the reactor
- Temperature of the cooling water for each of the three reactor passes
- Temperature of the product outlet from the bottom of the reactor
- Temperature of the first neutralizer vessel
- Temperature of the second neutralizer vessel

...into Operational Performance

Expanding to the Ops Board for enhanced oversight.

Panel operator with direct view of critical parameters in DCS

Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric
Add-ons
Tree Map
Asset Tree
Formula

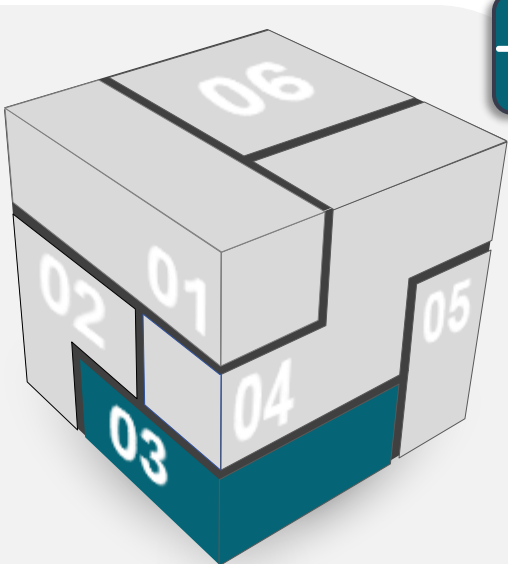
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The Result | Turning Process Data into Operational Action

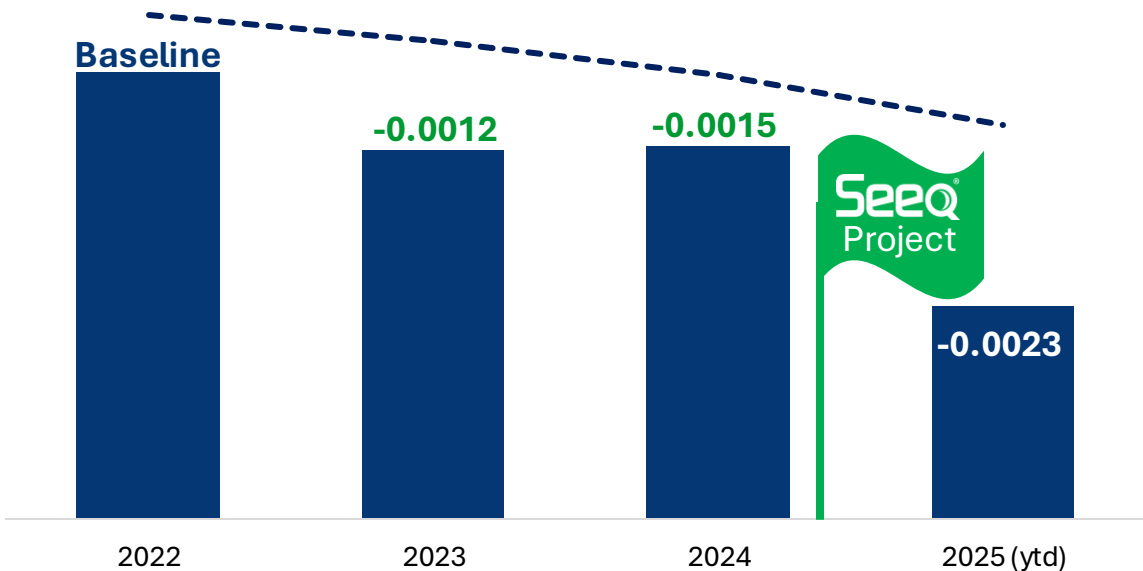
Transforming Operational Insights into Frontline Decisions



Process Eng.

Project: Sulfation Optimization Key Process Parameters

Defining **optimal operating parameters** for the sulfation process using DMAIC methodology. By leveraging real-time mass balance and **process correlations**, it **reduced alcohol consumption** while **maintaining** product **quality** and **improving reactor efficiency**



Lower **technical index** driving stronger **unit economics** and improved **variable-cost performance**.



Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric
Add-ons
Tree Map
Asset Tree
Formula

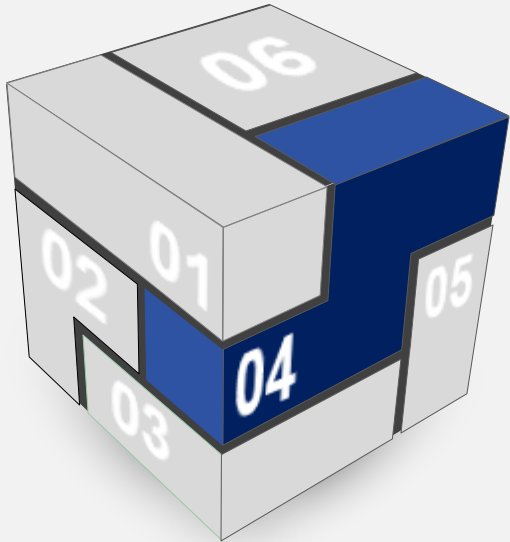
Predicting Risk Before Escalation

Protecting people, assets, and the environment

Business Impact



The Results



EHS

Project: PSV Pre-Opening Dashboard

Project establishes **real-time detection** of PSV pre-opening conditions, automatically **flagging the event in red** on the control system & **triggering immediate email** alerts to the maintenance and operations teams.



Pre-opening of PSV



Normal operating conditions



Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric
Add-ons

Tree Map
Asset Tree
Formula



Real-Time Safety Escalation

Immediate e-mail alerts for safety risks and abnormal conditions.

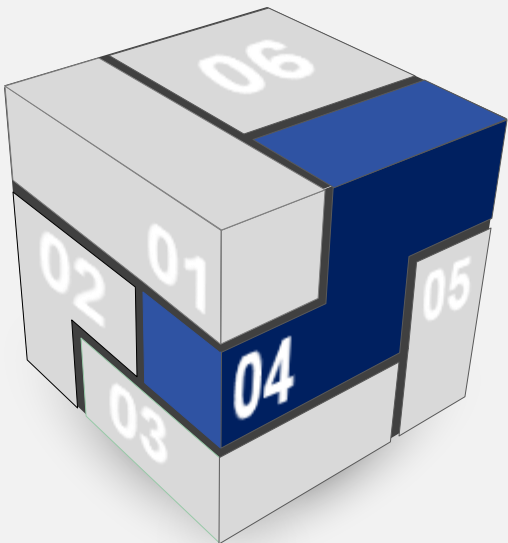
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Proactive Safety. Operational Discipline.

Protecting people, assets, and the environment



EHS

Project: PSV Pre-Opening Dashboard



Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric Add-ons

Tree Map
Asset Tree
Formula

Process Safety – Tier 1 and Tier 2 Events



Zero Tier 1/2 events are sustained through **proactive operational discipline**, enabled by real-time **analytics** and **rapid escalation visibility**.

Project establishes **real-time detection** of PSV pre-opening conditions, automatically **flagging the event in red** on the control system & **triggering immediate email** alerts to the maintenance and operations teams.



“Our EHS purpose is clear: **safety** is more than a priority: it’s a **value**.”

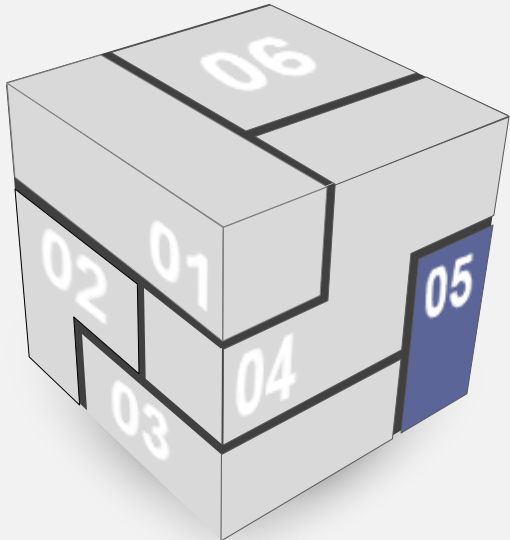
Quality as a Competitive Advantage

Ensuring consistency, compliance, and customer trust

Business Impact

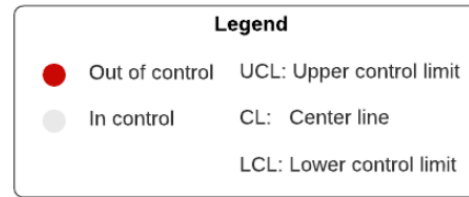


The Results



QC Laboratory

Project: Control Chart Quality Analysis

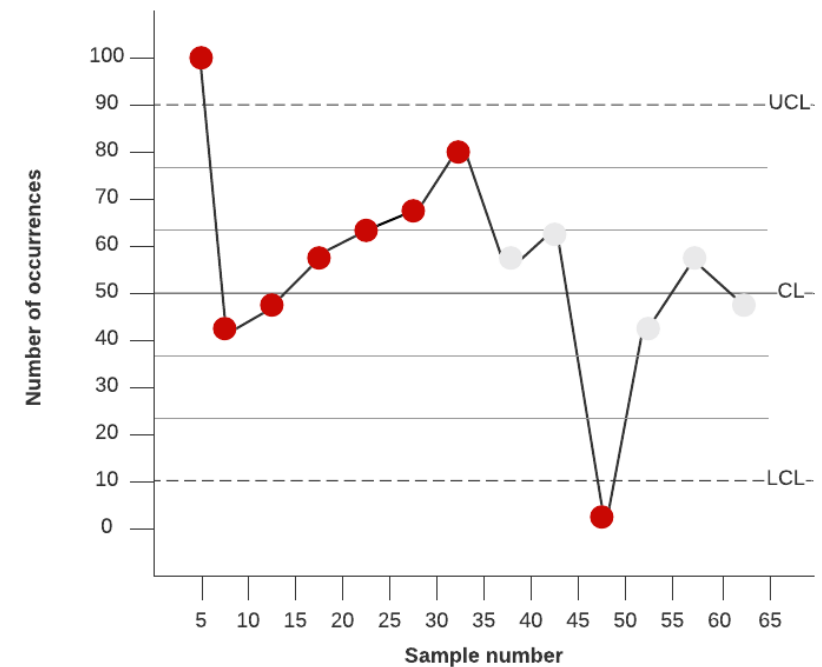


Anticipates **quality issues** before final product completion.

Forecasts final product quality using live process data.

Minimizes off-spec production and **material losses**.

Control Charts enable real-time visibility into process stability by **comparing current analytical results** against **historical performance**—supporting early detection of variability and proactive quality control.



Tools used

Identify & Value Search
Quantify & Signal
Signal Smoothing
Scorecard Metric
Add-ons
Tree Map
Asset Tree
Formula

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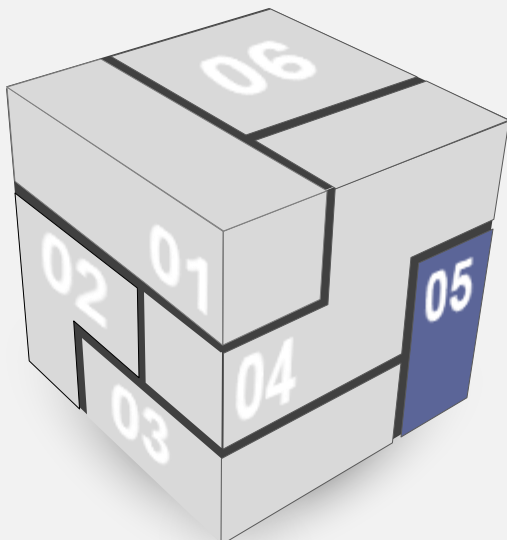
Quality as a Competitive Advantage

Ensuring consistency, compliance, and customer trust

Business Impact



The Results



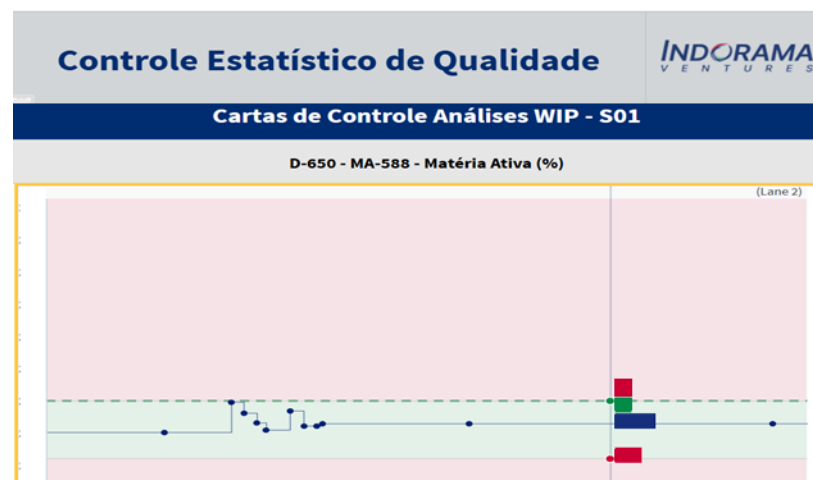
QC Laboratory

Project: Control Chart Quality Analysis



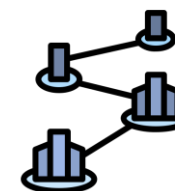
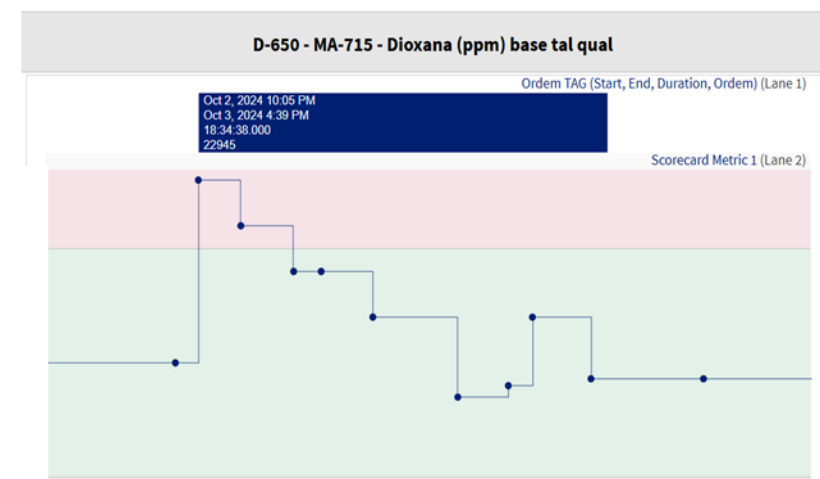
Tools used

- Identify & Value Search
- Quantify & Signal
- Signal Smoothing
- Scorecard Metric
- Add-ons
- Tree Map
- Asset Tree
- Formula



This solution was designed to be universally applicable, **covering all analytical methods** and the entire sulfation product portfolio, **enabling a standardized and scalable approach to predictive quality control.**

Control Charts enable real-time visibility into process stability by **comparing current analytical results** against **historical performance**—supporting early detection of variability and proactive quality control.



Enabling fast and scalable rollout

Transforming quality visibility into actionable performance



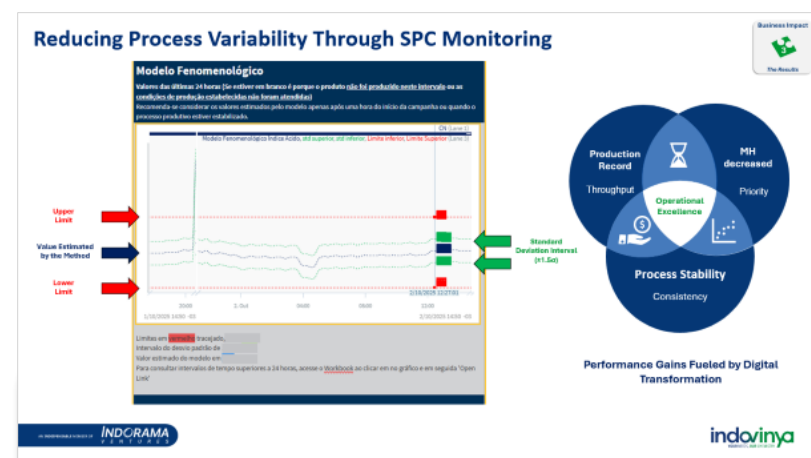
Project: Acidity Index Soft Sensor

- Tree Map
- Asset Tree
- Formula



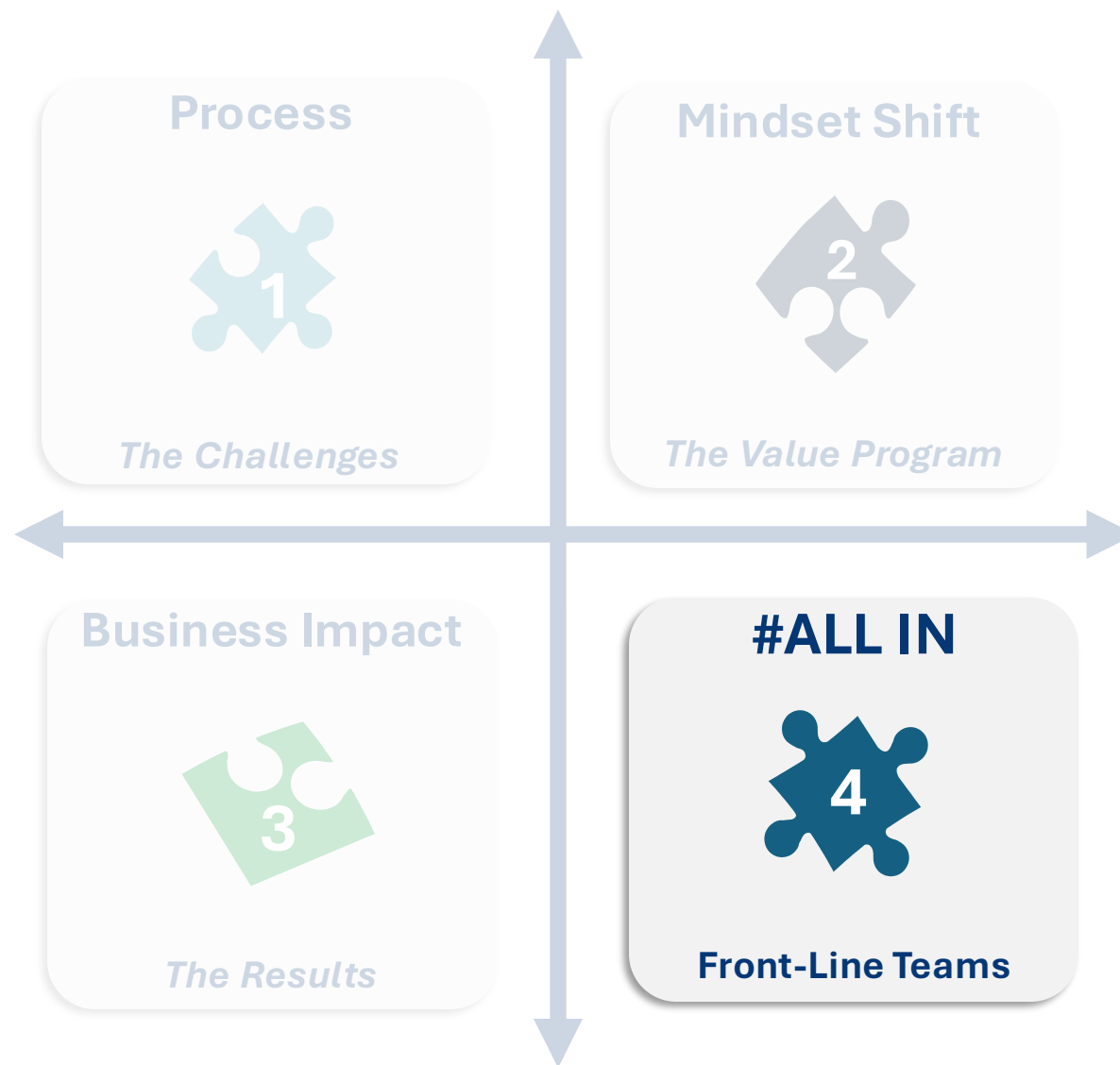
Enables early detection of IA deviations,
**reducing reaction delays & stabilizing reactor
performance.**

Hybrid **soft sensor** leveraging phenomenological **modeling & machine learning** to provide **real-time Acid Index** estimation in reactor R-2510, **minimizing lab analyses** & enhancing **quality control**.



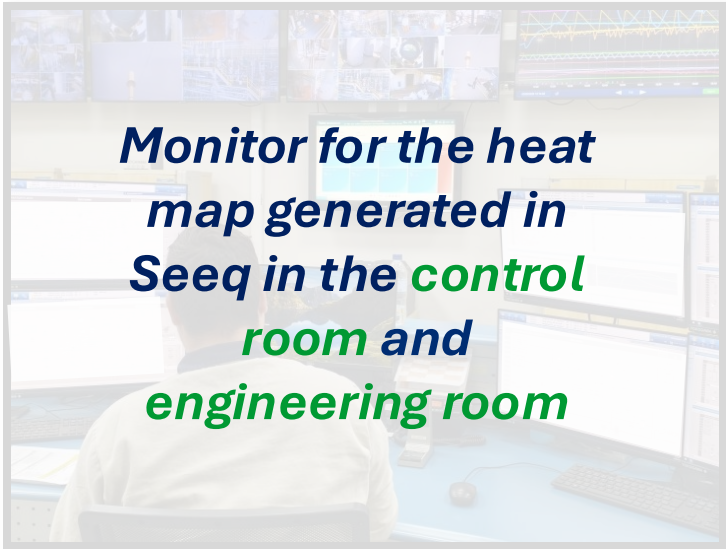
Supports **tighter control** of reaction conditions,
reducing variability and **off-spec risk**.

**Scalable digital solution across products
– easy rollout**

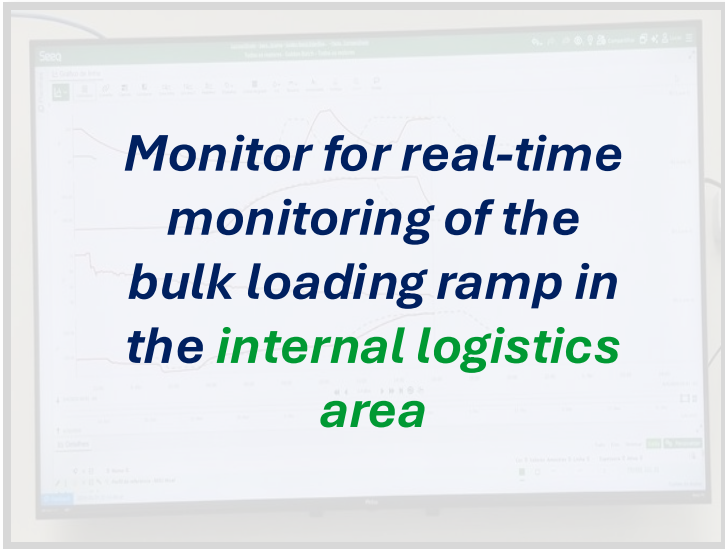


Digital Transformation from the Frontline

Engaging operators as key contributors to planning and execution



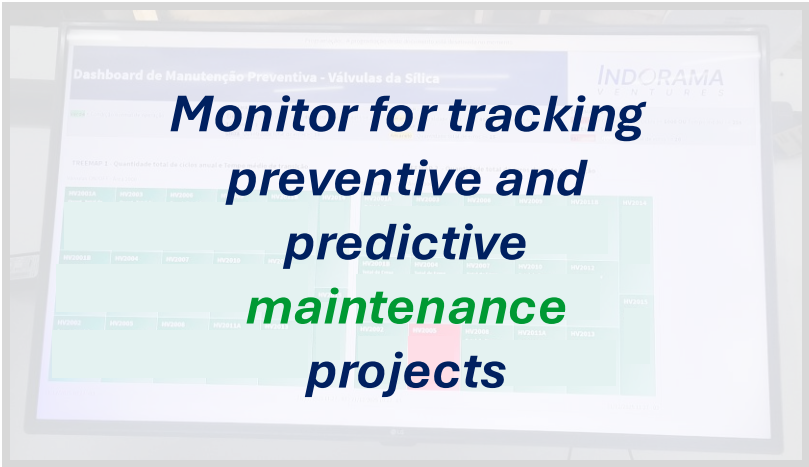
Monitor for the heat map generated in Seeq in the **control room and **engineering room****



Monitor for real-time monitoring of the bulk loading ramp in the **internal logistics area**



Monitor for quality control chart monitoring in the **quality laboratory**



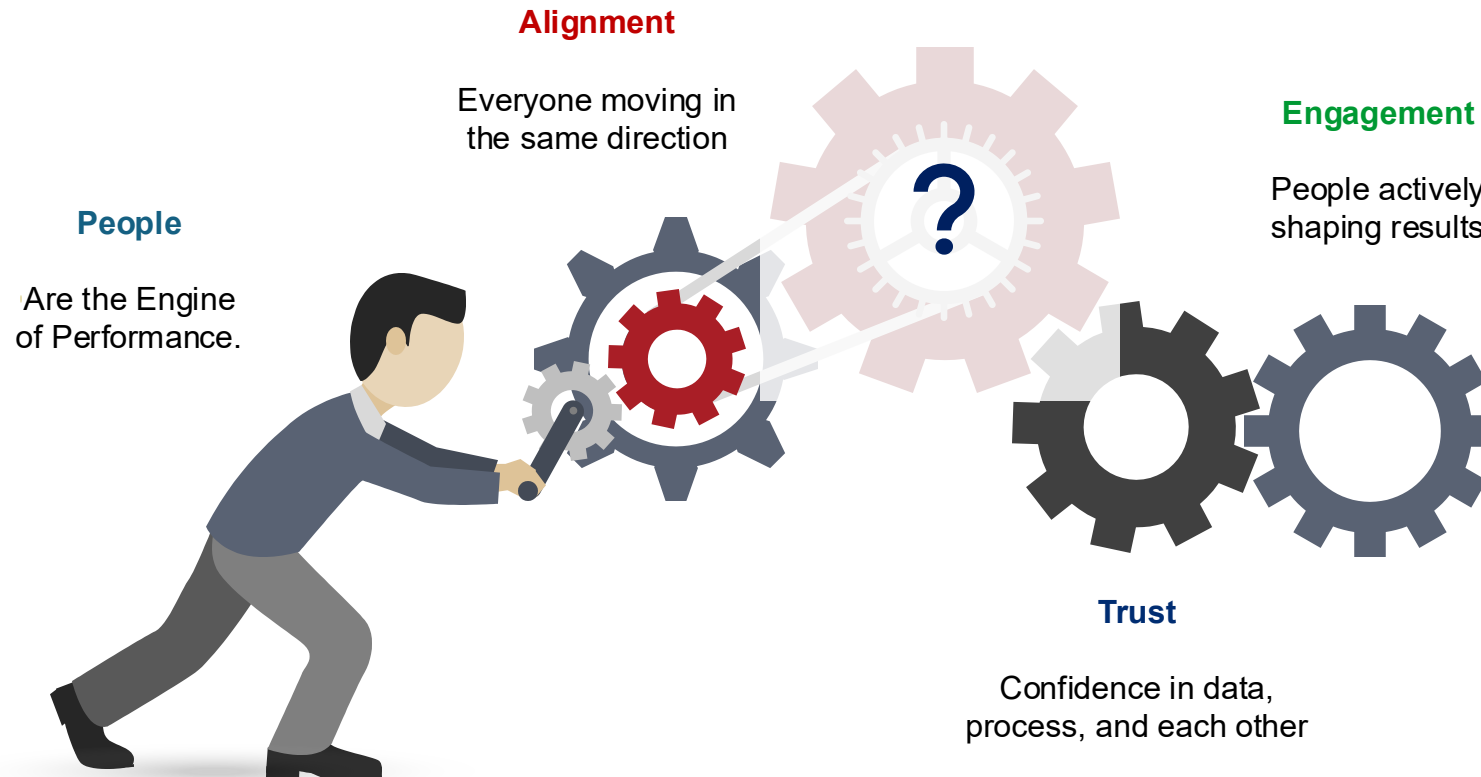
Monitor for tracking preventive and predictive **maintenance projects**



Provided open access to all **analytics projects for operators in the **sulfation area****

#ALL_IN Starts With Connected Teams

Culture as the foundation for lasting impact



The Missing Link Between Culture & Results

Culture as the foundation for lasting impact

#ALL IN



Front-Line Teams



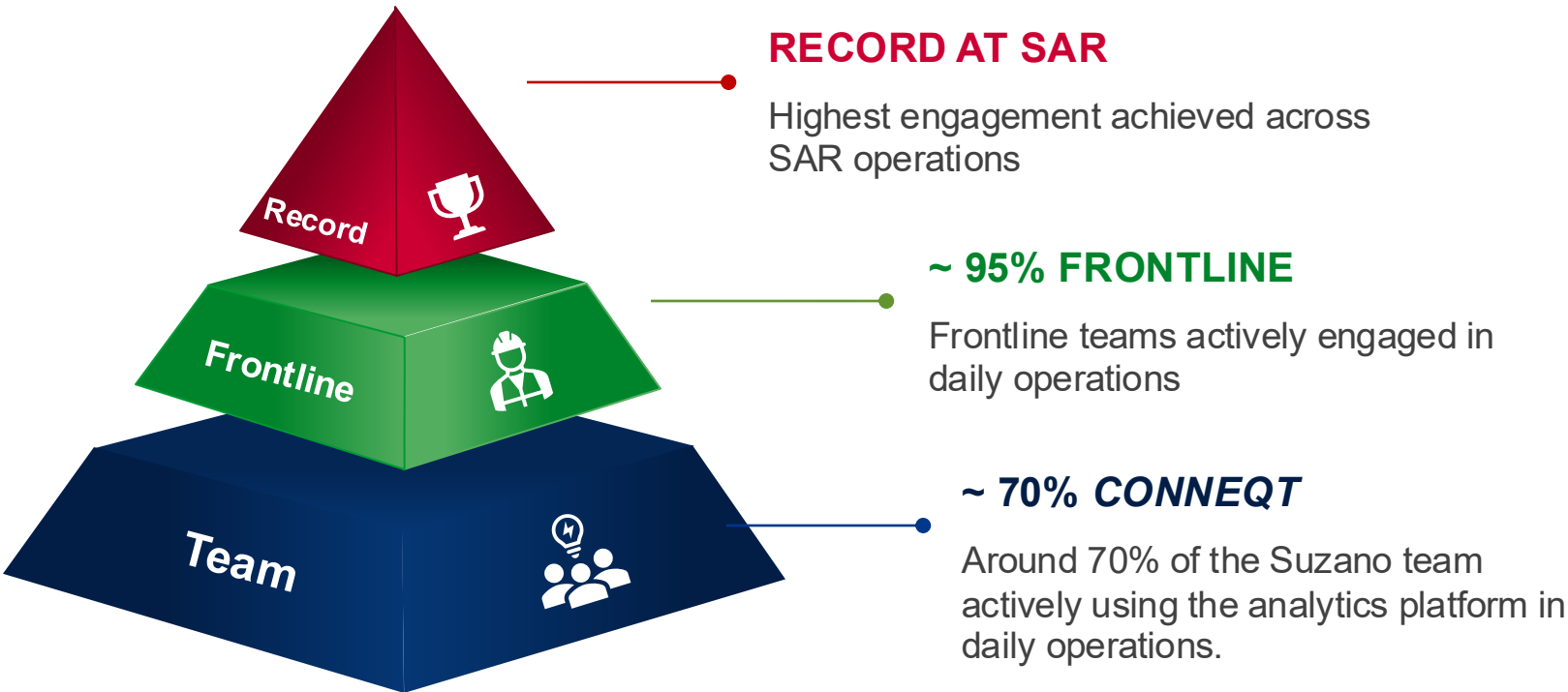
#ALL_IN | Building a Culture of Operational Ownership

Culture as the foundation for lasting impact

Production Growth Over Time



Sustained **operational discipline** enabled **record production** performance.



The strongest results occur when **empowered front-line teams operate** with **clarity, ownership, and speed to action.**

Empowered Front Lines. Connected Operations. Organizational Impact.

Eliminating Noise to Accelerate Front-Line Action

EMPOWERING FRONT LINES.

Equipping People. Enabling Performance. Driving Impact.

RIGHT INFORMATION
At the Right Time

SMARTER DECISIONS
On the Front Line

STRONGER OUTCOMES
Every Day

MOBILE ACCESS

EASY TO USE

BUILT FOR FRONT LINERS

REAL-TIME INSIGHTS

WORK ORDERS
12
Open

ASSET HEALTH
92%
Good

SAFETY
0
Incidents

PRODUCTION

ALERTS
2
New

CHECKLIST
5/5
Completed

TREND

SAFE
Promoting a strong safety culture

EFFICIENT
Streamlining work and reducing waste

EMPOWERED
Giving teams the tools to take action

IMPACTFUL
Driving results that matter

Internal Logistics

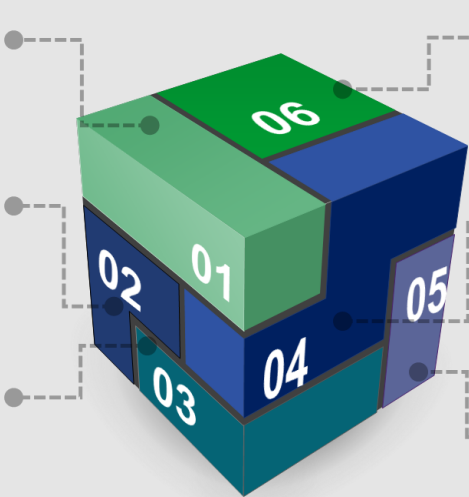
Connecting material flow and data to ensure operational continuity and efficiency.

Maintenance

Anticipating failures and improving reliability through data-driven decisions.

Process Eng.

Optimizing processes by turning analytics into actionable insights.



Production

Embedding analytics into daily routines to drive performance and stability.

EHS

Aligning planning and control through shared data and integrated decisions.

QC Laboratory

Ensuring product quality by integrating analytics into testing and validation.



Summary of Success | Made Possible by Our Leaders by Prioritizing PPL Development for a lasting Impact

SUZ Team *Presented by Site Sponsor & Champions. Supported by AIA Transformation Lead*



Global Digital Applications &
Advanced Analytics Leader



AIA Sponsor & Site Head



Site Seeq Champion &
Process Engineering



SAR AIA Leader



Production and
Engineering Manager

**ADVANCED
INDUSTRIAL
ANALYTICS**

Suzano Team



Analytics in Every Hand. Impact at Every Level.

Thank You to the Leaders Supporting!

Digital x IVEX x Sustainability

**ADVANCED
INDUSTRIAL
ANALYTICS**

#All_IN Analytics in Every Hand.
Impact at Every Level. **2026**