Data to Success

A Case by ST-One and Henkel

Case Study: The Impact of Henkel and ST-One's Partnership on **Reducing** Gas Consumption, **Lowering** Water Costs, and **Advancing ESG** Initiatives

The Henkel

A global leader in the chemical industry, renowned as the world's foremost producer of adhesives, sealants, and functional coatings.

The Customer

Founded in 1876 in Germany, Henkel's journey began with the production of a universal silicate-based detergent. Over the years, the company has expanded and diversified, evolving into a global powerhouse with a comprehensive and diverse product portfolio.

Henkel's products are integral to various industrial sectors, including automotive, electronic systems, woodworking, metallurgy, and packaging, among others. Beyond its industrial focus, Henkel also caters to home use with two main categories: Laundry & Home Care and Hair. The Laundry & Home Care division features market-leading brands and products in dishwashing, laundry, surface cleaning, and personal hygiene. The Hair division specializes in hair care, coloring, and styling products for both direct consumers and beauty professionals.

In Brazil, Henkel commenced operations in 1955, providing solutions for both the manufacturing industry and end consumers. To meet the growing demand, the multinational operates three factories in Diadema, Itapevi, and Jundiaí, employing over 1,000 professionals.

As a market leader, Henkel upholds sustainability as a core corporate value.

Henkel aims to be a pioneer in sustainable development, focusing on responsible productivity. To achieve this, the multinational is dedicated to transforming processes, products, and raw material usage to advance towards a resource-efficient and climate-neutral future.

In addressing climate issues, Henkel prioritizes reducing the emission of greenhouse gases. Concerning the increasing consumption and scarcity of natural resources, their ESG strategy emphasizes the responsible management of assets such as water, gas, and renewable supplies.

Increasing digitization is a key strategy in achieving these goals. By leveraging technologies like data science and integrating sensors into the production line, Henkel captures real-time information on efficiency, quality, and safety. This data-driven approach allows for sustainable analysis, leading to better utilization of production facilities, optimized material flow, and a reduced ecological footprint.

Testimonial

"The ST-One initiative originated from a modest need, which opened our eyes to various possibilities that could benefit us.

(...) we have been achieving numerous positive results, both financially and in management, reinforcing our belief that the ST-One ™ Solution will expand beyond the Jundiaí unit to other areas within Henkel."

- **Murilo De Lima**,
Engineering and Maintenance Supervisor.

Summary

Challenge:

Develop a project aimed at analyzing and optimizing water costs and gas consumption in the utilities area of **Henkel's Jundiaí** unit. Established in 1955 and located in Jundiaí, Brazil, this plant boasts over 3,500 assets.

Solution:

The solution involves installing **ST-One Hardware®** in PLCs to collect data from the machinery within the area. Next, START™ is utilized to classify the main variables in the process. With the assistance of STRUCT™, these variables are managed and assigned the appropriate competencies. Finally, the data is dynamically and intelligently displayed on a **Stash Platform™** dashboard.

Value delivered:

- 33% reduction in water costs;
- Annual savings of €119,000.00 through reduced gas consumption;
- Acquisition of ISO 50001 by the plant;
- Autonomy in defining the most relevant indicators;
- Dynamic visibility for rapid identification of water and gas waste;

Overview

Henkel's Jundiaí plant is one of the multinational's key units in Brazil, spanning approximately 79,000 square meters and housing over 3,500 assets. This facility is pivotal in producing several essential product lines, including hot-melt adhesives (**Technomelt**), water-based adhesives (**Aquence**), polyurethane and instant adhesives (**Loctite**), and surface treatment products.

In 2018, Henkel's Jundiaí plant was recognized **as the company's third most efficient facility worldwide.** Recently, Henkel announced the construction of a new innovation and technology hub, the **Henkel Latam Inspiration Center.** This center will be dedicated to developing cutting-edge innovations and solutions in adhesive technologies.

Initially, the plant sought the **ST-One Solution™** to gain better visibility into the adhesive production line, aligning with the company's sustainable development strategies. This production line involves several critical steps. First, mixing machines combine the main ingredients, such as resins, polymers, and additives. Next, reactors facilitate the chemical reaction of these raw materials to form the adhesive. For instance, in the case of polyurethane adhesives, this involves the reaction between polyol and diisocyanate. Finally, the mixture undergoes another high-speed blending process to ensure the homogeneous fusion of the components.

Fábrica Henkel (paletizadora)

Once this process is complete, extruders mold the adhesives into desired shapes, such as sticks or tapes, which is particularly important for hotmelt adhesives. For water-based adhesives, coatings are applied using rollers or sprays. Finally, curing ovens are employed for adhesives requiring thermal curing (hardening), cooling systems solidify hotmelt adhesives, and the products are then packaged.

Overview

To collect and monitor data across the production area, it was essential to conduct an architectural mapping of all the machinery in the line. This machinery comprised equipment from various manufacturers and production dates.

The flexibility of the **ST-One Solution™** was a key differentiator, as its capability to communicate with multiple protocols was indispensable for collecting information from the diverse range of equipment.

Within two weeks, the factory had access to the results and improved operational efficiency, demonstrating a proven financial return.

The enhanced operational visualization also led to better strategic visibility. Those responsible for implementing and using the solution recognized its potential to uncover and analyze data, create real-time dashboards for simultaneous information cross-referencing, and scale these capabilities to the utilities area.

This application beyond the production line **aligned with the plant's strategy and Henkel's values**, emphasizing ESG and sustainable development, particularly after the proven results.

Fábrica Henkel (esteiras)

Testimonial

"Initially, the implementation focused on availability, resource utilization, and production volume.

Our goal was to provide greater visibility and information to the maintenance and production supervision management team. Following our success, we incorporated additional process data, which was crucial for achieving better process control, ensuring product quality, and maintaining operational safety."

- **Fellipe Nascimento**,
Plant Manager

The Project

ST-One Deployment

The ST-One Solution™ was subsequently implemented in the utilities area of Henkel's Jundiaí unit. This solution relies on data collection via **ST-One Hardware®**, connected to the PLC. It leverages intelligent algorithms like START™ for clustering and STRUCT™ for analyzing the most relevant variables. Additionally, it enables the creation of customizable dashboards with instant access through the **Stash Platform™.**

Data Culture

The effective implementation of the solution on the production floor marked the beginning of a data-driven culture throughout the plant.

In the initial phase, around **20 dashboards** were developed to monitor and record machine performance data. Each set of dashboards was tailored to meet the visualization needs at different work levels. Detailed dashboards on daily operations and machine status became routine at the operational level.

Meanwhile, aggregated and comparative dashboards became essential for tactical decision-making. Dashboards designed to provide an overview of the operation, highlighting key indicators, became integral to strategic reporting.

The involvement of various employee groups was crucial in establishing this data-driven culture.

Leveraging insights from the production area project, the Jundiaí unit enhanced its strategic vision and began exploring the best KPIs for the utilities area. To achieve this, the plant's stakeholder team held weekly meetings with ST-One's data scientists.

During these meetings, the team not only identified the most relevant data to monitor but also refined calculations to improve analysis accuracy and efficiency. This was pivotal in fostering a data-driven culture within the unit and enabling informed decision-making at the plant.

In Progress

Data-driven decision-making

An analytical survey identified the best metrics to monitor, resulting in a strategy to reduce the plant's water and gas consumption. Five dashboards were developed for this purpose:

- **Monitoring of accumulated water and gas consumption;**
- **Performance of heaters;**
- **Chiller performance;**
- **Performance of air compressors;**
- **Boiler performance;**

These dashboards enable the monitoring of indicators such as temperature and process pressure setpoints, machinery status, operating speed, and more. This prioritization aligns with the Jundiaí plant's strategy and Henkel's sustainability goals.

With a well-implemented data culture, the development of this strategy relied on the platform users' complete autonomy. This led to the rapid creation of the dashboards, primarily through active exploration of the initial production data, a process that took around six weeks. Data-driven decision-making became integrated into the factory's routine, including changes in the physical space, such as integrating TVs into the tactical sector.

Within the production process, this autonomy is indispensable. To find the optimal consumption point, the team conducted several proofs of concept, testing various setpoints and indicators. With total mastery of the platform, this was done dynamically, keeping pace with the factory and resulting in significant improvements.

Testimonial

"The implementation of ST-One brought enhanced connectivity. Beyond data analysis, we received comprehensive support and guidance for creating dashboards.

The turning point was not just the expansion but also the customization of data visualization, which led to leadership approving further investments. This has resulted in the current scenario where 100% of the factory is connected."

- **Leandro Rezende,**
OT Security and Automation Manager Americas.

Impact

€119,000.00
annual savings through reduced gas consumption

33%
reduction in water costs

Acquisition of

ISO 50001

Dynamic visibility for rapid identification of water and gas waste

These achievements were unlocked through data science, implemented by the **ST-One Solution™.** This enabled a reduction in natural gas consumption, thereby decreasing annual CO2 emissions and cutting water-related costs.

The multinational utilized the technology to experiment with different setpoint values for boiler steam pressure.

After testing, the plant discovered it could operate effectively at 8 bar of vapor pressure, compared to the previous 9 bar.

This adjustment alone resulted in annual savings of approximately €119,000.00. This dynamic adjustment exemplifies how a data-driven culture, integrated throughout the industry ecosystem, yields environmental benefits and supports ESG initiatives.

Impact

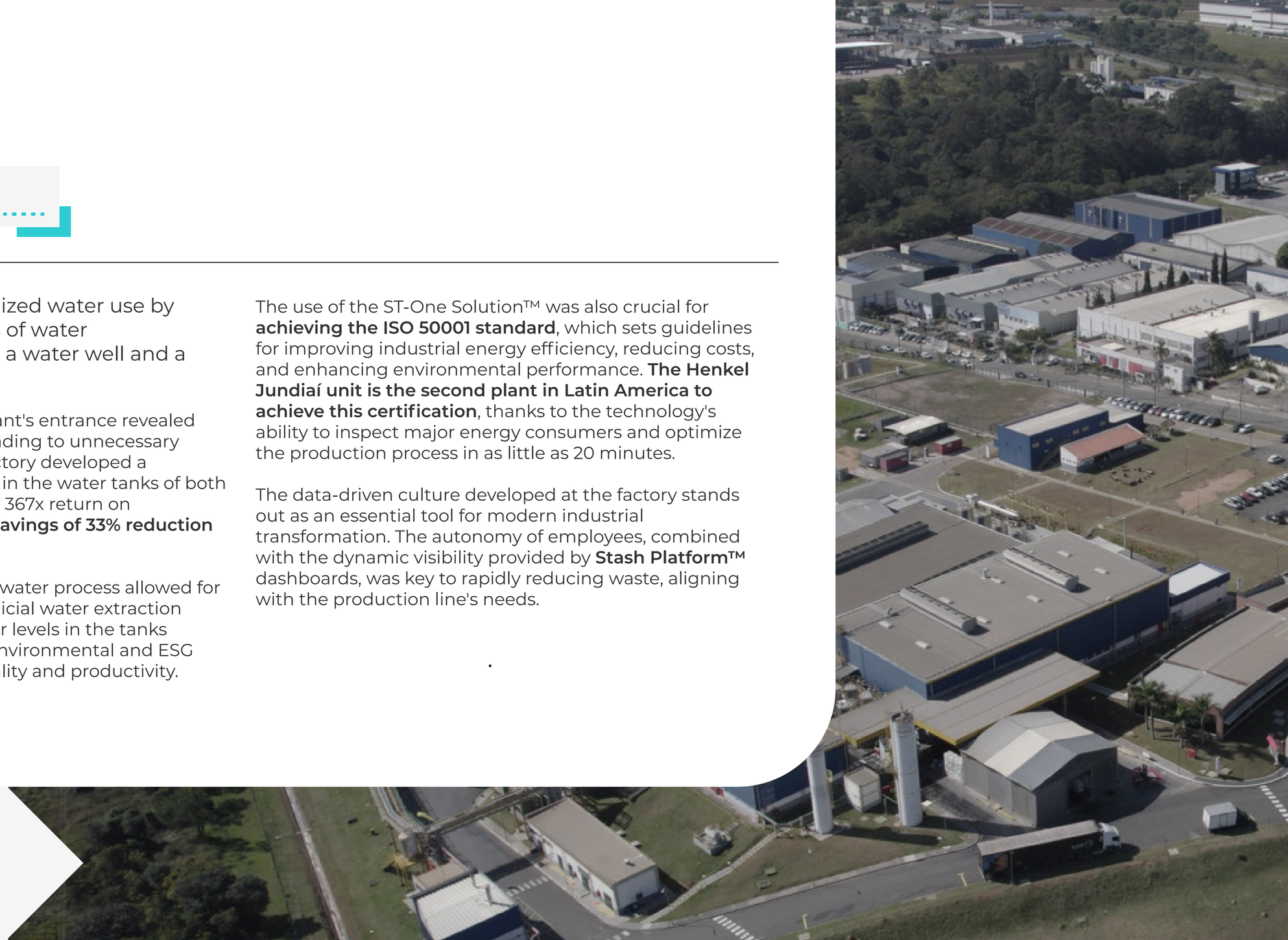
Additionally, the plant optimized water use by better controlling its sources of water consumption, which include a water well and a concessionaire.

Data from flow sensors at the plant's entrance revealed underutilization of well water, leading to unnecessary expenses. To address this, the factory developed a mechanism with buoys installed in the water tanks of both sources. This strategy delivered a 367x return on investment, resulting in annual **savings of 33% reduction in water costs.**

Furthermore, an overview of the water process allowed for the evaluation of the most beneficial water extraction source. Improved control of water levels in the tanks reinforced the commitment to environmental and ESG measures while maintaining quality and productivity.

The use of the ST-One Solution™ was also crucial for **achieving the ISO 50001 standard**, which sets guidelines for improving industrial energy efficiency, reducing costs, and enhancing environmental performance. **The Henkel Jundiaí unit is the second plant in Latin America to achieve this certification**, thanks to the technology's ability to inspect major energy consumers and optimize the production process in as little as 20 minutes.

The data-driven culture developed at the factory stands out as an essential tool for modern industrial transformation. The autonomy of employees, combined with the dynamic visibility provided by **Stash Platform™** dashboards, was key to rapidly reducing waste, aligning with the production line's needs.



Data to Success

A Case by ST-One and Henkel

ST-One was created with the goal of elevating industry productivity to new heights.

The science developed by ST-One evolves with each new challenge, enabling digitalization across various industrial sectors to achieve the next level of connectivity and intelligence.

UNLOCKRESULTS

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