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Case Study ||

Industry 4.0 – Integrated Management Platform Ensures Production Quality

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Management Summary

Keywords

✓ Industry 4.0 ✓ Quality assurance ✓ SAS Business Analytics Platform ✓ SAS Quality Lifecycle Analysis
✓ Near real-time reporting ✓ Data integration ✓ Quality management

Goals

✓ Optimization of production processes
✓ Increase in production quality
✓ More efficient production planning across locations

Approach

✓ Structuring of data to import into the analytical data model
✓ Recording of all production data in a central database
✓ Integration of suitable comparison parameters and thresholds for variance analysis

Results

✓ Complete view of all production data for the first time
✓ Basis created for setting up standardized, groupwide reporting
✓ Increase in quality through improved production monitoring
✓ Rapid responsiveness in near real-time

Initial Situation

Industry 4.0: Collecting information from production processes and recording it centrally opens up huge opportunities for manufacturers. Not only can critical quality parameters, usage data, and maintenance cycles be read in real time and assigned to individual products or batches, but they can also be analyzed over the long term. However, consistent and structured data management is a must if you want to tap into these benefits. At a company in the automotive industry, the shop floor systems in manufacturing generated valuable information, but it wasn't centrally recorded and analyzed. Reacting to errors in production, quality issues, or low utilization wasn't always possible due to the lack of an up-to-date overview.
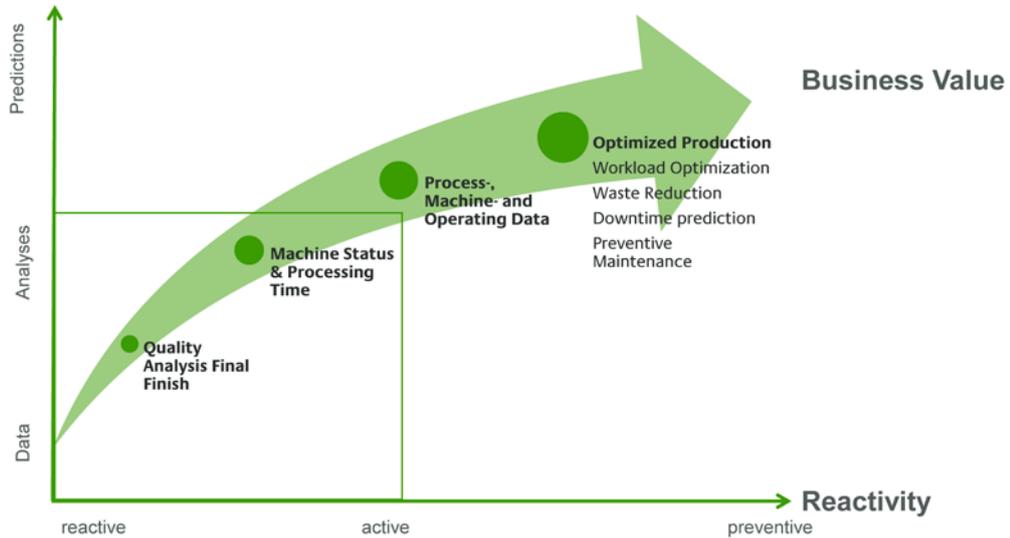
Integrated platform brings big benefits

From central production plants to integrated measuring devices, practically every system involved in the production process today has network interfaces. Yet, the information gathered is very often used only locally or saved to a dedicated software application. For a really global view of the data, however, all the information must be stored centrally. A company in the automobile component supplier industry recognized the enormous potential of such a production management platform and opted for SAS Business Analytics Platform and the provider's QLA (Quality Lifecycle Analysis) solution. The long-term objective of the project is to collect and analyze all the data that exists within the organization. Not only does the company aim to check the production quality of individual shop floor systems, it also intends to analyze and optimize this data in relation to other manufacturing facilities. Furthermore, in the long term, it plans to create forecasts based on the information it has gathered. As it currently stands, the concept envisages the storage of data over a five-year period.

"Only with an integrated quality lifecycle solution is it possible to achieve targeted optimization of the production quality."

Dr. Marcus Dill
Managing Director
mayato GmbH

Structured data provides the basis

To set the cornerstone for structured data analysis, the first step was to gather and process all the information accumulated on the shop floor and to send it to the data warehouse. This central task within the project was entrusted to the mayato team. Together with the engineers responsible in the user departments on site, the experts analyzed which systems deliver the data required and in what format. Because most of the shop floor systems only have rudimentary SQL functionalities and aren't suitable for the high-performance processing of data, the project team selected SAS Data Integration Studio to consolidate the data.

The following technical requirements had to be met:

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- Automatic recording of the data from all shop floor systems
- Parallel loading of the predefined QLA solution model
- Very high performance (near real-time)
- Maximum availability

Recording, Integration, Analysis and Management of Production and Machine Data

| Analysis & Data Mining | Near Realtime Reporting | Monitoring & Alerting |

| Pre-defined data model for quality analysis | Real-time data |

| "End-to-End"-Data Collection with proven tool |

| Environmental, organizational and process data | Production Planning | Machine Data | Testing Systems | Final Finishing |

Shop Floor Data

Performance in particular played a decisive role in the integrating the data, as these volumes reveal: In the automotive component supplier's final finishing stage alone, more than 10 million values are measured and recorded every day. This means approximately 350 million data rows are processed and stored a month, just from this system. In total, the mayato team integrated 12 different SAP, shop floor, and final finishing systems – plus a large quantity of related process data – on one site. All the data is transferred to the data warehouse automatically in near real-time, and stored there in the data model that was defined. In addition to the up-to-the-minute data from continuous production activities, predefined quality parameters are stored there, so that target-actual comparisons can be performed.

Transparent and reliable analyses

Right from the start, the managers at the automotive component supplier were highly impressed by the first analyses and reports created on the new integrated platform. The central availability of all the relevant data eliminated numerous hurdles in day-to-day business: Dubious evaluations using Excel lists, handwritten tables of measurements, and Excel analyses without versioning became a thing of the past. Instead, all decision makers – from shift supervisors and engineers to analysts and managers – now access the same data basis. All analyses can be performed fast and easily based on consistent, reliable data. Optimized production monitoring allows the company to identify any rejects quickly and compare the utilization of different work centers directly. Furthermore, the employees on the shop floor save valuable time, because they no longer have to prepare reports manually. After successfully implementing the production management platform at two locations, the company is extending the concept step-by-step to all its plants. By 2017, 20 sites will be deploying the new platform and more than 2,000 users across the group will be using the data gathered. The data basis will have grown to more than 25 TB by this time.

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"The transparent view of all data in the production process often leads to real lightbulb moments, even for experts with years of experience. We're finding completely new ways to proactively prevent rejects in production."

Eric Ecker
Head of Industry Analytics
mayato GmbH

About mayato

mayato GmbH empowers companies to capitalize on their information. Together with our customers, we develop and implement solutions in the areas of financial analytics, customer analytics, industry analytics, and IT security analytics.

A team of experienced process and technology consultants operates out of our offices in Berlin, Bielefeld, Mannheim, and Vienna. They analyze and optimize your business processes and work with you to determine the requirements for technical implementation. They assist you in selecting the right tools, develop successful strategies, and conceptualize tried-and-true modern architectures. And of course, mayato consultants also help with the practical side of implementing your chosen solutions. Technical standards and governance enable economical, effective projects and efficient operations in the long term.

Analysts and data scientists from mayato use these solutions on your behalf to establish connections between data from many different sources and to forecast trends and events. They devise convincing business cases and produce tangible monetary benefit from your processes and applications. Your employees learn how to use state-of-the-art data analysis methods, how to tackle data quality issues, and how to interpret and visualize results. Working with mayato future-proofs your company for the age of big data.

mayato GmbH was founded in 2007. Among our customers are renowned large and midsize companies from a range of industries. As a partner of several software providers, mayato is committed to remaining neutral and – first and foremost – to delivering its own high-quality services. For more information, visit www.mayato.com.

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