Manufacturing Execution System – added value and opportunities for dairies

In the dairy and beverage industry, production managers face major challenges not only due to high raw material and energy prices – the increasing knowledge and rising demands of customers also place equally high requirements on production processes: transparent production data and real-time control of all operational processes, as well as food-relevant legislative regulation compliance, verification and documentation.

The interest and know-how of consumers not only present challenges but also unique opportunities. Small and medium-sized businesses, in particular, can set themselves apart through credible concepts, for example with mountain farmers, organic products or dairy products from grassfed cows, thereby achieving greater acceptance when compared to conventional dairy products. After all, many consumers are prepared to pay more for local organic products. In return, customers expect these differentiated, higher-priced products to provide complete proof and, if possible, digital presentation of origin and quality.

The Manufacturing Execution System (MES) Plant Integrate iT from the German company ProLeiT AG offers the ideal solution to this and is used mainly in the dairy and beverage industry. For instance, when utilizing the MES solution, the product packaging can display QR codes that provide customers with information on the origin and quality of the product throughout the entire manufacturing chain. The full version of

the MES Plant Integrate iT, however, offers many other useful functions. It can make all production processes 'visible' and enables dynamic optimization of production processes. In combination with other add-ons, this can lay the foundation for the digital production of tomorrow. Shift and plant managers already benefit from paperless production.

A key prerequisite for achieving this objective is continuous information management at MES level, which can be integrated and operated infinitely across process sequences and departments. Data from the individual production areas is merged and evaluated at a central location. Access to this central information platform via Internet browser occurs using Microsoft standard software and therefore provides maximum flexibility and protection when implementing the company-wide MES solution.

The basis for this is a Manufacturing Information System (MIS) consisting of four areas: database, web portal, reporting and data analytics.
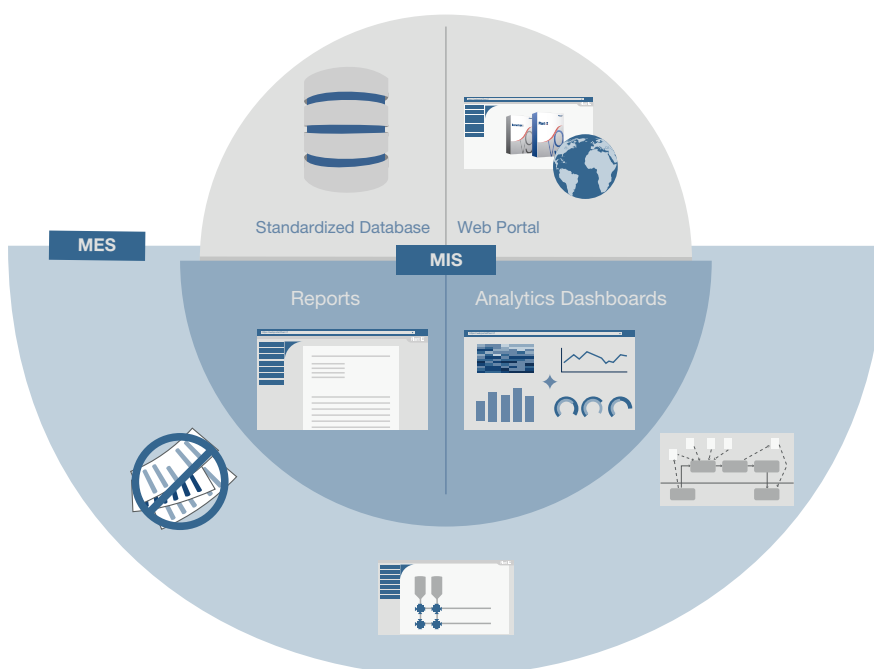
INFO

ProLeiT

Author: Dr. Thomas Wunderlich

Vice President Sales
Dairies & Beverages

At its core is an intelligent and standardized Microsoft SQL database, which is also understandable for non-programmers. Thanks to the web portal, information that was previously only available at workstations or on-site panels is now displayed in real time via an Internet browser. This enhances the flow of information and enables the integration of staff who previously had no direct access to production data. Using Microsoft's SSRS technology, plant operators can create and distribute reports in the browser independently and in a short space of time. Pre-defined Analytics Dashboards make it easy to keep track of even the most complex processes. These dashboards are ideal for showing direct optimization potential by analyzing a large amount of data (big data) in a detailed, fast and user-friendly manner.

To make it easier for plant operators in the dairy and beverage industry to enter the world of data acquisition, data analysis and plant optimization, ProLeiT offers Plant Integrate iT, a pre-assembled, out-of-the-box solution with integrated interface management and useful add-ons. This enables the connection of various data sources, such as programmable logic controllers and laboratory / quality systems, to Plant Integrate iT via standardized interfaces

Figure 1: The MES solution Plant Integrate iT

(e.g. OPC-UA) and ensures the flow of information for subsequent analyses: optimization of production faults, production energy analysis, CIP cleaning analysis and material traceability throughout each production phase, as well as a golden batch analysis in outstanding quality, which indicates any deviations of the current batch from the ideal batch.
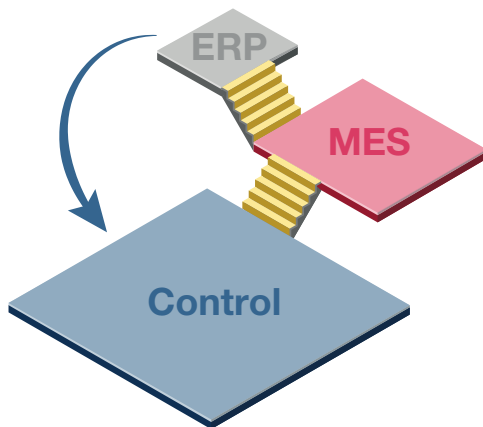

Figure 2: The three typical levels of a dairy

Numerous add-ons can be combined with the Plant Integrate iT MES solution.Plant iT Workflow, for example, enables the application of plant-wide order and replenishment control as well as recipe management as an ideal addition between the commercial level (ERP system) and the technical level (SCADA or PLS). Plant and production managers as well as shift managers and plant operators are thus provided with a uniform overview of the entire production process – from goods receipt to packaging or filling. This in turn significantly increases flexibility and leads to optimized collaboration when placing orders from the ERP world to the process level (control). This cooperation is extremely important, as the commercial view in the ERP world always focuses on the end product – at the process level, however, this view must be broken down into various partial orders, depending on how many intermediate steps are required to manufacture a product. As the link between the ERP system and the control, the MIS / MES reflects the technical view of the plant.

Besides mapping workflows, ProLeiT offers further useful add-ons, e.g. for the parameterization and visualization of manual business processes that arise in connection with actual process automation. This completely new and so far unique software module enables all manual processes to be mapped and structured in software by means of parameterization and the status of individual processes to be displayed. An example of this is the discharging of raw materials from a truck. This process can be electronically recorded and forwarded in individual steps (cargo documents, quality control, laboratory values, batch number, etc.). Data on the resources used and the costs involved is therefore mapped seamlessly, thereby ensuring comprehensive transparency throughout the entire manufacturing process.

The future

The modular MES solution Plant Integrate iT from ProLeiT ensures transparent and paperless production and is also available to OEM partners as a white label product.

ProLeiT is always looking ahead and planning for the future. After all, customers need to remain at the cutting edge of technology in the coming years with regard to analysis tools or system monitoring. The development processes from a paperless, transparent and optimized factory to an 'intelligent factory' that independently provides suggestions for process optimization have already been initiated. An increasing amount of data will be collected and systems networked. With ProLeiT's modular software solutions, customers keep up with the times – and benefit fully from the added value of Industry 4.0, Smart Factory and Big Data Analytics.