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Connected Quality Management
A modern MES can simplify quality and compliance efforts while improving productivity

Rockwell Automation

Allen-Bradley • Rockwell Software

The Quality Quandary

Quality is intrinsically linked to your brand. Even as regulatory and market forces put new pressures on your business, quality cannot be sacrificed. It must remain a constant commitment.

Yet continuing pressures to be leaner and more flexible are introducing greater complexity into operations across industries, making quality more difficult to manage. As a result, better visibility and greater overall control of production processes is needed to maintain high quality amid this greater complexity.

The challenges are even more pronounced for those in highly regulated industries, such as automotive, pharmaceutical, and food and beverage, where product quality can directly correlate with vehicle, drug and food safety. Any failure to ensure quality can have health implications on consumers, result in costly recalls and bring about greater scrutiny from government regulators. In these industries, the collection, sharing and reporting of quality information should be automated, replacing time-consuming and error-prone manual systems.

CONSISTENCY IS KEY
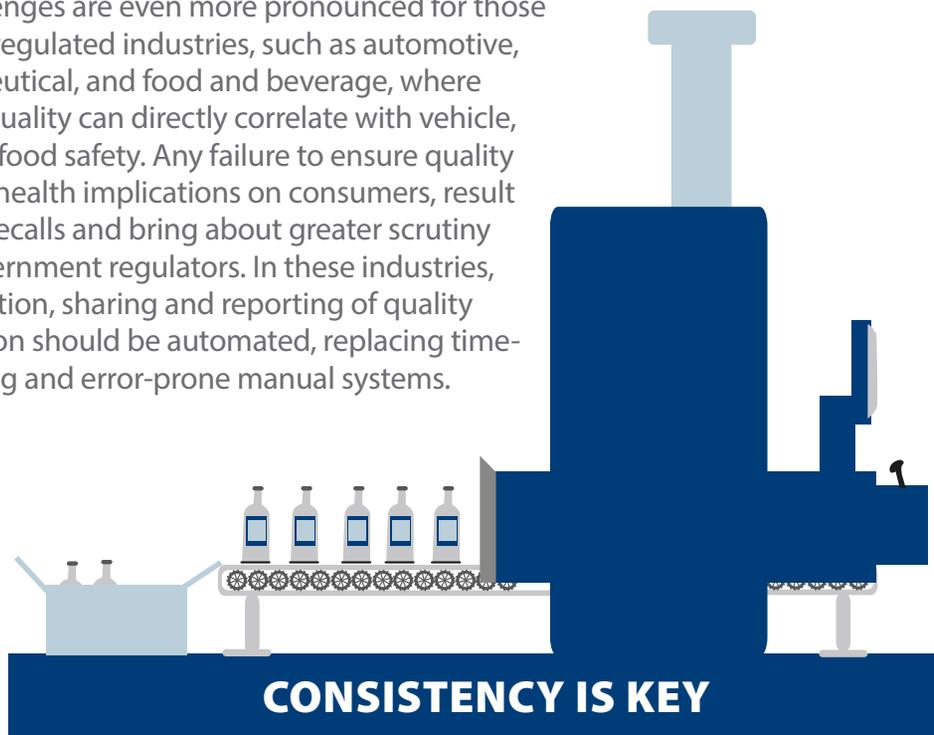
“ Among food industry executives, product quality failure is considered to be one of the biggest risks.” [1]

“ We believe a careful analysis of quality metrics can help FDA better identify which facilities are at the highest risk for quality problems. This will help us use our inspection resources most efficiently and effectively.” [2]

[1] The Food Value Chain: A Challenge for the Next Century, Deloitte, 2013
[2] Lightweight, Heavy Impact, McKinsey & Company, February 2012

MES-Based Quality Management

Modern manufacturing execution system (MES) software is an essential component for optimizing quality in today's information-enabled manufacturing operations. An MES integrates quality management and business analytics with production management to help you achieve the highest levels of quality and support regulatory compliance.

Consider some of the key advantages an MES can bring to your organization to help bolster your approach to quality management:

- **Data-Driven Decisions:** Automated information gathering and reporting allows for more informed decision making around quality issues, deeper insights into quality metrics and easier quality compliance

- **Greater Production Management:** Production management capabilities help you better manage key quality characteristics throughout your operations

- **Simplified Compliance:** Information and production capabilities can help simplify quality-related compliance processes

- **Ready for New Regulations:** Serialization and traceability capabilities can also help you meet emerging regulations regarding product safety and potentially dangerous counterfeits

> **QUALITY MANAGEMENT**
> + **BUSINESS ANALYTICS**
> + **PRODUCTION MANAGEMENT**
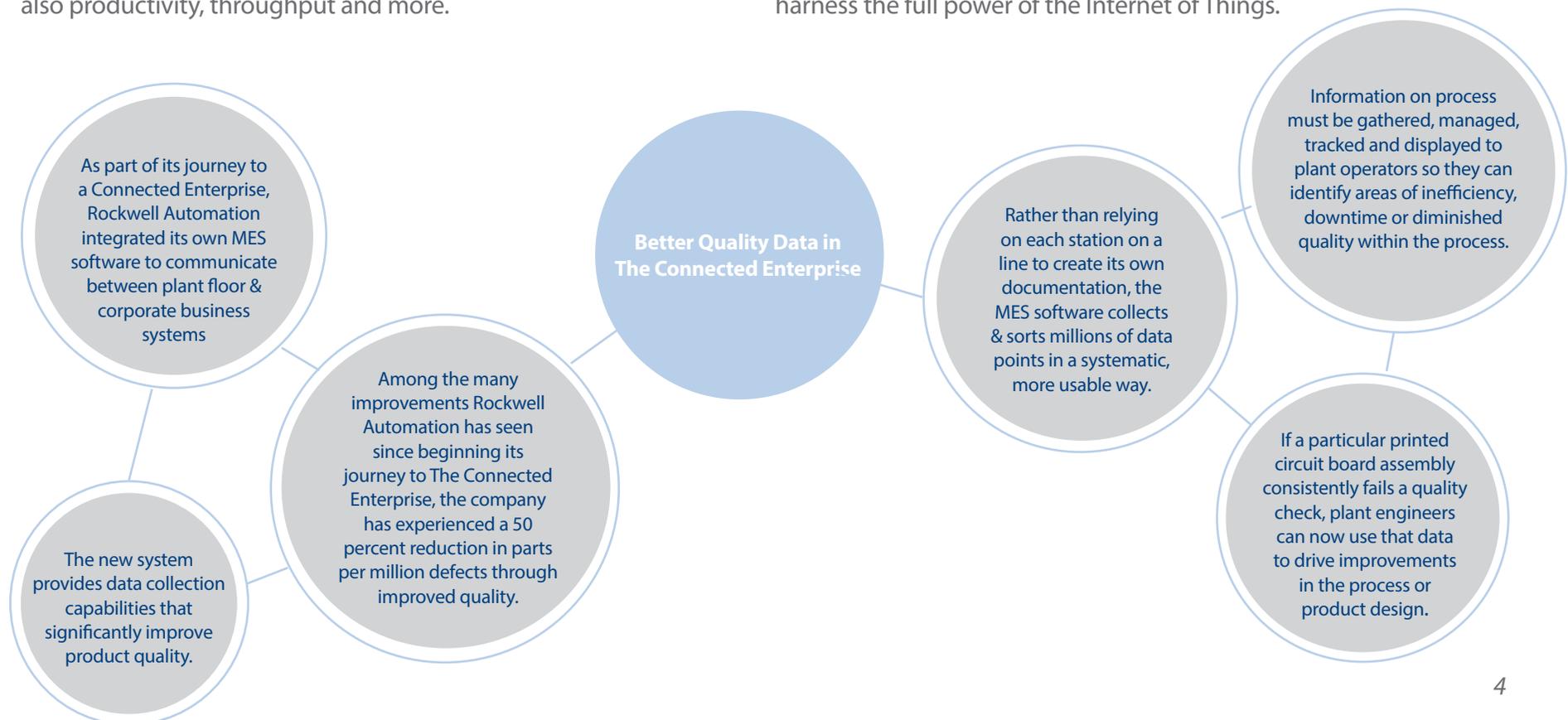> _____
> **HIGH QUALITY & REGULATORY COMPLIANCE**

" *Manufacturers must take a stand on product quality and build up their reputations, and increased traceability and transparency are critical components."[1] - Kimberly Knickle, IDC Manufacturing Insights*

Gain Enterprisewide Connectivity

Enterprise-based IT and plant floor-based operations technology (OT) are two data-rich systems that have long been disconnected in most manufacturing operations. A modern MES can serve as an integration gateway between your IT and OT systems, supporting the creation of what Rockwell Automation has termed The Connected Enterprise.

What is a Connected Enterprise? It connects your people, processes and technologies, and enables unfettered information sharing across your entire organization. This ensures you can deliver the right information to the right decision maker at the right time, helping optimize not only quality management but also productivity, throughput and more.

A Connected Enterprise requires a network foundation that enables seamless connectivity. Consider using a single network architecture tapping EtherNet/IP, today's most-used industrial Ethernet protocol. Built on standard, unmodified Ethernet and IP, EtherNet/IP allows you to deploy both industrial and commercial Ethernet solutions to harness the full power of the Internet of Things.

As part of its journey to a Connected Enterprise, Rockwell Automation integrated its own MES software to communicate between plant floor & corporate business systems

The new system provides data collection capabilities that significantly improve product quality.

Among the many improvements Rockwell Automation has seen since beginning its journey to The Connected Enterprise, the company has experienced a 50 percent reduction in parts per million defects through improved quality.

Better Quality Data in The Connected Enterprise

Rather than relying on each station on a line to create its own documentation, the MES software collects & sorts millions of data points in a systematic, more usable way.

Information on process must be gathered, managed, tracked and displayed to plant operators so they can identify areas of inefficiency, downtime or diminished quality within the process.

If a particular printed circuit board assembly consistently fails a quality check, plant engineers can now use that data to drive improvements in the process or product design.

Automate Data Gathering and Reporting

An MES automates the collection of data from multiple disparate sources, replacing outdated processes of manually collecting data in paper-based systems. Speeding up data collection can be especially beneficial in industries such as pharmaceutical, where extensive record keeping is required for regulatory purposes, and automotive, where time-consuming data collection can be a burden on high-velocity operations.

Automated data collection also reduces the potential for human error in documentation processes, which can lead to unacceptable product quality or even product recalls.

Data collected from systems dispersed throughout your operations can be viewed on dashboards or reports, providing deeper insights and better decision making. From a quality standpoint, this enables you to:

- Compare product quality against manufacturing conditions
- Review finished-product quality against individual suppliers' raw materials
- Deliver quality reports to different stakeholders, with information contextualized to each person's role

Integration up to your ERP systems also enables greater tracking of non-conformant product and scrap, and a better understanding of rework costs.

" Connected and smart products will demand that our quality management processes mature and are better connected, and key to this is tracking the actionable content derived from the ubiquitous product cloud." [1]

[1] Internet of Things: Why Quality Management Leaders Need a Strategy Now, LNS Research, Nov. 7, 2014
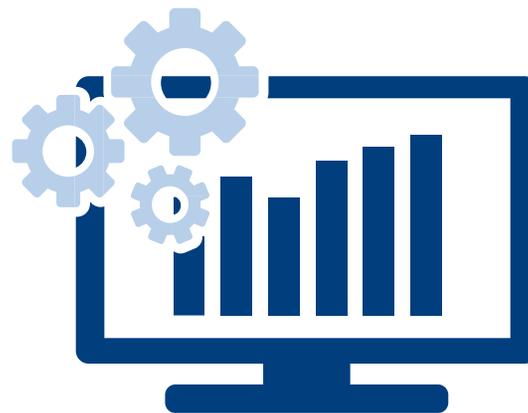
Improve In-Production Quality Management

An MES can synchronize production activities to help operators coordinate real-time production sequences in increasingly flexible manufacturing environments. These production-management capabilities can play a vital role in your quality-management efforts.

Key opportunities for managing quality during production include:

Create and implement **enforceable workflows** that guide operators through each production process and help ensure products are built to specification, which can help improve first-pass quality.

Leverage product **quality tests** and **no-fault forward systems.** You can view results in real time and use the information to help prevent the release of below-quality products.

Hold and quarantine capabilities help keep products that don't meet your quality requirements – and are potentially dangerous – in your facility instead of reaching your customers.

Security features such as role-based access help restrict production activities to authorized workers.

Ease Compliance

Quality management can have significant implications on compliance for companies in highly regulated industries. In these instances, a modern MES can help you manage your workflows, ensure the proper tests are being conducted and speed review times to help ease your regulatory and auditing burdens.

For example, compliance-specific instructions can be delivered to operators and specific processes and procedures, such as required sign-offs, can be enforced at different points in the production process to help ensure compliance. Quality and safety managers also can access compliance results in a dashboard-style report, quickly search any production anomalies and take immediate corrective action.

Unique MES elements also are available to help companies meet compliance requirements specific to their industries. In the pharmaceutical industry, this includes electronic batch recording (EBR) capabilities, which can significantly simplify and speed compliance reporting compared to cumbersome, time-consuming paper-based systems.

> " *An EBR solution is the GPS of manufacturing operations. It guides the user to the desired destination, finds the shortest trip, alerts one to dangers and feeds them back in real time"* [1] *- Jerome Repiton, associate director of Lean Six Sigma programs, Ferring*

Achieve Product Traceability

Regulations are emerging around the world requiring greater traceability of products. Companies are being asked to better secure supply chains to protect consumers against potential counterfeits or diverted products, and to better track product history for consumer-safety reasons. A serialization system will be instrumental to helping them achieve this.

An effective serialization system can seamlessly access and share data across every level of your manufacturing enterprise – from serialization components such as printing and vision systems to plant-floor equipment, MES and ERP systems, and the supply chain – to trace products and their event histories throughout their life cycles. The system also can ensure adherence to industry or regulatory serialization standards, such as GS1.

Fortunately, the software used for your MES can support the serialization and track-and-trace systems needed to meet these requirements. And beyond providing traceability, these systems also can help you conduct more efficient product recalls, shorten containment response times and augment your marketing efforts.
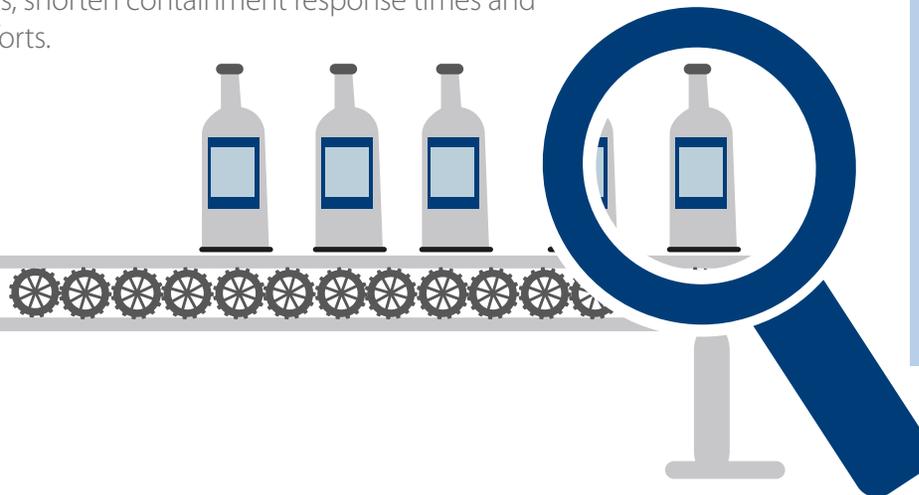
MES Helps Beingmate Meet Compliance Demands, Increase Productivity

Beingmate, one of China's largest producers of baby food, sought to build a new production facility that would double its annual production from 50,000 tons of infant formula to 100,000 tons. At the same time, the company needed to comply with a new government traceability regulation to help ensure the quality of infant formulas.

Beingmate sought a single production management system that would improve operational effectiveness and information integration, centralize recipe management, and meet the new traceability regulations. The company opted for the CPGSuite MES from Rockwell Automation.

The MES increased visibility and control of operations across the new site, and met 100 percent of China's requirements for manufacturing process traceability. The company also saw productivity improve three percent and labor costs reduce seven percent.[1]

[1] Beingmate Meets Government Regulations and Boosts Production With CPGSuite MES Solution, Beingmate, 2015

Summary

Quality is more than another metric or check-box. It's the foundation on which your brand exists. For your customers, quality is often the deciding factor between you and the competition.

A modern MES can play a critical role in optimizing quality management in today's increasingly connected and information-driven operations. It can help your workers make more-informed business decisions and better manage quality throughout the production process, and can help ease the burden of complying with both existing and emerging regulations.

To learn more about how an MES can help you modernize your quality-management efforts, contact a Rockwell Automation sales representative or visit:
http://www.rockwellautomation.com/rockwellsoftware/products/quality-management.page?