EPICOR

Leveraging digital process control to optimize quality, training, and throughput

Manufacturing Digital Transformation

INTRODUCTION

Manufacturing is constantly evolving. To keep pace with the competition — and meet the shifting demands of customers — manufacturers need to embrace a cycle of continuous improvement. This comes down to investment in three key areas: quality, training, and throughput. Each is complex, multifaceted, and vital to success.

Fortunately, manufacturers have a vast digital toolkit at their disposal. Manufacturing Execution Systems (MES) like Connected Process Control (CPC) can improve efficiency, empower employees, and bolster productivity.

In this practical guide, we'll explore the three pillars of digital transformation — **quality, training, and throughput** — and unpack how you can utilize technology to streamline and optimize each area.

Boosting Quality

In an environment shaped by rapidly changing regulations and elevated consumer expectations, quality assurance is paramount.

With the right technology, manufacturers can boost customer satisfaction while improving compliance, mitigating quality issues, managing costs, and achieving long-term sustainability.

To begin your digital transformation journey, start with the following steps.

- **Audit your process for clarity and consistency.** Remember, a consistent process means a consistent product.

- **Establish quality checkpoints.** These clearly delineated data points will help you determine what to tackle first.

- **Develop a digital twin.** This recreates your system digitally, enabling you to monitor processes, detect downtime, and predict performance

  ◦ **Eliminate quality escapes.** Leverage your digital system to define and control potential scenarios that could arise during the production process.

  ◦ All pre-defined possibilities are configured in the system. This gives employees a transparent troubleshooting process to follow so they don't have to waste time waiting for approvals or sign-off.

  ◦ When deviations occur, the system enables additional process steps, ensuring all stops flow to a logical end.

  ◦ Scrap and reject codes and process data are captured in the system, creating a comprehensive history for engineering analysis.

- **Reduce human error** by integrating Internet of Things (IoT) devices and programmable logic controllers (PLCs) into your digital process. An MES can capture data from devices such as DC torque tools, USB barcode scanners, and more — offering further control and data validation.

- **Analyze data.** If you're experiencing repeat quality issues, an MES will allow you to drill down into your process. This data can pinpoint where the problem is stemming from and inform your next steps.

- **Use traceability and genealogy.** These tools are proof of the quality of your product.
  - Guided process control ensures you set up employees to produce only good parts — with a complete digital record to back them up.
  - Digital records provide engineers and front office staff visibility into the product's genealogy. If complications arise in the future, you'll have a traceable record, allowing you to perform a root cause analysis for recall containment or warranty repair.

- **Maintain compliance and regulation standards.** With digital process control, you capture and validate data for your entire build process. You can also push that information to other systems as needed, eliminating the risk of human error from manual data transfers.
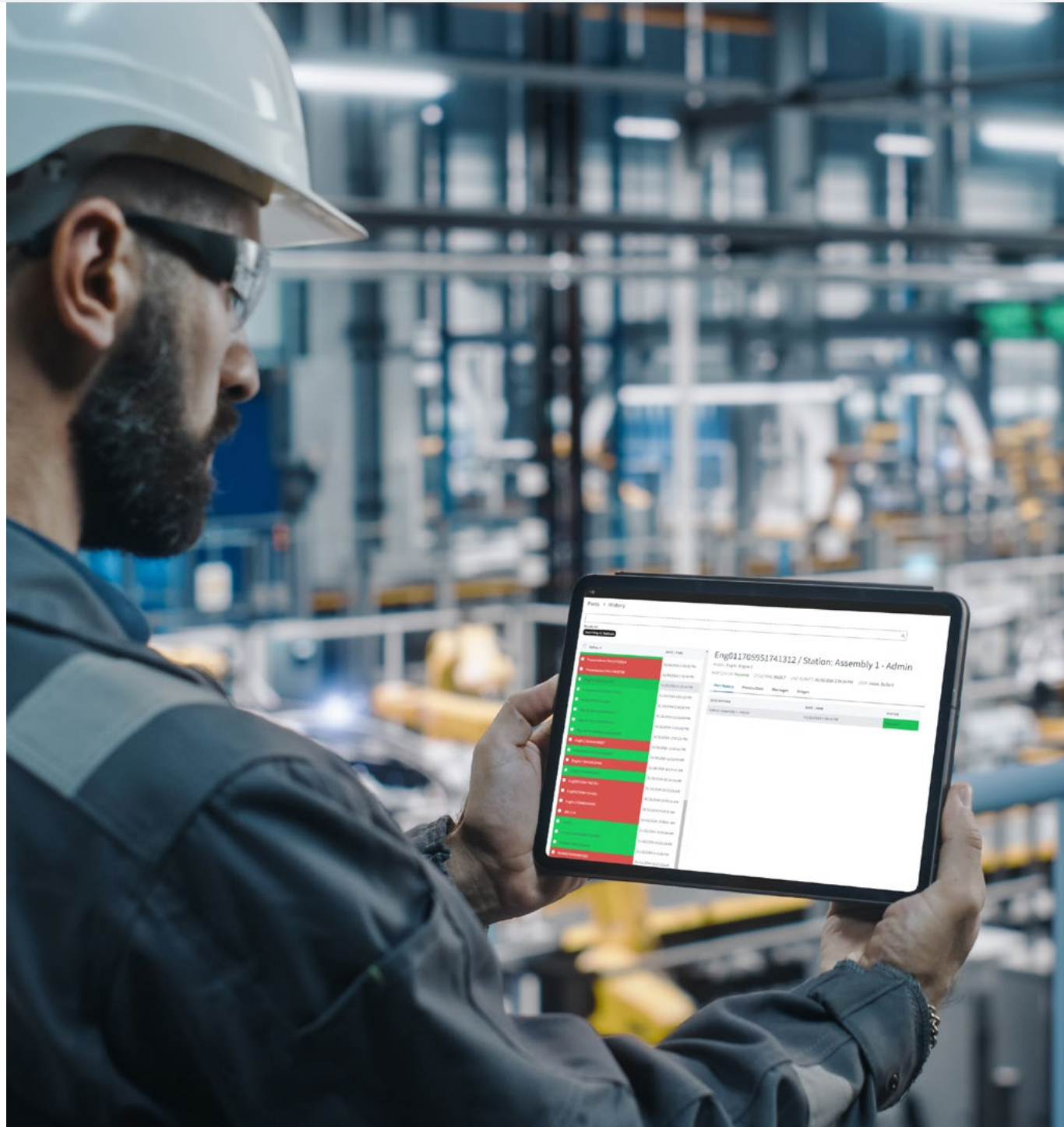
Enhancing Training

Technology doesn't just provide transparency and improve quality, it is integral to upskilling your workforce. A strong employee training program can reduce turnover, bolster job satisfaction, and increase productivity and adaptability. It's also crucial for maintaining safety on the plant floor.

The tips below can help you use digital tools to establish a responsive, impactful training program that empowers your employees.

- **Determine outcomes.** Pave the way for successful onboarding by setting clear performance standards.

- **Pinpoint specific skill gaps.** Identifying areas for growth and knowledge requirements for operators can ensure you select the correct user levels and skill tags.

- **Understand your process.** Create granular instructions geared towards new employees. For example, rather than providing an electrical diagram for wiring, consider using a simple, color-coded image.

- **Dynamically change the instruction based on skill level.** This allows entry-level operators to build deliverable products from day one.

- **Set up digital operator guidance.** This reduces reliance on highly skilled staff for job shadowing.

- **Take advantage of modern media.** Videos and GIFs can be easier to follow than static images or complex schematics. For instance, if an operator is installing a wiring harness, a GIF can be a straightforward way to demonstrate how they should route the wires.

- **Connect IoT devices to your assembly process.** This helps ensure operators follow the right procedures, use the right tools with the right tolerance levels, at the right time, and enforce quality standards.

- **Utilize time tracking.** Rather than using antiquated methods like a handheld stopwatch to complete time studies, take advantage of in-system time tracking mechanisms. This will enable you to understand an operator's ability to hit takt, offering insight into where their skill level tag should be.

Optimizing Throughput

For manufacturers, throughput is a critical metric. Optimizing throughput can improve resource utilization, enhance customer satisfaction, and increase profitability. But getting the most out of your digital transformation journey isn't just about choosing the best tools. It's also about involving the right people.

Engaging your **engineers** in the following steps can ensure you're utilizing their expertise to analyze workflow, identify bottlenecks, and streamline operations.

- **Define process owners.** Empower the correct individuals that are responsible for the process the ability to create and edit it, without the need to rely on additional departments (i.e. IT or controls).

- **Create the standard process.** Create a digital twin of your standard operating procedures (SOPs)

to help ensure operators are performing the process consistently.

- **Implement kaizen.** This includes evaluating the workplace to prioritize efficiency and ergonomics.

- **Use business intelligence and data insights.** Define strengths and weaknesses down to the task level, using digitization to complete root cause analysis of failures.

  ◦ For instance, digital time studies can provide visibility into overburdening issues and allow you to quickly re-distribute tasks.
  ◦ Similarly, time studies can enable you to understand where the highest takt is spent and rebalance your process.

For operators, the steps below can contribute to a productive, safe, and efficient assembly environment.

- **Use a uniform process.** Utilize visual aids that spell out what to do and when to do it — leaving no room for ambiguity.

- **Leverage IoT devices.** Devices will be enabled or disabled at the appropriate step and give the operator confidence they are performing their job correctly.

- **Provide reject and repair instructions.** The preconfigured digital process provides guidance to the operator when issues occur, guiding them through the necessary steps. The system records all reject codes and historical records.

Embracing the Potential of Digital Transformation

Epicor is here to help you harness the power of technology on the factory floor — leveraging data to gain essential insights and boost business performance.

Ready to accelerate digital transformation and drive growth?   **CONTACT US**

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