4 ways to prepare your workforce for smart manufacturing

Discussion and training are critical when implementing digital and statistical tools

By Bill Frahm | March 13, 2023 | 0 Comments

If a metal fabricating or forming company wants to get the most out of smart manufacturing technologies, it needs to create an environment that encourages workforce engagement. *elenabs/iStock/Getty Images Plus*

In any industry, adequately informed employees are more likely to accept and manage new technology. For press shops looking to implement smart manufacturing, workforce engagement in development is key to success.

Smart manufacturing broadly describes the use of digital and statistical tools to support manufacturing decisions. The biggest influences of smart manufacturing on your workforce will be the introduction of information management into their responsibilities. Silos must be broken if smart manufacturing is to be truly smart. This means that design/simulation, die tryout, and production must develop and support robust feedback loops. These feedback loops are the core to learning best practices and minimizing errors going forward.

And, because industry is still discovering the current and potential capabilities of artificial intelligence and machine learning (AI/ML), people remain your most versatile resources and should be your most reliable controls over AI/ML's misuse and misapplication.

Encouraging acceptance and constructive engagement by employees requires open communication about the opportunities of smart manufacturing and its potential impact on production and employees. Explain to them your definition of smart manufacturing, your objectives and implementation plans, how they will engage in the new technologies, and your ethics about

1. Define and Enforce Ethical AI

AI is intrusive. We are all familiar with the discomfort of casually mentioning a product, only to be assaulted with endless ads in social media and email for that product. Even worse, more than a dozen years ago, Target creeped out customers by sending coupons to women based on the retailer's "pregnancy prediction" score, calculated from their purchasing habits. When the retailer started sending maternity coupons to a high school girl near Minneapolis, upsetting her unknowing father, Target realized it went too far.

Your employees have boundaries about how much you can influence their personal lives and behaviors. You also have a responsibility to respect employee opinions and prioritize their safety. Before beginning your smart manufacturing journey, it's important to define what level of employee monitoring is acceptable. You must also define how management will handle employee intervention in equipment operations and in questioning the integrity of analysis. Knowing you have a firm, reasonable respect for employee safety and privacy will help you gain their acceptance and prevent abuse.

2. Explain Responsibilities for Information Management

Smart manufacturing is all about learning. Growth comes from understanding what processes reliably build quality components. Any new technology investment will only be as good as the quality and integrity of the data it uses. This means that each employee is responsible to ensure that decisions and activities are captured accurately.

Learning also demands that old, naive silos must end. The storied wall between simulation and tool and die design is counterproductive. The best way to learn how to design dies to meet geometric specifications and manage springback is to capture the history of changes and adjustments in a feedback loop to the design and simulation group.

Your employees should understand the importance of data in a modern plant environment. Not only should they capture accurate data, but they must also be confident to question data when it appears to reflect the plant environment inaccurately.

3. Ensure Accurate Sample Population Selection

Selecting a sample population is the most critical step in data analysis. I spent five years of my career repairing damage caused by seriously flawed analysis conducted on the wrong sample population.

Given the complexity of material properties, lubrication application, and tooling in today's press shops, it is critical that a knowledgeable employee review the population samples used to support production decisions. Your data analysts and auditors won't have a deep enough understanding to choose exactly the right elements to analyze.

4. Introduce the Fundamentals of Analysis

While it is unnecessary to teach calculus to plant floor employees, they must understand how results are obtained, what the results mean, and the vocabulary of statistical analysis. Whether analyzing component dimensions and integrity, developing a statistical model of historical data, or measuring press operations, it is important that responsible employees understand what is being analyzed and how to make good decisions.

It's Still All About the Materials

In the midst of implementing these digital and statistical tools, however, the bottom line is still the material you are forming—the one constant in every press shop.

With a basic understanding of the properties and behaviors of the materials being formed and the application of lubricants and other supplies, your employees can make better shop floor decisions using the results obtained from your smart manufacturing implementation.