



# SMART MANUFACTURING:

Building Talent to Accelerate  
a Digital Transformation



SMART MANUFACTURING  
INDUSTRY REPORT  
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## NO EXCUSES: Build a Smart Workforce Today

According to SME's Manufacturing in the New Industry 4.0 Era Survey<sup>1</sup>, manufacturers say that two top barriers preventing smart technology are people-related:

**LACK OF CORPORATE LEADERSHIP TO LEAD AND PLAN A SMART MANUFACTURING STRATEGY**

**LACK OF SKILL SET TO MANAGE IMPLEMENTATION**

Early adopters, however, are already taking a leadership role by creating and implementing a talent strategy to train team members on the integration and use of technology throughout the supply chain.

To grow and innovate in what is projected to become a nearly \$400 billion market by 2025<sup>2</sup>, digital leaders like Steelcase, and LAI International are transforming their operations, by investing in technology, equipment...and their people.

Their success demonstrates that the Industrial Internet of Things (IIoT) technologies add value for facility managers, helping them move beyond data collection to smart manufacturing.

With nearly half (47%) of manufacturers planning to invest in digital technology solutions in the next 24 months<sup>3</sup>, now is the time to determine needed competencies, ramp up recruiting, and bolster training of both new hires and incumbent workers.

This latest Smart Manufacturing Report focuses on the importance of a learning culture, and how manufacturers are developing a "smart" workforce to drive business results.

<sup>1</sup> Smart Manufacturing: 7 Essential Building Blocks, SME's Smart Manufacturing Industry Report. Vol. 1, No. 2

<sup>2</sup> Smart Manufacturing Analysis By Component, By Technology, By End-use, By Region And Segment Forecasts, 2014 – 2025, Grand View Research, Inc., Nov. 2017

<sup>3</sup> Smart Manufacturing: 7 Essential Building Blocks, SME's Smart Manufacturing Industry Report. Vol. 1, No. 2



**SAY A TOP CHALLENGE IS FINDING SKILLED WORKERS.**

47%

**OF MANUFACTURERS PLAN TO INVEST IN DIGITAL TECHNOLOGY SOLUTIONS IN THE NEXT 24 MONTHS.**

13%

**SAY THE INCREASED ABILITY TO ATTRACT YOUNGER TALENT IS A POWERFUL BENEFIT OF DIGITAL TECHNOLOGY.**

# SMART STARTS AT THE TOP

## Leadership with a Digital Strategy

A quarter (25%) of companies consider lack of corporate leadership to lead and plan a smart manufacturing strategy a primary barrier that prevents or slows the adoption of digital technologies.

Just as leadership commitment is essential for implementing digital transformation, senior management must develop a learning culture, providing the vision — and support for — a workforce development plan to support the new initiative.

**A learning culture directly supports leadership goals by aligning digital strategy with key performance indicators such as boosting operational effectiveness, reducing downtime, reducing scrap, heightening quality capabilities, and improving safety.**

In other words, leadership must understand the benefits of training, and invest time and resources to schedule it.

Steven Jones, Technical Material and Process Consultant, Global Technical Services & Manufacturing Engineering, Steelcase, agrees.

“The leadership within Steelcase is very knowledgeable and aware of what’s happening right now,” he said. “As a result, they have made it obvious that it’s very important for the organization to manage its way through this digital transformation time period.”

1/4

**of companies consider lack of corporate leadership and strategic plan as a primary barrier that prevents or slows the adoption of digital technologies.**



## MOST POWERFUL BENEFITS OF SMART MANUFACTURING



## SMART TECHNOLOGY REVOLUTION

Technologies enabling Smart Homes — sensors and cloud-based systems — are bringing the age of Alexa to manufacturing. A smart factory starts with the integration of business and manufacturing systems. This is often referred to as Information Technology (IT)/Operational Technology (OT) integration. Smart technology solves business challenges using data throughout the operation that allows operators to adjust as needed. Truly “smart” machines self-adjust based upon a growing database of information and output. To use the technology to its full potential, manufacturers must train employees to understand the data, trust it, and use it to improve operations.



## STEELCASE & DIGITAL TRANSFORMATION

Despite being a 100-year-old company, Steelcase, the largest office furniture manufacturer in the world, continues to innovate in the marketplace through its focus on smart manufacturing, and this comes from leadership.

Steelcase's Steven Jones was asked by management to look into the Industrial Internet of Things (IIoT) two years ago.

"The more I learned, the more I was fascinated by the potential of IIoT to have these very rather inexpensive sensors, and ways of collecting, organizing, visualizing and storing data in a secure, scalable fashion," Jones said. "It's a revolutionary concept. We can collect all this information and it can help us make decisions that will drive improved efficiency and impact the bottom line."

Steelcase now has an initiative to digitally transform its manufacturing operations around the world.

"We're making big jumps in the production process through the Industrial Internet of Things," said Steelcase Vice President of Global Operations Robert Krestakos in a recent Steelcase Q&A<sup>4</sup>. "It's really changing the roles of people on the plant floor. For example, zone leaders are getting access to real-time data about how production activity is going and can make ongoing adjustments."

He added, "Our data-driven tools and capabilities give us creative freedom and engineering flexibility."

<sup>4</sup>"Choice is the New Black." Steelcase



# BUILDING KNOWLEDGE AND SKILLS



A second barrier cited by manufacturers (28%) was lack of skill set to oversee and manage implementation.

“The vast amounts of data being collected across the various manufacturing system hierarchies will create needs for new types of manufacturing skill sets where workers at all levels are savvy in instrumentation, sensing and actuation, data analytics, computer science, and systems engineering practices,” said Al Sanders, Ph.D., president and owner of Design-Vantage Technologies LLC.

He added that smaller manufacturing companies likely lack a legacy organizational structure and the workforce skill sets required. “Providing manufacturing IT training and certifications for OT professionals (operators, technicians, manufacturing engineers, industrial engineers, etc.) and OT training and certification for IT professionals (network administrators, IT engineers, etc.) could address the knowledge gaps present in each discipline,” Sanders said.

Forward-thinking manufacturers are investing in training programs and using competency models to build the capabilities they will require to remain competitive.

It starts with putting a system in place to codify knowledge and skills required for job roles, aligned with training curriculum, and tied to business goals.

For instance, manufacturers are using competency models such as Tooling U-SME’s Competency Framework for Manufacturing Excellence, to assess and build knowledge, skills and abilities, as well as create clear career pathways for employees.

This structured approach to workforce development promises consistency when building high-performance team members to meet the demands of the Industry 4.0 economy.

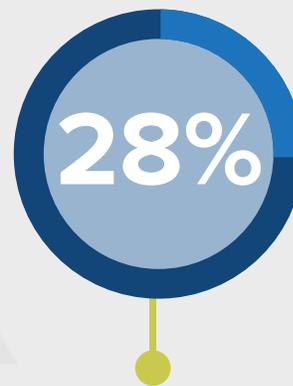
The bonus is that innovation comes when a workforce is fully immersed in the technology. Workers can then make connections, and envision improvements or completely new approaches to problems.

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**“You need operations people that actually know how things connect and what relates to something else, and you need data scientists that can statistically write code to start building decision trees to perform those same roles.”**

– Lincoln Hughes, Director ME PLM, American Axle & Manufacturing

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**HAVE LACK OF SKILL SET TO OVERSEE AND MANAGE IMPLEMENTATION.**

# LEADERSHIP LESSONS: BURN THE BRIDGE



For Arizona based LAI International, a premier provider of highly-engineered, mission-critical components since 1937, smart manufacturing started off as a natural extension of business as usual.

“All projects at the company tie to five basic premises,” said Patrick J. “P.J.” Gruetzmacher, Chief Executive Officer and President, LAI International.

“We needed to know if it made sense in our business, and if it did make sense, can we build the roadmap to safety, quality, delivery, inventory and productivity?”

The company developed a beta test case and rolled it out across one line.

“From a cultural perspective, boy, did we get resistance,” Gruetzmacher said. “We failed miserably because people had options. I couldn’t get the team to buy in.

“We’re gonna burn the bridge behind us,” Gruetzmacher decided, confident in the new system that had been validated through beta testing.

LAI literally ended the old system by flipping the switch. “We stuck to our guns and we made sure we put a bunch of resources out on the factory floor, and we trained, trained and trained,” said Gruetzmacher

## EMPLOYEE BUY-IN: Implementing Valuable Manufacturing 4.0 Lessons

- **Find champions.** These are informal leaders that become the “go to” people, who adopt the technology first and start to show others how to use it.
- **Prioritize team feedback.** Once the LAI teams started using the new technology, they quickly began suggesting additions and changes. “We took whatever they recommended and put it right at the top of the list. We turned it from a push project to a pull project where people were trying to pull it into their lives and it ended up being fantastic,” said LAI’s Gruetzmacher.
- **Incentivize your teams.** When they needed to figure out moving from single piece flow to batch processing, Gruetzmacher told the IT team that nobody would get a raise until they rolled it out companywide. “They thought I was kidding.” (He wasn’t.)
- **Keep training.** With each change, LAI does more training. “We follow up and make sure everyone’s good with it,” said Gruetzmacher.



# ADVANCE YOUR COMPANY WITH SMART MANUFACTURING TRAINING

## Training is the Best Recruiting Tool

Smart manufacturing is new for everyone, and both employers and employees are motivated to learn more.

Today, one of the best recruiting tools is offering a standardized learning and development program.

“As part of the hiring package, it says training is an important part of the wellness program to keep employees sustainable and still of great value to the company for many years to come,” said Thomas R. Kurfess, Ph.D., P.E., Professor and HUSCO/Ramirez Distinguished Chair In Fluid Power and Motion Control, George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology and 2018 SME President.

For companies to excel and use smart manufacturing to its potential, they must focus on developing the current generation as well as the next generation of manufacturing workers. Training comes in many forms, from apprenticeships to online training.

Often these opportunities are offered in conjunction with local educational institutions such as high school career and technical education (CTE) providers, community colleges, and universities.

For instance, according to the Tooling U-SME Industry Pulse: 2018 Manufacturing Workforce Study, three-quarters of companies (75%) offer internships for students in manufacturing. Additionally, 7 in 10 (69%) support community college manufacturing skills development programs.

These educational partnerships help build the talent pipeline, ensuring new hires are familiar with digital technology, as well as provide incentives for high performers to stay with a company by helping them become more productive and effective in their current roles.

“If you want the best people in there, say ‘we are going to train you.’ This approach is good for the economy, the employees, and the employers,” said Kurfess.

He added that students understand education continues for rest of their career, and that they can’t just graduate and stop learning. They expect employers to share the philosophy of lifelong learning.



**“You can’t sit still because your competition from around the world is going to pass you right by, and it is the technology that will keep you at the leading edge.”**

*– Thomas R. Kurfess, Ph.D., P.E., Georgia Institute of Technology and 2018 SME President*



## About SME

SME connects all those who are passionate about making things that improve our world. For 85 years, SME has dedicated itself to ensuring the health and competitiveness of the manufacturing industry through developing the workforce and promoting advanced technologies.

As a nonprofit organization, SME has served practitioners, companies, educators, government and communities across the manufacturing spectrum for more than 80 years. Through its strategic areas of events, media, membership, training and development, and the SME Education Foundation, SME is uniquely dedicated to the advancement of manufacturing by addressing both knowledge and skills needed for the industry.

Learn more at [sme.org](http://sme.org), follow @SME\_MFG on Twitter or [facebook.com/SMEmfg](https://facebook.com/SMEmfg).

## About Smart Manufacturing

SME is the hub for Smart Manufacturing knowledge and connections. We are helping companies navigate the 4th industrial revolution via Smart Manufacturing magazine and seminar series, industry studies and white papers, technical groups and the inaugural Smart Manufacturing Experience event. SME connects manufacturers to the latest in smart technologies and expertise every day. Learn more at [sme.org/smartMFG](http://sme.org/smartMFG).

## PROVEN STRATEGIES AND SUCCESS STORIES IN THE LATEST SMART MANUFACTURING REPORTS.

The Smart Manufacturing Report Series by SME helps manufacturers consider, evaluate and execute strategies to become strong entities as the industry shifts to integrated and flexible advanced manufacturing technology and tools. Reports provide a roadmap for manufacturers who want to adopt these practices, outlining the right technologies and solutions as well as how to recruit and train a “smart” workforce.

## CONTACT

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