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Changing the face of automation to revitalize U.S. manufacturing

By Todd Lucey

Andrew Liveris, advocate of manufacturing for the long-term health of our nation's economy and author of *Make it in America*, emphasizes "Manufacturing employs nearly 13 million people in the U.S. and 6 million in related fields. No other sector performs more R&D [research and development], drives more innovation, exports as much or contributes more to the nation's economy than the manufacturing sector."

We must reinvent the face of U.S. manufacturing in the automation industry to prosper. This requires "all hands on deck," for the long-term well-being of our economy. Here are my recommendations:

- Invest in new infrastructure
- Develop cutting-edge R&D
- Lead through education and workforce development

As one of the largest instrument manufacturers in the industrial automation industry, Endress+Hauser sees it as the responsibility of its company to lead the way in this initiative and thinks other companies should do the same.

Out with the old, in with the new

Investing in infrastructure is essential to reinventing U.S. manufacturing and is fundamental for prolonged economic health. Flexible manufacturing and customization of product portfolios will drive our economy, so we must position resources accordingly.

Companies must expand operations, invest in infrastructure, and become more flexible partners for customers.

For example, Endress+Hauser invests an average of 10 percent of annual revenue into infrastructure. By 2014, more than $40 million will be invested into U.S. operations, resulting in 90 percent of all instruments ordered and shipped within the U.S. being manufactured in the U.S.

Manufacturers must lead the way to produce more sustainable products in the U.S. and develop the workforce to fully optimize the supply chain, generating a positive impact on the manufacturing sector.

Made in America

Customers continue to expect more from suppliers, such as solutions for everyday operational needs (i.e., increased plant safety, reduced maintenance and project costs, and improved process reliability). Driven by the need for greater productivity and efficiency, organizations will increasingly adopt smart technologies to serve their customers. This leaves great potential for automation and customized solutions in industrial applications.

Manufacturing is the center of innovation and R&D through the development of new technologies and product designs that yield sustainability and efficiency. For example, Endress+Hauser reinvests an average of 10 percent of annual turnover into R&D, resulting in more than 200 patent applications per year, adding to the more than 3,500 currently registered.

Industry leaders, engineers, and technicians knowledgeable in automation are critical for keeping U.S. manufacturing alive. The Automation Federation and U.S. Department of Labor developed an automation competency model that helps clearly define the competencies needed today in the field of automation.

For individuals to have these skills and be successful in the workplace and to secure the talent pipeline, we must embed these competencies into our curricula. We must encourage the highest quality science, technology, engineering, and math (STEM) education.

Cradle to grave

The cradle-to-grave approach, led by the Automation Federation's Workforce Development plan, stresses the importance of strengthening STEM. Working toward the same goal, we can join the efforts headed by Project Lead the Way—a provider of STEM education curricular programs used in middle and high schools across the U.S.—to create a greater awareness of STEM-related careers in the field of automation.

We must start at the beginning. Educators and industry leaders must engage students at the grade-school level in problem-based learning. This means

more hands-on opportunities for solving real problems, using critical thinking, and inspiring innovation. For example, Endress+Hauser's training program was developed around a hands-on learning experience for its end users. Enrollment increased 50 percent in 2012, and since then Endress+Hauser has begun building five more training facilities across the U.S.

It is equally crucial we work alongside our universities to develop more STEM-related degree programs like automation engineering. There needs to be more financial investment to enable educators to better train students with the proper technology needed—specific to automation. Suppliers should donate equipment to local schools, helping to keep their labs up-to-date.

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As stated by Liveris, "manufacturing matters," and we cannot ignore the role our industry plays in the long-term health of our economy. We must reinvent U.S. manufacturing in the industrial automation industry. This will require the right mentality—the opportunity is ours, and we must seize the day. As author Jim Collins said, "Greatness is not a function of circumstance. Greatness, it turns out, is largely a matter of conscious choice and discipline." The key to U.S. manufacturing prosperity lies in the hands of every industry leader. Each leader must make a conscience choice to be great.

ABOUT THE AUTHOR

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