Automation Investment High Among U.S. Manufacturers

written by Lauri Moon | June 28, 2016

MAPI survey shows actual, planned automation investment high among U.S. manufacturers

(Logistics Management – Patrick Burnson: 6-13-16) A new report from the MAPI Foundation indicates that despite the economic slowdown in the industrial sector over the past year, the incidence of actual and planned automation investment is very high in American manufacturing.

The report is based on a national survey of U.S. manufacturers and non-U.S. manufacturers with a presence in this country and is the second in a series of studies on productivity that the MAPI Foundation is producing this year.

Written by Cliff Waldman, director of economic studies at the MAPI Foundation, and sponsored by Rockwell Automation, a global leader in industrial automation, the findings of the national survey show that the high incidence of automation investment spans various company sizes and manufacturing subsectors:

- 83% of respondents indicated they engaged in automation investment in the past five years.
- More than three-quarters (76%) plan to engage in such investment during the next three years.
- 45% indicated their automation investment was part of a broader technology upgrading and 35% said it was a stand-alone investment. The remainder of respondents indicated they engaged in both.

“Automation implementation exhibits characteristics of both capital investment and innovation investment,” observes Waldman. “While deploying machinery into a production line has characteristics of capital equipment investment, it does not appear to be as short-term oriented as capital investment.”

Waldman added, “Automation also does not appear to be an element of business

expansion. Rather, *it is more like process innovation whose principal goals are cost reduction and product quality improvement."*

"The findings in the MAPI Foundation's second study confirm that automation is a critical driver of productivity and quality improvements for manufacturers as they seek to stay competitive in this challenging environment," said Joe Kann, vice president of global business development at Rockwell Automation.

"The study also points out that automation investments are more often seen as part of a broader business-wide technology upgrade as opposed to a stand-alone application. This is consistent with Rockwell Automation's vision of *The Connected Enterprise* in which operational technology is converged with information technology to drive higher levels of productivity and competitiveness," Kann noted.

(Patrick Burnson is executive editor for *Logistics Management* and *Supply Chain Management Review* magazines and web sites.)

DCED Releases Business Services Matrix

written by Lauri Moon | June 28, 2016

Pennsylvania offers a variety of financial and technical assistance programs to support business location, expansion and industry growth. The Department of Community & Economic Development (DCED) has compiled a list of the department's business assistance programs.

IMC is part of the state's Partnerships for Regional Economic Performance (PREP) program.

DCED Business Services Matrix 2016

Technology Driving Convergence of Industries & Their Workforces

written by Lauri Moon | June 28, 2016

Packaging, processing, food service and restaurant operations are all automating

(On the Edge Blog – Keith Campbell: 5-31-16) This past week, I had the opportunity of combining my attendance at The Automation Conference and Expo, focused upon manufacturing and produced by PMMI Media Group, with a visit to the NRA Show 2016, focused upon food service and produced by the National Restaurant Association. Both events were held in the Chicago area. I expected to find some elements in common, especially workforce issues, but I was surprised to find so many common elements related to both workforce and automation.

It is but a small step from a food processing and packaging line in a low volume manufacturing plant to a food service kitchen for a caterer or institution such as a school, hospital, or military base. And it is but another small step from food service to retail restaurants. Recognizing this, it should be no surprise to find a convergence of issues driven by technological change.

Food service operations, restaurants and bars are automating using many of the same technologies found in manufacturing. The NRA show floor included exhibitors selling sensors, controllers, pumps, valves and motors. It included processing and packaging machines for performing unit operations and combinations of these machines organized into workcells. It included robots and 3-D printing. Automation systems integrators, business systems integrators, and IT companies were promoting products and services, and the Internet of Things (IoT) was a popular theme.

What appears to be an exciting growth area for these food services industries are what manufacturers would call Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and Manufacturing Execution Systems (MES). Many of the solutions shown were based upon the use of tablets and the cloud. Suppliers indicated that increasing complexity of the industry, lack of appropriately skilled workers, and rising minimum wage standards have been causing their phones to ring off their hooks as food service and restaurant operators seek to automate.

Experience tells us that automation drives up the skill requirements of the workforce. Lower skilled tasks are often taken over by machines and software, and people in those jobs often have the opportunity to move up by acquiring new skills. The workers that remain perform higher value-added tasks such as data analysis, problem solving, troubleshooting and maintenance. As food service automates, workers will need to be upgrading their skills. Our high schools will need to be turning out graduates with different and better skills, as lower skilled jobs of the past disappear. I would caution, that this should NOT imply sending more to college! Career paths will be altered. Career pathways between manufacturing and food service may also converge.

My mind isn't made up if this will exacerbate or reduce the skilled worker shortfall for both manufacturing and food service.

Smart Manufacturing & The Internet of Things

written by Lauri Moon | June 28, 2016

(IW — Andrew Waycott: 6-3-16) There's a rumor going around, centered in Germany, that we're now in our fourth Industrial Revolution. According to this rumor (in which I believe):

The first Industrial Revolution started in England in the 18th century. Think: mechanical looms.

- The second centered on electrically-powered mass production, near the start of the 20th century. Think: Henry Ford and assembly lines.
- The third is electronics and robotics and IT. Think: computers enter the office and manufacturing space.
- The fourth is about harnessing, finally, the power of data. It's about big data and predictive analytics and artificial intelligence, and it includes Smart Manufacturing. Early computers did what humans could do, but faster and better. Smart Manufacturing puts machines in the business of real decision-making—through calculations outside the range of human capabilities. Think: the data tells us what to do.

With Smart Manufacturing, the Data Tells us What to do.

Or to state it more dramatically, the computers control the process! While the smartest person in the room is still human (depending on how we define 'smart'), machines can tell us things we don't know and could not figure out on our own.

Say we're talking about maintaining aircraft engines. In the old days, all we could do as humans was:

Analyze how frequently they failed, and work to a preventative maintenance schedule cycle slightly shorter than the average of that period.

- Wait for it to fail.
- Fix it.

It's not optimal. But now, with sensors providing considerably more data about the engine, and software that is able to analyze that data in a highly sophisticated manner, we can have a much more precise idea of when each engine needs maintenance, and what type.

Better data and better analytics give us considerably more insight into the root cause of any specific shop floor event or process. And the root cause makes all the difference, in terms of increasing efficiency and quality, while decreasing cost.

The Industrial Internet of Things (IIoT) applies Internet of Things technology to manufacturing. IIoT incorporates machine learning and big data, harnessing sensor data and automation. The big idea behind IIoT is that smart machines are better than humans at capturing, analyzing and communicating [some types of] data. Manufacturers can pick up on inefficiencies and issues sooner, and find answers faster.

A major part of the story is the drop in technology costs. The emergence of cheap connected devices, coupled with the availability and affordability of mass computing power, has been the biggest driver of Smart Manufacturing.

It All Hinges on Visibility

Visibility is the driver of ROI, in manufacturing efficiency. And Big Data and Smart Manufacturing have taken visibility to a whole new more granular level. In real time.

With greater visibility of the real workings, your shift supervisors and operators can make better, more informed decisions, all day long. There are all kinds of possibilities: messages on their phones; displays on a monitor; an overhead dashboard that highlights your six key processes. It’s all about visibility.

One Last Point About Smart Manufacturing

Just to clarify—you can, in theory, run a Smart Manufacturing plant that has no connection to the Internet. Essentially, Smart Manufacturing is about using analytics and Big Data to run your plant better (think: the data tells you what to do!).

So Smart Manufacturing isn’t really about the Internet. It’s about collecting and crunching data to make more informed decisions.

(Andrew Waycott is Chief Operating Officer and Chief Technology Officer, Factora)

The M4.0 Tidal Wave is Coming-Are You Ready?

written by Lauri Moon | June 28, 2016

(Manufacturing Leadership — Paul Tate: 6-7-16) "Industry is about to experience more change, across more aspects of the business of manufacturing, and in a shorter time than perhaps any period of transition in the history of manufacturing", predicted David Brousell, Co-Founder and Global Vice President of the Manufacturing Leadership Council in his opening address at the *2016 Manufacturing Leadership Summit* earlier today.

Hosted by international research and consultancy company Frost & Sullivan at the Omni La Costa Resort in Carlsbad, CA, the theme of this year's 12th Annual Summit focuses on ***Manufacturing 4.0****: The New Rules of Leadership,* and has brought together over 200 senior industry leaders from across multiple sectors of the global manufacturing sector.

Citing the results of the Manufacturing Leadership Council's recent research study on *Factories of the Future*, Brousell continued that over the next five years the research suggests that a "tidal wave of digital change is coming" for manufacturing. This will engulf production and assembly processes, the devices and equipment on plant and factory floors, how design relates to production, how companies interact with customers and suppliers, and, perhaps most importantly, how and where leadership teams will pilot their companies in the years ahead.

On a broader scale, the impact of this digital transformation across society will be profound, he added. For example, until about 1900 observers suggest that human knowledge doubled around every 100 years. But today, he noted, IBM estimates that the build out of the Internet of Things alone will cause human knowledge to double every 12 hours!

Yet the digital transformation that is inherently part of M4.0 for the manufacturing sector, is still in its early stages in most companies, he explained. What's more, any manufacturing company that believes M4.0 is simply about investing in new digital

technologies alone is missing the point.

Digital tools are critically important, of course, but M4.0 is also about "cultural change and organizing differently – understanding and successfully implementing such things as flatter organizational structures and a collaborative innovation model – as well as re-tooling leadership teams with non-traditional skills sets," he added.

The problem is that many manufacturers appear to be struggling today to fully absorb and get into position to drive and lead this new industrial revolution.

Citing another recent Council research project on *Next-Generation Manufacturing Leadership,* Brousell reports that, "While manufacturers expect to receive significant benefits from digitization, they also say their leaders have not yet fully adjusted their mind-sets, behaviors, and skills in ways that will be necessary to take advantage of the possibilities of digitization."

Perhaps that's where the biggest challenge along the journey to M4.0 may lie for many manufacturing organizations in the years ahead. Time, however, is not on the side of those who delay.

"You will not have 25 years to get on board with M4.0," advised Brousell. "You are going to have to act fast – and with as much precision as possible."

(Paul Tate is Research Director and Executive Editor with Frost & Sullivan's Manufacturing Leadership Council. He also directs the Manufacturing Leadership Council's Board of Governors, the Council's annual Critical Issues Agenda, and the Manufacturing Leadership Research Panel.)

The Rise of Manufacturing Marks

the Fall of Globalization

written by Lauri Moon | June 28, 2016

(Geopolitical Weekly – Rebecca Keller: 6-7-16) Whether you're reading this article on a smartphone, tablet or laptop, chances are the device in front of you contains components from at least six countries spanning three or more continents. Its sleek exterior belies the complicated and intricate set of internal parts that only a global supply chain can provide. Over the past century, finished products made in a single country have become increasingly hard to find as globalization — weighted a term as it is — has stretched supply chains to the ends of the Earth. Now, anything from planes, trains and automobiles to computers, cellphones and appliances can trace its hundreds of pieces to nearly as many companies around the world. And its assembly might take place in a different country still. Opportunities for producing and assembling products and their components have spread worldwide, making it is easier for countries to climb the production value ladder. States at the bottom, extracting raw materials, can gradually move up, first making low-value components and then progressing to higher-value ones or basic assembly.

But just as technology spurred globalization and the shifts in international trade that followed, so, too, will it revolutionize how countries again do business with one another. Compounded by the economic and demographic changes taking place today, automation, advanced robotics and software-driven technologies are ushering in a new era — one of shorter supply chains that will provide fewer opportunities for the developing world. Regions once labeled "emerging economies" may instead stagnate, and the divide between the haves and have-nots within and among nations could widen further.

2016-17 WEDnetPA Funding

Applications Now Available

written by Lauri Moon | June 28, 2016

Did you know that the cost for attendance at one of IMC's Open Registration Workshops or Onsite Training at your facility could be covered by WEDnetPA funding? Contact Lauri Moon to discuss your training needs.

Applications for the Workforce and Economic Development Network PA (WEDnetPA) training reimbursement program for Fiscal Year 2016-17 are now available. Funding is provided through the PA Department of Community and Economic Development (DCED) and administered by 27 WEDnetPA Partners throughout the Commonwealth. The goal of WEDnetPA is to strengthen the business environment of Pennsylvania by providing qualified employers (primarily manufacturing or technology-based businesses) training reimbursement funding for new and existing employees that can improve their skill level and productivity. Companies determine their own training needs and can select among a wide range of training providers (the WEDnetPA partners, third-party providers or in-house staff) as well as how and where the businesses will receive the training (onsite, offsite or online). For more information on WEDnetPA visit www.wednetpa.com or click here.

Digital Manufacturing is a Growth Sector

written by Lauri Moon | June 28, 2016

American manufacturers are investing heavily in digital technologies, pouring 2.6 percent of their annual revenue into digital systems, according to PwC. That investment "is expected to increase to almost 5 percent of revenue in the next five years, an estimated $350 billion," says the consulting firm.

Venture capital firms have invested $3.6 billion since 2011 in start-ups developing

digital technologies for manufacturers. This funding reflects “an increase of nearly 50 percent annually with start-up investment focused on manufacturing software, ERP and inventory software and robotics and sensor technology,” states the consultancy.

Of the manufacturing companies that PwC surveyed, adopting digital manufacturing technologies will lower operating costs by at least 11 percent, “mostly through efficiencies gained by automating processes and production.”

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Why Good Marketing Photos Are So Important for Industrials

written by Lauri Moon | June 28, 2016
Customers often encounter a business through photographs. Why not make a good impression?

Good Marketing Photos Are Good Marketing

Marketing is all about communicating your value to the customer. Unfortunately, many industrial businesses don’t understand the importance of good marketing photos and how the right styling and consistent imagery can help them not only convey quality, but also help them successfully tell their company story and create alignment across their brand.

Read more from *Industrial Marketer*

U.S. Manufacturing Sector Attracting Foreign Investment from Asia, Europe

written by Lauri Moon | June 28, 2016

(Forbes – Ellen Sheng: 5-27-16) The U.S. manufacturing sector, which has been on a decades-long slide, is increasingly attracting foreign capital from Asia and Europe, a recent study found.

The study, which was compiled by seven business schools, found that even though China remains a top manufacturing destination, more companies are shifting production volume to the U.S., rather than moving manufacturing out of the U.S.

Notably, the trend is being driven by foreign companies, mostly from Asia or Europe. The study surveyed senior supply chain executives at 85 of the world's largest manufacturers. The report was put together by The Global Supply Chain Benchmark Consortium, which consists of seven business schools and Avnet, a maker of electronics components.

"Companies are coming to the U.S. for proximity to the U.S. market and technological innovation," said Shiliang Cui, assistant professor of operations and information management at Georgetown University's McDonough School of Business

The U.S. is still the largest economy in the world and companies come for market access, he explained. The second reason is for innovation, particularly in research & development as well as manufacturing efficiency and capability.

"When people say reshoring, it means a U.S. firm bringing back manufacturing to the U.S.," said Cui, *emphasizing that the study didn't find much evidence of reshoring*. But "manufacturing is on the upwards trajectory here and, at least in our sample, this was brought on by non-U.S. firms," he said.

Jiangnan Mold Plastic Technology Corp., which makes plastic mold parts for the automotive industry, invested $45 million to set up a 250,000 square foot plant in Greer South Carolina that is expected to be fully operational in the second half of next year.

“This investment in South Carolina and in Spartanburg County will further strengthen Jiangnan’s effort to expand its global leadership role in the plastic molding industry,” Robert Cao, Jiangnan Mold Plastic’s chairman and general manager said in a statement in April.

In other cases, foreign companies buy existing manufacturers. The largest such deal was Haier Group’s $5.4 billion acquisition of General Electric’s appliance business, based in Louisville, Kentucky, earlier this year.

Drawn By Research & Development, Cost Efficiencies

Proximity to the U.S. market as well as R&D, innovation, and design capabilities were key reasons foreign companies wanted to shift manufacturing to the U.S., the survey found.

Increasingly, the U.S. is also attractive from a cost standpoint. China’s rising labor cost is narrowing the difference. Wages in China have risen about 15% a year for the last decade. The low cost of oil and gas as well as high productivity, driven by technology and automation, also makes the U.S. manufacturing sector attractive.

A recent study by Princeton, N.J. consulting firm BLS & Co. and Tractus Asia, an Asia-based foreign direct investment advisory firm, found that median electricity prices for U.S. industrial plants are one-third to half the prices in China while electricity savings in the U.S. can be as much as 70%.

China’s unit labor costs are just 4% lower than in the U.S. since wage growth has outpaced productivity growth and the yuan has appreciated, according to Oxford Economics. While manufacturing output per employee in China doubled between 2003 and 2016, *the U.S. remains 80% to 90% more productive*.

U.S. manufacturing may not be in a renaissance yet, but studies are finding increasing interest and signs of a shift.

(Ellen Sheng is a Forbes contributor.)