Advocacy Clips is a weekly compilation of relevant news articles from around the country on subjects that impact the metalworking industry. These articles are compiled by Bracewell & Giuliani, NTMA and PMAs public relations firm. **Please forward this e-mail to a colleague who may have interest in these topics.**

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Sen. Eric Lesser: High-tech manufacturing experiencing renaissance in Western Mass. [NTMA Feature]
Mass Live
By: State Senator Eric P. Lesser
2/15/2017

There are many reasons for optimism about our region's economy. Springfield's skyline is dotted with cranes, and the next two years will see Union Station, the CRRC rail-car plant and the MGM Springfield casino open and come to life. Together, these developments represent billions of dollars in new investment and hundreds of new jobs.

But there is another economic trend worth our attention. It's more difficult to see because it largely plays out at local, family-owned shops up and down the Pioneer Valley. It's a renaissance in high-tech manufacturing - and the high-paying jobs that go with it.

Companies like Dielectrics in Chicopee, Meridian Industrial in Holyoke, FloDesign in Wilbraham and Advance Welding in Springfield are using cutting-edge techniques and highly skilled Western Massachusetts workers to make components for medical devices, aircraft engines, wind turbines and sonar systems sold all over the world.

Despite our leadership in this cutting-edge field, our region is not producing enough skilled workers to fill the available jobs. As a result, there are vacancies across Western Massachusetts and thousands more projected in the coming years. This shortage will become even more pronounced once the CRRC railcar plant comes on line.

Failure to address this skills gap is more than a statistic: it's a threat to our economic future.

Wages in this high-tech field can approach averages of $75,000 a year. Imagine the billions of dollars in lost

potential if we allow those positions to go unfilled, denying thousands of families the chance to buy homes, save for retirement and invest in the Western Massachusetts economy.

Eventually, we would do permanent damage to our economy because manufacturers will move somewhere with a steadier supply of skilled workers.

That's why I spent so much time focused on manufacturing policy last session, as Senate chair of the Legislature's Manufacturing Caucus.

It's also why, in the new legislative session, we need to expand and improve our vocational education programs, especially in high-tech manufacturing, and incentivize collaboration between local employers and local educators.

High quality training is especially important given the competitive nature of modern manufacturing. Workers are expected to operate complex, multi-million dollar machines and the computer systems that control them. This requires mathematics and engineering skills, along with the ability to adopt new technologies like 3-D printing.

Luckily, many of our region's leaders and organizations are preparing the next generation of high-tech workers in innovative ways.

The machine tool technology programs at Chicopee Comprehensive High School and Putnam Vocational-Technical Academy are statewide models.

On a college level, the Smith & Wesson Applications Center at Springfield Technical Community College continues to see record enrollment and placement.

And for those striving to enter the workforce, the Regional Employment Board of Hampden County and the Western Massachusetts chapter of the National Tooling and Machining Association run a pilot program for unemployed and under-employed workers, including veterans, an initiative my colleagues and I substantially increased funding for last session.

There are many new initiatives aimed at supporting the Pioneer Valley's high-tech manufacturing scene.

Valley Venture Mentors, for example, launched a manufacturing accelerator to help local manufacturers get connected to new business opportunities.

Greentown Labs, a clean-energy incubator in Somerville, is opening an office at the Springfield Technical Community College Technology Park in Springfield to connect start-ups in eastern Massachusetts with manufacturing companies here, the fruits of an initiative led by House Speaker Robert DeLeo.

Tech Foundry in Springfield is pioneering new workforce training techniques and continues to grow and attract applicants.

These public-private partnerships need more support from Beacon Hill so they can continue to foster a vibrant, high-tech ecosystem in Greater Springfield.

We also need to do a better job marketing the high-tech manufacturing scene in Western Massachusetts and showing young people the type of futures they can have in this fast-paced industry.

Ever since George Washington placed the Armory here, Springfield - and the Pioneer Valley - has had a proud history of making some of the world's most important and innovative products, from the first monkey-wrench to the first gas-powered automobile, from Rolls Royce cars to the rifles that won World War II.

We have been a high-tech center for centuries. Now, it's time to recapture that spirit for the next generation.

Last year, I worked with my colleagues to secure funding for a new high-tech manufacturing program at the Lower Pioneer Valley Education Collaborative. The program is a partnership between nine area school districts, local employers and the state. During one of several visits, I met a high-school student who was learning to fashion aluminum for jet engines and other machines. He showed the same pride as my paternal grandfather, who worked as a tool-and-die maker his entire career.

At 18 years old, this young student will graduate and enter a high-tech field with clear pathways for advancement.

After a few years, he can use his new skills and networks to open a local shop of his own. The products he makes will be used across the world, in some of the most important and competitive fields, from clean energy to aviation to healthcare. People will rely on his work to grow food, ship goods, fly planes, power cities and do everything else essential to powering our modern economy. And he will do it close to his home and his family, without having to move to Boston or New York or San Francisco, and without taking on tens of thousands of dollars in debt.

As a new year begins, let's work to make sure we give thousands more people in Western Massachusetts the same opportunity.

State Sen. Eric P. Lesser, D-Longmeadow, is co-chairman of the Legislature's Joint Manufacturing Caucus and co-chair of the Gateway Cities Caucus. He represents the 1st Hampden & Hampshire District in Western Massachusetts.

Is This the Real Life? Is This Just Fantasy? AR Hits Manufacturing

Is This the Real Life? Is This Just Fantasy? AR Hits Manufacturing
Industry Week
By: Matt LaWell
2/1/2017

Way back in December 1890, decades before it landed its first defense contracts, Newport News Shipbuilding delivered its maiden hull, a 90-foot tugboat affectionately named for the young daughter of a former Navy Secretary. Dorothy was delivered at a loss, well over budget. Big data might have helped to curb the overrun.

Augmented reality might have helped, too.

More than a century and a quarter later, NNS is on the front lines of manufacturers implementing augmented reality into any number of processes. The nautical leader, a division of Huntington Ingalls Industries, started to explore AR in 2007 and introduced the burgeoning technology to its shipyard in 2011 as part of a larger digital effort, according to engineering manager Patrick Ryan.

The tipping point, Ryan said, was a large project, sustained over three months in 2012, that introduced "digital storyboarding, a kind of mobile (virtual reality) solution" that cut down on the need for the massive drawings used for reference throughout the yard: "When we bring in a new generation of shipbuilders, giving them a drawing that's three feet wide, two feet tall and a foot thick is not how they're going to want to go to work." Of course, the digital storyboarding also demonstrated a 35% cost reduction in the construction of one craft over those three months, which helped spark the overall shift toward digital.

Since then, Ryan said, "we've fielded more than 50 projects into our industrial waterfront using augmented reality to reduce cost, improve quality, improve safety, and reduce schedule—the four pillars."

NNS uses tablets for just about all its AR initiatives, most often for inspection—Ryan said one inspection process that normally lasts 36 hours had been trimmed to 90 minutes—as well as work instruction, training and the continued elimination of those oversized ship diagrams. How can other manufacturers mimic the sort of success enjoyed on the Virginia shores, incorporating tech that most folks might recognize only because of the overnight success of Pokemon GO? Read on for some suggestions from Ryan and a panel of other industry leaders who have already dived into the enhanced world of augmented reality.

Start (Relatively) Small

Even now, after more than five years of development, the number of NNS employees working directly with AR remains "unimpressive," Ryan said. The digital department numbers more than 200, but the company is only now exiting an AR pilot program and transitioning into a scaled deployment.

"That's the next hurdle for us to cross," Ryan said. "It's an immediate effort for us. It's not something we're putting off—we're working on it today—but no one would start with a scaled rollout. That would be crazy. You have to understand it first."

AR has a learning curve, like any developing technology, and jumping in by ordering dozens of smart helmets, smart glasses, or even tablets, makes about as much sense as installing a new IIoT plan without a whit of research. Using the hardware might feel like second nature, but it's not.

"A good place to start with AR is where you have a reasonably high task complexity and, as a result, a pretty sophisticated staff, places where they have a really high mix of activities," said Matt Kammerait, product marketing vice president at DAQRI, which manufactures a smart helmet designed for field engineers and introduced more streamlined smart glasses designed for plant work stations in December. "I think AR especially is the platform that's going to transform how people and technology interact."

Ryan subscribes to that idea, and has developed some guidelines for successfully weaving it into his manufacturing process:

• Introduce it first in areas "where it creates the most value and (where) it can actually be subjective." In some instances, that means helping workers become more efficient. In others, cutting down on errors or beefing up safety is the focus.

• Balance the needs of workers against the capability of the AR solution. By its very name, AR is intended to provide a supplement to what we see and do, not replace folks on the floor.

• Implement and test potential solutions only after fully defining use cases and culling data. More often than not, potential use cases wind up on the cutting room floor.

So much about AR is still being written, developed and tested that it can be hard to get a grip on its industrial possibilities. Not everybody has been deep in the process for five years like Ryan and NNS. Just like the National Association of Manufacturers and the Manufacturers Alliance for Productivity and Innovation can shed light on general best practices, the Augmented Reality for Enterprise Alliance, or AREA, focuses on helping manufacturers who want to delve deeper into AR.

"Organizations are still a little uncertain about where to invest, providers are struggling to find customers, and technology readiness is a little bit unclear," AREA executive director Mark Sage said. "It's an irregular ecosystem."

Sage said AREA is trying to foster "a much more developed ecosystem so people understand the best tools for the jobs, and companies and providers are speaking the same language so they can have a conversation about augmented reality."

And once you have a plan in place, you can turn more attention toward the fun stuff: all the gear.

Explore Your Options

The second generation of smart glasses is starting to ship, and most of the models are "really addressing the lack of maturity that the first-gen devices had," said Jay Kim, chief strategy officer at Upskill, which develops focused software systems for smart glasses and recently changed its name after six years as APX Labs. "This is really the first generation of glasses that is in position to be deployed by the thousands. A lot of this is backed by the fact that you've seen market entry over the last year by big names like Intel, Microsoft and Google."

Google, of course, was the first company to enter the mainstream AR conversation thanks to its Glass. Kim, Kammerait and Barrie Vince, software architect at Plex Systems, all lamented the lost potential of that prototype, which Google stopped producing in January 2015. (The company did file a patent for a new version less than a year later.)

Glass remains a major player in the smart glasses market, one of the top three devices in market share along with the Recon Jet Pro and the Vuzix M100. But there are more options than ever now, with the monocular Vuzix M300 and RealWear HMT-1, and the binocular Epson BT-300 and -350 all expected to ship this year.

"The (Microsoft) HoloLens effectively singlehandedly unlocked the mixed reality market for the masses," Kim said. "By combining good-enough optics and a whole suite of sensors that can effectively characterize your environment, it has unlocked an entirely new way of thinking and a new way of sensing the environment."

While smart glasses receive the bulk of the headlines and attention—again, thanks to Glass and, more recently in

the virtual reality realm, the Oculus Rift, PlayStation VR and Samsung Gear VR—smart helmets have established a niche in the market. And tablets, of course, are still king.

"Tablets are it," Ryan said. "I have not found a pair of safety glasses I would want to put on somebody for eight hours a day. There's an expectation in the market that you need to be augmenting something all the time, and that's not at all true. Augmented reality is competing with paper documentation, and nobody would walk around with paper in front of their face. They would put it down, because their brain still functions, and they can remember what they just saw. You don't need a head-mounted display in most cases.

"That said, I have them, we're working with them in our lab, and we're trying to understand what to do with them."

And even after the madness of CES, more new models are expected to be released later this year. No matter if you prefer tablets, glasses or helmets, the hardware choices could soon take as much time to sort through as the initial planning and testing.

And Explore Your Goals

For some manufacturers, like NNS, augmented reality will be used primarily to replace paper.

Paul Boris, vice president of manufacturing industries for GE Digital and a recent addition to the board of directors at Vuzix, recently finished a wearables challenge with the help of Upskill. He received about 130 different submissions.

"Half a dozen or so were bizarre," Boris said. "But for most of them, what we found is that there are three things that you do with them. You either look at things and get instructions on how to act, you look at machines or devices and get real-time feedback on those assets, or you phone a friend and create some remote interaction."

The scope of his vision for the technology, though, is far wider in scope.

"I like the gadgets, I like the tools, I like the devices. I think they're key to augmenting that space for an operator and letting them function effectively, but I think the biggest impact we can have with the Industrial Internet of Things and these devices in combination is augmenting that entire space, making every action more effective and more aligned with the business objectives. That's a bigger view, maybe, but that's where I try to stay focused."

And Kammerait, the DAQRI VP, pitched an idea that could blend AR and workforce—along with the narrowing of the skills gap and the impending exodus of manufacturing workers—for the foreseeable future.

"The old way of solving problems was to have a 30-year expert who had essentially seen most permutations or most potential tasks or problems, and then to have somebody right next to them in training who can become the old hat. But what we've seen is with the bifurcation of the workforce, the person standing next to them, instead of having 25 years of experience typically has three or four. There's this big knowledge gap. There are fewer people who have those 20-year apprenticeships and need access to information in a totally different way.

"The good news is that a lot of those people are digital natives, so they're consuming content in a very different way. … Think of it as an access layer for everything that you could potentially know, all that digital information that you have access to but that you don't know inherently because you haven't been through it before. What I really see AR doing … is really erasing that barrier and putting that knowledge as close as possible to the point of use."

How will you use AR over the next year, or two, or five? Will it provide another tool for your workers? Will it help train those workers? Will the tech help attract more young people to industry? No matter what solutions you aim for, it will be important to remember that augmented reality really is a technology focused on people.

"It's not robotics, it's not automation, it's not taking people's jobs," Ryan said. "It's making people better at what they do and making them more efficient. This is about making people's lives better, not about them replacing them."

Factory Production in U.S. Rises for Fourth Time in Five Months

Factory Production in U.S. Rises for Fourth Time in Five Months
Bloomberg Markets
By: Patricia Laya
2/15/2017

U.S. factory output increased for the fourth time in five months amid gains in machinery and chemicals, extending a gradual recovery in manufacturing.

Production at factories, which make up about 80 percent of all output, increased 0.2 percent in January from the previous month, a Federal Reserve report showed Wednesday. That matched the median forecast in a Bloomberg survey. Total industrial output, which includes mining and utilities, fell 0.3 percent as warm weather reduced demand for heating, with utility production falling the most in 11 years.

Healthy consumer spending and a recovery in the oil sector have supported recent gains in manufacturing, with a key gauge of industry rising last month to the highest since November 2014. At the same time, modest overseas demand, a strong U.S. dollar and soft investment in equipment from domestic firms have made for slow progress.

Estimates in the Bloomberg survey for manufacturing output, which accounts for about 12 percent of the economy, ranged from a decline of 0.1 percent to an increase of 0.6 percent. The previous month's reading of a 0.2 percent gain was unrevised.

For total industrial production, the Bloomberg survey showed estimates ranging from a 0.6 percent drop to a rise of 0.4 percent, with a median projection for no change.

Capacity utilization, which measures the amount of a plant that is in use, declined to 75.3 percent in January from a revised 75.6 percent the prior month.

Utility Output

Utility output dropped 5.7 percent, the most since January 2006, after December's 5.1 percent gain. Last month was the 18th-warmest January in the last 123 years, according to the National Oceanic and Atmospheric Administration.

Mining production, including oil drilling, expanded 2.8 percent in January after a 1.4 percent drop. Drilling of oil and gas wells jumped 8.5 percent.

U.S. rig counts increased to 741 in the week ended Feb. 10, the highest in more than a year, helped by increasing energy prices, Baker Hughes Inc. data show.

Machinery output rose 0.9 percent, while chemical production rose 1 percent. Consumer durable-goods output fell 0.9 percent last month on a 2.8 percent drop in automotive production. Business equipment production ticked up 0.1 percent following a 0.8 percent increase.

What's Standing Between You and Asset Performance in the IIoT Age?

What's Standing Between You and Asset Performance in the IIoT Age?
Automation World
By: Jason Kasper
2/13/2017

The Industrial Internet of Things (IIoT), smart connected assets and digital transformation have been top themes for just short of two years. Organizations often view them as distinct focus areas, perhaps unwisely so. The asset is at the heart of each of these topics, making them inextricably related. Businesses that come to that realization

position themselves for more pragmatic choices about technology architecture, empowering the workforce and business processes.

Because the asset is at the root of each, asset performance management (APM) is a prime target to lay the foundation for sweeping transformational efforts throughout the enterprise. LNS Research has studied the market and marked the success of organizations that have used APM as an entry point for digital transformation. Companies that follow in their footsteps can expect better asset reliability, longer asset life, lower decommissioning and disposal costs and, as a result, lower operating costs. They also gain competitive advantage—not just in cost structure, but also in greater uptime and availability, better on-time delivery and higher quality.

With so much to gain, why then do operations leaders face resistance and downright opposition when making overtures toward APM project or technology pilots? According to surveys conducted by LNS Research, the top three roadblocks are funding for projects, building a business case and understanding IIoT. There is a direct correlation between these three barriers—insight that hopeful or enlightened operations executives can exploit to advance their project.

Armed with the knowledge of what's standing in the way of an APM project, what steps can organizations take to build the business case and get the funding? A good strategy is to start small with a pilot project. Small wins provide the opportunity to learn about the capabilities the market offers and proof points to illustrate value and help build a business case. As pilot projects take hold in a variety of industries, no one industry has the lead. Still, use cases are now emerging, and they also provide ammunition for expansion across more asset bases or different parts of the business.

As operations leaders strive to address concerns of executive leadership and to get buy-in to fund larger projects, data ownership also becomes a key consideration. Companies that have contemporary attitudes toward data leverage it to enable new business models. It's still a novel concept, but nearly every week LNS analysts uncover stories about the opportunity it presents. Almost half of industrial companies (47 percent) have not deployed smart connected assets and therefore are not getting the APM-related data they so richly provide. Another split is the remaining 43 percent that do have assets that are generating APM data; just over half (22 percent) will not allow suppliers to access it. This is a missed opportunity in vendor relationships.

If companies and vendors share data with each other, they will undoubtedly reap future benefits like better product designs and proactive fixes to support warranty issues. Forward-thinking organizations do at some level share APM data, either with proactive or diagnostic-level support. Starting here allows asset-intensive organizations to understand how suppliers use the data and can be the first step in requesting smart services or usage-based asset models.

The shakedown toward digital transformation doesn't stop at sharing data with vendors. Early adopters of smart connected assets demonstrate increased reliability. The proof point is in overall equipment effectiveness (OEE), the product of availability, productivity and quality. Asset reliability has an impact on all three factors, and operations with higher reliability achieve higher OEE. Organizations with real-time visibility of APM data exhibit a substantially higher OEE than those that do not, with a median OEE of 75 vs. 67.

Even with the knowledge of what an organization can expect from a pilot project, it's important to document wins and failures along the way—it's the expanded knowledge and building the business case that will ultimately have an impact on operations' ability to get the funding for a full-blown initiative.

In today's age of IIoT, APM is no longer a silo with only operations and maintenance responsible for the Plan, Do, Check, Act process. Assets will evolve digitally and physically, with more touch points with outside groups, and a huge appetite for data to help manufacturers, suppliers, sales and marketing, and customers. This forces everyone to think of APM as a platform. For industrial platforms to take hold, we must go beyond IIoT thinking and deliver the platform to the point of greatest value: the asset. It's not just about connecting the asset, adding more sensors or enabling predictive analytics; it's about creating as many connections to that asset throughout its entire lifecycle. This means connecting assets, services, workforce, suppliers, manufacturers, sales and marketing, operations and maintenance together on one platform, with many applications that span specific users or use cases, to enterprise apps for many.

Organizations that have targeted APM as the testing ground for the IIoT and digital transformation will undoubtedly lay the foundation for transformation throughout the enterprise. A thoughtful approach can be pilot projects that lead to an expanded initiative and a more holistic view of the relationships that exist around APM. The LNS Research agenda throughout the coming year will address the emerging issues and concerns around these topics.

Organizations ready to act now should keep these key considerations in mind:

• Begin the business case journey by preparing technically for what is to come. The best approach is a pilot. Understanding at a small scale how things work improves the plan and helps develop the value to move to a larger scale.

• Vendor collaboration is critical for delivering smart connected assets; there is no "one size fits all" approach, so look to vendors with strong partnerships that can provide a broad reach across the platform.

• Expand knowledge throughout the organization to overcome objections and concerns, particularly in the areas of data, smart connected assets, IIoT and digital transformation.

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