
TABLE of EXPERTS

MANUFACTURING

Nationally, the industry has lost jobs. Yet it has grown in the Capital Region over the past decade. How can we continue that momentum? The *Albany Business Review* hosted two experts to discuss the challenges and opportunities for manufacturing in the region, a conversation that touched on topics ranging from automation to workforce development.

Can you tell us a bit about yourselves?

Michael Lobsinger: I'm the center director at The Center for Economic Growth. I also run our Business Growth Solutions Team at CEG and the Regional Manufacturing Extension Partnership Center. CEG is a 200-plus, membership-driven economic development organization. We look to attract businesses to the region and prepare the region for growth by looking at things such as infrastructure, education, broadband, you name it. We try to be a voice for the businesses in those spaces, and for the growing businesses that are here.

Daniel Walczyk: I'm professor of mechanical engineering at RPI and also director of The Center for Automation Technologies and Systems, which is the New York-designated Center for Advanced Technology that focuses on the advanced manufacturing of robotics. Our center has a staff of about eight. We pull in faculty and students from the RPI community to work with the industry on new technology and advanced manufacturing in many forms. We also partner with CEG when we can. We focus more on the details and the processes. CEG focuses more on the higher-level stuff.

What challenges come to mind as foremost in our region for manufacturers?

Lobsinger: The first thing is sales. It's when there's not enough business, or there is enough business, but you are not getting the sales they need. There are various reasons for that. Sales are not just getting more sales people or sales training. Sometimes it's a deeper issue than that.

Our second challenge is workforce. We are seeing an increase in manufacturing. It's slowly coming back. It's probably good that it's paced. But manufacturers say they can't fill the pipeline of what we would call middle-skill technical jobs or trade jobs.

There's an increased pressure for meeting quality requirements. A lot of the manufacturers in our region are not OEMs, but they're first-tier and second-tier suppliers to larger companies that have a very high demand in quality and deliverability in meeting

standard processes or requirements. In order to stay competitive, you have to meet your quality requirements, and that costs money for a small business to go through that process and maintain it.

Some of the industry is changing and there's more demand for low-volume, custom piece flow. The days of smaller manufacturers having continuous running of products of thousands and thousands of units per day or per week, has changed a little bit. We are moving to more advanced products that are much more custom and take a lot more time. Then there are the competitive price pressures. There are still a lot of price issues with international companies, and even companies from New York, bidding against companies from, say, Atlanta, Georgia.

Walczyk: High taxes in the state certainly don't help us. Of course, there are outcomes for those high taxes in terms of social benefits. But companies have a hard time justifying that when they're trying to make ends meet. There's also foreign/domestic competition. Foreign is not just on the sales pressures, but on technology. You could pick specific high-tech fields and you'll see that companies in Europe or Asia or elsewhere, have significant technology advantages. That's because of their infrastructure, their government policy, their government investment. These are the R&D challenges our companies face: They have a new product, they have a new material, and they think it will be big in the market. They don't know how to do it, so they have to figure it out and that takes resources.

Moving forward, what do we need to be wary of?

Lobsinger: Workforce challenges, for one. I've seen successes with some of our small- and medium-size manufacturers being very actively involved in the workforce, both internally and working with the universities and community colleges in helping to develop a pipeline. The many, many people that are retiring over the next few years in these fields must be replaced. So, it's definitely about being more active and involved in developing the workforce. I see examples of small manufacturers that have found these niches.

Manufacturers really need to start implementing some technology into their business. It's going to allow them to have more throughput. It's going to open up space on the floor. It's going to reduce their cycle times. Sometimes it's an MRP, which is a manufacturing resource-planning tool, or an enterprise research-planning tool, to help them reduce all the paperwork. These things are going to require capital expenses, so there needs to be some investment in this, whether it's help from the state to reduce taxes, enticing investment from outside investors, or private money.

Walczyk: Federal government policies and funding are up in the air right now. I think that's one of the biggest issues that manufacturers are facing in the near term. Right now, at least from a manufacturer's viewpoint in terms of government funding, they don't know if some of the more enlightened Obama investments will continue. The current administration could wipe all that out.

Another thing to pay attention to is what the foreign competitors are doing. What are their governments pushing for? New products, new technologies? 'Smart manufacturing' is actually a hub of one of the institutes at RPI that's focusing on that. People are concerned that automation is going to take their jobs. I think to some degree, that's true. But if you look at employment overall, employment has increased as automation has become more pervasive. So, we have to be smart about how companies implement automation.

Michael, what role does CEG play in addressing those challenges?

Lobsinger: We primarily focus on four areas: growth, innovation, operational efficiency and workforce development.

On the growth side, we will sit and work with executive teams on their strategic plans. We will help put their sales teams and customer service teams through training.

In the continuous improvement or operational efficiency area, we do a lot of lean enterprise work. The Six Sigma training within the industry is another

program we do. It helps people streamline and capture things that help manufacturers improve their process and get rid of wasted time.

We're also helping in the innovation space. We're actually going to come in and talk more with them about their strategy for design for manufacturing and the process they're actually going to go through, to make sure they're talking to their customers – the outlying things that happen when you're doing innovation. We'll talk with them about new markets and the importance of understanding who those markets are and how they can talk to them and understand what their needs are.

And our senior level management is on the shop floor. Our director of project engineering, Tom Bell, is on the floor with clients helping with the industry-mapping to the point where he's helping them paint the floors and tape the lines. He's right there with them.

There's a lot of pressure from the larger companies that they're supplying, to be ISO-certified. We help with ISO certification.

Daniel, can you talk about Rensselaer's Center for Automation and the role it plays?

Walczyk: We focus on higher-level workforce development. We train engineers. We train scientists. We have faculty members that serve as experts. We focus on the technology of manufacturing, how it's implemented. A company might come to us and say, "We are being beaten in the market because our competitor knew this and we didn't," or, "We heard about this new technology but we have no idea how to implement it."

So, we'll put an undergraduate or graduate student on a project, or maybe a staff engineer, depending on the type of product and the urgency for the company, and try to solve their technical problem. And



Daniel Walczyk (left) and Michael Lobsinger.

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it works very well with CEG because CEG is dealing with more conventional, higher level stuff – people who need more support than what we're doing. We will basically de-risk the technology development for the company. We make new engineers. We make new scientists. We will work and develop new technology or a process or a system, demonstrate it for the company, and tell them exactly what they need to do to implement it.

Ideally, the student who works on that project goes to work for the company. It's a direct transfer of technology. The best way that we help businesses is to give them the technology and the people that were

responsible for that technology.

Are most of the companies you work with local?

Walczyk: Half and half. Our charter is to help New York businesses. But we're also the research center on the RPI campus for scaling up for manufacturing. We are responsible for helping any faculty member or any company that comes in and needs help scaling something up.

Can you provide some examples of the problems that manufacturers come to you with?

MEET THE PANELISTS



MICHAEL LOBSINGER
Center Director, Business Growth Services | MEP, Center for Economic Growth

Michael Lobsinger is the Center Director for the CEG's Business Growth Services (BGS) and Manufacturing Extension Partnership (MEP). Michael directs the BGS|MEP team in providing exemplary support to manufacturing and technology companies with a focus on continuous improvement, technology acceleration, growth & innovation, export, supply chain, sustainability and workforce development. Michael has more than 17 years of experience ranging from engineering and product development, manufacturing, business development and operations. Prior to joining CEG in 2013, he was director of an incubator program, an entrepreneur, and a senior engineer at Boeing. Michael earned a BS in mechanical engineering from North Dakota State University and an MBA from Rensselaer Polytechnic Institute.



DANIEL WALCZYK, PHD, PE
Professor of Mechanical Engineering at Rensselaer Polytechnic Institute and Director, Rensselaer Center for Automation Technologies and Systems (CATS)

Daniel Walczyk, PhD, PE is currently a professor of mechanical engineering and director of the Rensselaer Center for Automation Technologies and Systems (CATS), a NY state-sponsored Center for Advanced Technology that focuses on advanced manufacturing, automation and robotics. Dr. Walczyk was a post-doctoral associate at RWTH Aachen in 1995, and received his Ph.D., MS and BS degrees in mechanical engineering from MIT (1995), Rensselaer (1991) and Syracuse University (1986), respectively. His current research activities, which are evenly funded by government and industry, include composites manufacturing (advanced composites, biocomposites, 3D printing of thermoplastic composites), battery manufacturing (Li-Ion anodes, cellulose separators), fuel cell manufacturing and material handling with air cushion vehicles. Prior to starting his academic career at Rensselaer in 1996, Dr. Walczyk worked for seven years in industry as an automation designer with Schneider Packaging Equipment Company and then as a research engineer at GE.



Walczyk: Their cycle time is too long. Manufacturing costs are too high. They don't have the skill sets, both high- and low level, to do what they need to do. They don't have sales. They can't get their costs down so that they're competitive. Or, they need to get into a certain area of technology because they have new material, new products, new parts, whatever, that they can sell, and they know they what they don't know.

We can use the entire RPI faculty infrastructure and capabilities to address a problem. We're good at many, many things. That's the value of working with universities. You get this broad range of expertise.

Michael, what is advanced manufacturing?

Lobsinger: Everybody has a completely different view. To me, advanced manufacturing is anytime you take a traditional process or one that's there and you introduce technology to make it more advanced – basically making a sale flexible whereby it can use more than one product just by modifying how it's set up, using collaborative robotics.

It's easy for custom companies to be more competitive if they start implementing these aspects. It's going to be key to implement these technologies in order to address a lot of the problems and the challenges that manufacturers are going to see moving forward.

How does the Capital Region stack up in relation to other regions around the state in manufacturing?

Lobsinger: In the past, I think you could go to New York and see pretty large identifiable means of manufacturing here. What's left now are what I call niche manufacturers – job shops doing custom work for OEMs. They're what I would call first-, second- and even third-tier suppliers of OEMs, and the majority

very deep, very good engineering program. Clarkson has a presence here. The University of Albany is putting up an engineering school. Hudson Valley is one of the best community colleges in the state. You've got Adirondack Community College. You've got Schenectady County Community College. You've got some very good schools, and it's somewhat unique that we're not just relying on one school to provide all the technical talent for a manufacturer. There's some benefit to being near the capital and, perhaps, resources. GlobalFoundries and others like it help with the manufacturing base. And you also get the spinoff effect.

In terms of upstate, we're in one of the best positions to help with the renaissance of U.S. manufacturing.

How are we situated for developing the workforce?

Walczyk: The infrastructure to create the talent that companies need at all levels is here. Some of the companies need very specific skills, and the universities or the community colleges can kind of tailor their curriculum to that. It's keeping them here and attracting companies here to take advantage of the talent and keep it in the region. If we can do that, the region grows and the economy grows.

From CEG's perspective, what's being done to fill that pipeline of workers that you mentioned as the top challenge for the industry?

Lobsinger: We definitely need to see some things change policy-wise and tax-wise, to be more business friendly.

We can't just sell the region because of its quality of life. The younger generation that's graduating wants to see very active employers that consider their lifestyles. I can think of a local company that actually has a bar, a workout space and a little health center right

ly going towards what you see: It's always beautiful people and very clean environments, lots of glass, a lot of high-tech computers and things flashing. Certainly there are industries that are dark, dirty and dangerous, but it's because they're kind of legacies from the region's excellence in that area. Probably, unless they change, they'll become dinosaurs.

Do we have time, with the pace of technological change with the competition from other countries and with the generational change from the baby boomers exiting, to fill that pipeline with workers? Isn't that pretty urgent right now?

Lobsinger: I would say it's urgent. It depends on the mentality of the manufacturer. I think they need to realize that if they're going to be implementing some new technologies and moving towards automation in advanced manufacturing, they've got to get away from the idea of the "assembly line worker." They have to get away from the idea that they're going to find the exact person that they need to run this piece of equipment, and instead find the person that has the technical acumen and train them, help them go through school and get them exposed.

There's only so much the system can do when it comes to government and education. We need manufacturers that are moving forward. When we did see offshoring and competition, the ones that stuck around were the ones that adapted.

So, manufacturers have to be pretty active and engaged to be informed. What resources can they avail themselves of?

Lobsinger: You want to be on our e-mail list because we're sending out information all the time, economic information, information about classes and resources, or follow us on social media, Facebook, Twitter.

There is a group that we administer called Chief Executive Network for Manufacturing. It's a group of about 60 manufacturers that regularly meet and have discussions about their challenges. We bring in different programs to talk to them. It's kind of an exclusive group. They're very particular about who they let in and allow to speak to them, but it's a place where manufacturing executives meet to talk about their problems and share their common best practices.

Get engaged with the educational resources in your region, your universities, teachers, your community colleges, your community, things like makerspaces and hackathons and community events. Sponsor some of these events. You really want to be visible to your community. Businesses that are visible at some level are often more talked about. It helps to build that image that ultimately leads to employees.

Walczyk: The technical talent that comes from our universities is at a high level. The engineers, the scientists that are trained, they may not have exactly the set of skills the company is looking for, but they have most of them. And if they work with hands-on projects, they'll hit the ground running with that company. If the company is enlightened and they're serious about wanting to be the forefront of the industry, they should engage the local schools.

Michael, I own a manufacturing company or am about to start manufacturing my product. What should I be doing and thinking as I go beyond RME to producing my product?

Lobsinger: It's important is to reach out to CEG, the Manufacturing Partnership Center. Reach out to RPI. Reach out to people that can actually guide you, especially if you're a startup company. The biggest thing that we are going to bring to bear is the experience. When it comes to startups, they have a product. They

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DANIEL WALCZYK, PHD, PE, Professor of Mechanical Engineering and Director of the Rensselaer Center for Automation Technologies and Systems (CATS)

of them employ under a hundred employees. Amazingly, they make up about 95 percent of all manufacturing in New York.

One thing that I think is unique about our region – and I think GE had a big role in this in early on – is we have quite a few machine shops that have pretty amazing capabilities. They're working in a wide variety of industries with some pretty advanced materials.

Daniel, from your perspective, how do you see the Capital Region manufacturing sector?

Walczyk: I've been here since the mid '90s and I've seen the aftermath of the exodus and most of the big manufacturers. But you did have some anchor companies, like GE. The R&D Lab is an incredible resource for this area. Not just for employment, but spinoffs. Former GE employees are taking advantage of some new technology they've developed, or have a new idea.

And we have a concentration of technical schools that are unique. You've got RPI, the oldest technical school in the country. You've got Union College with a

in their building.

The bigger challenge is the pipeline of those trade skills. We need to be re-thinking how we, as educators, educate our youth and fill that pipeline. We push for people to get a four-year degree and I think that's a very positive thing and we should continue to do that. But maybe it can be a six-year degree. To become an engineer, perhaps you actually have to go work a trade with a business. Some of the most valuable engineers are engineers that have real world experience.

Could you describe today's manufacturing in more detail?

Walczyk: High-tech manufacturing requires precision; everything timed perfectly, parts coming in at just the right time. The logistics of doing this are incredibly complex. The expectation of your supply network to provide what you need at the right time is a challenge. High technology robots, control systems, very innovative processes to make things, to put parts together and to assemble. How they would kind of glorify high-tech manufacturing in movies is actual-

have a sketch. They have a drawing. They may even have a 3D model. But they are at that point where they are going to make early mistakes and those mistakes could be costly – cost overruns, back and forth with contract manufacturers.

The best thing they can do is get early advice, have a process laid out, understand what the challenges are going to be. In this day and age, when you're starting a business, getting that MVP, minimal viable product, to market is very critical. Sometimes it's more critical than the natural and intellectual property. Talking to organizations like ours that understand that and have seen it, is valuable.

Should I consider going to China?

Walczyk: Established manufacturers know how to get to market, but they may need expertise they don't have in-house. The university can act as a surrogate R&D for the organization, and you see this more and more as large companies get rid of their R&D capabilities. On the smaller scale, the startups have someone with a good idea that may even have a prototype.

The reason they go to China is because for 20, 30 years, they've evolved into this tremendous network of suppliers who can make parts, make parts at scale, at good costs, and walk, talk with other suppliers to satisfy the needs. But the company loses their value making. They will have a design, a product design or a new process, which is at risk of being seen by a competitor in Asia that can do the same thing. There are many advantages to keeping things in the U.S., and our job at CEG and CATS is helping them see that going to China or India or someplace like that is not always the best alternative.

Startups face two problems. One is ethical. How do you go from making something once or twice to making it a thousand times, 10,000 times, a million times? That is what they call "cast of the valley of death." It is real. You need people who have had this experience to help you get over that, to build a bridge. The other part is that startups need sales. They need to be able to sell products or get some kind of revenue that can generate resources to continue developing the product until they know how to make it economically and compete in the market.

What are the benefits of a company being a manufacturer in the United States?

Lobsinger: Obviously there are things that, at a commodity level, don't make sense. That's the world that we live in. But economics is the big driver as well, the pressures for price, things like that. Economics-wise, it's more regionally integrated manufacturing. The more we're using local suppliers to supply a local and regional OEM, when that OEM creates a job, it creates more local jobs. So, economically, it's very beneficial



The panel discussion, from left: Moderator Mike Hendricks from Albany Business Review, Michael Lobsinger from the Center for Economic Growth, a court reporter and Daniel Walczyk from CATS.

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for them to do manufacturing locally. With that, they pay higher wages that benefit local service providers. Real estate, municipal taxes, all those things benefit from manufacturers.

Companies are usually faced with making the decision of going overseas because of international competition. The startup thing is an interesting one because even though they could get product at a lower cost, a lot of the manufacturers overseas are going to say that they need to make 5,000 of them. Now you're stuck having to do the large volumes. You can still eat up all your cash, so you really need to pay attention.

We would tell people to do their homework and understand what their true costs are, and ask them how specialized the manufacturing process is. Is it in line with their core competency or do they need to develop that? Is it part of a promise that is valuable to their customer? If it has some value to the customer and that pulls him the right way, they're willing to pay more for it. It changes with things that are non-commodity type things.

What is the future of robotics? Is it going to mean more efficiency, fewer jobs? What else do you see looking forward?

Walczyk: I see reshoring because it makes economic sense, not just for the companies that are making stuff or a supply network, but our economy is so blessed when there's a strong manufacturing sector. You have to make things in your economy because so much of the service economy supports that.

Since 2008, a lot of companies have been buying

robots. It scares workers and I certainly can understand why, but they're doing it because there are benefits to having automation. It's going to continue because companies need to be able to cut costs, increase throughput, increase yield and get rid of defective products. You're going to see more integration of computers and the Internet in controlling a manufacturing system or a manufacturing plant.

Lobsinger: I hope to see a strengthening of niche manufacturing as well as more local supply change. The niche thing we've kind of seen, but using local supply chains and bringing more business to support it will strengthen our economy.

I think we have to be careful to not be a region that says we can do it all. We do have a lot of different capabilities here. New York, in a sense, is a melting pot of different technologies. But I think that also makes businesses with very specific industries looking at New York, wary of us sometimes. We need to play to our strengths and our core competencies, and better define what they are.

We also need investment in new technology in developing strategies around that, and using that to get into new and existing markets. Companies need to look at how they can be competitive in the remainder of this century. Our smaller manufacturers must be nimble, produce quality parts and react to change. Employing technology that makes them relatively price-competitive will gain the attention of much larger players, especially if they focus on certain areas and become really good at them. The region has to step up to that. ■

TRANSCRIPT LIGHTLY EDITED FOR SPACE AND CLARITY.

Thank you to our participants



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