DAY 2

TUESDAY | SEPT 14, 2021

FABTECH

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SHOW DAILY

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TODAY'S EVENTS

Keynote: Adam Steltzner, Leader & Chief Engineer, NASA Mars 2020 Mission, Rover Perseverance
8:30 – 9:30 AM
Lakeside Center Ballroom

Leadership Exchange: State of the Industry – Navigating into 2022
12:30 – 1:30 PM
Lakeside Center Ballroom

3D/Additive Manufacturing Showcase
During Show Hours
Booth A1220

Careers in Welding Exhibit
During Show Hours
Booth B20084

Manufacturing Leadership in a Time of Change

The FABx Tech Talks yesterday featured a powerful lineup of visionary leaders who are transforming the future of manufacturing. These manufacturers are integrating technologies like automation, artificial intelligence (AI), and data analytics into all aspects of how they operate — from the production floor to the supply chain.

Harnessing the Cloud to Drive Change

Jon Sobel, Co-founder & CEO of Sight Machine, noted in his Tech Talk that most of the innovation in data analytics and AI today is happening in applications hosted on public and private clouds.

"The major cloud platforms offer seamless scalability of computing resources, efficient data sharing ability across physical locations, a huge array of software tools that can be easily integrated, and world-class cybersecurity," he said.

Sight Machine's manufacturing productivity platform provides a dynamically updated view of production. It converts unstructured plant data into a standardized data foundation, and continuously analyzes all assets, data sources, and processes, from machine to enterprise level. This gives manufacturers the data-driven insight they need to meet their biggest challenges in throughput, quality, flexibility, cost, sustainability, and value chain optimization.

"Some manufacturers remain wary of hosting their data on servers they don't physically control," said Sobel. "But the reality is that the major cloud platforms are protected by cybersecurity capabilities that almost no private company can match, including multi-layered and continuously evolving security technology and some of the world's best cybersecurity talent."

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Cultivating the Next Generation of American Workers

FABTECH's Thursday Keynote features Adam Genei, owner of two groundbreaking American companies, Mobsteel and the Detroit Steel Wheel Co. This session presents a chance for attendees to hear from someone steeped in the rich automotive and fabrication heritage of Detroit.

In his talk, "The Greatest Machines Ever Made: Cultivating the Next Generation of American Workers," Genei will discuss how his upbringing shaped him, and why he believes it is so vital to buy homegrown products. He will also reveal a workforce development formula he devised that creates a positive, invested, and competitive team.

Genei is all about preparing the next generation of the workforce to embody the work ethic of our fathers and forefathers in American industry. Focusing on character, work ethic, and long-term thinking, he will share the milestones and learning moments he has experienced while building two worldwide brands.

Motor City Raised

Born in Detroit and raised in its suburbs, Genei developed a love for the auto industry at an early age. During that time, he worked in his grandfather's Ford Dealership. He grew to appreciate the hard work and dedication of industry professionals. From there, he expanded his skills in his parent's shop supplying the Big Three. With that relationship established, he began making his own parts for automotive OEMs, turning that hobby into a business.

Genei grew up hearing family and neighbors share stories from the glory days when Detroit led the automotive field and taught the world how to build cars. He believes that spirit is being rekindled in businesses like his.

"I was fortunate enough to have one side of the family on the dealership (retail) side where you see the consumer's passion for the finished product, and the other side as part of the manufacturing

supply chain in the automotive industry where you experienced how those vehicles were created," said Genei. "This upbringing, seeing the processes involved, and appreciating the hard work of industry professionals made me excited about a career in automotive. A car is more than something you think is cool; it takes on a whole new value when you realize what goes into creating it."

As owner and creative soul of Mobsteel, he started in a one-bay garage with a welding bench and a mission to celebrate the automotive industry. He is a staunch supporter of American engineering and his city. He celebrates their storied history by transforming vintage cars into custom, modern rides. He sees this as mixing Detroit's celebrated past with its evolving future.

As a design/build company that manufactures automotive aftermarket products and builds custom cars, the Mobsteel brand continues to strengthen its ties with the likes of Ford, Axalta, Autodie, SATA, and ACDelco. Mobsteel hit the big time in 2015 when it was featured in a reality TV show

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September 13-16, 2021 / Booths A2904, B18005, B16004

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American Welding Society Launches "AWS Certified" to Bring Awareness to Younger Workforce

Welding is among the most crucial and essential skilled trades that impact everyday life, yet the number of skilled welding technicians and professionals continues to decrease. It is anticipated that by 2024, over 300,000 welders will be necessary to satisfy our nation's workforce demands (Emsi, 2021). To impact this decline, the American Welding Society has launched a new initiative targeting students and early career welders, titled "AWS Certified."

For over a century, AWS has been the leader in the advancement and standardization of welding and allied joining and cutting practices, and those who have been in the welding industry understand the value of an AWS Certification credential. However, younger generations may not see the necessity of certification so early in their careers. The AWS Certified initiative shines a light on the importance of obtaining AWS Certifications.

"Members of the welding community genuinely care about the technology and skill sets required to inspect welds and weld correctly, and they're eager to learn more about the intricacies of their trade. Each AWS Certification they get is a badge of honor," said Denny Smith, Managing Director, Certification.

AWS is best known for the Certified Welding Inspector (CWI) credential, and to date, there are over 40,000 CWIs worldwide. But AWS has 10 more certifications, each one focusing on a different specialty or career path that is critical in the welding industry. Other certifications include Certified Welding Supervisor (CWS), Certified Welding Educator (CWE), Certified Welding Engineer (CWEng), Certified Welding Sales Representative (CWSR), Certified Resistance Welding Technician (CRWT).

"Being AWS Certified shows you're proud to be in this industry, and it requires you to master the skills that uphold our industry standards. It gives you credibility and respect among your peers," stated Nate Bowman, Director of Welding Optimization & Education at Central Welding Supply. "Welding education is the key to success in the industry."

Becoming AWS Certified also ensures that as the next generation of our welding workforce is developed, the integrity of how welding processes and procedures are performed will remain as consistent as our century-young organization. ■

For more information about AWS Certified, visit aws.org/certified.

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Manufacturing Leadership in a Time of Change

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He added that the continuous improvement methodologies that flourished in the last third of the 20th century had a great run. But the best manufacturers have squeezed out just about all the improvement that can be achieved using traditional methods. These methods, he said, focus on improving one small piece of production at a time.

"The advent of data platforms unlocks far bigger opportunities for improvement, enabling manufacturers to optimize production across thousands of variables, encompassing all their machines, lines and plants, and extending up and down the supply chain," said Sobel.

Rather than just preaching such views to potential customers, Sight Machine embraces these principles internally. Sobel accepts that change is often hard. But he said his company's integrated approach to innovation and change combines culture on the inside, technology underneath, and how the company partners with manufacturers. This includes the hiring of talented and humble people with good values and empathy. And embracing technology to drive improvement.

"One of the single greatest points of leverage for improving the global quality of life is the manufacturing sector," said Sobel.

Why? For one thing, it's the world's largest sector. But Sobel added that at its deepest level, good manufacturing is a mindset. It's about trusting and empowering each other, solving problems, and getting a little better every day. Technology should be used to make that happen faster and more efficiently.

"One of the single greatest points of leverage for improving the global quality of life is the manufacturing sector"

"Technology should advance all industries, especially traditional ones like manufacturing and fabrication that drive the global economy," concluded Sobel.

Digitized Parts and Quotes

Paperless Parts is a secure manufacturing platform that empowers everyone on your team to make smarter, faster, more informed decisions. Its Co-Founder and Chief Technology Officer (CTO) Scott Sawyer kicked off his Tech Talk by detailing some of the problems inherent in life in a job shop or on the manufacturing floor.

A lot of time is wasted, for example, in trying to figure out if a familiar-looking part has been made before. Is it something that was manufactured in the past or does it just look similar to another part? Oftentimes, a search of the part number database doesn't reveal any matches. In some shops, the only recourse is if someone on the shop floor remembers it. Accordingly, Paperless parts offers a system to locate identical as well as similar geometries by dropping in a CAD file. Any matches are tagged in the Part Library.

"So much rote work in estimating is automated by leveraging information inside of CAD files and prints and by referencing historical data," said Sawyer.

This, he added, frees up skilled workers from laboriously building out BOMs and cobbling together enough data for a quote. That enables them to focus on selling and delivering shop services.

"Did you know your win rate more than doubles if you turn a quote around in 12 hours compared to 72 hours?" said Sawyer.

He acknowledged that the manufacturing industry in general can be slow to adopt new software. But the pandemic changed the overall mindset. As well as enforcing working from home, it drove many shops to begin the digital transformation journey.

Sawyer used the consumer world to provide an example of the progress that can be made in a short span of time. Compare ordering a pizza from an app in 2019 to today.

"The whole restaurant industry turned on a dime to survive," said Sawyer. "People started expecting these rich digital experiences in the B2B and industrial world. They want to buy a sheet metal assembly the same way they order takeout."

That's why the cloud is becoming so important in manufacturing and fabrication — it helps solve some tough problems. Things change too fast to wait years between upgrades on an on-premises system. Sawyer believes cloud providers now offer a viable alternative via a great many Software-as-a-Service (SaaS) offerings.

"They're keeping up with cybersecurity threats and the software stays up-to-date with what's happening in the world," said Sawyer. "Plus, the cloud creates new ways to communicate and collaborate across your systems, your customers, and your vendors."

He warned, though, that there are what he termed "false clouds"

out there. In reality, these are old, stagnant applications that just got moved to a server you don't own. That can end up being the worst of both worlds: you keep paying for software that doesn't evolve, doesn't integrate with anything, doesn't run on your phone, and isn't secure.

"When we started Paperless Parts almost five years ago, job shops were reluctant to move to the cloud as they were concerned about cost, security, and availability; we almost never hear that now," said Sawyer.

On the other side of the coin, many on-premises systems have been exposed as insecure. Week after week, there are news stories about businesses hacked and held to ransom by cybercriminals. SaaS companies have dedicated staff keeping software up-to-date and monitoring what's happening on their network. What's more, most SaaS run on servers and networks provided by the big infrastructure providers (like Azure, Google Cloud Platform, or AWS), who offer high availability and fewer worries about losing data.

"To match that in-house, your IT staffing costs would far outweigh software subscription costs," said Sawyer. "Maybe servers don't cost that much but recruiting and retaining IT talent sure does."

The future of manufacturing, according to Sawyer, is tied to software development. He considers modern software to be so much better now than it was 20 years ago. Implemented correctly, it provides the ability to provide quotes, fulfill orders, and streamline production.

"The next generation of software systems supports this future of manufacturing by seamlessly connecting the supply chain," said Sawyer. "We have fabricators on Paperless Parts receive RFQs, get finishing quotes from vendors who also use Paperless Parts, and win the job before the competition has sent their quote." ■

How to Recruit the Elusive Gen Z Candidate

Generation Z, those born between 1997 and 2015, has been fully immersed in the online world from their earliest days, making them a different breed of workers. Not only do they work and communicate uniquely, compared to previous generations, getting them excited about a career in manufacturing can seem like an uphill battle. So how do today's metal fabricators reach and recruit these digital natives? Luckily, it's arguably easier than ever if you use the right tools and methods in FMA's recruiting guide.

Considering how advanced manufacturing is and how many prosperous careers are available, why aren't droves of young job seekers pursuing manufacturing positions? It turns out the perception of manufacturing is all wrong. In a 2018 ThomasNet.com survey, half of Americans said they thought manufacturing was low tech or they weren't sure.

In reality, some of the most cutting-edge technological concepts like the Internet of Things, Industry 4.0, 3D printing, and Artificial Intelligence are used in the manufacturing industry — enabling employees to interact with some of the most powerful technology in the world.

Not only is it widely unknown to the public that manufacturing uses innovative technology, but many Americans also don't realize the lucrative pay, robust benefits, and plethora of career options that are available in the industry.

Recruiting future employees

When you flip the focus on manufacturers, they could be doing more to reach Gen Z candidates too — with some creativity and help. One way for metal fabricators, in particular, to better engage with the younger generation is to go where they are. As digital natives, Gen Z consumes information on Instagram, Twitter, YouTube, Snap Chat, and TikTok. Unfortunately, many fabricators don't have an established presence on those platforms.

In a panel discussion with young manufacturing professionals from the 2021 FMA Annual Meeting, they recommended potential employers use the social media platforms that Gen Z uses for recruiting them.

So metal fabricators should go where Gen Z candidates are, but they also need to keep in mind that this younger generation consists of highly visual learners, quickly consuming information through photos and videos. In fact, fabricators have just about 8 seconds to engage with them. Gen Z also multi-tasks across 5 screens on average, so if what they're consuming isn't clear, short, and highly visual, they'll keep scrolling or hop over to another platform.

While many organizations like FMA work to change outdated misunderstandings of manufacturing to the general public, metal fabricators can change these perceptions locally.

Learn about the most enticing aspects of fabrication careers for young people and tips on how you can speak to them when getting the message out, in FMA's newly released guide "Careers in Metal Fabrication". It takes a practical approach that explores real-world case studies, strategies, and tactics for attracting career-minded employees to your company in today's competitive job market. ■

Download FMA's Free Careers in Metal Fabrication Employer Recruiting Guide at https://www.fmamfg.org/campaign/attracting-quality-talent.

A Glimpse into the Future of Advanced Manufacturing

Yesterday's panel on advanced manufacturing gave many FABTECH attendees a glimpse into the future. Not only the distant future but also how our industry is going to change over the next couple of years. That shift is being led by manufacturing and fabrication pioneers who are among the early adopters intent on transforming the landscape of how we operate daily.

Dave O'Neil, Vice President, SME Media, moderated the panel. He noted that the companies best positioned to successfully navigate ongoing market disruption are those that embrace advanced manufacturing technologies and solutions. Thus, it is one of the goals of FABTECH to help members and attendees keep pace with emerging manufacturing technologies. One of the best ways to do that is by accessing the latest technical information from industry thought leaders.

Two such leaders detailed how they are using advanced manufacturing in their products. The common denominator to their approach is

how to harness manufacturing data to adjust processes, raise efficiency, increase profitability, heighten quality, gain a competitive edge, and add value to the organization.

Unlocking Plant Data

Sight Machine was founded in 2011 close to Detroit, Michigan, one of the birthplaces of manufacturing in the United States. Its founders descended from a long line of factory workers and worked in factories themselves. They grew up surrounded by manufacturing. They observed firsthand the benefits it brings – good jobs, support for schools and the arts, and the feeling of pride from making things that are essential to every aspect of our lives.

But the latest generation of manufacturers have great familiarity with technology, the internet, and big data. For Sight Machine, this opened up opportunities to unlock plant data and give every stakeholder a single, trusted and dynamically updating view of production. A decade in development, the Sight Machine manufacturing productivity platform is purpose-built for manufacturing. It securely unifies all data sources related to production and provides tools for cataloguing and associating plant data to physical processes. Flexible connectors link to data at every level of maturity and aggregation.

"Sight Machine's manufacturing productivity platform gives every stakeholder from the plant floor to the C-suite a trusted and dynamically updating view of production," said Jon Sobel, Co-founder, CEO, Sight Machine.

The company's product suite includes four components: Connect, Transform, Analyze, and Build. Some utilize one module, and others take advantage of them all in plant operations. It offers common data models applicable to any production process, discrete or continuous. Tools are available to assure data quality, trust, and transparency into every level of the pipeline, as well as spinning up and simultaneously managing hundreds of pipelines.

Sight Machine Analyze, for example, guides operations with continuous, real-time decision-making. It includes a suite of visualization, data discovery, analytics, and artificial intelligence tools to aid in improving productivity. From asset to enterprise, applications utilize the data foundation to drive continuous improvement across every factory use case: throughput, quality, cost, flexibility and to answer every question from what's happening, to what the rules should be, to what will happen.

"Sight Machine is an end-to-end solution that turns raw production data into insight," said Sobel. "We transform real-time streaming data into a data foundation representing the full manufacturing process across every machine,

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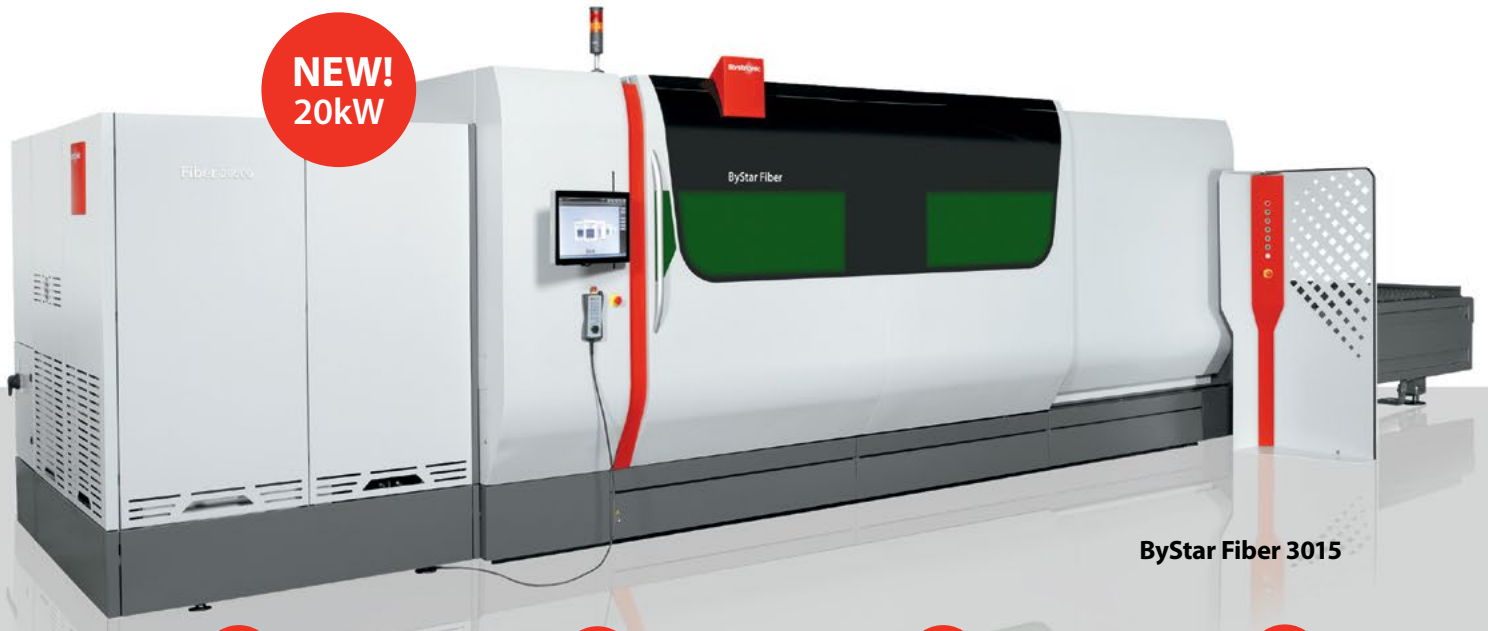

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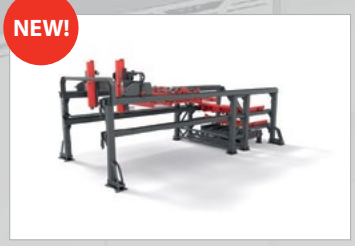

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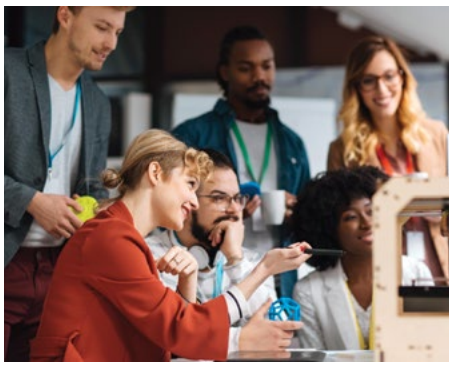
Smart Technology Needs a Smart Workforce

To survive 2020, manufacturers were forced to adapt, finding new approaches to solve supply chain, customer service and human resources challenges. Smart manufacturing solutions—and a smart workforce — were an integral part of that progress.

"Innovation and flexibility have been compulsory during the past year," said Jeannine Kunz, Vice President, Tooling U-SME. "The pandemic accelerated the use of smart manufacturing across the industry and made clear that a skilled and highly trained workforce is essential to the successful implementation of 4.0 systems, processes and technologies."



The industry is moving toward transformative technologies that are changing the way manufacturers approach supply chain, product design and productivity including:

- Additive Manufacturing & 3D Printing
- Automation & Robotics
- Cybersecurity
- Artificial Intelligence/Machine Learning
- Data Analytics
- Augmented Reality (AR) & Virtual Reality (VR)
- Industrial IoT
- Workforce Transformation

For optimal use of these new technologies, companies are strengthening and expanding their manufacturing training programs. Building new skills and knowledge with incumbent workers is as important today as recruiting an experienced skilled workforce.

An unforeseen bonus is that these new technologies are fueling an updated image of manufacturing.

Offering exposure and training to new technologies is becoming a strong recruiting and retention tool, especially important as the industry aggressively addresses the skilled labor gap.

For instance, Acieta, a Wisconsin-based leader in automation technology integration, is show-

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LAKESIDE BISTRO

The Lakeside Bistro is a convenient place for exhibitors and attendees to eat, meet and network. Located in the Lakeside Center Ballroom, the Lakeside Bistro will be open on event days from 11AM-2PM and feature a buffet menu that will change daily. Reservations are not required and credit cards are accepted.

CCAI's Women in Finishing FORUM Returns to the University of Notre Dame

From October 4 – 6 women throughout the finishing industry will come together at the Embassy Suites South Bend, IN, at Notre Dame for CCAI's Women in Finishing (WiF) FORUM. The unique program features professional development sessions as well as networking and team building activities, providing a valuable development opportunity for all women in the finishing industry — from the finishing line to executive management.

A welcome reception on Monday evening gives attendees the opportunity to get to know each other in a casual setting before diving into the program first thing Tuesday morning with a tour of the diverse finishing operations of global manufacturer, Lippert. During the tour, attendees will have the opportunity to see powder coating, liquid coating, and one of the largest electrocoat systems in the U.S. in action, in one location.

An outstanding program built upon feedback from the highly successful 2019 WiF FORUM, webinars, and networking events follows the tour and is chock full of skills-focused presentations and industry updates. Taking full advantage of its host location, a team building exercise and wellness walk will be held on the beautiful campus of the University of Notre Dame. "I look forward to reconnecting in person with the amazing women in our industry at this year's FORUM," states Sheila LaMothe, CCAI's vice president of strategic initiatives and WiF program manager. "Women in Finishing strives to provide tools for women in our industry to grow and advance their careers. With a phenomenal program in place, every FORUM attendee is sure to learn tips and techniques they can implement when they return to the office," she adds.

Participation in the FORUM fosters professional connections and new friends.

FORUM presentation topics and speakers include:

- World-Class Operations Driven by a Culture of Caring — *Jason Lippert, President & CEO, Lippert*
- Managing Conflict: Turn Fight, Flight or Freeze into Calm, Confident and Productive — *Kim Lisiak, Director of Leadership Development, Lippert*
- Creating the Structure for Accountability — *Lee Ann Schwope Cochran, Partner, Amphora Consulting*
- Journey to Leadership Panel – *Shelley Bausch, Senior VP Global Industrial Coatings, Axalta Coating Systems; Alesha Miller, Assistant General Manager, Lippert; Allison Lee, General Manager & Partner, Coatings Plus; Michelle Striggow, Senior Finishing Account Manager, Graco*
- Embracing Market and Technology Trends in Industrial Finishing – *Shelley Bausch, Senior VP Global Industrial Coatings, Axalta Coating Systems*
- Sales Strategies for Women in Finishing — *Leslee Robinson, Sales Representative, Cardinal Paint and Powder*
- A Feminine Touch in a Masculine World: Why Manufacturing Needs the Healthiest Version of You — *Dr. Amber Selking, VP of Leadership and Culture, Lippert*

2021 also marks the debut of the Elizabeth Teska Women in Finishing FORUM Scholarship program. Two of this year's FORUM attendees will benefit from this new program established to honor the memory of one of WiF's first official members. The scholarship aims to support women in the industrial finishing and coatings industry by expanding their opportunity to participate in WiF programs. Specifically, the scholarship enables more women to participate in the annual FORUM by covering registration fees and accommodation costs for up to two successful applicants each year. "Liz embodied the spirit of Women in Finishing. It seems only natural to remember our friend through a program that will continue to support the women in our industry," shares LaMothe. Scholarship recipients are selected by the CCAI Finishing Education Foundation Board of Directors. ■

To learn more about the Women in Finishing FORUM and to register, visit www.womeninfinishing.org/forum.

Working Toward Zero Recordables in the Metal Fabrication Shop

A conversation with an FMA Safety Award winner provides a glimpse at how a large manufacturing organization minimizes injury risk

By Dan Davis, Editor-in-Chief, *The FABRICATOR*

A lot can go wrong on the shop floor of a metal fabricating company. Debris in eyes and lacerations represent just the tip of the iceberg, but even those small events can result in lost time from work. Keeping employees safe on a daily basis is a real accomplishment.

That's one of the reasons that BTD Manufacturing, which has four locations (Detroit Lakes, Minn.; Lakeville, Minn.; Washington, Ill.; and Dawsonville, Ga.), routinely applies for—and wins—FMA Safety Awards. These awards, presented to Fabricators & Manufacturers Association members who apply and qualify, are celebrated by the company because both management and employees recognize the commitment it takes to avoid injuries doing a job filled with risk.

What makes for an FMA Safety Award winner? The Safety Award of Merit, which all BTD Manufacturing locations qualified for in 2020, was presented to companies posting an injury and illness incidence rate for 2019 that is better than the published Bureau of Labor Statistics rate by 10% or greater, based on the company's North American Industry Classification System code. In 2019 BTD Manufacturing had 16 Occupational Safety and Health Administration (OSHA) recordable injuries and three cases of days away from work. Just under 1,300 employees worked approximately 2.4 million hours in 2019, and those were the only injuries that BTD Manufacturing reported.

BTD Manufacturing's Heywood Avenue location in Lakeville, a tooling facility, won the 2020 Safety Award of Honor, which is presented to companies having a perfect safety record. That's no OSHA recordable injuries or illnesses in 2019. With that performance, it also garnered FMA's 2020 Most Improved Safety Record.

To learn more about how a large manufacturing organization is able to minimize injuries in its facilities, The FABRICATOR talked with Chief Operating Officer Robert Bradford

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What is Beam Shaping Technology in Laser-Cutting?

Laser-cutting technology, like most modern technology, is constantly advancing. From CO2 lasers to fiber lasers, to advanced cutting heads with beam diameter control, and now generators that perform beam shaping. The next development in laser-cutting is here.

Variable Beam Parameter Product (V-BPP) offers beam shaping technology that comes directly from the generator rather than having to make beam diameter and shape changes in the laser cutting head. V-BPP is a way to command to the generator from the CNC a variety of shapes, sizes and power distributions that can be used for different cutting techniques and applications.

V-BPP can start with a very small diameter beam with the heat profile directly center to that beam. This shape is often referred to as fiber mode. But the beam can get wide and create a "donut-shape" mode. While V-BPP alters and changes the beam diameter, it is also altering the shape of the beam, where the power density is concentrated, and where the heat resides in the total spectrum of the beam profile.

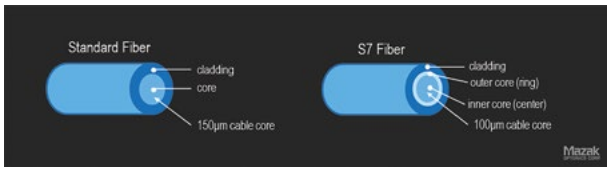

Figure 1

Fiber Cable Delivery

The proprietary beam types are created from inside the generator. Then, that beam type is delivered through a fiber optic cable. With this next level V-BPP technology, a standard fiber cable cannot transfer these beams effectively.

Mazak has paired both, a new generator technology and a new multi-core fiber cable for the OPTIPLEX NEXUS FIBER S7. This new multi-core fiber cable has an inner core and an outer ring core.

By having a dual fiber core, power is directed to both the center core and the outer ring core allowing for a balance in power distribution. In doing so, the power can switch from the center core for rapid piercing through heavy plate, then switch and balance out that power to the outer ring core and reduce the power in the center ring core. This gives a wider kerf width but maintains the heat profile needed to get through heavy plate. By doing so, it gives an advantage in thick plate cutting in edge quality, straightness of cut and speed of cut.

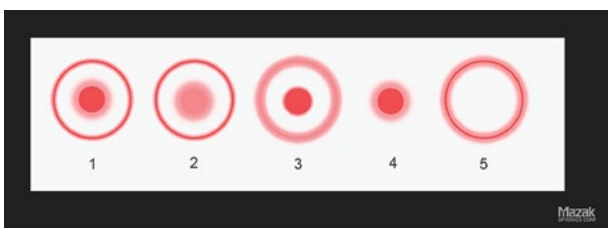

Figure 2: Example 1 shows 50% power in the center core and remainder of the laser power is on the ring core. Example 2 is much more power on the outer ring core and only a little bit of power on the center ring core. You can see how this power distribution changes.

Standard Fiber Versus V-BPP Fiber

Unlike traditional fiber lasers, V-BPP users can command to the generator not only a different size diameter of beam, but also where the heat resides in the total spectrum of the beam profile. For example, when utilizing V-BPP with 0.250" mild steel, all the heat is directed to the center core of the beam and the diameter is rather small. When climbing to a thicker material, the beam diameter is increasing along with a changing heat profile.

Comparing standard fiber to V-BPP, even with a standard fiber increasing its beam diameter, there will still be heavy striation and the speed is limited due to the diameter of the beam. With V-BPP, using a much larger diameter and the heat not in the center core but on the outer edges of the beam, gives a much smoother edge, a straighter edge and faster speed.

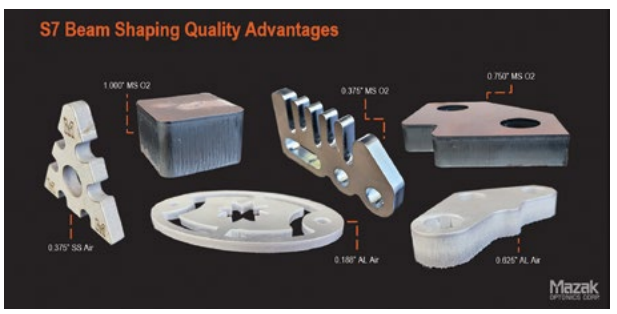

Figure 3: From left to right: 0.375" stainless steel with high performance air, 1.000" mild steel with oxygen, 0.188" aluminum with high performance air, 0.375" mild steel with oxygen, 0.750" mild steel with oxygen, and 0.625" aluminum with high performance air.

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TUESDAY, SEPTEMBER 14

SCHEDULE-AT-A-GLANCE

TECHNOLOGY	8:00 AM – 9:30 AM	10:30 AM – 12:00 PM	1:00 PM – 2:30 PM	3:30 PM – 5:00 PM
3D/ADDITIVE MANUFACTURING	**NEW!** ■ **WS1:** Navigating Technology and Design Considerations in Additive Manufacturing Workshop (8:00 AM - 12:00 PM) **Room S405B**			■ **F17:** Viable Power Quality & Legal Issues to Sustain Additive Processes **Room S405B**
AUTOMATION/ ROBOTICS	**NEW!** ■ **F24:** Position Your Business for Future Growth & Speed Up the Workforce with Automation Process **Room S405A**	**NEW!** ■ **F25:** Do You Know How Much Money You Are Losing Due to Equipment Downtime? **Room S405A**	**NEW!** ■ **WS4:** An Introduction to the World of AGVs: Identifying the Considerations for a Successful Application Workshop (1:00 PM - 5:00 PM) **Room S405A**	
CUTTING		**NEW!** ■ **F35:** Advancements in Cutting Automation **Room S401D**		
FINISHING	**NEW!** ■ **C14:** Automation - Controlling the Process **Room E353A**	**NEW!** ■ **C15:** Busting the Myths: What Really Matters in Metal Cleaning **Room E353A**	**NEW!** ■ **C16:** Improving System Performance **Room E353A**	
	■ **C24:** I Want to Powder Coat, Now What? **Room E353B**	■ **C25:** Optimizing Your Powder Coating Operations **Room E353B**	**NEW!** ■ **C26:** Operating Liquid Systems Efficiently **Room E353B**	
	NEW! ■ **C34:** Pretreatment - Get The Latest and Greatest! **Room E353C**	■ **C35:** See It, Touch It, Fix It - Identifying and Solving Finishing Defects **Room E353C**	**NEW!** ■ **C36:** Solutions for Metal Cleaning Issues **Room E353C**	
	NEW! ■ **C100:** Industrial Finishing Safety Workshop - Day 2 (8:00 AM - 12:00 PM) **Room E271B**			
FORMING & FABRICATING	■ **F44:** Roll Forming: In-line Punching, Cutoff Dies, and Press Tonnage **Room S403B**	■ **F45:** Machine Safeguarding **Room S403B**	■ **F46:** Roll Forming: Justification and Welding Profiles **Room S403B**	**NEW!** ■ **F47:** Addressing Modern Day Metals in the Roll Forming Process **Room S403B**
JOB SHOP	**NEW!** ■ **F74:** Improving Production Outcomes Through Cross-Crew Synthesis **Room S403A**	**NEW!** ■ **F75:** Made to Order Tooling & Production Scheduling **Room S403A**	■ **F76:** Are Scheduling Problems Really Symptoms: "A Quick Fix for Job Shops" **Room S403A**	**NEW!** ■ **F77:** Transforming a Tired Manufacturing Company Back to an Industry Leader **Room S403A**
LASER	■ **F34:** Laser Ecosystems for Fiber Laser Cutting & Surface Cleaning **Room S401D**		**NEW!** ■ **F36:** Advantages of Laser Welding Applications **Room S401D**	**NEW!** ■ **F37:** Industrial Laser and Cutting Applications & Solutions **Room S401D**
LEAN	**NEW!** ■ **WS6:** Lean Overview – Principles & Practices Hands-On Learning Workshop (8:00 AM - 12:00 PM) **Room S402A**		■ **F56:** Lean Principle: Value Stream Mapping: Understanding the Whole from Sales to Shop to Customer **Room S402A**	■ **F57:** Lean Principle: A3 Thinking; Developing People & Solving Problems **Room S402A**
MANAGEMENT	**NEW!** ■ **F64:** Gen Z Is Coming - What You Need to Know for Your Business **Room S404BC**	**NEW!** ■ **F65:** That Was Fun! Where Are We in 2021? **Room S404BC**		**NEW!** ■ **F67:** Strategies To Create a Workplace Culture That Works! **Room S404BC**
MARKETING & SALES	**NEW!** ■ **F84:** Winning With Social Media & Website Connections **Room S402B**	**NEW!** ■ **F85:** Ensuring A Successful Product Launch **Room S402B**	**NEW!** ■ **F86:** Building an Inside (Outbound) Sales Team **Room S402B**	**NEW!** ■ **F87:** Client Engagement: Compete on Awesome **Room S402B**
SMART MANUFACTURING	**NEW!** ■ **F94:** Key Steps to Jump Start Your Smart Manufacturing Journey **Room S404D**	**NEW!** ■ **F95:** The Manufacturers Data-Driven Playbook **Room S404D**	**NEW!** ■ **WS10:** Digital Transformation Models for Industry 4.0 Workshop (1:00 PM - 4:00 PM) **Room S404D**	
STAMPING		■ **S15:** Processing Parts for Progressive Dies - Evaluating Strip Layouts **Room S404A**	■ **S16:** Processing Parts for Progressive Dies - Engineering Principles and Design Guidelines **Room S404A**	■ **S17:** Automatic In-Die Part Quality Monitoring & Tool Adjustments **Room S404A**
WORKFORCE DEVELOPMENT	**NEW!** ■ **F114:** Blue-Collar Leadership® & Culture: The 5 Components for Building High-Performance Teams **Room S401BC**	**NEW!** ■ **F115:** The Art of Assertive Communication **Room S401BC**	■ **F116:** How to Attract and Keep the Right Talent **Room S401BC**	**NEW!** ■ **F117:** Give Your Employees C.R.A.P...The Success Formula for Building Employee Loyalty **Room S401BC**

WELDING	**W3:** AWS/Weld-Ed Conference - Project Based Welding Curriculum - **Room N228**	8:00 AM - 4:00 PM
	W5: Advanced NDT Methods and Your Future as a CWI - **Room N230AB**	8:00 AM - 11:00 AM
	W6: Metallurgy (Intermediate) - **Room N230AB**	1:00 PM - 5:00 PM

Schedule subject to change. Detailed Conference Program session descriptions, speakers, pricing, room locations and more can be found at **fabtechexpo.com/conference**.

■ = Basic ■ = Intermediate ■ = Advanced

Working Toward a Full AM-Data Ecosystem

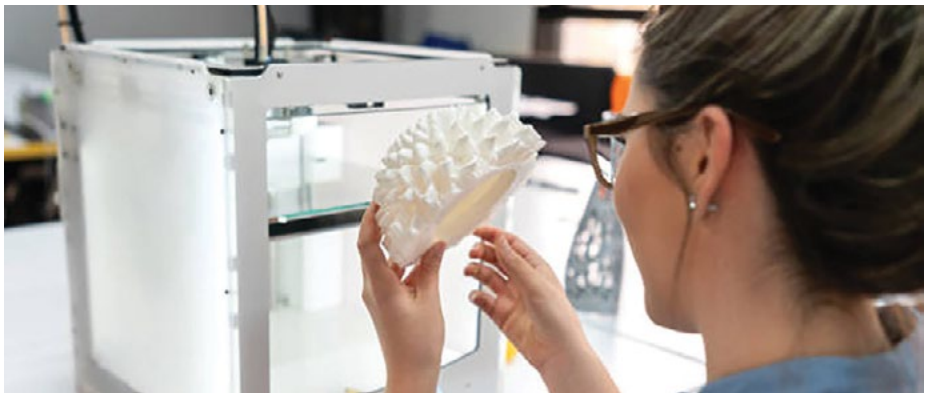
By Luke Mohr, EWI applications engineer

From 3D Metal Printing magazine

Knowledge tends to grow exponentially, and a large base of knowledge acts as a strong foundation on which to build. The fastest way to accelerate this kind of growth is to facilitate the ability to share information, a principle demonstrated effectively with the growth and advancement of the internet.

Additive manufacturing's (AM's) many processes have been developed in a digital world and generate a large volume of data, including part-design files, build parameters and monitoring information, inspection and characterization results, and more. Ideally, we can leverage this data to create predictive models that improve these processes, and the cycle can begin again: collect data, improve, repeat.

This vision, however, can prove difficult to achieve without a well-developed data ecosystem, and currently the AM community



lacks a standard approach to gather, manage and share data. But, recent efforts by the ASTM Additive Manufacturing Center of Excellence (AM CoE) have been made to identify gaps in the data ecosystem, and actions needed to address them. Earlier this year, AM CoE, in its Strategic Guide: Additive Manufacturing Data Management and Schema, outlined three key action items in a plan to develop an AM data ecosystem:

- Develop a common data dictionary (CDD) to set consistent terms and relationships for AM data.
- Develop a common data-exchange format (CDEF) to enable robust data sharing.
- Automate data acquisition, for affordable, fast and accurate data capture.

EWI has been part of a community effort to push these initiatives forward, and we summarize the status of each initiative here.

Common Data Dictionary

The AM Data Management Working Group (AMDMWG), led by Yan Lu at the National Institute of Standards and Technology, has begun to investigate and address the shortcomings of the AM data ecosystem. Early on, the group identified a basic problem limiting the ability to share data. That is, when it comes to data, everyone does not speak the same language. Many organizations use different terms for the same concept or may use different definitions for the same term.

The AMDMWG is continuously developing the CDD to establish common terminology, definitions and relationships for AM data elements across every aspect of the AM lifecycle. Experts across industry, academia and the government have developed and reviewed the CDD.

EWI, the Penn State University Applied Research Laboratory and NIST partnered on an ASTM-funded effort to create a standard based on the CDD. A new ASTM standard work item, WK72172, is in the balloting process and represents the first step toward comprehensive standardization of AM data terminology and, thus, the first step toward robust data-sharing capabilities across organizations.

Common Data-Exchange Format

Once everyone begins to speak the same AM-data language, organizations need a simple way to share their data. Currently, the way data are stored varies greatly depending on whom you talk to; some organizations use commercially available data-management solutions, while others have developed their own solutions. With the CDEF, the AM CoE does not intend to upend current systems but rather to establish a common format as a middle ground. This includes common file formats for storing data, as well as establishing data types, definitions and relationships based on the standards established in the CDD. By establishing a CDEF, organizations will be able to share data easily by translating it from their current management systems to the CDEF, and vice-versa.

The AM CoE has identified as a major roadblock the amount of time required to parse data from different systems and expects the CDEF to alleviate this all-too-

common issue. EWI has begun to actively pursue opportunities with other industry leaders to push this effort forward.

Automated Data Acquisition

Data pedigree is a key requirement for a mature data ecosystem. To be valuable, data must be believable, accurate and error-free. One way to improve data accuracy: removing human error in data entry as much as possible. Too often, data entry occurs by transferring data from one system to another via USB for manual entry into a spreadsheet.

Recognizing that this manual process can create many potential entry points for mistakes, EWI has built a semi-automated internal website for uploading data to make the data-acquisition process as straightforward and error-free as possible. The website reduces human error by utilizing QR scanning to enter values (where possible, such as for operator names and sample or part IDs). The operator also points to machine-generated log or output files, which automatically are parsed and imported to the database. This setup also allows for effective management of powder-inventory information in the database throughout the full AM-process lifecycle.

As a next step in this effort, EWI plans to develop a fully automated data-importing solution and accompanying standards that establish best practices for this process. With this resource, the AM community will gain more confidence in the correctness of its data. Together with the CDD and CDEF, automated data acquisition will support the sharing of quality data between organizations, greatly accelerating AM growth and understanding.

A Promising Start

The actions outlined above represent a key step and a promising start toward developing a robust AM-data ecosystem. Our shared vision is to enable the quick and secure sharing of AM data between organizations, greatly accelerating the rate at which knowledge is processed and gained, and ultimately leading to more efficient processes across AM. This has been, and will continue to be, a true community effort, requiring the input and consensus of collaborators with a variety of expertise. ■

For information on how to get involved, e-mail Luke Mohr, lmohr@ewi.org. 3DMP

Working Toward Zero Recordables in the Metal Fabrication Shop

continued from p. 15

and Director of Tooling and Organizational Development Jeff King.

The FABRICATOR: Where does safety fit into BTD Manufacturing's core values?

Robert Bradford: From an operational standpoint, we focus on safety, quality, delivery, productivity, and people. That's what I preach to all the sites. So for us, safety is the cornerstone. It's one of our core values. It's part of everything that we do.

Every Tuesday we have a new-hire meeting where some of the executives and other leaders in the company meet with the new hires. Of course, we're doing that virtually now. But when we get together, one of the things that we talk about is reiterating the fact that we want everyone to be safe. Always be looking out for unsafe conditions. If you don't feel safe, don't do it. If you don't know what to do, ask questions. Safety is definitely one of the things we talk about all the time.

FAB: What type of communication structure exists to share safety issues with all members of the BTD Manufacturing team?

Bradford: We have quarterly meetings with the company's leaders. We used to do them in person, but we have been doing video-conferencing over the past year. That's where we talk about the core values, such as safety, and set annual goals for each of those areas. Those goals then are shared with everyone in the company.

Every Monday a discussion occurs with the safety professionals from all over the company. This is where an OSHA recordable or a DART [days away, restricted and transfer injury] is talked about and shared with the other facilities. That discussion might then work its way down to the 10 a.m. meeting at every site when leaders talk about safety, quality, delivery, and productivity. It also might be discussed in the daily huddles that begin before each shift.

We have a corporate goal every year in terms of overall safety measures, such as OSHA recordables, but we're also looking at things like near-misses and reported unsafe acts. We want to have goals set for different departments in different facilities. A facility that didn't have a recordable the year before might be working on different things than a site that had two or three recordables the year before.

FAB: Does each site have a dedicated safety professional?

Bradford: Each facility has someone called a safety coordinator. There's one in every facility. I meet with those people weekly to talk about safety.

In two of our facilities, the safety coordinator is a full-time position. In the other two facilities, that person also has learning and development duties. Those two facilities are smaller. Also, those safety coordinators lead a safety committee in their facility. The safety committee is made up of people from different functional areas.

FAB: How do you get to the point where you are able to rely on good planning instead of good fortune to minimize the risk of injury to employees?

Bradford: There's always some good fortune, no matter what you do. There's also going to be something that happens, and there's nothing that you can do about it.

What you can do is start looking for and identifying patterns of unsafe behavior. Then you can put into place corrective actions to prevent that. The focus on trying to eliminate the unsafe act or condition might prevent an injury from happening.

When those unsafe situations are identified, we have a process that looks to solve the problem that could lead to a recordable injury. It might be something simple, such as removing a pallet from the aisle, but it'll force further discussion. Why do we think that's the way to do it? What do we really want to get done here?

Jeff King: When unsafe incidents happen in any location, they are reported and shared with company leadership. That fosters the sharing of information throughout the company. So, if something happens in Detroit Lakes, that is shared across the board—to all the sites. Then people can pick up on that, look at it, and consider whether the same thing could happen in their own facility. Maybe they want to make sure that's shared in the daily huddle.

We use an app called Vector EHS, and it does a good job of notifying everyone in company leadership. All incidents, no matter whether it's recordable or not, goes into it. It documents the unsafe conditions.

FAB: What makes employees feel OK about reporting an unsafe act, which in some other manufacturing facilities might be construed as telling on another employee?

continued on p. 25

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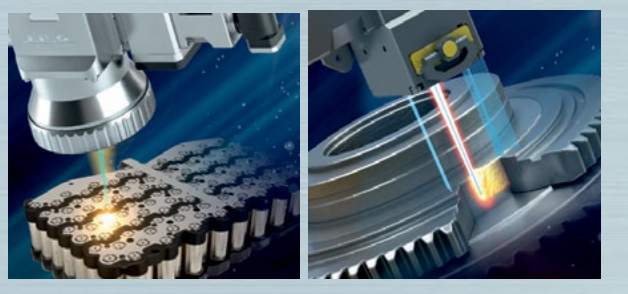

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Cultivating the Next Generation of American Workers

continued from p. 4

on NBC Sports Network. In 2016, Cleary University awarded Genei with the Friedt Medallion and an Honorary Doctor of Science in Business Administration. In 2017, the History Channel signed Genei and his Mobsteel crew for a series called Detroit Steel.

He and his team take Detroit's finest vintage cars and turn them into modern-day, menacing street machines. Made from vintage Detroit steel supplemented by some fiberglass repro, Genei said that the blood, sweat, and tears of our families and friends are in these motors, frames, and bodies.

The success of Mobsteel led him to start the Detroit Steel Wheel Company, the manufacturer of the original Smoothie Wheel. Embodying the ideals of Mobsteel, Detroit Steel Wheel is one of many manufacturers that symbolize the resurgence of U.S. industry.

Hard Work

The mantra of success at Mobsteel is hard work. And if you want to deliver a quality product, do it yourself. If you don't know how, learn those skills rapidly to make your company even more valuable. As a result, the company has graduated from fabricating vehicles to manufacturing after-market components such as suspension, wheels, and injection molding. These self-taught skills shaped the identity and destiny of Mobsteel.

"The minute you decide you want to create something, you need to roll up your sleeves and do it," said Genei.

Beyond hard work, his recipe for success is to surround yourself with good people, and conduct business with virtue. These values helped the company persevere through economic downturns. He augments those values with a firm conviction that businesses have a responsibility to make product in the USA.

"Growing up in my father's shop, being a part of the automotive supply chain, seeing what the American worker does, the many complex pieces of the puzzle, and the importance of doing it right; all of this had a big impact on me," said Genei. "Ultimately, this experience led me to understand the importance of the American worker and home-grown manufacturing."

Yes, you can sometimes import product cheaply from China, he added. But that doesn't feed anything back to your community and reduces the demand for manufacturing jobs at home.

"Many people in the community want to buy products made here, and anyone starting a business has a social responsibility to make products in the U.S," said Genei.

Such a viewpoint requires a motivation and purpose that extends beyond profit. Yes, money is vital for survival and expansion, but it is never enough. Cutting corners by importing parts from halfway around the planet is short sighted. Genei encourages people to take a look at their own communities and envision how much better they would be if those components were made locally.

Further, he gauges success by the relationships he builds, the happiness of the people around him, and how he interacts with and assists the growth of the community around him.

"People are our greatest asset: We help people to understand the behaviors that build a successful company and create a clear path to success in their own lives," said Genei. "Success is built with character, attitude, and work ethic. As a business we stay focused on healthy acts of compassion by continually looking for the next highest valued function or position within our organization. This approach has built a great team full of future leaders that share the same direction and drive, focus on creating success."

That's why the company always seeks to do business with virtue and diligence. By viewing employees as the true assets of the business, it becomes possible to build a brand that has value and a good reputation.

"It's all about comradery and wanting to build a great product while taking care of employees," said Genei. "When opening a business, too many people are quick to focus on themselves, but there is a bigger picture here—community."

The Next Generation

Giving back isn't just about hiring local talent and buying local. There is a responsibility to instill a passion for manufacturing in the next generation. That's why Genei is a frequent visitor to schools to talk with kids about careers in manufacturing and the many skilled trades available. He explains how lucrative these careers can be if you work hard and apply yourself.

"I tell kids they need to figure out what they are good at and what they like doing," said Genei. "If you develop a skilled trade right now you can be as successful as you want to be."

Once a valuable technical skill has been acquired, he says to identify what you're trying to turn that skill into, and the destination, direction, and behavior necessary to get you there. Ask lots of questions, find out about different business models, get in touch with people like him who followed that same path. He encourages those starting out in industry and those considering beginning businesses to track down those who've inspired you as many of them will be more than willing to give you some time, he added.

"Developing the next generation of the American workforce is critical in shaping the future success and prosperity of this country," said Genei. "This is how we can create prosperity for everyone." ■

Hear more from Adam Genei Thursday, September 16 at 8:30 AM in the Lakeside Center Ballroom.

Working Toward Zero Recordables in the Metal Fabrication Shop

continued from p. 22

Bradford: Whenever I think about why people want to participate, I think about culture. I also think about this quote: "It is easier to act yourself into a new way of thinking than it is to think yourself into a new way of acting." It's really about behaviors, and culture is really the culmination of behaviors that you are doing.

It's the mundane things over and over every day. We have the 10 a.m. meeting every day. We ask about unsafe acts and unsafe conditions every day. We ask if there was an OSHA recordable every day. We're putting tools out there and establishing a cadence that lets everyone know that safety is a major value and a safe work environment is expected.

John Abbott, senior vice president, Otter Tail Corp. [parent company of BTD Manufacturing], once said, "Bad news is good news." The point he was making is that you can't do something if you don't know there's a problem. So we tell people that it's OK to bring something up because we can deal with it. If you don't say anything, then it's really hard to make anything better.

I once knew a Japanese lean consultant who used to say that in the absence of standard work, there can be no kaizen. That's right, and with safety, it's sort of the same thing. We've got to report the unsafe conditions. We need to solve the problem. We've got to do it the same way. We've got to create the cadence. We've got to have people create opportunities where we can make things better.

FAB: How does BTD Manufacturing introduce new hires to its safety culture?

Bradford: That's obviously a challenge. Like I said, every Tuesday we see these new hires, and they're getting inundated by people telling them to be safe. What I try to stress is that you have to slow down to go fast. What I mean is that while they are getting fed with a firehose of information, they need to make sure they take their time and they are safe.

Remember, it's safety, quality, delivery, and productivity. It's in that order.

A lot of things can get you in trouble. It doesn't matter if you are a brand-new employee or a guy who's been here for 30 years. If you are not paying attention, something can happen. It only takes a few seconds.

Also, we make sure we provide new hires with whatever tools we think they might need. Obviously, we provide all the PPE for everybody.

FAB: What's are BTD Manufacturing's main key performance indicators as you they track safety in your facilities?

Bradford: Our KPIs are familiar ones for manufacturers. We watch OSHA recordables and DART.

King: It's all about people going home the same way they came in that day.

FAB: What do you do to maintain a consistent focus on safety so employees don't tune out the effort?

King: At our facility, we celebrate routinely. We do a lot of cookouts. This is just part of our culture when it comes to safety. One thing that COVID made challenging is rewarding people without the ability to have people really enjoy what they were used to. With the pandemic ending, they are really going to get their bang for the buck with the free burgers.

But in reality it's not about the reward. It's the recognition. It's about being thanked.

We also have the good fortune of having a very seasoned staff. They take safety seriously. They watch out for the new people. For example, we've got these grinding wheels, and it's very easy to just touch your knuckle on them and scrape them up really quick. When a new person comes in, the veterans explain right away what to do to avoid injury. That's the type of team approach that you get in this facility that helps to keep people safe.

Bradford: It really is the people on the floor who make this work. It's not me. It's not Jeff.

We send out this quarterly newsletter, and one of the things I included in it was that last year, even with the crazy economy, shutdowns, and furloughs, we actually got better with our safety performance year over year. It's because of our employees. They're the ones that think safety is important. ■

Article originally appeared in The FABRICATOR, July 2021 issue.

A Glimpse into the Future of Advanced Manufacturing

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line and plant. Data analytics and machine learning helps to identify problems and highlight opportunities for improvement. Modeled manufacturing data can be integrated with other enterprise applications to drive supply chain optimization, increase customer satisfaction and improve financial forecasting."

Making Smarter Manufacturing Decisions

Paperless Parts is another company blazing a trail towards manufacturing excellence. It offers a secure manufacturing platform that empowers the entire team to make smarter, faster, and more informed decisions. While it is an IT-centric company, it is proud of its heritage. It didn't start in a garage like Hewlett Packard, Apple, or Microsoft. It all began in a job shop.

"Paperless Parts automates so much of the rote work in estimating by leveraging information inside of CAD files and prints and by referencing historical data," said Scott Sawyer, Co-Founder and Chief Technology Officer of Paperless Parts. "That lets talented folks shift their focus from building out BOMs and quotes to selling shop services."

In building its product suite, the owners and the technical team took the time to visit hundreds of manufacturing operations. These spanned from the smallest one-person job shop to high volume production operations doing $100 million contracts. To ensure its software provides what manufacturers need, Paperless Parts analyzed tens of thousands of 3D parts files.

That homework as well as years of development resulted in the Paperless Parts platform. Its mission is to help job shops, contract manufacturers, and finishing companies improve business and grow by providing them with the most advanced, secure, cloud-based sales and quoting system available. The software streamlines manufacturing workflows by combining modern business process automation tools with a configurable geometric pricing engine that drives speed and consistency in the quoting process. It integrates with Customer Relationship Management (CRM) and Enterprise Resource planning (ERP) systems to supercharge front office operations and sales teams and enables more efficient responses to RFQs for a variety of manufacturing processes.

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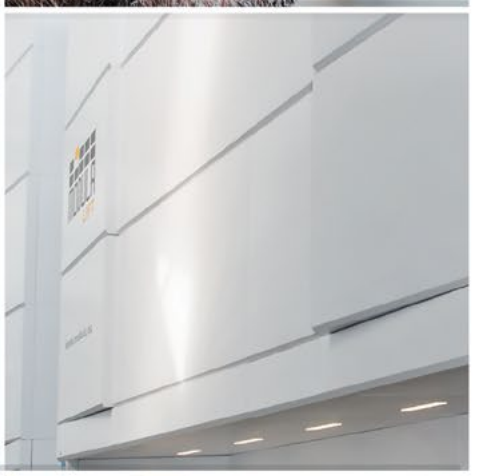

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Smart Technology Needs a Smart Workforce

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casing robotics to motivate and engage millennials and younger generations.

Tom Moylan, Automation Manager, Acieta, said during a presentation at SME's The Best of SMX Virtual Event, "Removing the menial labor with the use of robots opens up more challenging, rewarding and higher-paying jobs for your team. All that translates to employee retention."

Another growing area of interest for job seekers is cybersecurity. With machines and systems connected across supply chain networks, the importance of securing data and training employees to avoid cyber risks is more important than ever.

Technology is also changing how the industry trains its workforce. In his keynote session at the Best of SMX, "Ford's Journey to a Digital Manufacturing Operation," Mike Mikula, chief engineer, Advanced Manufacturing, Ford Motor Company, speaking of employees, said, "They are our most valuable asset. As a result, we focus a lot on the technology around how to improve the employee experience."

For instance, Ford is implementing an Extended Reality solution which uses light to guide employees in the right direction to choose the correct part or tool to make sure the work is completed properly and safely.

Now, with more than 50 online classes available in smart manufacturing, Tooling U-SME has seen increased demand for its elearning classes on topics from additive manufacturing and cybersecurity to data collection and machine learning.

The company's new virtual reality (VR) labs are set to debut this fall. VR will provide an efficient way to safely build skills after trainees complete their online curriculum and before training on real equipment.

As the manufacturing industry transforms, a skilled and highly trained workforce is essential to the successful implementation of smart manufacturing systems, processes, and technologies. ■

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A Glimpse into the Future of Advanced Manufacturing

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"One story we hear a lot is about how much time shops spend trying to figure out if they've made a part before – if it looks familiar but the part number doesn't match, estimators just walk around until someone remembers," said Sawyer. "We've created fast and accurate ways to find identical and similar geometries. Drop in a CAD file and we'll tell you right away if there's a match in your part library."

Since its inception in 2017, manufacturers across the U.S. have uploaded over 1 million job files using the platform and are processing over $1 million worth of orders a day. The company continues to innovate and recently launched Advanced Analytics, an upgraded feature in its Paperless Quoting platform. In order to use data to optimize the front office, prioritize quotes, and price work effectively, manufacturers need the ability to analyze the data they are collecting at every level. The Advanced Analytics feature is a business intelligence tool that enables manufacturers to leverage multiple layers of data to make impactful decisions. Manufacturers can now understand when and why they are winning or losing jobs.

Manufacturers harness it to query their own data and pull information like win rates by part geometry, manufacturing process, or material. While shops may already be collecting this data, many have not had a simple way to analyze it. With Advanced Analytics, manufacturers can now make sense of the information they have and act on it. The solution allows manufacturing companies to not only see how their business is performing at that moment but also how it's performing over time to continually improve operations.

Customized reports help evaluate past business performance and determine critical future decisions like:

- Which quotes to prioritize responding to first
- How quickly they need to respond to RFQs to win the job
- Which customers are just shopping around for pricing based on past trends
- Win rates based on the complexity of parts being quoted
- When to buy a new piece of equipment to support winning new jobs

"It's all about the future of manufacturing," said Sawyer. "We're continuing to focus on connecting the supply chain and making manufacturing more accessible." ■

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