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TODAY'S EVENTS

State of Manufacturing 2023
8:30 – 9:30 AM
Lakeside Center Ballroom

LEADERSHIP EXCHANGE
Financing Business: Sources of Funding for Business Owners
10:00 - 11:00 AM
Lakeside Center Ballroom

Careers in Welding Trailer
During Show Hours
Booth B25111

FABTECH Merchandise Truck
During Show Hours
Booth B19111

Digital Leadership: The 5 Simple Habits of Digital Leaders

FABTECH was proud to host Erik Qualman yesterday for yet another epic keynote at this year's show. His inspirational talk on digital leadership provided attendees with countless useful tips on how they can take their jobs and their companies to the next level. It is his firm belief that the leaders in this digital decade are made, not born. The key, he stressed, is understanding the balance of offline and online.

Qualman's words have been inspiring people around the world for more than a decade. This five times, number one bestselling author has performed in over 55 countries and reached more than 50 million people. He was voted one of the most likeable authors in the world. His Socialnomics work has been on 60 Minutes and showcased in the Wall Street Journal. It is used by businesses and government agencies such as the National Guard and NASA.

Qualman is a current professor of Digital Leadership at Northwestern University. His materials are used in over 500 universities. His animation studio works with brands such as Disney, Oreo, Chase, Cartier, and many others. In addition, he is a former sitting professor at MIT and Harvard's edX labs. He is also the inventor of the popular board game Kittycorn.

Life Lessons for FABTECH

Using profound and practical research, Qualman treated the FABTECH crowd to a summary of some of his work. In particular, he outlined the five habits that drive success and happiness for employees, partners and customers in a world that is increasingly dominated by Wi-Fi connections. He revealed a series of new techniques including Posting-It-Forward, Being FLAWsome and other insights aimed at helping event attendees to positively impact and transform their companies.

"Posting-It-Forward is all about staying connected online," said Qualman. "We can't replace face-to-face connection, but when time, distance, and safety are obstacles to meeting with someone in person, you can find ways to deepen those relationships online

These points can most easily be remembered as S.T.A.M.P.

Simple: success is the result of simplification and focus

True: be true to your passion

Act: nothing happens without action – take the first step

Map: goals and visions are needed to get where you want to be

People: success doesn't happen alone



Qualman said each person and each company leaves a digital stamp which is the combination of what we present to the world online, what others add about us to the digital space, and how we approach the relationships, information, and momentum to build our business. He summarized each of these five points during his keynote. Here are some of the highlights.

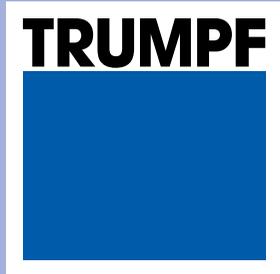
Simple:

The first of the five points of S.T.A.M.P. is to keep things simple.

"Simple is really hard," said Qualman.

Simple means many things. It entails taking personal to-do lists and company goals and stripping them

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Leadership Exchange: Advancing Robotics in the Fabrication Metal Industry

Modern robotic technology is already contributing to higher quality products and shorter turnaround times in every sector, performing a wide range of human activities with accuracy. These robots are proving to be effective, prone to fewer errors, require less downtime, and are more cost-effective than those of earlier robotic generations. But where will robotics take us from here?

Yesterday's Leadership Exchange panel on robotics addressed that very subject. It brought together a group of industry experts who are leading the way in advancing this technology in the fabrication metal industry. They included:

- Aaron Prather, Director, Robotics & Autonomous Systems, ASTM International,
- Edward Mehr, Co-Founder & CEO, Machina Labs
- Gijs Van Der Velden, CEO, MX3D
- Arnold Kravtitz, CEO, Blueforge Alliance
- Chuck Brandt, Vice President, Technical Initiatives, ARM Institute,

They discussed trends such as the integration of Artificial Intelligence (AI), rapid design and dieless robotic

sheet-forming which are generating increased demand for manufacturing robots. They highlighted how robotics can be harnessed to automate incredibly complex tasks and processes to increase efficiency. They laid out how robots and humans could collaborate more closely to take the effort and time out of routine activities.

AI and Dieless Robotic Sheet-Forming

Ed Mehr, CEO and Co-Founder of Machina Labs, is a major proponent of AI and dieless operations. His company combines robots and AI to act as robotic blacksmiths. They can shape sheet metal into practically any possible shape using a process called Roboforming; all without needing a mold to do so. This enables rapid iteration and production in a matter of days to accelerate design, engineering, and iteration.

Roboforming leverages precise industrial robotics and AI-driven process control which is essentially dieless, digital sheet metal forming. This approach shapes sheet metal into large, complex parts that would otherwise be extremely expensive and slow to produce with conventional manufacturing tools.



"The robots have the ability to change tools and sensors instantly to perform a variety of operations such as forming, scanning, and trimming on a wide range of materials," said Mehr. "Dieless robotic sheet-forming processes can reduce the time to produce a part by eliminating the cost of designing and manufacturing molds and dies.

The same process also enables optimized designs that were not previously manufacturable. It enables manufacturers to realize higher performance, lighter weight, and more efficient products using virtually any metal from aluminums and steels to titanium and nickel alloys.

The FABTECH audience heard Mehr discuss how material- and geometry-agnostic technology can

outperform traditional sheet metal methods.

"Dieless robotic sheet forming processes reduce time to produce the first part from months to minutes, while saving up to \$1M per design," said Mehr.

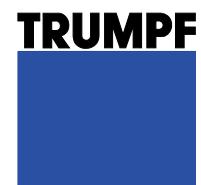
He also touched upon the growing trend of reshoring. After decades of American work being sent overseas, it looks like the tide has turned on offshoring. Manufacturers are moving many of their facilities back home from distant lands to obtain the quality they desire at a competitive price.

"Reshoring is on the rise, and we believe we can contribute to bringing more manufacturing jobs back

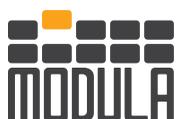
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Quality Assurance vs. Quality Control

Quality assurance (QA) and quality control (QC) are often considered the same; however, they are distinctly different, and the inspectors performing these functions usually have different duties and responsibilities.

Definitions

QA provides general guidelines used in the comprehensive quality system. The core of QA is to provide confidence that the quality requirements will be fulfilled. Verification is the main focus of QA and is typically accomplished through auditing. The extent of auditing may be defined for the project or may be at the QA inspector's discretion. When the QA inspector's audit finds systemic discrepancies, expanding the scope of the audit would be appropriate. The focus of QA is to ensure the QC functions are correctly carried out.

QC is specifically related to products or services. QC is focused on fulfilling the contract-specified quality requirements and is primarily accomplished through inspections.



QA and QC in Welding

How are QA and QC explicitly related to the welding industry, and who is typically responsible for these roles? AWS D1.1:2020, Structural Welding Code – Steel, uses the terms contractor's inspection and verification inspection in Clauses 8.1.2.1 and 8.1.2.2.

The contractor's inspection is the inspection and testing that shall be performed before assembly, during assembly and welding, and after welding to ensure the materials

and workmanship meet the requirements of the contract documents. Fabrication and erection inspection and testing shall be the responsibility of the contractor unless otherwise specified in the contract documents. As stated in Clause 8.1.2.1, these are the actual product inspections (i.e., dimensions and weld quality), and these are the contractor's responsibility and generally are delegated to the contractor's inspector. In addition, the contractor must perform welding procedure specifications (WPSs) and welder qualifications. These duties are often delegated to the contractor's inspector as well.

Verification Inspection

The verification inspection is a type of inspection and testing performed in which the results are promptly reported to the owner and contractor to avoid delays in the work. Typical verification inspection (think of auditing for this function) elements are as follows:

- Review of the contractor's WPSs for suitability for the work to be performed;
- Review of the contractor's welder performance qualification records (WPQRs), or perhaps even witness the welder's qualifications demonstrations;
- Review of the material test reports (MTRs);
- Corroboration that the inspection and test plans (ITPs) or travelers are updated and current; and

- Verification that the nondestructive examination (NDE) reports and personnel certifications, as well as other quality-related items required by the contract, are properly documented.

This auditing intends to ensure that the QC functions have been adequately performed and the contractor's quality system is functioning correctly. The intent is basically to "QC" the QC; however, QA functions do not necessarily exclude the QA inspector from verifying some or all of the QC's responsible inspections.

The extent of actual product inspection may be specified in the contract – in the QA inspector's work contract – or may be determined as necessary whenever there is reason to question the credibility of the contractor's inspections. This function is typically performed by the owner's QA or contracted third-party inspector.

At the owner's discretion, QA functions may be delegated to the contractor; however, this may be construed as the fox guarding the hen house. This option is better reserved for contractors with an excellent reputation for quality and with a robust quality system, such as the AWS Certified Welding Fabricator (CWF), ISO 9000, and others. Contractors with certified quality systems are audited by the certification body periodically to ensure there is evidence the contractor is performing the quality duties in accordance with their documented quality system. Typically, the owner's organization would audit the contractor's quality system and approve them as an approved supplier. This approval may justify delegating some or all the QA functions to the contractor.

Welded Products

Concerning welded products, QA and QC inspectors typically play different roles and have different responsibilities. For instance, a

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Want Better Leaders? Build Character

Leadership principles start with caring about people first

By Lincoln Brunner, Published in the June 2023 issue of *The Fabricator*®

When Mack Story gets a call from a CEO asking for his help to change a company's culture, his thoughts and advice turn to one word: Character.

That word, *character*, gets a lot of lip service, mainly in conversations about "soft skills." But character means something deeper and more binding than emotional intelligence, Story believes. To him, character revolves around values—specifically what the CEO and the company's leadership team value. That set of values inevitably flows down from the top of the company, creating and defining the very culture that the CEO wants to change.

The implications are clear.

"Quite often, I get top leaders who want to transform their culture, but they haven't even thought about transforming their own values," said Story, author and owner of Blue-Collar Leadership, a consultancy based in the Atlanta area. "The culture of the organization is exactly where their values have led it."

Leading Versus Managing

One recent Story client in the automotive industry brought him in for more than two weeks recently. The CEO wanted Story to guide more than 100 company leaders, from directors up to the C-suite, through a study of his book, "Blue-Collar Leadership & Supervision." Why? Because most of them had never been through any leadership development. As a result, many of those bosses had inadvertently suffered such a lack of relational capital with their employees that they lost a lot of respect from the rank and file, who viewed them as dictators they resented instead of leaders they trusted.

"You don't work *for* high-impact leaders," Story wrote in his supervision book. "You work *with* them. They know it, and you know it. You don't work *with* managers. You work *for* them. They know it, and you know it."

The difference is that leadership is about relationships, while management is about tasks. Leadership builds trust; mere management,



because it's non-relational, often creates mistrust. And that's where bosses in that automotive company found themselves tripping.

"A lot of the leaders were not approachable," Story recalled. "They had an old-school management mindset. People who haven't had leadership development, unless they're just naturally good leaders—which most people are not—most of them manage people just like they do things and processes. There's no connection. There's no relationship."

In Story's mind, gaining that trust requires people in leadership to adopt a risky posture: Vulnerability.

Leading Through Vulnerability

The Storys, in fact, focus on the concept of vulnerability because of how well they've seen it work in trust-building. Story offered an example from his experience leading groups of 20 people per week for many successive weeks through lean leadership certification.

"One guy in there, on Wednesday, he was still resistant," Story recalled. "He wouldn't say anything. He just kept crossing his arms. He wouldn't even look up at me. He just sat there for the whole eight-hour day."

A key tenet of vulnerability, to Story, is seeking to understand before being understood. So, sincerely believing there was something he didn't know that could help fix the situation, he walked over to the man, put his hand on his shoulder, and apologized to him in front of everyone for not knowing whatever it was that was keeping the man from engaging in the training. When he returned to the front of the table from where he was speaking, that one gesture got the man to open up.

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What Does a Tool and Die Maker Do?

By Peter Ulintz, technical director, Precision Metalforming Association, Published in the May 2023 issue of MetalForming magazine

Does your company struggle to find qualified candidates for apprenticeship programs? Part of the problem: a lack of interest, or more likely a lack of awareness by high school and vocational school students of apprenticeship opportunities in manufacturing. Those seeking apprenticeships often choose construction trades instead, leaving many manufacturing apprenticeships vacant. This proves particularly true with tool and die apprenticeships because most people have no idea what a tool and die maker does. Our inability to describe to young people the roles, responsibilities and opportunities available to tool and die makers contributes to the lack of interest in this field. If you struggle to explain the complexities of this trade, here's some help.

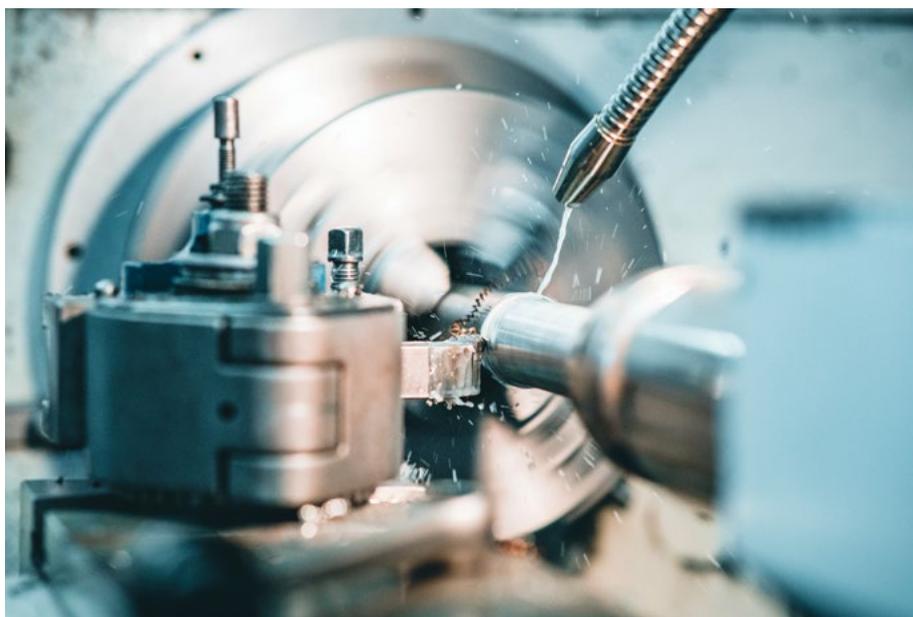
Tool and die makers possess a range of specialized skills, knowledge and experience related to designing, producing and maintaining the dies, molds, tools and fixtures used to manufacture various products.

Die makers serve apprenticeships to learn how to read and interpret technical product drawings, and to gain understanding of the precise dimensions and specifications of the parts their dies will make. In addition to other specialized skills and knowledge, tool and die makers need access to advanced tools and equipment, such as CAD/CAM software, precision measuring instruments, specialized cutting tools and state-of-the-art computer-controlled machinery.

And, many die designers and tooling engineers begin their careers as tool and die apprentices.

Design and Engineering

Designing metal stamping dies involves a series of steps that require careful planning and execution. The first step in designing a die: Define the project scope and requirements.



This includes identifying the type of part to be produced, the material it will be made from, the required tolerances and surface finishes, and any other specifications or constraints that must be controlled during production. This information guides the design process and ensures that the final product meets the required standards.

With the project scope and requirements defined, the die designer and die maker then develop a process layout for the die. They create concept drawings and determine the sequence of operations required to produce the desired part. The concept incorporates a clear understanding of the part geometry, tolerances, the number of process steps and the process methodology required to produce the part.

Dies are designed based on one of several processing methods including single-station dies loaded and unloaded by hand or with automation; progressive dies that automatically feed coil strip through multiple stations to incrementally cut and form the desired part as it remains attached to the coil strip; transfer dies consisting of multiple single-station dies that automatically feed coil strip or blanks into the die and mechanically transport parts from one die station to the next; or progressive-transfer dies—sometimes called hybrid dies—that

combine the benefits of progressive and transfer dies.

With the desired concept in place, CAD software is used to create a detailed design of the die. This may involve the creation of custom punches and dies, as well as other specialized tooling to perform specific operations. The die must be designed to meet required tolerances and specifications, and manufactured to exacting standards to ensure precise, accurate operation.

Construction and Validation

After the design phase comes machining of die components and die assembly. Die makers must understand the properties of different tool-steel materials and select, handle and machine them appropriately to ensure long life and production of high-quality parts. This requires knowledge about metallurgy, heat treatment techniques and

surface-finishing methods to ensure creation of durable die components with the required surface characteristics.

The die maker assembles the die to precise clearances and tolerances to ensure accurate and repeatable operation. Die makers must be skilled in using advanced machinery such as CNC machines, EDM machines, and other specialized equipment to manufacture parts to exact specifications. Following machining comes secure assembly of components into a precision die set that ensures proper component alignment.

After assembly, the die enters a tryout press to test and refine its performance. This involves a series of test runs to identify any issues or areas for improvement. The results of these tests enable refinement of the die design and any necessary tooling adjustments. This process may be repeated several times until the die runs at peak performance.

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Tips for Keeping Your IT Systems Safe

A fabricating company doesn't need a large IT staff to protect it from cybercriminals

By Dan Davis, Published in the May 2023 issue of *The Fabricator*®

In March 2022, Wilson Tool Intl. in White Bear Lake, Minn., found itself locked out of its information technology (IT) systems. That included everything from the enterprise resource planning software to modeling software. Its information was being held for ransom.

The company pulled together, going back to manual processes in some cases, and responded to customer requests as efficiently as it could. Eventually, it righted itself, and with the payment of the ransom, it got back control of its software and servers. (For more on this cyber-attack and the subsequent steps taken to get the business back online, search for "Why manufacturers need to be prepared for a cyberattack" on TheFabricator.com. The original story appeared in the July 2022 issue of The FABRICATOR on p. 58.)

But the point of this feature is not



to recap the Wilson Tool story. It's to remind metal fabricating companies that no one is safe from being a target. Upon looking to see how the cyberattack occurred, investigators found that Wilson Tool was delayed in patching an old email server. The cybercriminals, who are often the

motivation behind software companies sending you reminders to set aside time for maintenance, found their entryway into the company's IT systems through that crack in the email server. That's all they needed. From there, they just waited to find out who had administration privileges and gathered the necessary intelligence to assume the supervi-

sory role that used to belong to the system administrators.

The Wilson Tool IT staff knew it had to make the patches, but it just didn't do it in a timely fashion. The matter of a few days ended up being all of the time that the cybercriminals needed.

There's a reason for that. Cyber-crime is a big and successful business model.

"You can operate out of a country that refuses to help law enforcement in the country that you're attacking, so there's no repercussions for your actions," said Bryce Austin, founder of cybersecurity consultancy TCE Strategy, which worked with Wilson Tool after the incident. "This type of crime is so much easier than running drugs, human trafficking, racketeering, or the other horrible things that organized crime does. This is a much easier pathway, so they're taking it."

These are no fly-by-night operations either. These cybercriminals have a tried-and-true business model. Typically, it begins with a group that looks for weaknesses in an organization's IT systems, which include dated and vulnerable servers or clueless employees who have mistakenly responded to a fake email and provided an opening of which the cybercriminal can take advantage. Once in, that group of internet ne'er-do-wells sell the access to a second tier of cybercriminals, ones who are more skilled at gaining "persistence" in the network, as Austin described it. They find a way to get their hooks into the IT infrastructure so they can take control and lock out the original administrators. These middlemen then sell the entire setup to cybercriminals who handle the exfiltration of in-

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Quality Assurance vs. Quality Control continued from page 5

QC inspector (who works for the contractor) is generally considered highly knowledgeable in welding and is perhaps an AWS Certified Welding Inspector (CWI). In addition to the typical inspection duties, the contractor's inspector (QC) may be tasked with directing the contractor's welders on quality and welding matters. This same activity would be wholly inappropriate for an owner's inspector (QA). The owner's inspector's responsibility is to promptly report observations (both acceptable and not acceptable) to the owner and the contractor's management or supervision. This means a QA inspector may bring concerns to the welder's supervision, thus allowing the contractor to initiate the appropriate corrections. In either case, the personality of the inspector (either QA or QC) plays a key role in the quality system.

Communication is Vital

The quality professional (QA or QC) must be an excellent communicator. They must be able to speak and understand engineering and welder slang, and they must strive to develop a professional relationship

with all parties concerned. Having worked in both the QA and QC roles, I like them equally. They both have their unique challenges and rewards. Both roles are grounded in helping to ensure the customer re-

ceives the highest quality products and services within or exceeding the contract requirements.

IT DARYL PETERSON (daryl.peterson@outlook.com) is quality man-

ager at Central Maintenance and Welding, Lithia, Fla. He's an AWS SCWI, ASNT Level III, API 653, and SSPC PCI Level II inspector. ■



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Challenges in AM for Cold and Hot Stamping Tooling

By Louis A. Kren, Senior Editor, *MetalForming* magazine

Michigan-based Diversified Tooling Group (DTG), a full-service tool and die design-and-build company that also performs prototyping, low-volume stamping and assembly as well as other operations, is no stranger to additive manufacturing (AM). Its work in AM began with Oak Ridge National Laboratory (ORNL) in 2017, studying the feasibility of using AM to produce automotive tooling. Since that time, DTG has been evaluating AM for die build and repair, and fixture build, using metal, nonmetal and sand materials. Of particular interest: use of AM for production of hot stamping tooling and inserts.

To survey what DTG has learned thus far on the AM-tooling front, MetalForming talked to Mike Austin, DTG director of manufacturing engineering, responsible for research and development of new production capabilities and capacity, and new manufacturing processes.

"We did some evaluation with ORNL on cold and hot stamping dies as well as fixtures, using wire-fed AM

technology," Austin recalls. "Prior to that, we explored laser powder-bed fusion and other AM processes but realized quickly that they were relatively slow and did not fit our business model, which involves mostly lower-cost tooling."

DTG also explored sand printing for casting cores, which has applications in hot stamping tooling due to its ability to produce conformal cooling lines within sand-cast tooling. Here, Austin sees potential, but views some improvement in tool performance as outweighed by complexity of the process and cost. However, he notes, interest would return should use of sand AM for hot stamping tooling increase and scale to a cost-competitive level.

Advances in Wire-Fed AM Offer Hope

Wire-fed AM for production of hot stamping tooling has progressed beyond what DTG and ORNL had researched earlier—collaboration between the two has since ended—as outlined by ORNL officials in a pre-

sentation last fall at MetalForming's Hot Stamping Experience and Tech Tour. In a recent collaboration with Dienamic Tooling Systems, ORNL touted improved cooling effects and reduced lead time in AM test tooling, specifically a 400-lb. 5-ft.-long full-scale automotive B-pillar hot stamping die, as compared to a fully machined tool with machined channels. Three days of printing, using Type 410 stainless steel toward the exterior with a mild-steel core, followed by finish-machining, yielded the tool. Using AM, ORNL officials cited tool-build lead reduction from 20 days down to eight with 20-percent cooling improvement in selected tool regions, owing to optimized sizing and routing of cooling channels not possible via machining alone. Austin acknowledges this improvement and is keeping a close eye on the wire-fed process for hot stamping tooling, but still has reservations, namely in residual stresses and deposition rates.

"When we evaluated wire-fed AM, we concluded that, for management of

residual stress, we needed to be able to map those stresses in advance," he says. "I know that ORNL has done some collaborative work in mapping residual stresses to predict where stress is created."

With such knowledge, according to Austin, a tool can be printed on a two-axis rotating table that allows for stress placement in a plane perpendicular to loads to reduce delamination, cracking or other failure modes.

"With shrinkage compensated for (as the tool cools after deposition and heat treatment)," he says, "such a tool would be capable of withstanding typical impact loads and thermal shock loads found in the hot stamping tooling business. But while deposition rates are improving, these rates still are far short of what's required economically to produce large-scale tools."

While Austin also sees R&D improvements that allow for viable printing

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Want Better Leaders? Build Character

continued from page 6

"That guy uncrossed his arms and looked at me and said, 'What I'm going through is not your fault,'" Story recalled. "He said, 'I'm going through a divorce. That's what my thoughts are on every day.'

"And you know, nobody knew that." Story said. "But because I gave him room to breathe, and I took responsibility for his behavior, he actually took responsibility for his behavior and shared with us why he was being that way. The next break, though, all of his co-workers were offering him support."

No Instant Solution

Some companies Story works with want instant change, but it doesn't work that way, he said. It's a purposeful process.

One example he points to often is one of his marquee clients: Chick-fil-A. The privately owned fast food chain's sandwiches and drive-through service have made it a roaring success, but it's the company's customer service that's made it legendary. And it does it with an army of Gen Z employees who supposedly have no work ethic.

"A lot of people say young people don't want to work, and that's one reason I tell them about Chick-fil-A — it's full of young people," Story said. "And they'll say, 'Well, that's a different business — we aren't in the restaurant business.' And then I'll say, 'Well, what about the other restaurants? Are they different? Is their service different — the way that people talk to each other, the way they talk to the guests, the cleanliness of the store, the lan-

guage they use?' They say, 'Well, yeah, it's a lot different at the other places.'

"I say, 'So they're in the same industry. These people have these other businesses, and they have billions of dollars. They can buy the same locations; they can buy the same materials. They can build a nice building. They can buy good ingredients, and they can pay people whatever they want to pay them. But you can't buy character. You've got to build it. And most people aren't willing to build it.'

People Are the ROI

Story said that a lot of people who lead businesses both large and small come to him wondering what the return on investment is going to be for his training — how it will

immediately benefit the bottom line. He would say that's the wrong question to ask.

"If a leader ever talks to me about ROI, I know ... I'm not the person to help them," Story said. "They're worried about the money. So, that conversation doesn't go very far."

"People who aren't worried about the money are the ones who do the best job at this. And the reason they do it the best is because they're worried about the people. They genuinely care about the people. They're the people who get us in the room. They want to help their people have a better life at home and at work. The ROI for them is, they're helping people. And their people respond to that really, really quick." ■

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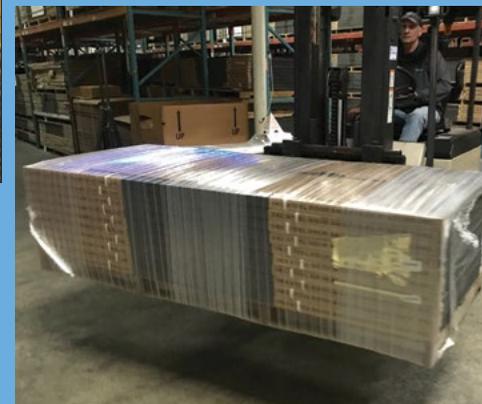
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Tips for Keeping Your IT Systems Safe continued from page 8

formation and the ransom. These gangs work in the darkness, but their names — such as Medusa or Conti — might be familiar even among the analog generation that still gets a newspaper.

A lot of people associate ransoming of IT systems as the main cybercrime, but that's not the case, according to Austin. It's wire fraud.

In this scenario, cybercriminals only need to gain access to an email account. They go through all the email records to find one associated with a bill and then send out emails, as that person, trying to convince people to send them money to a bank account that's been set up for these nefarious reasons.

Does this sound like something that's more likely to affect senior citizens who are easily confused? Think again.

Austin recounted the tale of a university professor who was duped by a party claiming to be the Massachusetts State Police. Over a phone call, the professor was convinced by the fake law enforce-

ment representative that her bank accounts had been compromised and that she needed a new social security number, which can take a while. Focusing on the ongoing threat, the criminals convinced the professor to transfer her funds into bank accounts specially set up by the Massachusetts State Police. The professor, who was in her 30s, followed those instructions and ended up losing \$200,000.

"Anyone can be a victim," Austin said. "There are hawks circling overhead looking for the squirrels, so we want to be porcupines in the land of all of these squirrels. As a result, the cybercriminals will pick the easier target."

What Can a Shop Do to Protect Itself?

Austin said he recognizes that the cybersecurity threats can seem overwhelming for a small to medium-sized business, but that's just part of the risk of being a part of a digitally connected world. Companies can't afford to forego the modern conveniences associated

with the internet, so it needs to be smart about how it goes about its business.

Austin suggested that a third party, like his company, could be called upon to help a manufacturer, and it wouldn't have to be a full-time relationship, likening it to keeping an attorney on retainer. A company might only need about 10 hours' worth of the attorney's time per month to look over certain legal situations. The same sort of arrangement can exist for a cybersecurity specialist.

In the meantime, here are some other steps that metal fabricating companies can take to secure their own IT systems:

Be Vigilant Against Phishing Scams. These emails sent to company addresses might notify parties of a problem with a financial account, ask for individuals to confirm some information, or try to entice someone to make a late payment. They might even look pretty close to an official organization that does business with the email recipient.

If there is a question, it's always safer to go to the official company website or mobile app.

A company should consistently remind email recipients to be careful what they click on in an email. A company also could choose to send out fake phishing emails to company accounts to see if people are as vigilant as they need to be.

Arrange for Multifactor Authentication on Email Accounts. This approach offers extra security by requiring two steps to log into an account. These extra credentials could include knowledge familiar to only the account holder, such as a PIN or the answer to a security question; a passcode sent by text, email, or an authenticator app; or a biological feature, such as a face or fingerprint. Multifactor authentication is one more layer of protection in case a cybercriminal gets access to a username and password for an account.

Invest in a Strong Antivirus Package. This is almost a no-brainer, especially in the sense that most people have some familiarity with these systems through at-home experiences. The difference in a commercial setting, however, is that people are joining the network all the time, particularly in the work-at-home environment that is much more common since the pandemic. "You have to demand that people use antivirus before they can hook up to your network," Austin said, "or you might need to set up a network where you assume that certain machines don't have any virus protection and you treat them in a much more suspicious manner."

Consider Offline Backups of Data. The best insurance against a ransomware attack is having a backup of the data that has been stolen. "If you have a ransomware attack and those backups aren't on your network but in a drawer somewhere, you have a get-out-of-jail-free card. Those offline backups are very hard

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Challenges in AM for Cold and Hot Stamping Tooling

continued from page 10

of conformal-cooling tool segments, “cross-drilling will be cheaper for the balance of a tool that features somewhat straight holes in the channels.”

Segmented Tooling, Heat Cycles Also Challenge AM

The hot stamping industry's interest in segmented tooling when compared to large one-piece tools also affects the choice of AM or machining.

“The industry wants segmented tooling that allows for repair or replacement of portions of the tool,” he says. “An A-pillar or B-pillar part features some areas at the ends that benefit from conformal cooling, but the center of the part has some long, relatively straight holes that can be drilled more cheaply. As long as I'm producing segments and tying them together, I'm better off drilling.”

As for prototyping hot stamping dies, these often can be produced in one large piece and, being prototypes, without the need for conformal or any cooling channels. This precludes the need for AM, Austin reports.

Progress as to pre- and post-heating during wire-fed AM also must be made to make it more viable for hot stamping tooling, according to Austin.

“We see the need for a process to preheat the tool before we feed the wire into it and strike the arc,” he says. “Then after the arc leaves, we need to slow the cooling—a post-heating process. A head that combines wire feed with pre-imposed laser heating would address metallurgical issues related to what happens when additively building a tool and not being able to keep it at an elevated temperature.”

All of the heating and cooling experienced when adding material brings undesirable stresses, according to Austin.

All of this said, Austin remains happy with the results during DTG's first go-round with wire-fed AM, and with recent improvements he remains optimistic on its future use for hot

stamping tooling, with qualifications. One qualification: issues with locating metal when performing high-speed finish-cut machining.

“A cutter flying around and suddenly hitting metal at high speed can break the cutter,” he says. “Shrinkage or metal movement after printing makes it difficult to locate metal

accurately and program the machining accordingly. Surface scanning can resolve this challenge in cutter-path programming.”

continued on page 19



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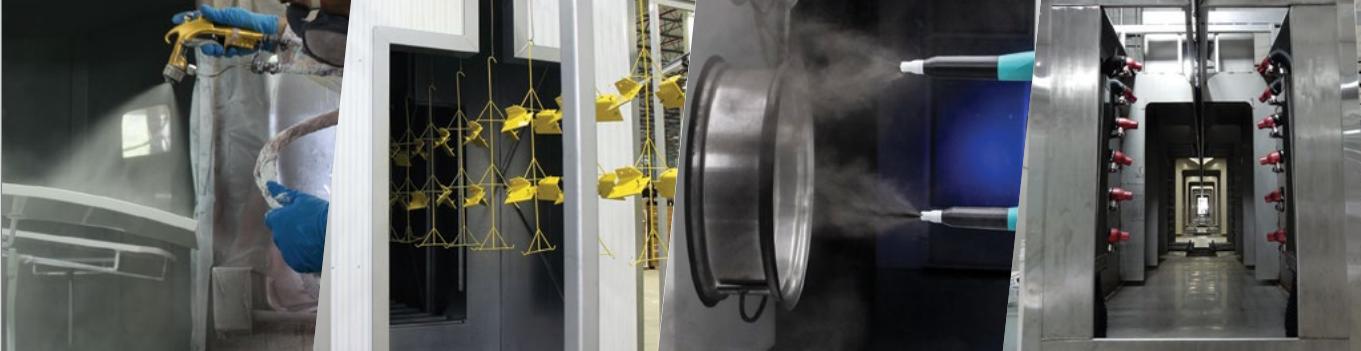
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Digital Leadership: The 5 Simple Habits of Digital Leaders

continued from page 1

down to only the key basic and simple things that must be done to contribute to productivity and success. Everything else should be eliminated or put off till a later date. The more of your activities that are simplified, the better off you'll be.

For those who struggle to simplify their daily and weekly lists, Qualman suggested they write "not to do" or "not yet" lists. This kind of separation and prioritization of duties makes it clearer what needs to be done now and what really should be delayed until a later point.

For example, this might require the simplification of longer-term goals into more tangible and doable immediate targets. Instead of trying to change the world or revolutionize the company on a daily basis, break it down to things that can actually be done now and that might contribute to the longer-term targets. Baby steps towards these goals are better for morale than shooting for the stars daily and failing to get anywhere — or being overwhelmed by the enormity of the task ahead.

Another useful simplifying tip offered by Qualman was to cut down on multitasking. He said it is much better to focus on one thing at a time instead of switching tasks to become more efficient. This one is particularly difficult in the modern age. But studies show that multitasking reduces efficiency considerably. It is more productive to set the mind to one task and complete it fully then move onto the next one.

Staying True

The T of S.T.A.M.P stands for True. Qualman said to stay true to yourself and what you believe must be done. He recommended that people take a breath to consider what is important and determine if what they are spending their time on is really what needs to be done. Email, for example, often absorbs enormous amounts of executive



and personnel time. He challenged attendees to not waste their days dealing with an endless array of messages. Yes, those messages need dealt with. But people need to make time for the things that could bring about desirable change. Email is not going to change the world — or the company.

Acting

Qualman is a man of action. He encouraged others to do the same. His mantra is to take action, even if it leads to mistakes. Don't worry about being perfect and having the most professional online presence if that introduces long delays and is really being driven by fear of failure. Put your attention more on acting now even if it exposes some flaws and you make some flubs. Qualman said that customers respect you more if you are FLAWsome i.e., you make the occasional mistake but then work hard to fix it. By doing so, you can demonstrate your commitment to the customers.

"Being Flawsome is all about how we, as individuals, brands, or companies, respond when we make a mistake," he said. "Research shows that when a company makes a mistake and takes the time to resolve the issue with a customer, that person is 3x more likely to return as a customer than someone who never had a problem in the first place."

Mapping

M is for mapping. It would be nice to have everything in life fall into place and move steadily toward expansion and an ideal business situation. But life is rarely a linear journey, said Qualman. You must figure out how to deal with many obstacles on the way to achieving your goals. He said it is all about remaining firm about your destination but being flexible in the path you take to arrive there. If obstacles push you aside, find a way to return to the path you desire. Don't let barriers, problems and difficulties interrupt your overall momentum.

People

P is for people: specifically, not forgetting about people. There is no long-term joy in achieving success in business in a way that alienates the employees, suppliers, partners and customers that got you there. Therefore, managers need to pay attention to what they can do for others.

Qualman said the 'me, me, me,' attitude comes back to haunt you later. It doesn't work in the real world and it doesn't work in the digital world either. The winning approach is to post it forward and shine the light on someone else. That manifests in a variety of ways. Show by your actions and resolutions that you

care about your customers and employees.

The digital world — and hence the modern business world — seems to move at light speed. It is easy to get caught up in online and social media activities. But offline personal interactions are just as important and are a big contributor to overall success.

"Digital relationships don't replace face-to-face," Qualman said.

One at a Time

S.T.A.M.P, then, means **S**implify, staying **T**ruer, **A**cting, **M**apping goals, and caring about **P**eople. Some may be able to get all of these points going at once. But trying to do so often leads to overwhelm — and it can violate the first point of keeping things simple. Qualman recommended instead that the FABTECH attendees pick one and work on that. Once it is mastered, move onto another of the five points.

"When it comes to metal forming, fabricating, welding, finishing, and beyond, the key to future-proofing yourself and your organization is simply staying one year ahead of the completion but never a year ahead of your market," said Qualman. "In short, it's achieving the right balance between the offline and online worlds. It's understanding how the physical and digital worlds can work harmoniously together. After all, technology changes every second, but human nature never does." ■

Leadership Exchange: Advancing Robotics in the Fabrication Metal Industry

continued from page 4

to the United States," said Mehr. "By bringing roboforming to the table, we make it possible to do manufacturing well in the United States again, because we can bring more automation and customization right at our customers' fingertips."

He urged FABTECH attendees to visit Machina Labs at the KUKA booth where they are demonstrating a new capability that has been released at the show.

Automated Complexity

Gijs Van Der Velden is CEO of MX3D, a company that sells 3D metal printing systems that enable manufacturers and fabricators to replace traditional casted and forged parts and obtain reduced lead times and improved mechanical properties. Parts typically are one foot to several feet in size, weighing anywhere from 20 to 2000 pounds. Bigger parts are possible.

The technology is based on robotic MIG welding, generally called Wire Arc Additive Manufacturing or WireDED. The company focuses on the energy, maritime and manufacturing markets. Its customer list includes BMW Group, Damen Shipyards and ENGIE. Its flagship project is a 36-foot 3D-printed pedestrian bridge made of stainless steel for the city of Amsterdam.

"More than ever, robots allow for automated complexity," said Van Der Velden. "Where robots have typically been implemented for repetitive jobs, MX3D robots rarely make the same move twice. Advancements in intelligent and responsive CAM allows for 3D printing complex metal parts without human supervision, 24/7."

He agreed with Mehr about how AI improves the quality and output volume of new processes much faster than most people can imagine. Implementation cycles of such new technologies are shortened. This changes the game for manufacturers and fabricators.

"Companies in this industry need to keep a closer eye on new technology," said Van Der Velden. "Earlier adoption becomes more important than ever in order to stay competitive."

He believes AI-aided part selection and optimization for additive manufacturing will further speed up adoption of 3D printing technology more broadly across the metal parts manufacturing industry. With

such a radical shortage in the number of qualified workers combined with the need to reshore (due to rising cost and the risk of production abroad), companies are opting

continued on page 21

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FINISHING	■ C103: Maximize Your Paint Finishing System Room S253B			
	NEW! ■ C203: Invest in Liquid Coating Operations to Lower Costs and Become More Sustainable Room S253C			
	NEW! ■ C303: Navigating EPA Regulation Changes Room S253D			
FORMING & FABRICATING	NEW! ■ C403: Hemming Sheet Metal on a Press Brake...The Wide Range of Solutions Available & Determining Which Is Best for You Room S403A			
JOB SHOP	NEW! ■ F603: Looking to Move? U.S. and Mexico Relocation and Expansion Incentives Room S404D	■ F604: Innovative Manufacturers: To Patent or Not to Patent? Room S404D		
MANAGEMENT	NEW! ■ F903: Authentically Weathering the Storms of Your Life from Sinking to Soaring Above Room S402B	NEW! ■ F904: The Long-Lasting Implications of Choosing the WRONG Manufacturing ERP Solution Room S402B		
MARKETING & SALES	NEW! ■ F233: You Don't Need New Customers: How to Reactivate Customers and Drive Referrals Room S404A	■ F234: Building A Sales Machine to Overcome Challenges & Drive Revenue Room S404A		
SMART MANUFACTURING	NEW! ■ F323: Leveraging AI for Success & Achieving Operational Excellence Room S402A			
WELDING	W11: Professional Program - Day 4 Rooms N138-N140			8:00 AM - 11:00 AM

Challenges in AM for Cold and Hot Stamping Tooling

continued from page 15

An alternative of drastically slowing machining would extend lead time and add costs.

Opportunities in Die Repair: Tailored Surfacing

Shifting to die repair, AM again holds promise, according to Austin, especially via directed-energy and powder-fed AM.

“This has great interest to us,” he says. “In general, for cold and hot stamping we build a tool from the same material over the entire tool surface, perhaps with inserts here or there, or some blocks of different material. But, especially in forming and cutting tools, there’s a need for different localized properties in the material. We can heat treat to surface-harden somewhat selectively and locally. With laser heat treat-

ment or possibly in combination with powder-fed AM, we see the ability to change the surface of a die – attaching powdered metal to the die surface of a different metal alloy.”

Specific to hot stamping, Austin identifies two areas of a tool that often undergo significant abrasion and galling, and coating pickup: male radii and sidewalls.

“Those areas are candidates for changing surface material via AM,” he says. “If we can additively place powder selectively into areas of a new die susceptible to abrasion and galling, the AM material may not last very long, but we’ll have the ability to add it on again and again. Most hot stamping tools experience a relatively short life before recutting, and recutting doesn’t work very

well for sidewalls due to the lack of contact pressure due to sidewall geometry. We see opportunity in the repair business where, instead of performing one or two recuts and then replacing some or all of the steel as is common for longer-term or higher-volume part programs, we can use AM for tailored surfacing – placing hardness or toughness where needed.”

AM also may find use, Austin notes, in repairing gaps in hot stamping tooling, which can cause material or coating buildup that detracts from heat transfer and leads to longer quench times during hot stamping, and distortion that affects part quality.

One other thought from Austin on future use of AM in die repair: “I can see the creation of standardized

cells that scan a die, then selectively rebuild via AM. Another scan then provides the new surface for CNC-machine recutting. This hybrid cell would allow us to use AM to add material to repair a die or build new, then scan again before some final subtractive work. In almost all cases, we’ll never be able to print net shape – it will be near shape and we’ll need machining to finish.”

With AM, Austin concludes, “everyone originally had stars in their eyes, saying that ‘we’re going to print a whole tool and do it lights out, and we’ll have a cost reduction.’ That is not on the horizon.”

But, as Austin has detailed, AM definitely has a future in tool build and repair, especially in the hot stamping arena. ■

What Does a Tool and Die Maker Do? continued from page 7

The final step: Implement the die into production by integrating the die into the production stamping line and ensuring that it runs smoothly and produces parts to the required specifications at the specified production speed. The process is closely monitored to identify any issues or areas for improvement.

Die makers also perform periodic die maintenance and service to ensure continued performance over the lifetimes of the dies.

One of the most challenging problems faced by tool and die makers: the increasing complexity of parts. Advances in technology and en-

gineering have resulted in more intricate products that require more precision in their design, manufacture and maintenance. Tool and die makers must adapt constantly to changes in technology, skill requirements and market conditions to remain relevant and successful in their field. They also must find



ways to improve efficiency, reduce costs and increase productivity to remain competitive, as they face intense competition from other countries, particularly those with lower labor costs.

The tool and die making industry faces a shortage of skilled workers that makes it difficult for companies to find qualified candidates to fill open positions. This shortage arises from several factors, including the retirement of experienced workers and a lack of interest among younger generations in pursuing careers in this field.

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Leadership Exchange: Advancing Robotics in the Fabrication Metal Industry continued from page 17

for robotic manufacturing and 3D printing even in cases that are not currently considered economically viable, he noted.

"A higher cost per part is acceptable in many cases if the lead time is shorter and the quality assured," said Van Der Velden.

He also envisioned a near future where digital warehousing will replace at least part of the current stock of spare parts. Companies may still want to keep a bare minimal amount of parts in stock for instant replacement. But bigger stock amounts are likely to soon be replaced by files that are printed on demand by digital manufacturing methods like MX3D's 3D metal printing.

"A price increase for metals will cause a growing interest in using less material per part and reduce the waste in milling processes," said Van Der Velden. "By scanning and robotically adding material to a broken legacy part, lead times and cost can be shortened drastically allowing for critical infrastructure lifespan extension."

Collaboration and Robotics

Another panelist, Chuck Brandt is Vice President of Technical Initiatives at ARM (Advanced Robotics for Manufacturing) Institute. In collaboration with its nearly 400 member organizations that span industry, government, and academia, ARM is part of the Manufacturing USA Network. As such, it seeks to strengthen U.S. manufacturing through robotics and workforce innovations.

"The use of robotics in metal fabrication improves quality, speeds up cycle times, and reduces human error," he said. "This improved consistency and efficiency, prevents wasted parts and reduces overall costs."

Brandt pointed to the use of collaborative robots, or cobots, as another growing trend. Historically, industrial robots have been deployed extensively for metal fabrication.

"Cobots can take on smaller, tedious tasks or take on material handling for lightweight materials, working side-by-side with humans," said Brandt.

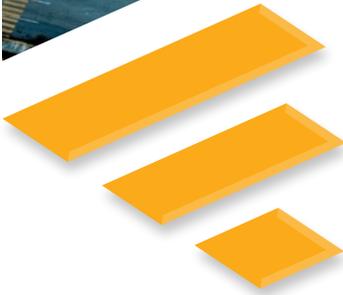
Like other speakers on the panel, he addressed trends such as the skills

gap and the growing use of machine learning (ML) and AI in robotics for manufacturing. In fabrication, the use of ML and AI can help to rapidly identify defective parts. For example, the ARM Institute's Automated Defect Inspection of Complex

Metallic Parts project with the University of Washington, University of Connecticut, and GKN Aerospace incorporated AI inspection resulted in consistent defect detection rates above 95%. ■

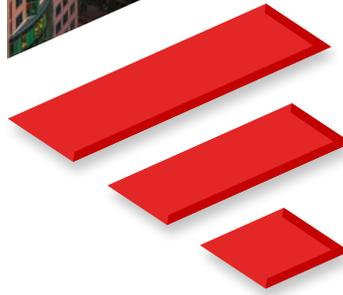
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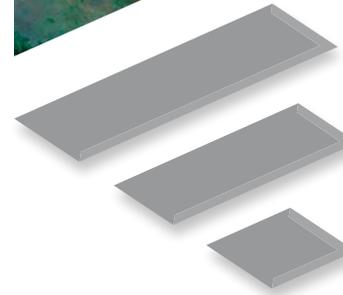
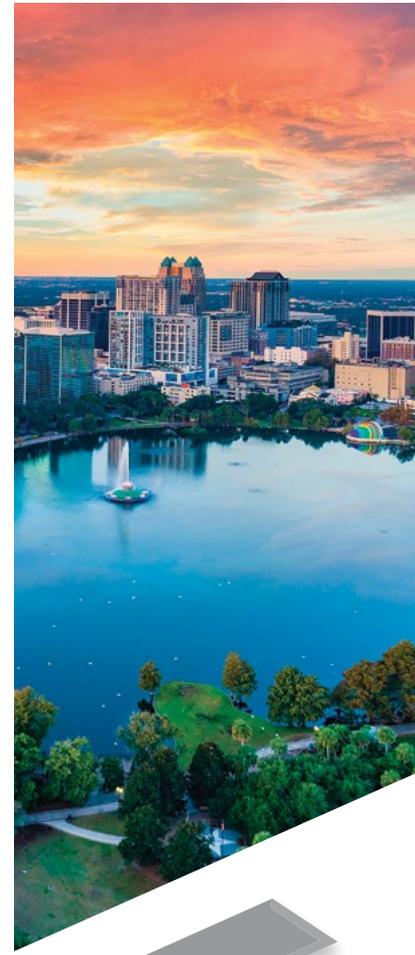
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Tips for Keeping Your IT Systems Safe continued from page 14

to hack because they are on their own," Austin said.

Provide Training to IT Staff. It's not a secret that if a company even has an IT expert, that person might be

someone who has shown talent in setting up a server room and coordinating the connections necessary to get the computer network up and running. Odds are that same person is not really well-versed in

cybersecurity. According to Austin, it really is two different skill sets, like an automotive engineer that might specialize in motor performance and another with expertise in a vehicle's crashworthiness.

A company needs to ensure that anyone given the responsibility of being a domain administrator has enough cybersecurity knowledge to keep unwanted outside parties from infiltrating internal IT systems.



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Commit to a Scanning or Patching Program. As previously discussed, a deficient piece of coding in a software package can be the door that welcomes unwanted parties into your IT system. Patches are sent out by the software developers to remedy these weaknesses and keep the cybercriminals out. At the very least, such a patching regimen should be done at least monthly. Companies also might want to commit to scanning for vulnerabilities, not just relying on software developers to stay on top of potential access points for outsiders. Austin said such scanning practices involve special software and requires someone that knows how to use it.

Manufacturers Beware!

In a world where there are few certainties, Austin said that companies can be certain that cybercriminality will continue to grow, both in resourcefulness and resiliency. The potential payoff is too great to ignore.

"I think there's a lot more awareness than there was a few years about cybersecurity issues, and things are starting to move in a more positive direction for the manufacturing industry," he said. "But the rate of change isn't keeping up. The bad guys are innovating faster than the good guys." ■

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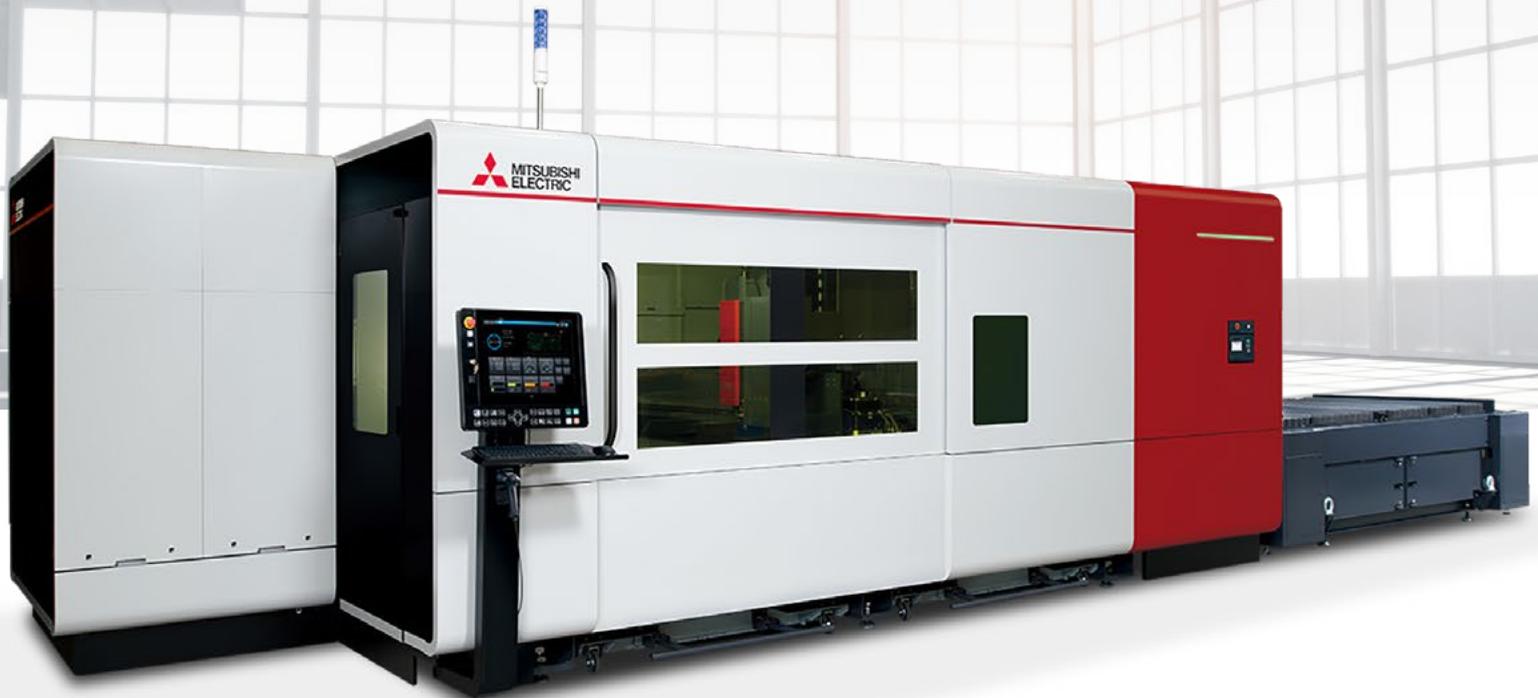
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