Smart manufacturing’s balancing act between edge and cloud computing

BY PIERCE OWEN
PRINCIPAL ANALYST, ABI RESEARCH

Smart manufacturing revenue will grow substantially during the next eight years, from $4.5 billion this year to $51.5 billion in 2026. This growth will hit all the revenue segments — including security, device and application platforms, connection, data and analytics, and networks — except for professional services revenue, which will drop from 31 percent this year to 13 percent in 2026. The reason for that drop is because as edge computing begins to augment the cloud, there will be less of a requirement for consulting on custom coding and systems integration. Simply put, it is going to get easier to deploy and scale most smart manufacturing technologies.

What’s the difference between edge computing and cloud computing? Edge computing is data processing at the edge of a network, whereas cloud computing is holding it in a central data warehouse. Balancing edge and cloud computing holds the potential to optimize smart manufacturing solutions. However, a major hurdle most manufacturers face is extracting data and networking equipment on the factory floor. That’s because there are operational technologies communicating with industrial ethernet proprietary protocols from individual OEMs to transmit data and information. The main challenge is getting OT to communicate with IT, namely Internet protocol HTTP, which is what the cloud uses. OT and IT really struggle to communicate and exchange data. Not only that, but OT also struggles to exchange or communicate data with itself. As these different protocols are propriety, they do not talk to each other.

On-premise computing deployments are still common due to concerns with privacy, security, and sometimes regulatory compliance, but there has been a significant rise in demand to implement cloud computing, which has almost unlimited computing power at about half the cost. Yet there are still challenges facing the cloud, mainly increases in the “Vs of Big Data”: volume, velocity, and variety of sensor readings — e.g., acoustic or video — that lead to increasing cloud costs for storage, processing, and transporting data. The solution is workload consolidation onto edge gateways and servers that can process streams of data on-premise and then feed that up to the cloud for further storage, analytics.

See Smart manufacturing page 3.
**INDUSTRY NEWS**

**Hurco Companies** held its annual awards banquet to acknowledge the team of accomplished distributors and agents throughout the United States, Canada, Mexico, and South America, who represent Hurco.

The winner of the Top Hurco Sales Representative Award was Tim Navalta of Braun Machinery, the full-service distributor that represents Hurco in Michigan. The other winners of the Hurco Top 5 Award were Jon Doell (#2) of Gage Machine Tool (Kansas), Jim Braun (#3) of Braun Machinery (Michigan), Fred Braun (#4) of Braun Machinery (Michigan), and Chris Queipo (#5) of Applied Machine Solutions (Georgia).

The distributorships were also recognized for their achievements in representing Hurco. The Top 5 Distributors from first to fifth were Braun Machinery (Michigan), Brooks Associates (Massachusetts), Reynolds Machinery (Ohio), Applied Machine Solutions (Georgia), and ACI Machine Tool Sales (Kentucky).

The winner of the Top Market Share Award was given to CJ Smith Machinery Company (Missouri). The other winners from second to fifth were Braun Machinery (Michigan), Foothills Machinery Sales (Colorado), Gage Machine Tool (Kansas), and Alta Machine Tools (Pennsylvania).

Hurco also awarded Northeast Precision Machinery (Pennsylvania) as Most Improved from 2017 to 2018.

**Methods Machine Tools** announced that Sergio Tondato has been appointed as Nakamura-Tome Product Manager. Tondato has stepped into the role as Richard Parenteau, Director of Application Development/Nakamura-Tome, retired from Methods after 29 years with the company. Tondato’s background in the machine tool and manufacturing industries spans over 20 years. Prior to joining Methods in his current role, Tondato has held various positions such as Director of Sales with FANUC America Corporation, Regional Manager for a production machining company and Applications Engineering Manager for the Methods’ Michigan office. Nakamura-Tome offers more than 20 twin spindle machine configurations.

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**EHRT North America** has hired William Laukat as an addition to its service team. Laukat is a veteran of the U.S. Army and an experienced CNC machinist. He retired from the military in September after 24 years of service. In addition to installing, maintaining, and troubleshooting machinery, Laukat will participate in a variety of fabrication and automation educational events throughout the year.

“I’ve been around machines my whole career from combat situations to corporate warehouses as an operator and in maintenance,” Laukat said. “You have to be able to understand the whole picture to get to a solution in the quickest way possible, and I’m able to do that.”

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and training models. These edge solutions can deal with those multiple devices from multiple manufacturers if they use the right solutions.

Using edge in conjunction with cloud to augment the cloud increases the capacity of data processing while decreasing the volume of data sent to the cloud, therefore, lowering the total cost of ownership.

The stream processing side of edge computing is huge because it empowers the user to catch anomalies in the data that batch data to the cloud will miss. When you have sensor readings every millisecond, there are going to be blind spots and jitters in batch data to the cloud. Which means, if you can process that on an edge gateway or server, you can use the stream processing much more effectively for executing predictive maintenance or quality control. The challenge for both vendors and end users is deciding what to publish to the cloud and what stays at the edge. CIOs of these enterprises need freedom of what to publish to the cloud and what stays at the edge.

• Give the end-user control of what to publish to the cloud. Every factory has unique requirements. The CIOs of these enterprises need freedom of what to publish to the cloud and what stays at the edge.
• Promote the ability as a vendor to extract data from equipment on the factory floor. The ability to mange data flows from different OEMs is huge. The ability to adapt and leverage existing infrastructure and protocol translation is incredibly valuable, and clients will struggle without those abilities.
• Have code-free application development and logic configuration that can be deployed at the edge. If you can minimize the need for custom code, you can speed up development scalability and deployment to get more innovation from more people, not just the people who know how to code.
• Implement architectures that have stream processing on-premise so you can take advantage of the low latencies of edge computing, fewer blind spots, and jitters to catch those anomalies. Deploying models at the edge means catching failure predictions and detecting defects earlier, and more easily in finding their root cause.

Predictive maintenance or quality control in assembly and more ease in finding their root cause.

To flexibly adapt to customers’ needs and help them scale, smart manufacturing vendors must:

• Have code-free application development and logic configuration that can be deployed at the edge. If you can minimize the need for custom code, you can speed up development scalability and deployment to get more innovation from more people, not just the people who know how to code.

Following this strategic guidance to optimize the balance of edge and cloud computing will enable smart manufacturing vendors and their clients to implement scalable and cost-efficient solutions for processing data across the board.
On Government

Trilateral Agreement on NAFTA reached

BY AMBER THOMAS
VICE PRESIDENT, ADVOCACY & COMMUNICATIONS

With no time to spare before the deadline, the United States, Mexico, and Canada reached an agreement to replace the 24-year-old North American Free Trade Agreement. The new deal, called the U.S.-Mexico-Canada Agreement (USMCA), is expected to be signed by the countries’ leaders in November. The administration said the USMCA will provide stronger intellectual property provisions, apply tighter rules of origin for auto production, and increase labor protections for workers.

The agreement-in-principle would protect Canada from the automobile tariffs that the administration has threatened. The tariffs would not kick in until Canadian auto exports to the United States topped 2.6 million units annually. Current production levels of roughly 1.8 million units would not be affected. However, Canada reportedly did not win assurances that President Trump would lift the steel and aluminum 232 tariffs imposed earlier this year. Administration officials said that no changes had been made and that those duties will be addressed in future negotiations.

The USMCA isn’t a done deal, but the inclusion of Canada helps. Congress won’t have the opportunity to vote on it until after the elections. For the most part, both parties have spoken favorably of the proposed agreement. However if democrats win control the House and/or the Senate in the November elections, they could make approval more difficult by calling for changes to the agreement.

For USMCA text and fact sheets, visit www.USTR.gov.

Tariffs
Is China succumbing to pressure from the White House? China’s finance ministry announced it is cutting import tariffs on nearly 1,600 products starting Nov. 1. Textile products and metals, including steel products, will be cut from 11.5 percent to 8.4 percent, and tariffs on wood and paper products, minerals and gemstones will be cut from 6.6 percent to 5.4 percent. Tariffs on machinery and electrical equipment will also be lowered.

Average import tariffs on nearly 1,600 products, about 19 percent of all taxable items, will be lowered from 10.5 percent to 7.8 percent, lowering China’s overall tariff level from 9.8 percent in 2017 to 7.5 percent in 2018 as a result. The reductions come just days after President Trump implemented a 10 percent tariff on $200 billion of Chinese goods, following a similar action against $50 billion of goods in August. The administration has threatened to increase the 10 percent tariffs to 25 percent at the end of the year if more progress isn’t made by China.

FY19 Funding
President Trump signed a minibus spending bill that funded off a potential government shutdown at least until December 7, 2018. The spending package allocates $860 billion to the Defense; Labor; Education; and Health and Human Services agencies for FY19 and includes a continuing resolution to sustain unfunded agencies past the Sept. 30 deadline. Agencies covered by the stopgap funding include the Homeland Security, Treasury, Commerce, Justice and State departments. Those budgets will either must be approved for FY19 by December 7 or need another continuing resolution.

Leading manufacturing organizations launch reshoring competition

Over the past several years, U.S. manufacturers have made significant efforts to bring back, add or retain jobs in the United States. In 2017, approximately 170,000 manufacturing jobs were shifted back to the United States from overseas according to Harry Moser, founder and president of the Reshoring Initiative. That represents a 20 fold (or 2,000 percent) increase since 2010.

In recognition of these efforts and results, AMT is proud to join the Reshoring Initiative, the National Tooling and Machining Association, and the Precision Metalforming Association in launching the second National Metalworking Reshoring Award competition. We encourage members to gain recognition for their equipment and their customers via the award.

Companies have their own reasons for moving and/or consolidating manufacturing operations in the United States. The number of jobs created and the size of investment may vary by company, but it all has an impact on strengthening the industry and economy. Domestic and foreign companies alike recognize that the United States is the best place in the world to do business, and it’s improving with the recent enactment of corporate tax cuts and less regulatory overreach.

More and more companies should be looking at their total cost of ownership when considering where to locate operations and sourcing. They may be surprised. To be eligible for the Reshoring Award, the work must have been reshored from outside North America to North America between January 1, 2013, and December 31, 2018. Applications must be submitted by January 31, 2019. A complete definition of reshoring is available at http://reshorenow.org/blog/definitions-of-reshoring/. To view award details and enter to win, visit www.amtonline.org/reshoringaward. The winner will be announced at The MFG Meeting in Tucson, Arizona, on March 6.
Market sees a strong finish to 2018

BY PAT MCGIBBON,
VICE PRESIDENT, STRATEGIC ANALYTICS

Last month’s column title “Will this IMTS be one for the record books?” was clearly a rhetorical question that deserved an exclamation point rather than a question mark. By any measure, IMTS 2018 was the best ever—square footage, number of visitors, weight, number of exhibitors, value of equipment shown and, most importantly, business generated.

That last point will not be official until post-show surveys are completed in early November, but interviews of members certainly point to a very profitable show for exhibitors. Exhibitors and distributors have been effusive in their praise. Members were saying that they still haven’t gotten back to their “day jobs” as they scramble to close deals and follow up on leads developed at the show. One exhibitor noted that IMTS has always been an important element in their marketing program but this year they were able to tie new business and orders directly to the leads developed at the show. He said they would take one or two weeks more than usual to settle IMTS business and to start fitting other business into their schedule. So where does the market go from here? Up.

With IMTS days away, the USMTO Advance app projected August orders up 14 percent from the previous year. Just as IMTS was closing, we all received a hint that August was a surprisingly strong month. The normally optimistic projection fell woefully short as August orders finished up 28 percent from August 2017. Based on late month conversations with USMTO participants, September’s figure will be up dramatically from September 2017. Manufacturing technology orders have been averaging about $1.3 billion dollars per quarter since the 4th quarter of 2017. If September orders reflect anything close to what USMTO participants suggest, then that average will increase significantly. The only question about 2018 is how will the 4th quarter of 2018 compare to 2017, and every indication is that the 4th quarter will outperform 2017.

The top 10 indicators point to a continued expansion in orders through the rest of the year. The Purchasing Managers’ Index dipped in July only to jump to a new high, climbing past 61 and suggesting not only expansion but an acceleration in that growth rate. Durable goods orders were more than $259 billion in August, the largest monthly total since the series began in 1992. The durable goods order rate continues to outpace shipments, leading to a steady increase in unfilled orders. The continued growth in durable manufacturing capacity utilization figures is the result of these trends in orders, shipments, and backlogs and point to the need for additional capacity to address the growth in demand for manufactured products.

Industry metrics continue to show strength in key customer markets such as the auto, aerospace, and medical equipment industries. Auto sales continue to maintain annual sales rates of 16.5 to 17.0 million units annually and capacity utilization rates in the industry are greater than 80 percent. The aerospace industry’s orders are up 14 percent and the backlog, which is measured in years, is increasing at an annualized rate of 4 percent. Gardner Business Media noted in their recent report on the medical equipment industry that the growth in new orders continues to outstrip increases in production rates, leading to expanding backlogs. Most of the capacity for delivering medical equipment and devices is in the job shop industry where approximately 50-60 percent of medical equipment and devices are produced on a contract basis. These trends suggest continued expansion in capital spending by these four major manufacturing technology consumers.

It is no surprise that the industry’s analysts have raised their forecasts in the latest iterations of their expectations. Steve Kline of Gardner Business Media has increased his expectations for 2018 and is currently projecting a double-digit increase in orders during 2019. Oxford Economics have increased their forecast for 2018 by a third since January and are more certain for continued growth in 2019 than they were in May. The Institute for Trend Research and IHS have both presented more positive outlooks for AMT members’ products in the past three months. In general, 2018 looks like it will end on a strong note and outlooks for 2019 have moved from pessimistic to cautious.

If you have any questions about the information above or about what’s happening with the various trade actions put in place by the Trump administration, don’t hesitate to contact Pat McGibbon at pmcgibbon@amtonline.org or call 703-827-5255.
IMTS 2018 was the best! What’s next?

By Peter Eelman, Vice President, Exhibitions & Business Development

While we’re all basking in the afterglow of a successful IMTS 2018, let’s remember there are many other events on the AMT calendar in trade show marketing worldwide! Let’s take a glance at upcoming global events in 2019.

**IMTEX 2019, The Indian Metal-Cutting Machine Tool Exhibition, January 24–30, 2019**

Located in the bustling manufacturing city of Bangalore, IMTEX is the premier manufacturing event in India and South Asia. For the eighth consecutive time, AMT will host the USA Pavilion featuring 15 AMT member companies. If you’ve never been or are considering marketing in India, take step one: contact AMT’s Global Services department. Step two: attend IMTEX 2019 to gain a sense for the market, see how fellow member companies participate, and work with AMT staff to introduce you to the manufacturing players in Bangalore. (www.imtex.in)

**CIMT 2019, The China International Machine Tool Show, April 15–20, 2019**

By far the largest manufacturing show in China, CIMT has been a fixture in the AMT/USA Pavilion schedule since 1989. CIMT is one of the top manufacturing events in the world where AMT members play a major role beyond the pavilion through presentations, special events and conference sessions throughout the show. AMT’s Asian headquarters, based in Beijing and headed by Xingbin Li, provides welcoming hospitality to our AMT members and extensive knowledge about entering into the Chinese market. AMT’s China offices are all represented and ready to assist with your market needs in China. (www.cimtshow.com)

**EXPOMAFE, The Brazil International Machine Tool and Industrial Automation Exhibition, May 7–11, 2019**

Reemerging onto the world stage, the time is right to re-enter the Brazilian market. As a 17 percent increase in Brazilian attendance at IMTS suggests, Brazil's manufacturers have capital equipment budgets and are looking for suppliers that can tool up their factories and provide current solutions. EXPOMAFE, held at a brand new, modern facility in Sao Paulo, is the largest manufacturing show in Brazil, drawing tens of thousands of visitors from around the country. Make the AMT/USA Pavilion the first step in your Brazil strategy. (www.expomafe.com.br)

**EMO 2019, The European Manufacturing Trade Fair, September 16–21, 2019**

Held opposite IMTS in odd-numbered years, EMO takes place this year in Hannover, Germany, and is the largest metalworking technology event in Europe. AMT staffs a stand at the show to assist AMT members with any needs they may have. (www.emo-hannover.de)

**IMTS 2020, September 14–19, 2020**

As our focus turns toward the 2019 shows, remember your IMTS 2020 application was due October 12. With 1,424,232 SF of exhibit space sold at IMTS 2018 and a waitlist of more than 20,000 SF for 2018, you’ll want to submit your IMTS 2020 application as soon as possible.

Thank You!

I can’t end this column without recognizing our AMT members, partners, and the AMT staff who all worked together to create one of the most exciting and memorable IMTS events! IMTS 2018 was a smash hit! An unprecedented success! Congratulations to everyone! And for more information on all the records broken at IMTS 2018, visit IMTS.com.
A strong economy, dynamic advances in technology, and an energized manufacturing industry all came together to make IMTS 2018 the largest show of all time. The 32nd edition of the show drew a record registration of 129,415 people and featured 1,424,232 SF of exhibit space, made up of 2,123 booths and 2,563 exhibiting companies. IMTS 2018 ran from Sept. 10-15 at Chicago’s McCormick Place.

“Connectivity, the digital transformation of manufacturing, automation, additive manufacturing and a strong economy drove record numbers at IMTS 2018,” said Peter R. Eelman, AMT’s Vice President – Exhibitions & Business Development. “Digitization collided with a robust manufacturing industry to create our most dynamic show ever.”

“The velocity of technology change has become different,” said Tim Shinbara, AMT’s Vice President – Technology. “Analog technology yields linear improvements. Digital technology creates exponential growth and transforms how manufacturers and job shops operate.”

Notable growth areas at IMTS 2018 included an expanded Additive Manufacturing Pavilion that featured 31 exhibitors and covered 31,550 SF, the strong partnership with HANNOVER MESSE USA and its four colocated shows and 510 exhibitors, and an expanded Smartforce Student Summit that drew more than 24,000 students, parents and educators — 7,000 more visitors than in 2016.

“Illinois Gov. Bruce Rauner addressed IMTS attendees on Sept. 12. “There are four reasons that manufacturers from around the world are coming to the state of Illinois to build great productive people, transportation, innovation and energy,” said Gov. Rauner. “We’re driving great manufacturing growth in this state.” He noted that Illinois is the 17th largest manufacturing economy in the world, generates 600,000 manufacturing jobs, produces $100 billion in manufactured products and creates the “most exciting and dynamic part of prosperity for everyone.”

“Constructive and dynamic part of prosperity for everyone.”

Gov. Rauner toured IMTS and rode Olli, a self-driving, digitally manufactured, 3D-printed electric shuttle made by Local Motors. Olli gave more than 1,400 rides at IMTS 2018.

The Miles for Manufacturing 5K on Wednesday, Sept. 12, drew a record 486 runners. The race generated almost $20,000 in proceeds, which were used to donate 14 Bionics4Education kits from Festo Didactic to STEM middle schools in the Chicago area.

**Spotlight on Advanced Technology**

The Emerging Technology Center has been featured at several editions of IMTS as a way of highlighting the industry’s most impactful technology transformations. The 2018 show was the first time ever that IMTS featured two ETCs — one focused on digital transformation, and a second focused on additive manufacturing.

As cybersecurity is very much top of mind for manufacturers looking to expand on their digital operations, the digital transformation ETC included information regarding best practices for data security, such as integrating modern security with legacy operating systems. There was also a demonstration of an automated cell that combined a Hurco CNC, a Universal Robot arm, and a Hexagon CMM all utilizing the MTConnect standard. ATHENA, the industry’s first voice-operated assistant, debuted at IMTS in the ETC where visitors could control a 3-axis DMG Mori CNC. ATHENA provides intelligent assistance to machinists to allow them to operate multiple types of controls.

The second ETC featured a “Knowledge Bar” hosted by America Makes, where visitors learned about the development of education roadmaps, an online platform for members to exchange information and establishment of industry-wide additive manufacturing standards and specifications.

To show additive’s speed and versatility, Oak Ridge National Laboratory created a “die-in-a-day” demonstration that featured four stages of development: printing the die at Lincoln Electric, machining the printed die at Mazak, molding a part from the die at IACMI and 3D-laser scanning the part at Quality Vision International.

**Education, Knowledge, Networking**

More than 2,500 visitors attended conference sessions during the week of IMTS. The largest event, in terms of both content and visitors, was the IMTS Conference, which included 71 total sessions. Other colocated conferences focused on digital manufacturing, additive technologies, and a special focus on job shops to help those companies learn about best practices and discuss ideas for growing their business.

“We had very astute attendees coming to IMTS 2018,” says Eelman. “They are more educated about the health of their business and know that connectivity, digitization, automation and knowledge are part of the solution.

“IMTS takes all this, puts it under one roof and fosters connections. By the time we reach IMTS 2020, what visitors learned this week will have already changed their operations. People will come to renew old friendships and uncover new possibilities that will expand their horizons.”
It’s spooky season. What’s your biggest fear?

BY PENEOLE BROWN
DIRECTOR, ADVOCACY & COMMUNICATIONS

When most of us are asked what our greatest fear is, we usually rattle off one of the obvious choices: Heights. Public speaking. Flying. Creepy-crawly things. (Personally, I don’t much care for large flying insects. I don’t really like balloons either, but we can talk about that some other day. I’m not saying it makes sense.)

But what if I suggested that your greatest fear is probably something less obvious to you, but just as impactful nonetheless? That this fear might be subconsciously guiding your actions and decisions in ways that aren’t even in your awareness? What I’m talking about, friends, is the fear of change.

If there was anything blatantly apparent at the most recent IMTS, it’s that change is everywhere in our industry. Technologies, materials, and processes are changing. The way we use our smartphones and other devices are coming to even the biggest machines – think remote and voice-activated technologies. The way we hire, work, and network with others is changing. There were more women on the show floor, and not just as “booth babes.” There were more girls in the Student Summit, a sight that gives promise to the future workforce and shrinking the broad skills gap.

But change hits us not just at the industry level, but at the company level too. Do you work somewhere that could have the slogan, “But That’s How We’ve Always Done It”? Are you guilty of delaying or even denying business process changes because of the potential impact you fear they’ll have on you or the rest of your team? (Or when you finally made a change, have you scratched your head and wondered why it took you so long?) You are not alone. But the good news is it doesn’t have to be that way. You can be a change agent in your organization if you foster a certain mindset, and are always willing to ask, “why?”

Keep the right attitude: Persistence pays, but so does some patience. Think of the Confucian virtue of ren. On its face, it means the good feeling you get from being altruistic, but it’s much more than that. The Chinese character ren shows two curved lines leaning in on each other – a visual representation of skills and knowledge leaning together with beliefs and attitudes. You must be fully committed to seeing your change through, but it’s much more than that. The Chinese character ren shows two curved lines leaning in on each other – a visual representation of skills and knowledge leaning together with beliefs and attitudes. You must be fully committed to seeing your change through, but success also depends on appointing others – especially the high potentials in your company – to take on the necessary challenges and thereby evangelize them to the rest of the organization. You must remember to stay positive in the face of resistance, and you cannot do it alone; change doesn’t happen in isolation.

Pick your battles: You probably have one big overarching goal for the betterment of your company. (Example: “Improve the company culture.”) Draw that up as your “umbrella.” Underneath that, break it into the elements that make up that goal. (In this case, things like break down silos; improve transparency and communication; hire talent that fits the ideal culture; build in accountability and trust, etc.) Then move down into the specifics that will help you meet those goals and set a plan for executing them. This is another great place to ask for some help from a mentor, trusted partner, or those high potentials you’ve asked to evangelize the change process.

Reflect and repeat as necessary: It might become apparent that some of your efforts are trying to fit round pegs into square holes. Don’t despair, and don’t give up. You might need to keep going back to the prior steps for a while before getting it right. Some things might take more time or effort than you first envisioned. There will most certainly be friction from others in your organization. Build on your successes and keep your eyes on the prize.

What are some of the areas of your business or even personal life that could use some change? It might be the season for ghosts and goblins, but there’s no need to fear pushing yourself out of your comfort zone and into a space that can bring you more fulfillment, more joy, and ultimately more success.

Thoughts? Email me at pbrown@amtonline.org
Signs of progress for manufacturing’s next generation

BY GREG JONES
VICE PRESIDENT, SMARTFORCE DEVELOPMENT

Our industry’s task of doing battle against the skills gap has been underway for decades now. Are we showing any signs of progress? Yes. I think that we can point to the recent Smartforce Student Summit at IMTS 2018 to find very concrete signs of progress.

Since 2012, we’ve seen registered attendance at the Student Summit increasing on an upward trajectory from 9,300 educators and students to 15,000 in 2014, more than 17,000 in 2016, and more than 24,000 in 2018. In 2018, we also saw our registrations among college students — both community college and engineering schools — increase by 32 percent to about 7,400, and those students came from 45 different states, D.C., and Puerto Rico, as well as from Canada and Mexico.

As I walked the show at IMTS and talked with these students, I found that many of them came with resumes in hand. They were mostly nearing graduation and workforce readiness and they came to IMTS looking for career opportunities.

Among the more than 24,000 registered attendees, we are growing the number of high school, STEM middle school, and STEM elementary school students who participate. Through Student Mentor Labs, project-based learning options, and STEAM and STEM project challenges, we’re giving students ideas about what their career pathway could look like and hopefully, as a result, they’ll choose a career in manufacturing.

For the Student Summit, it’s really less about the quantity of students who attend and more about the quality of the experience that we can present them to spark their interests.

Working with The City Colleges of Chicago, we helped to launch a STEAM Expo designed to spark an interest in manufacturing through a project-based learning challenge for high school students. The “Safe Stopping Robot” challenge was created by Project SYNCRE, a community-based organization from the south side of Chicago and enabled students to design a robot that turned itself off when it leaves a “safe” area. Students utilized principles of mechanical and electrical engineering to design their robot out of everyday items, e.g. a plastic cup, a couple of double-A batteries and wire. The goal of this project was for students to learn how to build a simple machine, learn about open and closed circuits and work in teams to complete the design challenge.

In the Student Mentor Lab area, we had college students and a couple of high school teams showing off their robotics projects, high-mileage vehicles, and Baja car builds to encourage younger students to explore an education in STEM.

Rippl3D.com joined us at the summit again with their 3D printing air rocket challenge with a newly redesigned launch control mechanism built by Festo, as well as a new launch silo that allowed for longer down-range distance and ample trajectory angle. Rippl3D also hosted their new Mission Mars Rover Challenge that allowed high school teams to design and build miniature Mars Rover models that they were able to run down a sandy track and a rocky track to simulate the surface of Mars.

Robots of all colors — yellow, blue, red, orange, gray, and green — were on full display in the Summit. On September 15, we hosted “Into Orbit,” the season competition launch for FIRST® Illinois FIRST® Lego League (FLL). In addition to hosting 600 FLL Team coaches and teammates, NASA Astronaut Capt. Wendy Lawrence provided a series of inspirational keynote addresses on her experiences in space to the teams.

We’ll keep fighting the good fight to change perceptions about careers in manufacturing and we’ll keep you updated on our progress.

For more frequent updates or a history of the Summit on social media, please follow my Twitter timeline @GregoryAJones.

The CMTSE 25th Anniversary Networking Event at IMTS 2018

Thanks to all the CMTSEs who were able to join us at the CMTSE Networking Event at IMTS. We trust that you were able to engage with your peers and AMT staff during the event, had the opportunity to see your name and credential listed on the CMTSE Wall of Fame that was on display in the Grand Concourse at McCormick Place, as well as your name and credential listed in more than 40,000 copies of the IMTS Directory of Exhibits.

Cheers to a strong finish to your 2018! Thank you!

Learn more about the CMTSE credential at www.CMTSE.org.
India is presently the world’s sixth largest economy and growing at 7 percent annually. In the last quarter, it witnessed growth of 8.2 percent: the largest in the last two years. The recent implementation of structural tax reforms, a rising middle class, and an ongoing increase in demand are all helping the economy build resilience and robust growth.

The government’s focus on “Make in India” is helping create new opportunities in the manufacturing area across the different sectors. New facilities are being built thanks to sustained growth in foreign investment. The index of industrial production and PMI are showing consistent positive metrics in this expanding economy. Machine tool consumption was $2.26 billion in the last financial year and is likely to touch around $3.5 billion by the year 2021. This represents a 25 percent growth year over year. The current demand for high precision-multitasking machines, micro machining, larger machines including presses, and forging and hot forming equipment are creating a need for foreign investment. These machines are used across the different sectors: infrastructure, power, railways, energy, defense, aerospace, automotive and process industries.

The Indian automotive sector will see investments of $80 billion to $90 billion over the next seven to eight years. Peugeot and Kia motors will be investing $3 billion over the next three years to expand their capacity in Gujarat and Manesar. Nissan is planning investments of around $2.5 billion to expand their capacity at their Chennai plant. Similarly, Hyundai motors is going to invest more than $1 billion to expand its capacity in the same city.

The construction equipment sector will grow from the present $4.5 billion to $10 billion in the next five years. The growth in this sector will be due to $450 billion of investments planned to boost infrastructure.

In the railways sector, Bombardier is expanding capacity in two of their rail plants for domestic and export products. Alstom has invested in expanding their manufacturing facility to be able to supply 800 electric locomotives for the Indian railways.

Electrical generation equipment demand is forecast to grow from the present $12 billion to $25 billion by the year 2022. Bharat Heavy Electricals, Thermax, Cummins, Mitsubishi Heavy Industry and ABB are investing to add capacity to their existing manufacturing plants.

IMTEX Metal Cutting Expo is Southeast Asia’s largest machine tool show and will be held January 24-30, 2019, in Bangalore. AMT, along with 12 member companies, will be participating in the AMT/USA Pavilion, located in Hall 1B. If you are interested in this market, attendance at the show is strongly advised.

For further information on these projects and other opportunities in India, please don’t hesitate to contact me at AMahajan@AMTonline.org.

IMTS International Briefing Breakfast draws a crowd

More than 60 AMT member companies joined us at IMTS to learn about business opportunities in China, India, Mexico, Brazil, and Europe. It was a great event for networking, as well as learning about the key indicators and prospects in these countries. In each region, the AMT International Management team presented major opportunities to help members grow their businesses.

This is the first time in many years that all global markets are forecast to be positive. Some of the prospects covered in the presentations were:

**China:** Remains the largest machine tool market in the world. Strong regional opportunities in aerospace, automotive, 3C, medical, power, rail, and robotics.

**India:** With new government tax reforms it is easier to conduct business in this country. The economic outlook continues to be strong, both short- and long-term, particularly in the automotive, aerospace, rail, defense, and construction sectors.

**Mexico:** The $150 billion automotive industry continues to expand at 6 percent. Aircraft components manufacturing is still growing double digits, and the new USMCA assures expanded trade between the United States and Mexico.

**Brazil:** Pro-industry reforms are now in place to facilitate doing business in Brazil. The world’s ninth largest economy has major opportunities in aerospace, automotive, wind energy, and agriculture.

**Central Europe:** Many CEE countries have good opportunities and strong growth: Poland, Czechia, and a several others in automotive and aerospace (the latter being quite strong and largely controlled by U.S.-based companies). Add Bulgaria and Hungary in electronics, and everyone in defense. Job shops abound with a high demand for precision engineering.

To learn much, much more the complete presentations are available to AMT members for download at www.amtonline.org/IntlBreakfast2018.
TECHNOLOGY

Introducing: The AMT Research add-in for Microsoft Word

BY JULES MCGUIRE, EDUCATION & DEVELOPMENT

Ethyl, a mechanical engineering graduate student, is composing a research paper for her Metrology for Precision Manufacturing class. As she writes about abrasive jet finishing, she struggles to find manufacturing technology papers on ambiguous terms like material removal, surface integrity, and polishing tools. Fortunately, she has downloaded AMT’s app that sits inside Microsoft Word.

Designed to streamline research efforts for graduate students, the AMT Research add-in allows the user to explore articles from research bodies such as NIST, NASA, CIRP, and NSF — all from the comfort of a Word document. The data that AMT receives on the back end provides insight on trends in academia. This insight helps AMT provide member companies with updates on new developments and priorities in the academic side of manufacturing technology.

Academics can download the add-in for free by visiting the Microsoft AppSource store (http://bit.ly/AMTResearch). After downloading, the user can type in or right click terms and gain direct access to cutting-edge research. Papers include industrial additive manufacturing, CNC machining, materials science, industrial cybersecurity, and more. The add-in is powered by AMT’s research aggregate Tech Trends.

Stay tuned for more great things for academia!

Export controls experts: Is United States at a disadvantage with China?

BY STEPHEN LAMARCA, MANUFACTURING TECHNOLOGY ANALYST

Concerns about relations with China, including tariffs, were priority topics at the latest Materials Processing Equipment Technical Advisory Committee meeting in Washington, D.C. In its August 7 meeting, the committee discussed Wassenaar Arrangement signatories and export controls surrounding additive manufacturing. The Wassenaar Arrangement is a voluntary export control group whose members exchange information regarding export control for conventional weapons and sensitive dual-use goods and technologies.

Discussions at the MPETAC meeting were regarding its primary concerns:
• That non-U.S. machine suppliers undercut U.S. suppliers in the U.S. market by leveraging favorable licensing positions in home regions to China;
• price discounts in the United States are offset by premium pricing in China, further eroding strength of the U.S. industry;
• and, how the recent tariffs could potentially impact these issues.

Experts at the meeting stated that U.S. companies are at a disadvantage due to China’s Ministry of Commerce, as it is seemingly much easier for other countries to work out export arrangements to China. Cornerstone Research has identified that the U.S. machine tool industry needs export help in this regard.

Points of interest surrounding the status of AM were mostly regarding proposed controls. The position remains that controls should be on end items, not general use additive equipment. Future additive controls could include those related to software designed to automate the process, such as generative design.

The open session wrapped up with conversation on Industry 4.0 and other new technologies to look out for such as artificial intelligence, human machine interaction, cyber-physical security, Industrial Internet of Things, and big data analytics.

The purpose of the MPETAC is to advise the Office of the Assistant Secretary for Export Administration with respect to technical questions that affect the level of export controls applicable to materials processing equipment and related technology.

MPETAC covers articles, materials, and suppliers of metalworking equipment, numerically controlled machine tools, and robots. One of the committee’s ongoing goals is to integrate the control definitions between the Export Administration Regulations and International Traffic in Arms Regulations.

For more information on China’s Ministry of Commerce, visit http://english.mofcom.gov.cn/
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2018

NOV
1
Deadline to Renew
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1–6
JMTGF
Tokyo, Japan

DEC
11–12
Distribution Group Committee Meeting
Vero Beach, Fla.

11–12
MTConnect Institute Standards Committee Meeting
Charlotte, N.C.

2019

JAN
17
Show Committee
AMT Headquarters
24–30
IMTEX
Bangalore, India

FEB
25
Winter Economic Update Webinar and Meeting
Cincinnati, Ohio

MAR
6–10
The MFG Meeting
Tucson, Ariz.

APR
15–20
CIMT
Beijing, China

MAY
7–11
EXPOMAFE
Sao Paulo, Brazil
14–16
EASTEC
West Springfield, Mass.

JUN
17–20
MT360
Santa Clara, Calif.

SEP
11–12
D19
Detroit, Mich.
16–21
EMO Hannover
Hannover, Germany
24–26
WESTEC
Long Beach, Calif.

OCT
2–4
MTForecast
Cleveland, Ohio
22–24
SOUTH-TEC
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Contact Dave Felinski, B11 Standards, Inc., at dfelinski@b11standards.org for updated information.

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