



## IMS SIGNS M.O.U. WITH ASM INTERNATIONAL

In order to advance manufacturing science and support integration of new materials and technologies by industry to ASM International's 25,000 member organization and the IMS international network, IMS International and ASM International signed a cooperation agreement to explore marketing and services opportunities for manufacturers, researchers, and manufacturing stakeholders. Areas of cooperation include workshops, forums, and innovation hubs. They will also explore publishing and disseminating manufacturing content as well as collaborate to integrate Materials Information into STEP/ISO-10303 standards.



*L to R: William Mahoney, CEO, ASM International, Jack Harris, Chair, IMS International, Dan Nagy, Managing Director, IMS International.*

ASM International is the world's largest association of materials engineers and scientists. They are the premier association for engaging and connecting materials professionals and organizations to resources in order to advance manufacturing and materials related work.

Regarding content collaboration, ASM has a long history of aggregating, curating and disseminating both reference and technical content. With recent investments in a new state of the art publishing system, its members and customers now have an easy-to-use, searchable, indexable and linked set of resources that they can access on any device. ASM will extend these capabilities to IMS and the WMF programs including the development of an SME Portal or set of resources to reinforce ManuVation 4.0 concepts on topics like Additive Manufacturing, Simulations, Cloud, Big Data and Analytics, IOT and others.

IMS also intends to update its existing Guidebook series to make them searchable and more interactive, publish event artifacts from IMS workshops or Innovation Hub activities, and work with ASM on publishing the next iteration of the 2020 Roadmap.

The organizations will evaluate opportunities to promote each other's membership as well as offer incentives or shared benefits in the future. In addition, IMS will work alongside ASM to create a workshop and speaking series in line with the ManuVation 4.0 program. IMS will work with ASM to create a special workshop session along with a WMF regional event at ASM's IMAT event from September 14-17, 2020 at in Cleveland, Ohio. In addition, IMS and ASM will collaborate during the Aeromat conference on May 6-8, 2019 in Reno, Nevada and the Heat Treat 2019 conference on October 12-17 in Detroit, Michigan.

## IMS TO HOST WORKSHOP IN PRETORIA, SOUTH AFRICA

In cooperation with our ManuVation partners, IMS will host a ManuVation 4.0 workshop in Pretoria, South Africa on February 25-26, 2019.

The workshop will be held in partnership with CSIR and CAMASA. The two-day workshop will focus on creating linkages between South African and US Aerospace clusters and identifying top issues for manufacturers which will be turned into collaborative projects.

Keynote speeches will be given by Prof. David Romero, World Manufacturing Forum, Robert Mansfield, Solomon Bruce Consulting, Johan Steyn, Aerosud CEO, and Dan Nagy, IMS International.

Prof. Romero will present the future of manufacturing and the top ten recommendations from the WMF Annual Global Report. Mr. Mansfield will give an overview of challenges in the aerospace industry. For the South African audience, Mr. Steyn will give an overview of the current state of the aerospace industry in South Africa and collaborations through CAMASA, CSIR, and universities. Mr. Steyn will also present Aurosud's new technology streams and discuss the impact of digitalization on "Design for Certification". To cap the speech, he will talk about PLM-ERP-MES integrated systems that are needed for manufacturers in order to thrive. Mr. Nagy will present current trends in finding and developing skilled workers.

For more information on this workshop and to register please visit: [www.ims.org/sa-workshop-2019](http://www.ims.org/sa-workshop-2019)



## 2019 WMF DATES ANNOUNCED

The next edition of the World Manufacturing Forum has been announced. **Villa Erba, Cernobbio Italy • September 26-27, 2019**



The theme for this edition of the forum will be "New Skills for Future Manufacturing." More information on the program, speakers, and registration will be available soon on [www.worldmanufacturingforum.org](http://www.worldmanufacturingforum.org).

IMS continues in a leadership position with the World Manufacturing Foundation and is solely responsible for the WMF regional events. If you would like to conduct a regional event, please contact: Dan Nagy at [dnagy@ims.org](mailto:dnagy@ims.org).

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## UPCOMING EVENTS



### IMS ManuVation 4.0 Workshop

- “Creating Collaborative Links for Aerospace Manufacturers”
- February 25-26, 2019
- Join IMS in Pretoria, South Africa
- More information is available on:  
[www.ims.org/sa-workshop-2019](http://www.ims.org/sa-workshop-2019)



### AeroMat Conference

- “Cutting Edge Aerospace Materials & Processes”
- May 6-8, 2019
- Join IMS and ASM International in Reno Nevada
- More information is available on:  
<https://www.asminternational.org/web/aeromat-2019>



### Heat Treat Conference

- “Innovations in the Heat Treating Industry”
- October 12-17, 2019
- Join IMS and ASM International in Detroit Michigan
- More information is available on:  
<https://www.asminternational.org/web/heat-treat-2019>



### World Manufacturing Forum 2019

- “New Skills for Future Manufacturing”
- September 26-27, 2019
- Join IMS and World Manufacturing Foundation at the Villa Erba in Cernobbio, Italy
- More information is available on:  
[www.worldmanufacturingforum.org](http://www.worldmanufacturingforum.org)



### IMAT (International Materials Applications & Technology)

- “Solving Global Materials Challenges”
- September 14-17, 2020
- Join IMS and ASM International in Cleveland, Ohio
- More information is available on:  
<https://expo.asminternational.org/IMAT2020/Public/Enter.aspx>

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## MANUFACTURING NEWS

### ■ Diversity & Inclusion in Manufacturers: Three Best Practices

(IW – Audra Jenkins: 1-17-19)

As the nation celebrates the legacy of Martin Luther King Jr., it's a good moment for us to think critically about the state of diversity and inclusion (D&I) in manufacturing. And from the outset, the numbers don't look good – for example, while women account for approximately 47% of the overall U.S. workforce, they make up only 29% of the manufacturing workforce, according to one study. What can manufacturers do to counteract this significant imbalance?

Here are four best practices. Pledge to provide equal pay. This is one of the simplest, yet most effective ways to elevate awareness around D&I at your company. Even if you don't think making such a formal pledge is necessary given your organization's commitment to equal pay, the numbers show that there's always room for improvement. Indeed, according to recent research, 53% of employees believe unequal pay is the top factor negatively impacting gender inequality in the workforce. That research also found that nearly half of female workers (49%) would leave their jobs if they learned a male counterpart was making 25% more than them.

### ■ Three Critical New Year's Resolutions for Manufacturing

(EBN – Srivats Ramaswani: 1-11-19)

Manufacturers have long embraced the concept of continuous improvement and innovation. In that spirit, what better way to kick off the year than by looking to see what the 2019 has in store.

Over the past few years, it has been impossible to escape headlines about the Industrial Internet of Things (IIoT)/Industry 4.0. New models for technology-enabled manufacturing have already moved into the implementation phase at many of the world's top manufacturers. One of the symbols of smart, connected manufacturing is uplifting the role of humans in decision-making processes, and allowing machines to make more decisions in cases where machines are faster and sometimes more capable. Machine decisions are enabled by analyzing data from an ever-increasing array of sensors and production data.

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### ■ IBM's New Battle in the Cloud

(MIT Sloan Management Review – Bala Iyer and Mohan Subramaniam: January 2019)

IBM's purchase of Red Hat is the largest acquisition in the history of software. According to The Wall Street Journal, this \$33 billion acquisition is expected to shore up IBM's position in cloud computing services. Yet, this is an expensive bet to seek parity with other cloud service providers like Amazon, Google, and Microsoft. Just a few years back, IBM was betting the farm on artificial intelligence through its Watson platform. That strategy has yet to deliver promised results.

Is it going to be any different this time with Red Hat? First, it's important to look at the appeal of this acquisition. Red Hat's business model is built on the Linux operating system, which came to the fore in the 1990s. Over the years, Linux has emerged as a stable and reliable OS that supports a vast ecosystem of software developers that meets most computing needs of users and enterprises, spanning all kinds of industries across the globe. In addition to its popularity and widespread use in computing devices (from desktop to mobile to smart devices and household appliances), Linux is open source software, available for free.

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### ■ Tech Apprenticeship Coalition to Make Workers 'Tomorrow Ready'

(Working Nation -- Matt Parke: 1-10-19)

Apprenticeships are breaking free from tradition and into new areas where the careers of the future are in technology and tech-adjacent industries. A new coalition led by IBM and the Consumer Technology Association (CTA) launched this week to shepherd this new paradigm and make thousands of new apprentices “tomorrow ready.” On Wednesday, IBM CEO Ginni Rometty announced the CTA Apprenticeship Coalition during her keynote address at CES 2019, one of the world's largest technology showcases.

With buzz about artificial intelligence and automation surrounding the event and abounding in media, Rometty links the emergence of these so-called job-killing technologies to their potential for job-creating opportunities. “I believe that 100% of jobs will change in the era of AI and that productivity gains resulting from these technologies will ultimately create more jobs than they replace. The priority right now is to help people around the world prepare for these jobs and benefit more from the prosperity that new technology creates,” Rometty wrote in an op-ed for CNN Business. The coalition is comprised of 17 leading companies, IBM along with corporate heavyweights Walmart, Toyota and Bosch.

## ■ Smart Factory May Hinge on Identifying Needed Skills

*(TechTarget – Tony Kontzer: 1-9-19)*

Technologies such as AI, the internet of things and data analytics are transforming how people manage their day-to-day affairs, turning their cars into autonomous rolling extensions of living rooms and enabling them to diagnose diseases faster and with more accuracy than ever before. They're even revolutionizing warfare. But as much as these innovations are pushing society forward on so many fronts, perhaps no industry has more potential to be transformed by these technologies than manufacturing. If there were any remaining doubts that factories have been headed for an extensive rethinking, an exhaustive 2017 report on the so-called smart factory from Capgemini doused them. The report predicted that smart factories could add as much as \$1.5 trillion to the global economy by 2022, with 76% of manufacturers claiming they either already had smart factory initiatives in place or were formulating them. Where manufacturers run into great difficulty on this journey is not knowing how to plan for the long term in such a fast-changing and expensive environment.

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## ■ Predictions for Worldwide Supply Chains in 2019

*(MH&L – Simon Ellis: 1-8-19)*

As we embark on a new year, the supply chain continues to undergo almost unparalleled levels of change. The older measures – productivity, quality and service – still apply of course, but we now see digital transformation poised to change everything. We believe now more than ever that business leaders who recognize the real impact of digital technologies on their industry, customers, partners, suppliers, functions and business practices stand to gain substantial advantage over their competitors. And the supply chain is increasingly viewed by manufacturers as a critical function for their future success.

According to our biannual survey, there were many fascinating insights into the role and approach for the modern supply chain: After years of being relegated to support status, the supply chain is now perceived by manufacturers as a strategic tool for business performance and growth – from “cost center” to “opportunity center.” ... Digital technology is now the top driver of change in the supply chain, reflecting both the potential for driving transformation and the lack of full clarity into true potential. ... Supply chain transformation is both about driving efficiency and effectiveness today for ROI and building resilience to disruption tomorrow.

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## ■ A Mixed Picture About Manufacturing's Strength in 2019

*(Advanced Manufacturing Now – Bill Koenig: 1-7-19)*

On consecutive days last week, economic indicators were released painting a mixed picture about manufacturing's economic strength. On Jan. 3, the Institute for Supply Management released its monthly manufacturing index. It had a noticeable drop, to 54.1% in December from 59.3% the month before. That meant manufacturing was still expanding, but at a slower rate. Anything above 50% is positive territory. Normally, the index, known as the PMI, doesn't swing that much month to month. The biggest drag was new orders. That part of the PMI plunged to 51.1% down 11 percentage points from November. The next day, the U.S. Bureau of Labor Statistics released its monthly jobs report. That showed a gain of 32,000 manufacturing jobs for December and 284,000 for 2018. That was part of an overall increase of 312,000 non-farm jobs, hailed as good economic news. ... The drop in new orders potentially is the most worrisome aspect of the December report. Orders received now dictate production in the coming months. For much of 2018, new orders were coming in at strong levels, according to the ISM survey.

## ■ Samsung Supporting Schools Using STEM to Solve Issues

*(IW – Staff: 1-7-19)*

Manufacturing companies have been stepping up efforts over the past few years to ensure that STEM skills are being taught to the future workforce. One company that has been supplying technology and dollars to the effort is Samsung Electronics America. On January 3 the company has taken it a step further and announced the 50 state winners in the Samsung Solve for Tomorrow Contest – a nationwide competition that challenges students to inspire change in their local communities by developing solutions to complex issues using STEM (science, technology, engineering and math) skills (<https://www.samsung.com/us/solvefortomorrow/>).

Each state winner will receive \$20,000 in technology and will advance in the next phase of the contest to compete for additional prizes and educational opportunities. The contest was created in 2009 and has provided more than \$23 million in technology to more than 1,700 schools nationwide. “The scale and importance of the issues addressed in this year's contest reflect how students are taking responsibility for their role as change agents for the future,” said Ann Woo, senior director of corporate citizenship, Samsung Electronics America.

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## ■ South Carolina's State Board of Education Approves Discovery Education's Math Techbook for Statewide Use

*(CSRwire -- Discovery Education: 1-4-19)*

Following a comprehensive evaluation, the South Carolina State Board of Education has approved the Algebra 1, Geometry, and Algebra 2 editions of Discovery Education's Math Techbook for statewide use as a core instructional resource through its state adoption process. South Carolina's adoption of the Math Techbook empowers the state's school systems to use State Board of Education approved instructional materials funding to purchase and integrate this innovative digital curriculum into teaching and learning. Currently used by approximately 5.6 million students across all 50 states and Canada, Discovery Education's award-winning Techbooks are fully interactive, comprehensive digital textbooks.

Updated regularly at no cost, the South Carolina Math Techbook is 100 percent aligned to South Carolina College- and Career-Ready Standards for Mathematics and provides educators detailed lesson plans, embedded formative assessments, hands-on activities, digital simulations, and robust teacher supports that immerse students in instruction.

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## ■ How IoT Might Transform Four Industries This Year

*(ZDNet – Bob Violino: 1-4-19)*

This could be a big year in the ongoing expansion of the Internet of Things (IoT) as many more businesses begin to deploy connected devices and bolster their network and analytics capabilities in anticipation of gathering enormous volumes of data from countless sources. In 2019, enterprise IoT pilot initiatives and subsequent implementations will continue to evolve rapidly, said Taseer Khaled, director of strategy at Nerdery, a digital business consultancy. “This acceleration is due, in part, to advances in manufacturing that have increased processing speeds, decreased physical size, and lowered costs of core technologies,” Khaled said. “However, barriers to adoption have also decreased with more senior leadership teams gaining familiarity with IoT's value proposition to the core business.”

The most meaningful new frontiers will emerge at the intersection of IoT and artificial intelligence (AI). “With data being analyzed through smarter and learning-oriented systems, more meaningful information will be generated easily and accessibly, ultimately fostering better informed business decisions and worker experience,” Khaled said.

## ■ Big Tech Deploys AI to Combat Hackers

*(Bloomberg – Dina Bass: 1-3-19)*

Last year, Microsoft Corp.'s Azure security team detected suspicious activity in the cloud computing usage of a large retailer: One of the company's administrators, who usually logs on from New York, was trying to gain entry from Romania. And no, the admin wasn't on vacation. A hacker had broken in. Microsoft quickly alerted its customer, and the attack was foiled before the intruder got too far. Chalk one up to a new generation of artificially intelligent software that adapts to hackers' constantly evolving tactics. Microsoft, Alphabet Inc.'s Google, Amazon.com Inc. and various startups are moving away from solely using older "rules-based" technology designed to respond to specific kinds of intrusion and deploying machine-learning algorithms that crunch massive amounts of data on logins, behavior and previous attacks to ferret out and stop hackers. "Machine learning is a very powerful technique for security—it's dynamic, while rules-based systems are very rigid," says Dawn Song, a professor at the University of California at Berkeley's Artificial Intelligence Research Lab.

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## ■ Global Supply Chain Pricing May Face New Pressures in 2019

*(Logistics Management – Patrick Burnson: 1-2-19)*

The global economy started 2018 with strong, synchronized growth, but the momentum faded as the year progressed and growth trends diverged. Notably, the economies of the eurozone, the United Kingdom, Japan and China began to weaken. In contrast, the U.S. economy accelerated, thanks to fiscal stimulus.

According to Nariman Behravesh, chief economist at IHS Markit, growth in the U.S. will remain "above trend," while other key economies will experience further deceleration. As a result, he predicts that global growth will edge down from 3.2% in 2018 to 3.0% in 2019—and will keep eroding over the next few years. "One major risk in the coming year is the sharp drop-off in world trade growth, which fell from a pace of above 5% at the beginning of 2018 to nearly zero at the end," says Behravesh. "The risk of an escalation in trade conflicts remains elevated. If such an escalation were to occur, a contraction in world trade could slow the world economy even more. At the same time, the sell-off in equity and commodity markets, on top of the gradual removal of accommodation by some central banks, means that financial conditions worldwide are tightening."

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## ■ AI May Be the Key to Tomorrow's Survival

*(Innovation Excellence -- Tom Koulopoulos: 1-2-19)*

AI has been getting a lot of attention lately. Much of it is fueled by the visibility it has received from a large number of well-respected people who have been warning us of the dangers that it poses to humanity. We are drawn to doomsday scenarios. It's in our nature. In many ways the history of civilization has been one of fearing and resisting the same technological advances that somehow help us beat the odds and propel us to the next level of progress. AI is no different.

Still, trying to separate the hyperbole from the facts is not always easy. I got wrapped up in it myself earlier this week when I wrote about an erroneous online Facebook report that its engineers had pulled the plug on chatbots which developed their own language in a simulation being run by Facebook. The bots did create a shorthand language, which is not unusual, and the engineers running the simulations simply stopped the bots in order to get them to communicate in English. Still, tantalized by the implications of AI run wild, I broke the glass and pulled the fire alarm. Mea culpa. The attention that incident has received, and all of the hype surrounding it, speaks to how incredibly sensitized we are to the threat of AI.

## ■ IT Leaders Take New Paths to Reaching Tech Talent

*(WSJ – Angus Loten: 12-27-18)*

Many large firms are on the lookout for data scientists, analytics experts and information security pros as more businesses expand their use of artificial intelligence, machine learning and other emerging technologies in the year ahead, chief information officers say. To attract these and other sought-after workers, many are planning to showcase innovative tech projects and a commitment to pursuing advanced capabilities – including tech investments and internal training programs – with an eye to drawing highly-skilled IT job candidates who are eager to experiment with the latest digital tools.

The unemployment rate for all IT jobs in the U.S. inched down last month to 2.4%, from 2.5% over the same period a year ago, compared to 3.7% across the entire economy, according to Comptia's analysis of the latest Labor Department data. Yet, despite the current tight IT labor market, it estimates that a wave of baby-boomer retirements, coupled with ongoing tech industry growth, will create some 140,000 open jobs in the IT workforce annually over the next seven years.

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## ■ Quick Tips for Incorporating the IIoT into your Machine Shop

*(American Machinist – Megan R. Nichols: 12-26-18)*

Sadly, there is no single best practice for incorporating or adopting Industrial Internet of Things (IIoT) equipment and devices within your machine shop. There are, however, measurable benefits for doing so — including a considerable boost to machining and performance data, that can help improve operations for the better. That is the promise of IIoT, after all: that data exchange among and between machines and data networks will enhance manufacturing processes by delivering critical new information for orders, for machine tolerances, or for innumerable other reference points that enhance performance.

The promise of better performance has empowered many machine shops to make the leap and deploy IIoT technologies within their processes and operations. As a result, we are able to discern many "do's" and "don'ts" for working with the tech. ... Before deploying a new piece of tech or machinery, consider if it will help or improve your operations and business. If not, there's no reason to bother right now.

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## ■ Industry 4.0 Predictions for 2019

*(New Equipment Digest – Matt Schoessler: 12-21-18)*

Heading into 2019, manufacturers will need to continue confronting new consumer expectations and preferences. People want the latest product, produced at the highest quality, in some cases customized just for them, at a reasonable price. And, by the way, they want it now. If I had to summarize the next year in five predictions, I would say that 2019 will be the year that any remaining skepticism concerning automation and digitalization will give way to a more bullish – and less abstract – view of the Industrial Internet of Things (IIoT).

This is the moment to put purpose to data, invest in the workforce, and deploy artificial intelligence. For U.S. manufacturing, 2018 was a phenomenal year. The Wall Street Journal reported in August that U.S. factories were "firing on all cylinders" with new orders, production and employment improving "sharply." Manufacturers added hundreds of thousands of jobs and now create some \$6 trillion in gross output. The 13 million people working in manufacturing are also expressing historically high levels of optimism about the future. According to MAPI, U.S. manufacturing production is predicted to increase by 2.8% for the 2018-2021 period.

## ■ Being Wise About Supply Chain AI

*(MH&L – Simon Croom: 12-21-18)*

Artificial intelligence is drastically changing the way the manufacturing supply chain works, from how human workers need to be trained to how managers oversee and run warehouses. We can think of AI as a way of intervening between data processes and humans to offset humans' lack of access or knowledge.

Every part of the supply chain – sourcing and procurement, logistics, operations planning and control, and delivery, fulfillment and customer service – has numerous opportunities to benefit. For example, AI can act as a project manager of sorts between suppliers and customers. AI has the ability to coordinate planning and delivery between manufacturers and suppliers, allowing manufacturers to respond to suppliers' changing needs without the inefficiency of human error. Specifically, machine learning algorithms can incorporate past decisions on schedules, forecasts and actual deliveries, relate those to subsequent financial performance, and adapt decisions to maximize both revenues and profitability. AI will explore every potential combination of demand, product mix and delivery times to develop more robust and accurate forecasts.

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## ■ What Industry 4.0 Means for the Automotive Supply Chain

*(Manufacturing.com – George Whittier: 12-20-18)*

When it comes to the automotive industry, innovation isn't anything new. A rich history of ideation – including Alfred P. Sloan Jr.'s commitment to new concepts such as automotive styling and Henry Ford's introduction of the assembly line – defines an industry in which change occurs more often than not.

The latest in a long series of new developments is poised to be delivered by Industry 4.0, or the fourth industrial revolution. Made popular in the manufacturing arena, Industry 4.0 is ready to reshape the automotive industry. From smaller equipment to a more dynamic supply chain, see what changes are on the horizon. ... Dreams of driverless vehicles are decades old. But with the help of Industry 4.0, those fantasies are turning into reality. Automotive giants such as Ford and GM plan on leveraging Industry 4.0 to deliver cars without gas pedals or steering wheels as early as 2019. Although time will tell whether such proclamations come to fruition, there's no denying the difference Industry 4.0 is already making in the automotive supply chain.

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## ■ What's Ahead for the Semiconductor Industry?

*(IW – Jim O'Neill: 12-18-18)*

Smart cities and devices, autonomous vehicles and smart medicine make it easy to imagine a world where there are chips in just about everything that defines our way of life. IHS Markit forecasts that by 2025, there will be more than 75 billion installed Internet of Things (IoT) devices worldwide. The semiconductor industry is already riding this wave and most industry experts see the same trajectory for the foreseeable future. While emerging, state-of-the-art devices get a lot of attention, traditional integrated circuits continue to be the workhorse of the digital economy.

This is great news for the semiconductor industry as the capital expenditure (CapEx) requirements for increasing existing capacity are significantly less than those needed to build new capacity. Regardless, it's abundantly clear that the world of "smart everything" is going to require some shifting of investment priorities. Smart devices also present a host of unique considerations depending on the application. For example, if your smart refrigerator fails, it will cause an inconvenience, but the implications aren't all that significant. If your autonomous vehicle fails, on the other hand, the consequences could be dire.

## ■ What GM's Layoffs Reveal about the Digitalization of the Auto Industry

*(Brookings – Mark Muro and Robert Maxim: 12-13-18)*

News that GM plans to cut up to 14,800 jobs in the U.S. and Canada was initially reported as a conventional business-cycle adjustment. The main causes of the cuts were understood to be slowing demand in the U.S. and China, slumping demand for sedans, and the need to reduce over-capacity in North America. Then the story turned political, as President Trump lashed out at GM while some observers framed the news as a blow to the president's promises to bring jobs back to the U.S. heartland. And then others focused on the community disruption of plant closings in the Rust Belt and how it might be mitigated.

While all of those perspectives are relevant, the most revealing aspect of GM's announcement may well be what the layoffs say about broader technology trends. GM's layoffs are not just incremental but existential: they are about accelerating the staffing changes mandated by the company's aggressive transition from analog to digital products and from gasoline to electric power. As such, the new layoffs (and associated future hirings) are likely an augury of much more disruption coming — in the auto sector, for sure, but also in firms all across the economy.

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## ■ Cyberattacks Skyrocketed in 2018 ... Are You Ready for 2019?

*(IW – Gregory Garrett: 12-13-18)*

Board directors continue to up their investment in cybersecurity. Seventy-three percent now say their organization requires that third-party vendors meet certain cyber risk requirements—up 30 percentage points from 2016, according to the 2018 BDO Cyber Governance Survey of 145 co-directors at public companies. This increase in requirements and investment is warranted as manufacturing companies adopt and integrate more advanced technologies into their operations. During 2018, we have seen a 350% increase in ransomware attacks, a 250% increase in spoofing or business email compromise (BEC) attacks and a 70% increase in spear-phishing attacks in companies overall. Further, the average cost of a cyber-data breach has risen from \$4.9 million in 2017 to \$7.5 million in 2018, according to the U.S. Securities and Exchange Commission. Risks have grown significantly around cyberattacks, information breaches from third-party vendors and information theft (i.e., personal identifiable information, intellectual property and trade secrets).

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## ■ America Can't Freeze Innovation in a Tech Cold War

*(IW – Jesse Z. Melton: 12-13-18)*

What happens with U.S. research during the next four or five years, and how much it can spur industry and manufacturing over that time, is going to determine our place on the global stage for the next 50+ years. It's that serious. Relatively speaking, the Cold War was no more important to our future than a research race between the U.S. and China would be. Fortunately, we don't have to let a research race escalate to the level of the Cold War. Significant new and sustained federal investment into research science right now will let us continue our legacy of invention, innovation and leadership. But the evolving trade relationship between China and the U.S. presents a situation we've never faced before. It's a situation where we don't have some sort of overwhelming advantage to leverage to ensure things remain in our favor. I came to manufacturing from the enterprise software world where we hired Chinese software developers, database architects and information science specialists. That worked in everyone's favor. We got top flight talent; they got to ply their trade in the only market where the number, scale and sheer value of opportunities existed. But that was a decade ago and our monopoly on opportunities no longer exists.

## ■ Boeing Launches Large-Scale Carbon-Fiber Recycling

*(MRO – Alex Derber: 12-10-18)*

Excessive plastic consumption is one of the greatest environmental problems of our times and is, for the present at least, receiving more attention than ever before. But while the single-use, throwaway culture associated with many plastic items is rightly criticized, plastics' use in aircraft – through carbon-fiber – is actually an environmental benefit as it allows lighter and more fuel-efficient aircraft. Nonetheless, in about 20 years' time the first wave of retirements of aircraft built mostly from carbon-fiber will hit, at which point aircraft recycling centers will need to have adapted their current tooling, which is geared towards aluminum airframes. The genesis of such adaption may be found in a recent deal between Boeing and ELG Carbon Fibre to recycle excess aerospace-grade composite material. Under the partnership, which builds on a pilot project between the two parties, Boeing expects to recycle "a majority" of the excess carbon fiber from 11 manufacturing sites. The material will then be suitable for the electronic accessories and automotive markets.

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## ■ Forces That Are Shaping the Future of Work

*(TLNT Daily – Ryan Jeffery and Rich Johnson: 12-7-18)*

A significant shift is transforming today's corporate landscape. The gig economy and technological advances are reshaping the workplace in ways that have significant ramifications for human capital and talent management. Flexible independent work provides increasingly attractive and viable career options for millennials and Gen Z, while artificial intelligence and automation are replacing job functions and requiring a fresh look at leadership training. What does this mean for HR leaders? The result of these trends is an even tighter labor market with new demands for developing and retaining top talent. The companies that embrace and proactively respond to this emerging reality will have the competitive advantage as they execute on strategies that will enable them to win the talent war, enhance employee productivity and elevate brand equity. Let's dive in and discuss the three people and culture investments that will be critical to the future of work: Purposeful work ... Innovative development ... and Enhanced collaboration.

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## MANUFACTURING FACT OF THE MONTH

*"Manufacturing is one of the largest sectors in the United States and the world."*

When analyzed alone, the manufacturing sector in the United States is the ninth largest economy in the world. This signals the vital part manufacturing plays in the United States and around the world.

*(Source: Manufacturing Institute)*

*For more information on IMS and its services please contact...*

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