



Periodic Newsletter | Volume 2 - No9 | December 2018

Intelligent Manufacturing Systems | IMS Inter-Regional Secretariat | Teresa Morin, Special Projects Manager

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NEW IMS BOARD ANNOUNCED

IMS is reconstituted its Board of Directors in order to align and support its ManuVation and World Manufacturing Forum programs. The new BoD members include experts in business development, advanced manufacturing technologies, and finance. At our recent Board of Directors meeting, they expressed excitement to advance and support our new direction to promote a wide range of services that help manufacturers understand and implement industry 4.0 manufacturing technologies through the ManuVation program and the World Manufacturing Forum. We are pleased to share their short biographies with you below.

Jack Harris, Chair was the Director of Advanced Manufacturing Technology, Rockwell Collins, with over 40 years and retired in September 2011. In this capacity he was responsible for the strategic direction of manufacturing technologies and process development. This included the alignment of business unit needs with manufacturing capabilities and implementation of Digital Manufacturing tools and technologies for over a dozen manufacturing locations, worldwide. Over this period, he held a number of executive positions in Operations, Engineering and Advanced Technology.

He has been engaged in economic development in manufacturing for over 25 years and has served as the Vice Chairman of the Iowa Innovation Council and was a member of the state's Technology Commercialization Committee (TCC). After his retirement, he launched the Iowa Innovation Corporation (IIC), which is a not-for-profit chartered to foster economic growth in Iowa through technology commercialization. In this role, he

served as the President/CEO of IIC.

Today he serves as General Manager for the PDES Inc., an international consortium, whose charter is to provide enterprise business value through improved information interoperability and usage and is the CEO of Parametric Studio Inc., a start-up STEM software provider. Representing Aerospace and Defense, Mr. Harris is the Chairman of the Advanced Manufacturing Committee for the Aerospace States Association. His Advanced Manufacturing involvement extends beyond the U.S. borders, where he is the Chairman and past U.S. Head of Delegation for the global Intelligent Manufacturing Systems (IMS) International.

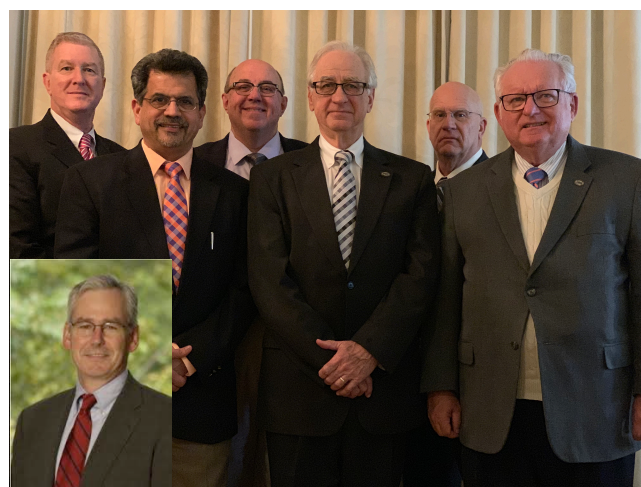


Figure 1. From left to right: Nagy, Kelkar, Bartles, Harris, Todd, Mansfield. (insert: Mahoney)

He holds an AAS and BS in Mechanical Engineering and a MS in Engineering Management. He served in

the United States Air Force from 1969 to 1973, as part of Headquarters Command. In 1993, he was recognized with the Collins Pioneer Leadership Award for development and implementation of a computer aided engineering strategy for Commercial Avionics Engineering.

Dean Bartles, Ph.D., is an expert in advanced manufacturing technology areas including Digital Manufacturing, Model Based Enterprise, Industry 4.0, smart manufacturing, advanced robotics and brilliant factory concepts. He is President of the National Tooling and Machining Association, a 1,200 member organization representing \$30 Billion in sales that promotes and advances the precision custom manufacturing industry.

Bartles worked in the Aerospace and Defense business of General Dynamics for 35 years prior to entering the not-for-profit world in the advanced manufacturing technology space in 2014. He increased sales from \$135 million to over \$600 million from 2001 to 2014.

His non-profit experience includes Director of the John Olson Manufacturing Center at the University of New Hampshire that focused on Industry Collaboration, Workforce Development, collaboration with students, and research in the advanced manufacturing space., Senior Advisor to The American Society of Mechanical Engineers, President of SME, and Chief Manufacturing Officer & Founding Executive Director of the Digital Manufacturing and Design Innovation Institute (DMDII) under the NNMI.

He is an operations professional with a Doctor of Philosophy (Ph.D.) in Technology Management with concentration in Advanced Manufacturing Systems from Indiana State University.

Atul Kelkar, Ph.D. is the new Chair of the Department of Mechanical Engineering and the D.W. Reynolds Distinguished Professor at Clemson University.

Kelkar has for the past two years worked as a program director at the National Science Foundation, where he co-led the Dynamics, Control, and System Diagnostics Program. He also served as one of the program directors on two NSF-wide, crosscutting programs: the National Robotics Initiative and Emerging Frontiers in Research and Innovation. Prior to joining the National Science Foundation, Kelkar was the associate chair for research and entrepreneurship for Iowa State's mechanical engineering department. He also served as professor-in-

charge for industry research and entrepreneurship for Iowa State's College of Engineering.

Kelkar has more than 130 publications and sustained research funding averaging \$600,000 per year. His lifetime total so far exceeds \$9 million. He has founded five start-up companies in areas ranging from smart materials to educational software. One of his start-ups, VSI Aerospace, worked with NASA on a hypersonic vehicle project.

Kelkar was employed from 1993-95 at NASA Langley Research Center as a national research council associate. He devoted most of his time at the agency to spacecraft modeling and control. His projects with the agency included work on the Jupiter Icy Moons Orbiter. Kelkar has a Bachelor of Science from the University of Poona and a master's degree and Ph.D. from Old Dominion University, all in mechanical engineering.

William (Bill) Mahoney, appointed CEO of ASM International in 2016, has oversight of ASM's 25,000 member organization, including business development member services, and materials technology services operations. Bill was formerly CEO at SCRA, and under his leadership over 11 years, annual revenues from SCRA's applied research and commercialization services operations grew from \$74M to over \$455M. In this same timeframe, SCRA annual year-end backlog grew from \$93M to \$1091M, annual net revenues set company records of up to 7.9%, and total contract value under management grew from \$235M to over \$5.2B.

During the roughly 30 years prior to coming to SCRA, Mahoney led companies small and large, which commercialized "first-of-a-kind" solutions in telecommunications, electronic publishing, automatic remote monitoring and other emerging applied systems markets, leading directly to IPO's or strategic acquisitions. Among these companies was SCT Utility Systems, of Columbia, SC. Between 1995 and 2000, SCT grew from startup to \$175M annual revenues, prior to its sale to Indus International (now Ventyx Corp). SCT's installed base of customer information systems for energy, utility, and communications companies is still one of the largest of its kind in the world.

Mahoney held a non-voting seat as secretary of the SCRA Board, and also served as the chairman of SCRA's wholly-owned applied R&D affiliate,

Advanced Technology International Inc. He currently serves on outside corporate boards as chairman of SCRA-invested tech startups STEM Premier and Carbon Conversions Inc. He also serves on national Boards with the National Defense Industrial Association, the National Energy Marketers Association and the Fuel Cell and Hydrogen Energy Association. On a state and local level, he serves or has served on the boards of the SC Hydrogen and Fuel Cell Alliance, Midlands Technical College Foundation, and SC Economics.

Mahoney is a Harvard graduate and former member of both the Harvard Crew and the U.S. National Rowing Team. He and his wife, Paula, have been married for 39 years and have two adult sons, one a U.S. Navy officer and one a professional baseball player.

Robert E. Mansfield, Jr.

Mr. Robert E. Mansfield Jr., is an Allied Associate in Solomon Bruce Consulting's Atlanta, GA Office. His practice provides executive level advice and counsel on strategic planning, leadership, supply chain management, operational logistics and business transformation matters.

Most recently, he served as Director, National Programs, for the Aerospace States Association (ASA). In this capacity, he managed ASA's nation-wide programs and initiatives to establish and promote the aerospace objectives of the US states and territories. He organized the first ever aerospace specific Foreign Direct Investment Exposition in association with the US Department of Commerce, facilitated the association's Industry 4.0 activities, established the ASA national distinguished service award, and developed strategies to grow ASA membership.

He was the chief architect of the Air Force's supply transformation initiative to improve weapons systems' availability, thorough the innovative application of commercial practices. He led the Department of Defense's global surplus and excess property operations; reshaping the global organization incorporating best commercial business practices, leveraging information technology, and focusing on customer determined outcomes.

Executive leadership roles in which Mr. Mansfield served include the following: Director, National Center for Aerospace Leadership (NCAL) and Principal Investigator, National Aerospace Leadership Initiative (NALI) for the Connecticut Center at the Advanced Technology (CCAT), East Hartford, CT; Director of Global Supply Chain Services, Lockheed Martin

Aeronautics Division, Fort Worth, TX; Practice Area Leader, Supply Chain Management, Altaerum Institute, Ann Arbor, MI; Executive Director, Center for Aviation and Aerospace Leadership, Embry Riddle Aeronautical University, Daytona Beach, FL. In community non-profit executive leadership roles, Mr. Mansfield served in the following positions: Supply Chain Council's Aerospace and Defense Special Industry Group (SIG); Member of the Clarkson University Business School's Board of Advisors; Emory Riddle Aeronautics University Worldwide Industry Advisory Board; Member of the Defense Science Board 2006 Summer Study on 21st Century Strategic Technology Vectors; Co-Chair, Michigan Governor's BRAC Task Force in 2005; Connecticut Lt. Governor's delegate to the Aerospace States Association; Member, Board of Directors of the National Council for Advanced Manufacturing (NACFAM); Member of the Board of Advisors for SecureRF, Westport, CT; Principal Advisor, ASD Global, Walnut Creek, CA; Principal Advisor, SEAM Aerospace, Norman, OK. The President nominated and the Senate confirmed him as a Brigadier General in the United States Air Force. He served in a wide variety of key command and staff positions in the Department of Defense and Department of the Air Force. He has led and managed industrial production and manufacturing, acquisition, and academic organizations that were required to adapt to changing global economies and environments.

Mr. Mansfield has received numerous awards for his leadership and public service in insuring ethics/integrity, attitudes of excellence and strong organizational achievement were implemented in global organizational climates.

He holds earned degrees from Arizona State University, cum laude (B.S.), Air Force Institute of Technology, (M.S.), Air War College (Diploma), Defense Systems Management College (Diploma). He holds Defense Acquisition Worker Improvement Act (DAWIA) certification in Acquisition Logistics Management (level III) and Program Management (level II), and is a fully qualified Joint Service Officer (JSO).

Jack Todd, C.P.A.

Jack is the owner manager of a small practice model for accounting firms. Jack has practiced for over 35 years in Tallahassee, Florida and provides self-involved hands on accounting, tax compliance and consulting services to his clients. His practice provides full service bureau accounting and payroll services, tax preparation for individuals, corporations,

partnerships and not-for-profit organizations. He has enjoyed an extensive diversity of clientele including small retail, wholesale and service businesses; state associations of voluntary hospitals; mineral mining operations; real estate partnerships; employee unions; waste hauling and disposal; class 3 and household single stream recycling and his favorite technology and manufacturing client in a CNC manufacturing facility with products in aerospace and ordnance, off shore drilling and green power.

Jack is a graduate of the business college of Florida State University and a Florida licensed CPA.

IMS AT BOSTON INNOVATION CONFERENCE

As part of its outreach activities, Mr. Dan Nagy, Managing Director, presented its ManuVation program in October at the Boston Innovation Conference held at the Reebok Innovation Center and FLEX Manufacturing. Emilia Luciani, Deputy Italian General Consul, and members of the Boston Economic Development Council also spoke about international cooperation. IMS was able to extend its network, discuss areas of collaboration, and looks forward to holding a ManuVation workshop in the Boston area.

IMS PRESENTED KEYNOTE AT FOURTH INDUSTRIAL REVOLUTION FORUM IN ULSAN

With approximately three hundred in attendance, Mr. Dan Nagy, Managing Director, presented a keynote speech titled “Industrial Revolution Driving Workforce Innovation” at UNIST Innovation Center in Ulsan, Korea. At the November event he referenced recent research noting that only twenty-nine per cent of the current workforce possess advanced manufacturing skills. The presentation focused on the skills gap and new methods of teaching and credentialing skills. He also noted the need for industry to advertise the attractive aspects of manufacturing jobs to our youth and methods to drive workforce innovation.

NEW 2018 WMF VIDEO RELEASED



#WMF2018

World Manufacturing Forum 2018, 27-28 september, Cernobbio

The World Manufacturing Forum released a new video this month highlighting the 2018 annual meeting which took place on September 27-28 in Cernobbio, Italy. The video features important events from the conference and gives a glimpse into WMF events. The video is available for viewing here:

https://www.youtube.com/watch?v=SLv_SscdlY

[The Mad Dash to Find a Cybersecurity Force](#)

(NYT – Paulette Perhach: 11-7-18) A stunning statistic is reverberating in cybersecurity: An estimated 3.5 million cybersecurity jobs will be available but unfilled by 2021, according to predictions from Cybersecurity Ventures and other experts. “It’s scary. Our power grid, our cars, our everyday devices — basically everything is online and able to be attacked,” said Georgia Weidman, author of *Penetration Testing: A Hands-On Introduction to Hacking*. Ms. Weidman is the founder of two cybersecurity companies, Bulb Security, where she is chief executive, and Shevirah, where she is chief technology officer. Shevirah specializes in security for mobile devices. “It would certainly cause mass destruction if our power grid went down or our water pumps started going haywire or our dams decided to open all their sluices,” she said. “That’s actually something that could happen.” According to a report released this year by the Identity Theft Resource Center, the number of data breaches tracked in the United States in 2017 hit a high of more than 1,500, up almost 45% over 2016. In one incident this year, the data of 29 million Facebook users was stolen.

[A Digital Transformation Strategy for Manufacturers](#)

(Vitria Marketing: 11-13-18) Digital transformation ... Industry 4.0 -- with lofty names like these it’s easy to forget that all of this new promise and innovation centers on one thing: data and the vital importance of making it work for you rather than against you. The onslaught of big and bigger data is inevitable, thanks to miniaturized electronics that can place RFID chips and sensors in just about any physical package. What you do with this data will have an immense impact on your transition into the all-digital realm. On the positive side, big data can be optimized by manufacturers in a variety of ways. A report by ScienceSoft noted some examples: *Production process optimization* led to a greater than \$10 million yearly revenue boost for a precious-metals maker, while yield improvements helped a chemicals company cut raw materials waste by 20%, and a pharmaceuticals maker boosted vaccine yields by 50%. *Preventive maintenance, using pattern recognition, fault detection and visualization*, helped Intel predict \$100 million in savings in 2017. *After-sales examples* include Caterpillar Marine which used analytics to help a customer optimize hull-cleaning processes, and General Electric which uses analytics to

monitor and optimize performance of wind farms.

[Manufacturers are Behind in Industry 4.0—and for Good Reason](#)

(IW – Stephen Gold: 11-9-18) The headlines about the pace of digitalization in recent years have been daunting. According to the experts, everyone should be on the Industry 4.0 bandwagon by now. One report predicted digital disruption would replace 40% of “incumbents” in a dozen industries by 2020. Consultants and solution providers have only ratcheted up the apprehension among executives. The warning: If you’re clinging to old ways of operating and delivering value, you’re already losing. No one doubts that the union of physical and cyber technologies, with its promise of artificial intelligence, data analytics, and cognitive technologies, will eventually lead to the development of global systems that create dramatic efficiencies and enable business leaders to make more informed integrated decisions. But at this point, manufacturers who haven’t figured out how to apply Industry 4.0 across their companies aren’t yet falling behind. ... In the current technology and policy environment, an optimistic but cautious approach presently makes business sense for most of their companies.

[DowDuPont CEO Says Split Will Generate Nearly \\$1 Billion in R&D Funding](#)

(CNBC – Elizabeth Gurdus: 11-8-18) [DowDuPont's](#) highly anticipated split into three companies, set to occur in 2019, will generate nearly \$1 billion in research and development funding, DowDuPont chief Ed Breen told CNBC on Thursday. “The beauty of redoing the portfolio — and I’ll use DuPont as the example — [is] we’re going to spend almost \$1 billion on R&D per year, so it’s at a rate that’s very healthy compared to the competitive peer set,” Breen told [Jim Cramer](#) in an interview. DuPont, where Breen will stay as a full-time executive chairman, will become a standalone specialty company focused in various secular markets including transportation, electronics and nutrition. “What happened is you’re bringing R&D in from the Dow businesses that came in and the DuPont [businesses],” Breen said on ["Mad Money."](#) “You’re bringing that R&D into the same end market opportunities like in nutrition and health. We both had nutrition and health companies, and now you’re bringing double the R&D to bear on that industry.” Breen, who successfully engineered a five-way split of former monolith Tyco,

said that DuPont represents the "fast-growth" portion of the spin-off involved in "secular growth" areas of the market.

[Integrating Climate Risk into Corporate Supply Chain Management](#)

(Triple Pundit – Samantha Harris and David Wei: 11-8-18) According to the [U.S. National Oceanic and Atmospheric Administration \(NOAA\)](#), 2017 was the third-warmest year on record, the U.S. experienced three of the top five costliest hurricanes in its history that same year, and the 20 warmest years on record have all occurred since 1995. Businesses already experience the negative impacts of climate change—including infrastructure damage, operational disruptions, logistics challenges, input supply interruptions, and effect on customers. Since 2011, the World Economic Forum’s annual Global Risks Report has [ranked climate risks a high priority for business](#) in terms of both likelihood and impact. Business must understand the full spectrum of climate risk—not merely how physical impacts affect infrastructure, but also the extent to which their workers and assets are exposed and how communities experience and adapt to these impacts. Our research shows that businesses do not yet fully recognize and understand how climate change affects the people in their value chains. They often overlook that building climate resilience simultaneously advances other goals, and managing supply chains.

[Making AI Work for Equipment Manufacturers](#)

(Automation World -- Brian Irwin and Eric Schaeffer: 11-7-18) Achieving success has never been more challenging for industrial equipment manufacturers. Not only are they faced today with macroeconomic volatility, shifting demand for products as services, and the ever-greater pressure to innovate, they must also find new ways to grow. Harnessing the power of artificial intelligence (AI) is one of those ways. AI is rapidly becoming the fuel for growth across business sectors, including the industrial equipment industry. Applying the right combination of AI technology—a collection of digital advances such as machine and deep learning and analytics—can help companies grow by enabling them to operate at unprecedented speed and scale, reduce cost and enhance customer experiences. *Accenture [research](#) suggests AI will add approximately \$3.7 trillion to the manufacturing sector by 2035.* However, while OEMs surveyed say they plan to invest heavily in AI technology over the next three years, until now many have lagged behind companies

in other industries such as financial services, retail, media, and healthcare that have already forged successful AI initiatives.

[Making Sense of Supply Chain 4.0](#)

(IW – Rahul Asthana: 11-2-18) Have you ever heard a joke where everyone laughed except for you – because you didn’t get it? That’s how I felt when I first heard about digital transformation. Everyone seemed to know what it was and was excited about it. In supply chain management, it was all anyone could talk about. Every article discussed the importance of *digitally transforming* the supply chain. Every conference showcased the latest technologies to help you do so. And yet, when I first heard the term, I wasn’t sure what it meant. In essence, the question I had was: If transformation implies a dramatic or radical change, then how does your supply chain “dramatically change” with digital transformation? To answer the question, I did some research, but the results were not very clear. [McKinsey](#), [Cap Gemini](#) and the [Boston Consulting Group](#) all suggest digital transformation is about applying digital technologies [such as Artificial Intelligence, Machine Learning, the Internet of Things (IoT) and Blockchain] to operational processes and creating improvements. The trouble with this definition is that it doesn’t explain what exactly changes in supply chain management—or what gets transformed—when digital technologies are adopted.

[New Blue-Collar Jobs Will Survive the Rise of AI](#)

(Bloomberg -- Craig Torres: 11-1-18) It’s hiring day at Rolls Royce’s jet-engine plant near Petersburg, Virginia. Twelve candidates are divided into three teams and given the task of assembling a box. Twelve Rolls Royce employees stand around them, one assigned to each candidate, taking notes. The box is a prop, and the test has nothing to do with programming or repairing the robots that make engine parts here. *It’s about collaborative problem solving.* “We are looking at what they say, we are looking at what they do, we are looking at the body language of how they are interacting,” says Lorin Sodell, the plant manager. For all the technical marvels inside this fully automated, 8-year-old facility, Sodell talks a lot about soft skills such as trouble shooting and intuition. “There are virtually no manual operations here anymore,” he says. People “aren’t as tied to the equipment as they were in the past, and they are really freed up to work on higher-order activities.” Call it the automation paradox: The infusion of artificial intelligence, robotics and big data into the workplace is elevating

the demand for people's ingenuity, to reinvent a process or rapidly solve problems in an emergency.

Defense Industry Calls for STEM Talent

(Signal – Kimberly Underwood: 10-31-18) In the information age, military operations are becoming more and more dependent on network-based capabilities. Meeting the rising communication technology challenges of the future means having a workforce versed in science, technology, engineering and math, leaders suggest. Barbara Borgonovi, VP, Integrated Communication Systems, Raytheon Space and Airborne Systems, shared that talented workers are needed to fill employment gaps at defense companies as well as in the military. She refers to the challenge as the *talent imperative*. To fill positions, industry and the government need to change how they identify, hire and retain talent, Borgonovi said. "For years, we've heard about the challenge that we don't have enough college students that are going to study science, technology, engineering or math, STEM," she stated. "And that's absolutely true." The U.S. has seen some progress in STEM education. Between 2000 and 2014 there was a 53% increase in the number of students pursuing STEM degrees; however, it is not enough, she stated. "Technology is as important as any weapon for this nation's ability to maintain its advantage over adversaries," Borgonovi said.

Perfect Storm Transforming Space Industry

(National Defense – Jon Harper: 10-31-18) A confluence of trends is reshaping the space enterprise for the military and contractors, industry leaders said Oct. 31. President Trump is pushing to create a new space force as an independent branch of the armed forces. Meanwhile, emerging threats to U.S. space assets from peer competitors and other adversaries have prompted the Pentagon to try to move faster and create more resilient architectures. The commercial space sector is also booming and creating new opportunities for partnerships, industry executives said during a panel discussion at the MILCOM conference in Los Angeles hosted by AFCEA and IEEE. All of this is creating "a perfect storm" that is leading to a greater focus and sense of urgency for developing new capabilities, said Kay Sears, military space general manager and vice president at Lockheed Martin's space division. "It feels like a different time right now for this nation and for space," she said. "We've got new organizations being formed to address the challenges. We have an increasing threat environment. And so I think there is a

significant change in behavior around space, and that requires a corresponding change in behavior of all of us."

Researchers Make It Easier to Teach Robots Basic Skills

(IEN – Amy Adams: 10-30-18) In the basement of the Gates Computer Science Building at Stanford University, a screen attached to a red robotic arm lights up. A pair of cartoon eyes blinks. "Meet Bender," says Ajay Mandlekar, PhD student in electrical engineering. Bender is one of the robot arms that a team of Stanford researchers is using to test two frameworks that, together, could make it faster and easier to teach robots basic skills. The RoboTurk framework allows people to direct the robot arms in real time with a smartphone and a browser by showing the robot how to carry out tasks like picking up objects. SURREAL speeds the learning process by running multiple experiences at once, essentially allowing the robots to learn from many experiences simultaneously. "With RoboTurk and SURREAL, we can push the boundary of what robots can do by combining lots of data collected by humans and coupling that with large-scale reinforcement learning," said Mandlekar, a member of the team that developed the frameworks. The group presented RoboTurk and SURREAL Oct. 29 at the conference on robot learning in Zurich, Switzerland.

As Infrastructure Crumbles, So Does U.S. Manufacturing

(IW – Michael Collins: 10-29-18) America is essentially in an infrastructure collapse that is having dire effects on manufacturing. Crumbling water systems that are unreliable can shut down production lines. Congested highways mean late deliveries, production loss, increased fuel and wage costs and excessive wear on assets. Port congestion, lock delays and the penalty associated with not having infrastructure in place to handle larger ships make American products more expensive. Before I address the benefits of an infrastructure upgrade, let's take a look at the state of our aging infrastructure: *Water and Sewer* -- Beneath most major cities, our current water and sewer systems are from 50 to 150 years old—mostly beyond their design life and in need of replacement. The old systems leak an estimated 20 to 25% of our public water every year. Washington D.C. alone sees an average of 400 to 500 water main breaks per year while an estimated 240,000 water

main breaks occur every year in the U.S. The EPA estimates that upgrading the public water system will require \$335 billion over 20 years, and upgrading the sewer systems will require \$298 billion over 20 years.

Innovation in Digital and Virtual Immersion Will Change the Way We Live

(Innovation Excellence – Andy Heikkila: 10-23-18) In 1999, the Wachowski siblings released a monument to modern film-making --The Matrix. Stylistically, the world really had never seen anything like it. However, the movie's impact wasn't confined to its entertainment value. The movie centered around metaphysical themes popularly attributed to Western philosophers Plato and Descartes, and reframed them in modern, digital fashion. For many, this was the first legitimate pop-culture representation of not just "virtual reality," but the concept of full "virtual immersion." This isn't to say that The Matrix was the first, or even the definitive, movie about virtual immersion. Ready Player One and Surrogate both offer their own takes on digital immersion with unique variation. However, there is almost always one constant in tales that explore the digital otherworldliness of an alternate existence, and that's the focus on negative elements. Of course, the mechanics of a narrative inherently dictate that there must be conflict present somewhere in the yarn -- but it's worth keeping in mind that the idea of virtual immersion, as it creeps from ether to existence, will likely be a multifaceted experience with ups and downs.

Here's How We Can Make the Next Big Thing Happen Much Faster

(Innovation Excellence – Greg Satell: 10-29-18) It often seems easy to know when the next big thing is upon us. Someone like Steve Jobs or Elon Musk stands on stage and tells us what is being launched next. The business press gets excited ... pundits swoon ... and a thousand imitators are created. Before long an ecosystem develops and the world is forever changed. In reality though, things are much murkier than that. Innovation is a process of discovery, engineering and transformation ... and it is only the last part that is visible to most of us. The seeds of a revolution start long before ... in obscure labs ... and at conferences with high priests presenting papers written in arcane vernacular. Since the 1950s, the engine that's driven new knowledge to "turn the wheels of private and public enterprise" has been the US government. Unfortunately, moving new discoveries out of federal labs has often been a slow and cumbersome process,

but a new model holds promise for greatly accelerating breakthrough innovation. ... The idea behind JCESR is that in order to accelerate innovation you need to strengthen links between discovery and commercialization.

GM Will Produce SUVs in TX Using Only Wind Power

(ThomasNetBlog – Anna Wells and Conor McGlade: 10-23-18) GM has its work cut out for it. The company has made a pledge to power all plant operations with renewable energy sources by 2050. More recently, it announced that its Arlington, TX plant – which is responsible for churning out popular SUVs like the Yukon, Suburban, and Escalade – will now be powered by 100% wind energy. The wind power is coming from the Cactus Flats Wind Farm in Eden, TX, and it also intending to supply at least some of the energy, for now, at GM's other Texas locations. GM's global manager of renewable energy Rob Threlkeld sees several benefits in the switch, one of which – he told the Detroit Free Press – is to position the Big 3 automaker as a "green" company. The other is cost savings. According to the blog GM Authority, "GM has already saved \$73 million this year by using greener and renewable energy sources." Secondly, Threlkeld says the company benefits from the stability of these energy sources in comparison to the price spikes that come along with more traditional energy sources.

Convincing Students That Learning Blue-Collar Jo Skills Will Pay Off

(The Hechinger Report – Caroline Preston: 10-23-18) The high school students clustered around a four-foot-tall red robot with long arms and cartoonish eyes. A so-called collaborative robot, programmed to work with humans at the Prent Corporation, a packaging company, it looked cute, not intimidating. But on this "Manufacturing Day," the robot delivered a not-so-subtle reminder that their teachers have tried to drill into them: The unskilled jobs that paid earlier generations so well are dwindling, gone offshore and to robots like this one. To compete for the manufacturing jobs of tomorrow, these teenagers will need specialized skills. So study hard. A decade ago, it would have been difficult to imagine this southern Wisconsin city of roughly 60,000 trying to sell its young people on careers in manufacturing. In 2008, GM idled the plant that had long kept thousands of Janesville's residents

in the middle class. But after enduring several years of double-digit unemployment, the hometown of Rep. Paul Ryan has seen joblessness fall to roughly 3.3 percent. Many businesses, some of which migrated to town after GM and its suppliers left, say they can't find enough skilled workers to fill jobs in manufacturing and the trades.

A Tale of Two Manufacturing Sectors: Reality Vs. Perception

(ThomasNetBlog – Kristin Manganello: 10-23-18) It is the best of times ... and it is the worst of times. It is the age of digital transformation ... and the age of cybersecurity risks. It is the epoch of job creation ... and the epoch of the skills gap. It is the season of the manufacturing renaissance ... and a season plagued by misconceptions. Since the Great Recession of the late 2000s, the manufacturing industry as a whole has bounced back impressively, reestablishing itself as the backbone of the American economy. By embracing cutting-edge technologies such as the Internet of Things (IoT) and automation in conjunction with progressive supply chain and procurement practices, the industry is poised for continuous growth. In spite of all this innovation and advancement, though, the American public still doesn't seem to recognize the manufacturing industry as the powerhouse it is. Recently, Thomas surveyed over 1,000 individuals from across the country to ascertain how the manufacturing industry is perceived by non-manufacturing Americans. The results were illuminating, revealing the manufacturing sphere is largely misunderstood by the public.

Why Is It So Hard to Invest in Technology?

(IW – Hari Candadai: 10-18-18) Much like people who know on an intellectual level that they ought to improve their diet and exercise habits—yet fail to do so—many organizations fail to invest in IT innovation despite recognizing the clear ROI of it. A recent global survey of IT and finance leaders by independent research firm Vanson Bourne revealed that 90% thought their organizations ought to be spending more on innovation; and 77% said a major barrier to doing so was the burden of “keeping the lights on” IT spending—the maintenance of existing systems and IT infrastructure. In addition, 70% cited a lack of support for innovation from their current technology providers; and 63% said they feel locked into those relationships. In fact, 74% said vendor lock-in was one of the major barriers to innovation. The survey is based on responses from 900 CIOs, IT leaders and financial decision

makers from a broad range of industries including: manufacturing, retail, healthcare, petrochemicals, oil and gas; public sector, and high tech /telecoms. Manufacturing execs represented the third most number of respondents after high tech/telecoms and the public sector.

AI and Machine Learning Help to Power Shell's Multi-Decade Digital Transition

(Computer Weekly – Caroline Donnelly: 10-16-18) Digitization is fast becoming a process that every enterprise in the world needs to embark on, as technology becomes embedded into how the economy at large functions. While some companies are under immediate and urgent pressure to digitally transform their operations, for the technology team at oil and gas giant Shell, it is a multi-decade process. “Digital transformation for Shell started 50 years ago and it has been a constant evolution,” says Yuri Sebregts, Shell CTO and executive vice-president for technology “We have had people working here who are at the edge of computational sciences, in the broader sense, for decades.” Proof of that is the company's newly announced artificial intelligence (AI) and machine learning push, which will see Shell primarily lean on these technologies to aid the predictive maintenance of the equipment used to run its upstream and downstream operations. The initiative will see Shell combine the capabilities of Microsoft Azure with C3 IoT's platform-as-a-service (PaaS) offering to create the underlying infrastructure for its AI effort as the firm looks to build on its earlier work in this field.

MIT Commits \$1 Billion to Study Artificial Intelligence

(IW – Staff: 10-15-18) In the single largest investment in computing and artificial intelligence (AI) by an American academic institution, MIT today announced on Oct. 15 a new \$1 billion commitment to address the global opportunities and challenges presented by the prevalence of computing and the rise of AI. At the heart of this endeavor will be the new MIT Stephen A. Schwarzman College of Computing, made possible by a \$350 million foundational gift from Stephen Schwarzman, the CEO of Blackstone, a global asset manager. “As computing reshapes our world, MIT intends to help make sure it does so for the good of all,” says MIT President L. Rafael Reif. “The MIT Schwarzman College of Computing will constitute both a global center for computing research and education and an intellectual foundry for powerful

new AI tools. Just as important, the College will equip students and researchers in any discipline to use computing and AI to advance their disciplines and vice-versa, as well as to think critically about the human impact of their work.” The new MIT Schwarzman College of Computing will be an interdisciplinary hub for work in computer science, AI, data science, and related fields.

Venturing Wisely into Smart Manufacturing

(IW -- Julie Fraser: 10-15-18) It’s less risky to start smart manufacturing initiatives now rather than later. Why? For one, there’s a good chance your competitors have started such initiatives, so you may be left behind. Our research at the not-for-profit Manufacturing Enterprise Solutions Association (MESA) shows that most manufacturers have had at least one project underway since the end of 2017. Perhaps more importantly, moving to smart manufacturing can help you reach and serve customers better and more profitably. There are always risks for new manufacturing technology programs. To ensure progress, you’ll need to consider five key aspects (see below). This is true no matter what the focus of your project may be. ... MESA defines Smart Manufacturing as the intelligent, real-time orchestration and optimization of business, physical and digital processes within factories and across the entire value chain. Resources and processes are automated, integrated, monitored and continuously evaluated based on all available information as close to real-time as possible. MESA’s Smart Manufacturing Working Group chairman, Conrad Leiva, believes that the time is now for manufacturers to move into a digitally connected future.

Separating Long-Term Supply Chain Technology Developments from Temporary Industry Disruptors

(SupplyChain24/7 -- Brian Thompson: 10-12-18) Technology partners with a long-game approach to development and implementation understand that trends come and go, and it can make little sense to heavily invest in trumpeted technological advancements just because they’re “the new thing.” While technological advancement brings with it solutions that can revolutionize how businesses in the supply chain interact, it’s important for all stakeholders to be a little bit skeptical when any company introduces a supposedly game-changing new technology. 3PLs are typically the first adopters of new technology as a huge part of their value proposition to their clients is their

ability to utilize advanced technology to solve their supply chain challenges. These logistics providers constantly keep their ears to the ground attending conferences and researching the latest technologies seeking new capabilities. 3PLs can make a single investment in technology and leverage that capability across many shippers. While 3PLs are usually on the bleeding edge of technical advancements, it’s critical that all supply chain stakeholders do their homework when looking for a technology partner.

The State of Industrial Augmented Reality

(PTC: 10-9-18) Over the life of our survey, use case adoption and customer business goals have shown that industrial enterprises are starting augmented reality projects internally, often piloting one or two use cases within their operations or service functions to prove value before expanding AR initiatives. Companies universally recognize the importance and benefits of adopting AR for their internal use. In today’s business climate of razor-thin operating margins and mounting economic pressures, the race for efficiency is starting to receive a nitrous boost from AR. This mid-year spotlight edition of our State of Industrial Augmented Reality series examines development and adoption trends for companies primarily focused on developing augmented reality experiences for their end customers externally by enhancing their customer-facing products, services, and solutions through the use of AR technology versus for their own internal use and benefit within their internal value chain. ... In this mid-year report, we’ll focus on the responses of those companies whose primary use is for strategic differentiation, or offering AR to their customers through innovative new products, services, and solutions.

Skilled Workers Harder to Find as Joblessness Falls

(AP – Josh Boak: 10-8-18) The U.S. economy has become a seemingly perpetual job-generating machine, having steadily added workers for nearly eight years. Even with the unemployment rate now at 3.7% — its lowest point since 1969 — hiring hasn’t stalled. So far this year, job growth has averaged a robust 208,000 a month, up from a pace of 182,000 for all of 2017. The trend has defied the predictions of most economists. Many have long warned that as hiring surged and unemployment fell, the pool of potential hires would shrink and trigger a bidding war that would ignite wage gains. It hasn’t happened. Many people are still being hired each month. And

pay raises, though rising, remain modest. “Every single time that we predict job growth is going to start slowing and wage growth is going to start picking up in recent years, we haven't gotten that right,” said Martha Gimbel, research director for the jobs listing site Indeed. To try to explain why employers are still managing to hire skilled workers at a steady pace, Gimbel paraphrased a line from the 1971 movie *Willy Wonka & the Chocolate Factory*: “There's no knowing where we're going, but it shows no sign of slowing.”

The Digital Factory: Rethinking Metal Production Processes

(IW – Kevin McAlea: 10-8-18) Every factory since the start of the industrial revolution has shared one very specific trait: tooling sets the identity of the machines and thus the factory. To create a specific part requires significant investment to manufacture in volume. Depending on the industry, it takes thousands or hundreds of thousands of parts to make a factory set-up profitable. If factories were computers, they would have to be disassembled and rebuilt each time a new software application was required. Digitalization is bringing speed and agility to product design and supply chain logistics. New business models are being built around the need for rapid response to consumer demand and rapid design iteration. It all works great until the factory gets involved. Then things slow to a crawl. Industrial OEMs realize drastic change is required. The global economy is becoming service-oriented. There are new value opportunities to pursue thanks to machine intelligence and increased connectivity. Manufacturers must respond with shorter production cycles that adapt to rapid product ecosystem evolution. They need to move from the traditional model of long lead times and long production cycles using machines which can only work with one identity at a time.

Digitization and Autonomous Driving to Halve Logistics Costs by 2030

(SupplyChain24/7 – Staff: 10-8-18) The digitization and automation of processes and delivery vehicles will reduce logistics costs for standardized transport by 47% by 2030, according to a PwC report. The *Global Truck Study 2018* finds that around 80% of these savings will be attributable to the reduction of personnel in the transport and logistics industry. In addition, there will be enormous increases in efficiency: autonomous lorries will be able to travel 78% of the time from 2030 onwards, as opposed to 29% of the time since 2030 because there will be no breaks for drivers and idling

time will be reduced through the use of algorithms. “Within a few years, the commercial vehicle and logistics industries will merge to form an ecosystem that will be managed digitally and efficiently. ... The missing piece of the puzzle currently is the automated comparison of freight and available vehicles. In a fully automated supply chain, a product on an Industry 4.0 production line would already be produced with the digital information to book the transport for its own delivery shortly before its completion,” explains Dr. Gerhard Nowak, a partner at Strategy&Germany.

Companies Hope STEM Programs Will Take Root and Flourish

(MH&L – Adrienne Selko: 10-8-18) The message was heard loud and clear: We need more STEM workers and we need them now. Students are abandoning Shakespeare for STEM, universities are providing real-world learning experiences and companies are offering paths to free education. Upon discovering that degrees in English literature are not leading to jobs, students are marching over to the computer labs. The share of bachelor's degree holders in the U.S. age 25 and over who majored in computers, math or statistics rose to 47% last year from 4.2% in 2009 – an increase of nearly 1 million students over the period. And at some universities they don't have to wander far to apply what they are learning in the classroom. For example, the Advanced Manufacturing Partnership Laboratory on the Western Michigan University (WMU) campus is stocked with 3-D printers and scanners, a CAD/CAM lab, plasma cutter, laser cutter, welding station, metrology equipment and prototyping tools. It combines prototyping, training and small-scale manufacturing so students can earn college credits for a degree or certification. This January WMU will offer courses for a certificate program in integrated design and manufacturing.

Sustainability is Critical to Modern Manufacturing

(The Hill – Mark Cancilla: 10-5-18) Manufacturers across the U.S. are innovating and redefining processes to create more sustainable operations. By making sustainability a top priority, they are helping ensure the longevity of not only the sector but also its customers. Current and future manufacturing will not look the same as manufacturing of days past. Today, they must remain committed to innovative, clean and technologically driven operations to ensure the development of products, processes and services that

provide environmental, safety and other benefits to customers. Manufacturers understand that sustainability goes beyond minimizing operational footprints, and extends to providing suppliers and customers with products that are more durable, create less waste and enhance the sustainability of the products to which they are applied. Modern manufacturers must engage with customers to ensure they are creating products and services that help them meet sustainability goals such as increased energy efficiency and reduced emissions and waste. Companies like PPG are developing coatings for homes and businesses that can improve indoor air quality, as well as automotive coating processes that require less energy and shorter cure times.

MANUFACTURING FACT OF THE MONTH

Manufacturing is a leader in promoting health.

According to the Kaiser Family Foundation all American manufacturing companies with more than 5,000 employees offer comprehensive health benefits. In addition, more than 65 percent of manufacturers offer wellness programs such as smoking cessation plans and on-site exercise facilities or gym memberships—rates twice those of other private sector employers.

(Source: Manufacturing Institute)

For More Information on IMS and its services please contact IMS Inter-Regional Secretariat Managing Director, Dan Nagy (dnagy@ims.org) or IMS ISC Chairman, Jack Harris (jack.harris@ims.org).