

## IMSI HOSTS FIRST EDITION OF TECHNICAL DAY AT THE 2019 WORLD MANUFACTURING FORUM



*Jack Harris, Chair of IMSI, begins the WMF Technical Day*

Intelligent Manufacturing Systems International, hosted the first annual World Manufacturing Forum Technical Day on September 25, 2019 in Cernobbio, Italy. The Technical Day is intended to focus on current shop floor and management challenges for manufacturers. New solutions utilizing Industry 4.0 technologies and sharing best practices with industry are intended to help companies find a pathway to low-cost solutions toward advanced manufacturing.

The Technical Day featured 2 plenary sessions and 4 breakout sessions from industry leaders. Speakers and sessions included representatives from our sponsors Accumold, Airbus, Altea UP, ANSYS, INC. ASM International, Clarex, CAM-I, Espedia Consulting, Minsait, an Indra Company, Grant Thornton LLP, Granta Design, Ltd., KPMG, Lockheed Martin, NCMS, Parametric Studios, Inc. PDES Inc., Questek Innovations, SAP, Solomon Bruce Consulting Thermo-Calc, Timken Steel Corporation, Vibram and more.

Following the strong industry focus, keynotes were given by the following: Rebecca Taylor, Vice President, NCMS; Marco Ferrogali, Vice President, Head of Modelling and Simulation (MBSE), Digital Design Manufacturing and Service, Airbus; Thomas Lezama, Vice President, Head of Digital Design, Airbus; Bill Mahoney, CEO, ASM International; Mike Lackey, Vice President, SAP.

The Technical Sessions produced many recommendations for manufacturers to be able to take home and implement into their practices and presentations will be available to attendees and members of the IMSI website.

Below are the summary recommendations produced during the breakout sessions at the technical day:

### **PDES INC: "STANDARDS ENABLE EFFECTIVE IMPLEMENTATION OF "READINESS INDICATORS FOR TECHNOLOGY ADOPTION AND INDUSTRY 4.0 SOLUTIONS FOR OEM'S & THEIR SUPPLY CHAINS"**

1. Develop a better way to communicate to SME's business value in using standards
2. Improve engagement of SME's in standards development
3. Encourage industries outside of aero and auto to engage in standards development; ie. furniture
4. Encourage PDES and IMSI to encourage Industry 4.0 Systems Integration and Systems Interoperability.

### **CAM-I "READINESS INDICATORS FOR TECHNOLOGY ADOPTION AND COSTING FOR MANUFACTURING COMPETITIVENESS"**

1. How target costing, value engineering and cost data helps with 4.0
2. International collaborative work on cost process and performance work adding value
3. Embracing risk management
4. Use of value analysis for customers
5. Enterprise planning and budgeting and performance management to all areas

### **SAP: "ADVANCED METHODS AND BEST PRACTICES FOR A CONNECTED REALITY. DESIGN, MANUFACTURING, DELIVERY AND OPERATE"**

1. The Customer Experience drives innovation- A product issue leads to a customer issue
2. To drive Digital Transformation, you must converge business data with operational data
3. A Intelligent Supply Chain requires the intelligent usage of real time data, digitized, automated processes, provide a unique, customer experience
4. "Education and Work": digital products, new business models and technology driven services will fundamentally shift the requirements for a companies' human capital. In addition, manufacturers need to address the needs of multiple generations in the workforce while competing in a scarce market for talent.
5. The move from a linear to a "Circular Economy" allows manufacturing companies to take a double role: first, their products are able to close the circularity gap by providing equipment and services for disassembly and re-use. Second, manufacturers are challenged to think about the circularity of their own products - new business models where the equipment remains in their ownership for the entire lifecycle will help to accelerate this trend.

### **ASM: "HARNESSING MATERIALS INFORMATION FOR MANUFACTURING"**

1. Use of thermodynamic modeling and integrated computational materials engineering can drive new materials for product innovation
2. A strategy for managing materials information and integrating it into corporate systems can save millions and speed manufacturing processes
3. Aggregated curated and validated materials information and data are essential to drive ICME and additive manufacturing processes

4.Linkage of tools, i.e. interoperability, can still be improved and needs to be.

To learn more about the WMF and the technical sessions please visit [www.worldmanufacturingforum.org/technical-day-2019](http://www.worldmanufacturingforum.org/technical-day-2019)

## WORLD MANUFACTURING FORUM REPORT RELEASED

The 2019 WMF Report: Skills for the Future of Manufacturing was presented on the stage of the World Manufacturing Forum in Cernobbio, at Villa Erba.

The Report, edited by the Scientific Committee of the World Manufacturing Foundation chaired by Prof. Marco Taisch and composed of major world experts on manufacturing, identified the six emerging jobs in manufacturing and the ten most sought after skills in the labor market.



*2019 WMF Report Cover*

The six emerging roles in manufacturing were identified as: Digital Ethics Officer, Lean 4.0 Engineer, Industrial Big Data Scientist, Collaborative Robots Expert, IT/OT Integration Manager, Digital Mentor. The top ten skills for future manufacturing were identified as:

- Digital literacy as a holistic skill to interact with, understand, enable, and even develop new digital manufacturing systems, technologies, applications, and tools;
- Ability to use and design new AI and data analytics solutions while critically interpreting results;
- Creative problem solving in times of abundant data and technological opportunities in smart manufacturing systems;
- A strong entrepreneurial mindset including proactiveness and the ability to think outside the box;
- Ability to work physically and psychologically safely and effectively with new technologies;
- Inter-cultural and -disciplinary, inclusive, and diversity-oriented mindset to address new challenges arising from a more diverse manufacturing workforce;
- Cybersecurity, privacy, and data/information mindfulness to reflect the rapidly increasing digital footprint of the manufacturing value chain;
- Ability to handle increasing complexity of multiple requirements and simultaneous tasks;
- Effective communication skills with humans, IT, and AI systems through different platforms and technologies;
- Open-mindedness towards constant change, and transformation skills that constantly question the status quo and initiate knowledge transfer from other domains;

To read the full report please visit: [www.worldmanufacturingforum.org](http://www.worldmanufacturingforum.org)

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## UPCOMING EVENTS

### **December 3-5, 2019: ASM Global Materials Summit**

Marco Island, Florida

For more information please visit: <https://www.asminternational.org/>

### **May 4-6, 2020: AeroMat 2020**

Palm Springs, California

For more information please visit: <https://www.asminternational.org/>

### **September 14-17, 2020: IMAT 2020**

Cleveland, Ohio

For more information please visit: <https://www.asminternational.org/>

## MANUFACTURING NEWS

### [Northrop Grumman Pilots New Student Talent Pipeline Program in San Diego](#)

(Northrop Grumman Newsroom -- Fiona Hamann: 10-16-19) Northrop Grumman announced the launch of a new talent pipeline program in San Diego that provides community college students enrolled in science, technology, engineering and mathematics (STEM) degrees with paid, work-based learning opportunities and a pathway to qualification for careers in the aerospace and defense industries. Northrop Grumman partnered with MiraCosta College and Palomar College for the pilot phase of the new program during school year 2019-2020 and is exploring additional partnerships through the San Diego & Imperial Counties Community College Association (SDICCCA) for school year 2020-2021. "Establishing a framework to collaborate with education systems is necessary for building a strong local talent pipeline and supports a long-term workforce planning strategy," said Alfredo Ramirez, vice president, engineering, Northrop Grumman. "Our decision to develop a community college pilot fills a critical gap bridging K-12 and university programming, allowing us to reach and engage students in San Diego throughout their education journey."

### [Can 'Marginal' Technology Improvements Justify the Decision to Bring Manufacturing Back Onshore?](#)

(IW – Peter Fretty: 10-16-19) According to a [recent report](#) by Information Technology and Innovation Foundation (ITIF), as robots and other autonomous systems continue to improve in functionality and decline in costs, their likely impact on productivity will be significant. However, when speaking with IndustryWeek, report author and ITIF President Rob Atkinson mentions the current mix of robotic advances, deployment costs and investment incentives have not been enough to prompt widespread action. "Right now, robotic technology is only marginally getting better and cheaper. As a result, it is not leading to the transformation we would hope for," he says. "Eventually the technology itself will turn into a compelling proposition where we see faster breakthroughs and more comfort from manufacturers wanting to go down this path. The continued integration of AI into these deployments will definitely help." There is understandably a big difference between ideal conditions and actual adoption. As ITIF notes, some industries (i.e. automotive) and global geographies are already fully committed to next generation, automated technologies. Whereas others are still waiting on an impetus to act.

### [Strengthening the Foundations of Trust in the Digital Age](#)

(strategy+business – Stephanie Hyde and Blair Sheppard:10-8-19) There appears to be an epidemic of distrust that is eating away at the fabric of society.

People have lost faith in institutions' ability to provide reliable public services and in businesses to provide the jobs that put food on the table and allow workers to lead a dignified life. According to the Edelman Trust Barometer which measures the levels of trust globally, less than half of the world's population for the past decade trusts government, business, or even civil society. The surge in inequality, despite economic gains for millions, is one important factor that has left people questioning whether their government or employer has their best interests at heart. The speed of technological change and the unprecedented volume of information available — anytime, anywhere, via smart devices — is exacerbating this phenomenon. Today, information that weakens our faith in society spreads faster than responses to it. This trend will only grow as 5G mobile networks increase the speed and expand the breadth of connectivity.

### **Building an Innovation Ecosystem**

(Training Journal -- Julia Kylliäinen: 10-3-19) Successful innovators approach innovation holistically. They understand that to keep their businesses competent, they need to innovate at scale and work on various types of innovations across all parts of the organization. However, operating and innovating in a highly complex and ever-changing environment isn't always easy. Because relying on the traditional, single process and R&D-focused approach to innovation just doesn't cut it anymore, companies must build flexible but well-organized networks of teams and people. Instead of solely relying on the skills and insights of a small R&D team, they partner with different groups and focus on building an ecosystem where learning and development is encouraged. Building and managing innovation ecosystems is about creating agile and open environments for innovation to thrive. It's about fostering active collaboration while making sure each party sees the value of innovation and ensuring the ecosystem has coherent structures and incentives to encourage it. The best innovators understand that no matter how good you are, there's always room to improve and find better ways to do what you're doing.

### **Rethinking the Renewable Strategy for an Age of Global Competition**

(McKinsey Article -- David Frankel, Nadine Janecke, Florian Kühn, Ingmar Ritzenhofen,

and Raffael Winter: October 2019) Over the past decade, renewables have developed from niche technology to global industry. With environmental concerns rising to the top of global and regional agendas, the debate has shifted from "When will renewables take off?" to "How much faster will they grow?" As the cost of renewables continues to fall and their growth rates soar, a virtuous cycle is set in motion. The need for clean power in emerging economies only adds to the momentum. Earlier concerns about intermittency and grid stability are fading as countries increase their share of electricity generated from renewable sources and as battery costs plummet. In Germany, for instance, renewables represented 38% of gross electricity consumption in 2018, up from 25% in 2013. At the same time, battery costs decreased from \$650 per kilowatt-hour (kWh) in 2013 to \$176 per kWh in 2018. According to McKinsey's latest Global Energy Perspective Reference Case, renewable-based power generation will represent more than half of the global total by 2035.

### **3D Printing Technique Accelerates Nanoscale Fabrication a Thousandfold**

(Georgia Tech Research Horizons: 10-3-19) Using a new time-based method to control light from an ultrafast laser, researchers have developed a nanoscale 3D printing technique that can fabricate tiny structures a thousand times faster than conventional two-photon lithography (TPL) techniques, without sacrificing resolution. Despite the high throughput, the new parallelized technique — known as femtosecond projection TPL (FP-TPL) — produces depth resolution of 175 nanometers, which is better than established methods and can fabricate structures with 90-degree overhangs that can't currently be made. The technique could lead to manufacturing-scale production of bioscaffolds, flexible electronics, electrochemical interfaces, micro-optics, mechanical and optical metamaterials, and other functional micro- and nanostructures. The work, reported Oct. 3 in the journal Science, was done by researchers from Lawrence Livermore National Laboratory (LLNL) and The Chinese University of Hong Kong. Sourabh Saha, the paper's lead and corresponding author, is now an assistant professor in the George W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology.

## [The Machine Whisperers: This Startup Improves Machine Health Through Digital Transformation](#)

(Forbes – Jim Vinoski: 9-30-19) Various predictive and preventive maintenance methods for industrial machinery have been around for a long while now. The newest technology disrupting this mix, though, revolves around continuous diagnostics and didn't get its start on the manufacturing floor. It came instead out of the medical devices world. Gal Shaul is one of two co-founders and CTO of Augury, an Industrial Internet of Things (IIoT) company focused on production machine health. Years ago, while he was working as a software developer of a medical device startup, he was visiting a client's site to understand why their product wasn't functioning properly. When he arrived, Gal could hear right away that the machine's cooling fan was clogged. That got him thinking about monitoring the sounds machines make to prevent failures. That episode eventually led him to partner with his fellow co-founder and CEO, Saar Yoskovitz, who was working on machine learning solutions for speech recognition at the time, to launch Augury in 2011. Their goal was to develop hardware and software, combining Artificial Intelligence and the IIoT, to improve reliability within the manufacturing industry based in part on the sounds that machinery makes.

## [Amazon and DCCCD Roll-Out Statewide Cloud Computing Degree Programs](#)

(Dallas Business Journal – Bill Hethcock: 9-25-19)

Community colleges and technical schools across Texas will offer associate degrees in cloud computing beginning in spring 2020 through a partnership between Amazon Web Services and the Dallas County Community College District (DCCCD). The partnership, announced Wednesday in Dallas by state, local and Amazon officials, aims to meet industry and employers' immediate needs and give students statewide a fast track into one of the fastest-growing and highest-paying high-tech careers. Joe May, chancellor of DCCCD, said the community college district will have students in classrooms studying under the new degree program at four campuses starting in the spring. "Students will have the opportunity to earn industry-recognized certifications that are transportable and that they can use throughout their career and build on going forward," May said. "This exciting partnership is not just about us. It really is about driving the entire state of Texas as we continue to see automation, cloud computing, artificial intelligence and other (technologies) change the way that our workers compete."

## **MANUFACTURING FACT OF THE MONTH**

### *World Trade in Manufactured Goods Has More Than Doubled*

The U.S. share of world trade in manufactured goods has grown from 7.6 percent in 2002 to 8.7 percent in 2017.

(Source: NAM and World Trade Organization)

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

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