WORLD MANUFACTURING FORUM

WMF2017

MONTERREY • MX

PROGRAM

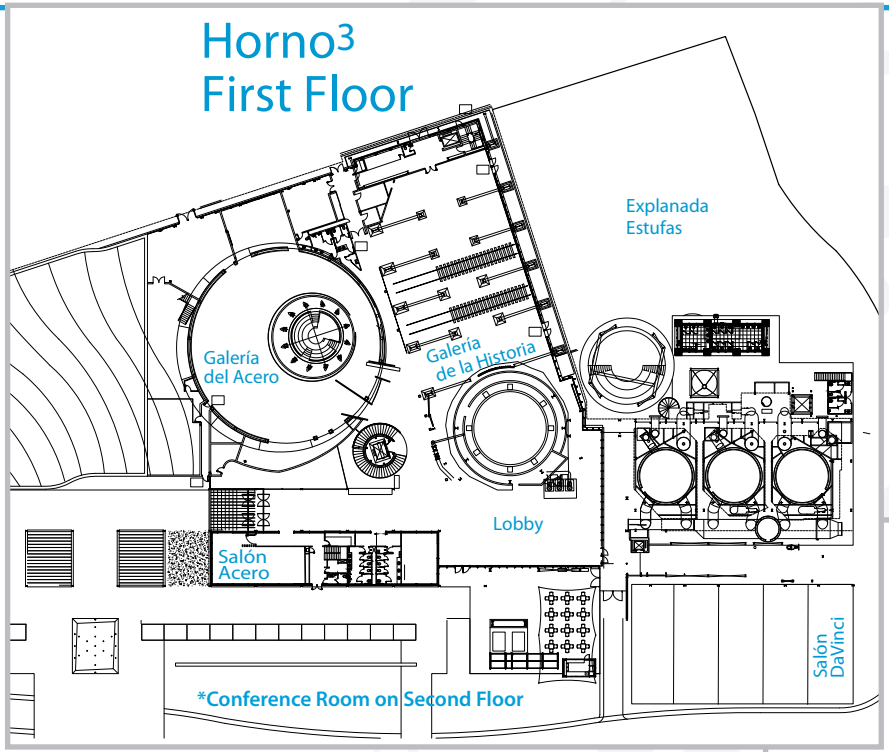
November 7-9 2017

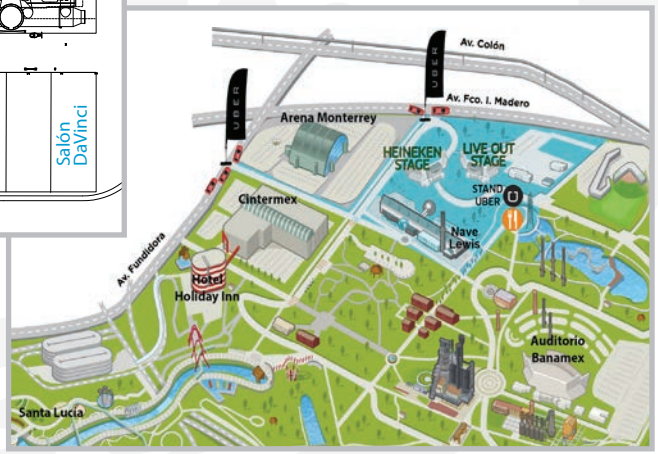
The Event Center at the Horno3

Museum of Science & Technology

Towards a Digital Market & Connected Manufacturing Ecosystems

Horno3
First Floor





Tuesday, 7 November

09:00 - 12:30
Factories and R&D Center Tours

- Please register on-line at worldmanufacturingforum.net and select the tour of your preference. There are limited spaces subject to availability.
- All tours will depart November 7th at 9:00 am from the lobby at the Holiday Inn Fundidora Hotel and will return to the hotel lobby.

Tour A - METALSA www.metalsa.com/

METALSA provides sustainable solutions for the global transportation industry and is one of the best global options for automotive structures in the world. METALSA provides innovative solutions focused on safe and sustainable product and process technologies, exceeding quality and service at a competitive cost. One of their main products are structures for light and commercial vehicles and some of its major customers are Ford and Toyota, with a large processing capacity with high-quality and precision processes such as laser cutting, CNC rolling, robotic punching, electrophoretic painting, among others. METALSA also offers logistics and engineering services such as transportation and customs procedures, services design, prototyping and fatigue testing.

Tour B - SISAMEX www.sisamex.com.mx/

SISAMEX is a world-class manufacturer of automotive components for commercial vehicles. SISAMEX manufactures axles, brakes, related components and assemblies for truck tract (Class 5 to 8), as well products for the agricultural industry off highway. SISAMEX provides its products to different companies such as John Deere, CNH, Magna, Axle Alliance and through Meritor to major original equipment manufacturers such as International, Freightliner, Kenworth, Mercedes-Benz, among others.

Tour C - NEMAK www.nemak.com/

Specialized in production of high complex aluminum components for automotive industry, such as cylinder heads, engine blocks, transmission parts and structural components. Along 30 years NEMAK has developed several competitive advantages that have led the company to be a global company. NEMAK has excelled in technology transfer, innovation and sophistication of productive processes. NEMAK has the 7th place in the ranking of the most important companies by Expansion business magazine.

Tour D - FRISA www.frisa.com/

FRISA has more than 45 top-notch forging technology investments and nurtured expertise. FRISA has achieved continuous sustainable growth, positioning it-self as one of the world's leading forging providers. FRISA is committed with the creation of value and delivering of quality forgings that enable its customers to confront the most demanding applications. FRISA conviction has allowed the company to grow and move forward, never stopping, always improving and preparing for a better future with the overhauling of standards, development of top-quality steel grades, and offering comprehensive forging solutions through best-in-class technologies and practices for more flexibility, reliability and extraordinary customer value.

Tour E - CIDESI / CIMAV

http://cidesi.com/wsite/en/index.php & CIMAV - http://cimav.edu.mx/en/

The Center for Research in Advanced Materials (CIMAV) is part of a System of Research Centers managed by the Mexican National Council of Science & Technology (CONACYT). CIMAV offers research, development and innovation services in the areas of materials, energy and environment.

Tour F - KIA Mexico

KIA Mexico is located at Pesquería Nuevo León, has a capacity to create 400,000 vehicles a year. In addition to supplying the Mexican market, where KIA aims to achieve a 5% market share by 2020, 80% of the production of this plant will be destined to supply various countries in the region, including the United States, Canada, Puerto Rico, Colombia and, of course, Brazil. This recently opened plant has high technology, with 420 robots that automate in 90 percent the processes of the areas of stamping, painting and assembly. The structure of the plant is one of the most advanced in Mexican territory.

12:00 - 13:30

WMF Registration & Expo Opens

13:30 – 14:07 WELCOME SESSION

- Prof. David Romero, WMF Scientific Chairman, Tecnológico de Monterrey
- Mr. Abraham Tijerina, IMS International Chairman, Coordinator Nuevo León 4.0, Metalsa

HORNO^3 SHOW!

- Mr. Juan Ignacio Garza, President of the Chamber of the Industrial Transformation of Nuevo Leon State & Director General Xignux Group
- Mr. Leopoldo Cedillo, WMF Chairman & CEO Metalsa

14:07 - 14:37 OPENING SESSION

Mexico's Manufacturing Competitiveness and Global Partners

- Chair: Mr. Leopoldo Cedillo, WMF Chairman & CEO Metalsa, Mexico
- Mr. Paulo Carreño, Director General, PROMEXICO

  Mexico's Manufacturing: Facts, Opportunities and Challenges

  This presentation will focus on sharing some relevant facts on the strengths of Mexico's manufacturing base, discuss on the emerging manufacturing opportunities in the country beyond traditional industrial sectors, and look forward to the challenges ahead towards preparing Mexico for the future of production.
- Mr. José Antonio Lazcano, Deputy Director of Technology Development and Innovation, National Council for Science and Technology, Mexico

  Manufacturing Automation: Elements for a New Science and Technology Policy

  Over the last few years, the world has witnessed an exponential transformation in technologies available, including manufacturing automation. This presentation will focus on answering what effects does automation have on Mexican production and markets, and what are the factors science and technology policies have to take into account in order to respond to these changes.

14:37 - 14:45 TECHNICAL SESSIONS OPENING & THANKS TO SPONSORS

- Prof. David Romero, WMF Scientific Chairman, Tecnológico de Monterrey

14:45 - 17:05 SESSION 1

Industrial Policies for Digital and Interconnected Manufacturing Markets

The Digital Marketplace, which forms the "digital thread", is expected to connect and drive future manufacturing supply chains. This marketplace will further drive rapid innovation, efficiency, and global collaboration. Cross-border policies and cooperation are needed to enable ecosystems of this scope and size.

- Session Chair: Mr. Dan Nagy, Managing Director, Intelligent Manufacturing Systems

SESSION 1A: Fast Growing Economies

- Mr. Rogelio Garza, Deputy Minister of Industry and Commerce, Ministry of Economy, Mexico

  An Industry 4.0 Public Policy for supporting Mexico's Manufacturing Digitalization

  This presentation addresses the Mexican Federal Government efforts, under the leadership of the Undersecretary of Industry and Commerce, at the Secretary of Economy, to develop an "Industry 4.0 Public Policy" that could serve as a collaborative platform for dialog, alignment and prioritization at national level of the triple helix efforts in terms of strategic projects, actions and stakeholders towards a smart digitalization of the Mexican Manufacturing Industry. Such efforts include the promotion of the adoption of new advanced and smart manufacturing technologies in large, medium and small-sized enterprises, further improvement of the national ICT-infrastructure to enable industrial internet connectivity, education and training of current and future manufacturing workforce with new digital skills, and the development of a cybersecure environment, legal framework, for the prosperity of a Digital (Manufacturing) Economy.

- Prof. Jinwoo Park, Director, Korea Smart Factory Foundation & Dept. of Industrial Engineering, Seoul National University, Korea

  Smart Solutions Help Korean Manufacturing Companies to Transform into Smarter Factories

  History of manufacturing industry in Korea is considerably short. Global companies such as Samsung Electronics started production in the early 1970s. Korea's small-and-medium-sized manufacturing companies have much shorter history and lack technology and management in all aspect. In line with the era of the 4th Industrial Revolution, the Korea Smart-factory Foundation (KSF) was established in 2015 to transform Korean manufacturing industries' digitalization and is pursuing a number of projects. Fortunately, some very effective factory support solutions have been developed in Korea and they are helping manufacturing companies' competitiveness. In this presentation, the activities of KSF and these smart solutions will be introduced. Because these solutions are inexpensive and easy to install, it is expected that they can be shared and used in global scale to cope with resource depletion and environmental problems as well.

• Dr. Jwu-Sheng Hu, Deputy CEO, Smart Machinery Promotion Office & General Director, Mechanical and Mechatronics Systems Research Labs, ITRI, Taiwan

The Development of Smart Machinery Industry in Taiwan

Smart Manufacturing or Industry 4.0, in which digital technologies, IoT, cloud computing, etc. are applied to manufacturing systems, has been one of the primary tools among the industrialized countries for economy growth as well as a better usage of natural resources. By means of technology, components in machineries and production lines across the enterprises will be connected for data collection. And these data are processed and computed to maximize the productivity with minimized resources. During this presentation, there will be information, delivered and shared, covering the current status of machinery industry in Taiwan, the promotion activities to develop a smart machinery industry and the plans of implementation driving Taiwan's industry towards smart manufacturing for industrial transformation as a national goal.

• Mr. Beeuwen Gerryts, Director, Technology Localization, Beneficiation & Advanced Manufacturing, Department of Science and Technology, South Africa

R&D Led Interventions to help Restore Manufacturing in South Africa

South Africa is in a phase where manufacturing's contribution to the economy has substantially declined, with the associated drop in employment and GDP growth. Government's effort to help restore the level of manufacturing focus on, amongst others, on changing the structural base of the economy, to ensure more inclusive industrial ownership; expand industrial activity away from the strong reliance on minerals exports, and to help diversify the economy. In support of the above is a series of R&D projects aimed at positioning and helping to establish the industries of tomorrow, such as a building grass-roots and focused capability in additive manufacturing; minerals beneficiation, and science intensive programmes such as the Square Kilometer Array (SKA). This presentation will outline some of these interventions and how they help to prepare the load capability and capacity to participate in the Fourth Industrial Revolution.

Session Change (10 min) – Stand & Stretch

SESSION 1B: Developed Economies

- Dr. Peter Dröll, Director of Industrial Technologies, DG Research & Innovation, European Commission

  Europe's Manufacturing Future: Objectives of European Research and Innovation Policies

  Research and innovation are key drivers of productivity and economic growth. With Horizon 2020, the 80-billion-Euro, seven-year research and innovation program, Europe has an attractive tool at its disposal capable of bringing together large and small industry, as well as academic researchers to collaborate on next-generation manufacturing technologies. Early findings from the mid-term assessment of the program show that efforts are already generating impact. A supporting policy framework called "Digitizing European Industry" aims to further create synergies between European and national initiatives toward Industry 4.0 goals.

- Ms. Cecilia Warrol, Program Director, Production 2030, Sweden

  Produktion2030: Towards Sustainable and Competitive Manufacturing

  Sweden is truly an industrialized country. The manufacturing and raw material industries make up close to 80% of Sweden's exports and more than one million people (10%) are employed directly or indirectly by industry. Well-known companies are LKAB, SCA, AB Volvo; Scania, Atlas Copco, Sandvik and SKF. Sweden's new industry strategy "Smart Industry" aims to increase sustainability and competitiveness in a high cost region. One of the mayor efforts within the strategy is a national platform for manufacturing: Produktion2030, which aims to involve industry, academy and research institutes for a sustainable and competitive manufacturing industry in Sweden 2030. Although many large companies and institutions are very competitive on a global level, many challenges remain to obtain sustainable growth and new jobs. To fully grasp the opportunities of e.g. digitalization, automation and new materials, industry and research institutions need to make great leaps through innovation and education, Produktion2030 offers a large number of actions and tools necessary to increase competitiveness, sustainability, digitalization. Produktion2030 provides test-beds, pioneering education in engineering project funding and dissemination actions for SMEs. Furthermore, Produktion2030 drives a number strategic projects to accelerate the manufacturing industry's entry into the digital age. Standardization, cyber security and a national platform for a "digital single market".

- Ms. Maria Beck, Member of the Executive Board, SME 4.0 - Competence Centers, Germany

  Effective Support Mechanisms for SMEs on their Way to Digitization: Practical Tips, Experiences and Success Stories

  The SME 4.0 Competence Centers for Digitization in Germany prepare the topics of digitization and networking for SMEs and offer practical help with the implementation. They are part of the funding initiative "Mittelstand 4.0 – Digital Production and Work Processes" from the German Federal Ministry of Economic Affairs and Energy. At the moment there are more than 15 SME 4.0 Competence Centers based all across Germany. The Competence center in Dortmund has a focus on SMEs from the manufacturing sector. It offers 21 different supporting services and basic information on digitization topics, which are free for SMEs. This presentation will share experiences and show best practices on how SME 4.0 Competence Centers effectively supports SMEs on their way to digitization.

- Prof. Charles W. Wessner, Global Innovation Policy, Georgetown University, USA

  Building the Industrial Commons: Manufacturing USA and the New York Nano-Cluster

  Recent research at Harvard Business School has underscored the need for an Industrial Commons, which is a place where companies large and small can cooperate with academia and each other to develop new technologies and new products. Work at the National Academy of Sciences has also illuminated the way other countries cooperate through, for example, the German Fraunhofer System or ITRI in Taiwan's Hinchu Park. This presentation will discuss the rationale for these public-private partnership's and the opportunity they provide for cooperative, applied research.

17:05 - 17:35 Coffee Break and Networking

17:35 - 18:05 KEYNOTE

- Prof. Dong Sub Kim, Chair Professor, Managing Director, Institute for the 4th Industrial Revolution, UNIST, South Korea

Technology and Innovation for the Future of Production

The future of production is expected to transform the manufacturing industry by utilizing technological and business model innovations. These technologies, including the Internet of Things, artificial intelligence, big data, smart sensor, advanced robotics, added materials, augmented/virtual reality, 5G communication systems, cloud computing and energy systems, are key enablers for the future of production. McKinsey reported that improvements in manufacturing productivity can create up to $1.5 trillion in 2025 by generating new jobs and new products. Despite this huge potential, most industry sectors are still in the early stages of adopting new technologies. A few Korea industry use-cases for large enterprises (LEs) and small and medium size enterprises (SMEs) are shown to share how implementation of important roles in employment and national production. However, the SME business model heavily depends on LEs and is constantly under pressure to reduce costs. A pilot project initiated by UNIST is underway to find solutions for SMEs by employing new technology and implementing new business models. In order to shape the future of production, international collaboration among large companies, small and medium sized companies as well as research institutes and universities is strongly recommended. This presentation will discuss a strategic approach to identify the new technologies of the 4th Industrial Revolution and proven use cases that transform the production value chain as well as it will demonstrate the added value of pilots and scale-ups to motivate and promote digital transformation.

18:05 - 19:35 SESSION 2

Connected Factories and Value Chains

Platforms for connected factories along a value chain ecosystem must be developed in a standardized way so that those entering or exiting a value chain may easily participate or disconnect. What are the reference architectures currently in development and how can they be implemented to create a value chain ecosystem?

- Session Chair: Dr. Christoph Runde, Vice-President of the European Virtual Reality Association
- Mr. Alejandro Nieto, VP of Global Sales IIoT Softtek, Mexico

  Three Keys for Making IoT Real for a Value Chain Ecosystem

  With the emergence of the Internet of Things (IoT) and Smart Manufacturing solutions, many manufacturers are already benefiting from an interconnected, networked factory environment where sensors, robots, machines, and more are contributing to their value chain ecosystem. But for many businesses, the reality of the IoT remains elusive. While the promise of the technology can't be denied, and while many firms are making this a top priority in their agendas; defining and implementing a strategy that moves the needle and yields quantifiable benefits presents a challenge. During this presentation, it will be discussed the three key elements that need to be accomplished to make IoT a reality and enable manufacturers to move beyond potential to achieving real results.

- Prof. Johan Stahre, Head of Division Production Systems, Chalmers University, Sweden

  5G Communication: Enabling the Next Generation World Class Manufacturing Systems

  Next Generation 5G Telecom solutions will enable a completely new platform for high-speed and high-security communication. Deploying 5G in advanced manufacturing systems will provide factory operators with mobile and extensive real-time control of almost any machine or device. By introducing 5G-connected sensors, not only new manufacturing plants can be integrated, but also brownfield installations may benefit from real-time and sensor-based control. Using 5G, cloud-based services allow machines to be remotely optimized or maintained and robots can use remotely located algorithms for navigation and safety measures. 5G solutions and standards will be available in a few years but experiences from a Swedish pilot project with telecom provider Ericsson, roller-bearing manufacturer SKF, and Chalmers University of Technology. This presentation will provide some hints of what the new 5G communication technologies are capable of for the manufacturing sector.

- Mr. Mike Lackey, Global Vice President of Solution Management, Digital Manufacturing SAP Labs, USA

  Digital Manufacturing Driving the Next Generation Operational Excellence with IoT and I4.0

  Profound shifts in society, business, and technology suggest that a new industrial revolution is underway. For example, manufacturers face increased cost pressure and market volatility. Product lifecycles are getting shorter, and products are becoming more complex as consumers demand individually made products. Manufacturing is in a digital transformational journey leveraging Industrial 4.0 in which technology merges physical and digital worlds throughout the entire value chain. Manufacturers are looking at strategies bringing operations closer to the end customer deploying new digital strategies to automate information flow and react to complex customer demands.

- Mr. Lokesh Payik, Chief of Business - Connected Industry, Emerging Markets, Bosch, India

  Unleashing the Potential of Industry 4.0 in Emerging Markets

  The inception of Industry 4.0 has triggered an extensive digital transformation across leading global industries and emerging market is not staying away for the revolution. Leading players are already reaping the benefits of digitizing their functions and processes. Industrial companies are leveraging manufacturing information technology, advanced automation, and analytics to improve asset performance, become more energy efficient, manage their costs, hasten new product introductions, and gain time-to-market advantages by achieving collaboration between development and production processes. For developed markets like Europe and USA, adopting Industry 4.0 has helped in regaining manufacturing competitiveness. Emerging markets such as Mexico and India, have a lot more to gain from these solutions as they offer a means to move up the value chain, in the face of rising labor costs. It is also creating and helping to realize new manufacturing concepts and jobs for the young new tech-savvy workforce. While emerging markets have already started their digital journey towards connected factories, some challenges still remain. Leading companies need to demonstrate that the gains from Industry 4.0 will justify the costs. Some progress has been made in this area, but many manufacturers, especially SMEs, are yet to gain confidence in the ability of the solutions. Other regulatory and policy-making challenges also exist, but governments globally have now begun to realize and have set frameworks in place to encourage digital transformation across the manufacturing sector.

19:50 Gala Dinner

- Mr. Fernando Turner, State Minister of Economy and Labor, State Ministry of Economy & Labor, Nuevo León, Mexico
  Nuevo León 4.0 Strategy Overview: A Smart State Initiative Led by Industry and Supported by Government and Academia

  Manufacturing in Nuevo León state is the most dynamic industrial sector, accounting for 25% of the state's GDP and 10% of all manufacturing in Mexico. This is the main reason why Nuevo León 4.0 (NL4.0) Initiative has been launched in May 2017, to ensure that manufacturing and all strategic industrial sectors and actors embrace the Fourth Industrial Revolution as an opportunity. NL4.0's tripe helix model incorporates the four major universities located at the state, its 12 strategic industrial clusters and government through its State Ministries of Economy and Labor, Education, and Science and Technology, as well as leading companies in the region. All actors working together towards a single objective of placing Nuevo León state as the leader of the Smart Economy in the American Continent. NL4.0's progress and transformational mechanisms include different working groups focus on Inviting to Action, Talent Development, Technological Infrastructure Enlargement, New Business Models, Industrial Policy and Proactive Partnership, which mandates will be shared during this presentation.

IMS Chairmanship Transition Ceremony from Mexico to the United States of America

- Master of Ceremony: Mr. Dan Nagy, Managing Director, IMS International
  - Outgoing IMS Chairman: Mr. Abraham Tijerina, Mexico
  - Incoming IMS Chairman: Mr. Jack Harris, USA

Wednesday, 8 November

08:00 – 09:00 Registration & Welcome Coffee + EXPO

09:00 – 09:15 OPENING REMARKS, DAY 2

- Mr. Jack Harris, Head of Delegation IMS United States, General Manager PDES Inc.

09:15 – 10:45 SESSION 3

Digital Workforce & Future Manufacturing Jobs

Connected manufacturing ecosystems will drive new architectures, but will also change how we utilize our workforce. The future company workforce will extend beyond its walls to also become interconnected as a shared resource. These employees will need to be agile, highly trained, and able to address rapid-fire challenges and changes. How do we train for such a workforce?

- Session Chair: Prof. Marco Taisch, Professor of Advanced and Sustainable Manufacturing, Manufacturing Group, School of Management, Politecnico di Milano, Italy
- Mr. Tony Bond, Executive Vice President & Chief Innovation Officer, Great Place to Work, United States

Organizations of the Future: The Essentials for Creating a Great Place to Work for All

The Organization of the Future will likely look a lot different from the organization of today. The forces of change including technology, demographic shifts, and ever-increasing transparency will greatly shift how work is performed in organizations across industries. Employees will need to master the skills that machines cannot do as well, critical thinking, innovative thinking, creativity and high emotional engagement with others. Leaders will need to be intentional in creating an environment that enables employees to develop and demonstrate these skills. Employees will likely have to be more agile and adaptive, updating their mental models based on changing realities. Organizations will have to build conditions where all employees can flourish, creating a great place to work for all. During this presentation, we will be exploring three big, existential questions related to designing the Organization of the Future: (1) How will organizations be able to learn, adapt and innovate to meet stakeholder needs faster than its competition?, (2) How will organizations be able to create an environment hat enables and promotes maximization of human potential, and (3) How can organizations maintain a culture design for the future that's people centric and a great place to work for all?

- Dr. Erastos Filos, Research Program Officer, DG Research & Innovation, European Commission

  Manufacturing Skills: A European Perspective

  Current technological developments in manufacturing put new demands on educational institutions and companies. Whilst educational institutions focus on developing curricula and training methods for the future manufacturing work force, companies need to specify and actively engage in developing further, e.g. through in-company vocational training, the required future skills. The Skills Agenda for Europe foresees a number of actions to ensure that the right training, the right skills and the right support will be available to the work force in the European Union. It aims at making better use of available skills, equipping people with needed new skills and helping them in finding quality jobs that will improve their life chances. Two of the 10 actions set forth by this agenda focus on 'Digital Skills and the Jobs Coalition' supporting co-operation among educational, employment and industrial stakeholders and on a 'Blueprint for Sectoral Cooperation on Skills' improving skills, intelligence and addressing skills shortages in specific sectors.

- Dr. Dominic Gorecky, Head of Swiss Smart Factory, Switzerland

  Training-as-a-Service & Open Training Platforms to prepare the Digital Workforce for Future Manufacturing Jobs

  In the future of Industry 4.0, all 'factory objects' will be integrated into decentralized, self-organizing networks. Production processes will become so flexible that even the smallest lot size can be produced cost-effectively and just-in-time to customer's individual demands. Customers can design and order products at the click of a mouse – and expect their products to be delivered within a few days – or even hours. Despite the huge potential of an Industry 4.0-based ecosystem, the introduction of Industry 4.0 enabling technologies is a complex challenge. Many socio-technical, interdisciplinary questions have to be answered first, including the appropriate education and training approach. This presentation explains, why novel training methods are one key element to prepare the digital workforce for future manufacturing jobs. Special emphasis is given to the introduction of 'Training-as-a-Service'-business models and open training platforms to overcome current bottlenecks in education of Industry 4.0 standards and concept. Through interactive and open live-training platforms, emerging technologies and concepts can be accessed at any time, at any place, by anyone and without any specific resource requirements. his will ultimately be leading us into the democratization of even highly complex technologies.

- Dr. Theodoros Ktistakis, Head of Region Central and South America, Festo Didactic SE, Germany

  Digital Skills Development for Smart Manufacturing in the Post 4th Industrial Revolution

  The factory of tomorrow will be networked and extremely flexible. The 'Industry 4.0' is yet used to describe trends of developments in the world of production, using Internet of Things (IoT) to create intelligence from components to production facilities. Such technological developments will bring flexibility of production, while achieving cost effectiveness of products' customization. But for Festo this is about much more than just technological developments. People, their qualifications and their further training are also critical success factors in the factory of the future. Across all its activities surrounding Industry 4.0, Festo focuses on the benefits of the users of automation technology to range higher productivity, and developing digital skills in the forthcoming of manufacturing.

10:45 – 11:15 KEYNOTE

- Ms. Helena Leurent, Head of Government Engagement, Member of the Executive Committee, World Economic Forum

  Four Contrasting Perspectives for the Future of Production

As part of an ambitious effort to assess and shape future global systems, the World Economic Forum has mobilized a number of distinguished individuals from around the world – representing government, civil society, academia and the private sector – to examine the Future of Production. The trajectory of production, especially up to the year 2030, is profoundly uncertain. At the core of this uncertainty are questions relating to advances in a number of technologies that are central to shifts in production, the shape of the external (or contextual) environment within which the future of production will unfold, the multilateral an instable world in which we now live, the lack of clarity regarding the future of the global economy, and the challenges all institutions are facing to adapt to a changing world and respond. Within this complex and volatile environment, four scenarios for the future of production will be presented: Disrupted, Deterred, Damaged and Devolved. These scenarios focus on exploring the contrasting visions of the future of production up to the year 2030 and are being used around the world to foster dialogue, explore potential implications and invite leaders to converge effectively towards shaping a more inclusive future through collaborative action.

11:15 – 11:45 Coffee Break and Networking

11:45 – 13:15 SESSION 4

Energy and Resource Efficient Manufacturing

Efficient use of resources will continue to drive manufacturing from business and social drivers. What are the major barriers for further efficiencies in manufacturing ecosystems? How can value chains drive these efficiencies in a cooperative way to spur innovation, reduce costs, and be environmentally responsible?

- Session Chair: Dr. Steve Ray, Distinguished Research Fellow, Carnegie Mellon University, US

- Mr. Marcus Baur, Director General, Bocar, Mexico

Resource Efficient Manufacturing of Automotive Parts

This presentation will focus on the description of different aspects and initiatives for improving energy consumption and resource efficiency. Vertical integration is Bocar's philosophy. To have all process in-house and have synergies in the whole value chain from receiving aluminum ingots to finish assembled aluminum modules and supply JIT to the assembly line at the customer engine plant. Standardized equipment is necessary to reduce complexity and increase flexibility. Several projects regarding Industry 4.0, which with data helps to better manage the equipment, process and technology. Different tools applied for the industrialization process and definition in the early development stage, (product and die simulation, layout simulation, monitoring systems and energy improvement software), also different approaches to have a better resource utilization, recovery or recycling (water, coolant, aluminum, sand, etc.).

- Dr. Pietro Perlo, CEO, Interactive Fully Electrical Vehicles, Italy

Flexible Low Investment Micro-factory for Safe, Secure and High Efficiency Electric Vehicles

This presentation addresses the flexible manufacturing of fully electric vehicles characterized by their efficiency, ability to recovery kinetic energy and harvest renewable energy. A novel method to produce safe chassis is proposed leading to a radical reduction of the needed investments. The presentation will show how costumers, supply chain, R&D, manufacturing plants and the full lifecycle of the produced vehicles can be managed by easy to implement Industry 4.0 concepts. The proposed energy independent micro-factories are studied to be easily replicated by all those regions and operators willing to manufacture their own state of-the-art vehicles without the usual constraints.

- Dr. Göran Granholm, Senior Scientist, VTT Technical Research Centre of Finland, Helsinki, Finland

  Sustainable Manufacturing: Designing Ecosystems for Multiple Values and Long-Term Success

  Advancements in manufacturing technologies, materials and digital solutions increased productivity and savings at factory level while networks of smart connected factories promise additional savings e.g. through efficient sharing of capacity. For further benefits, manufacturers need to look outside their own domain to include actors across the value chain in order to support collaborative innovation and achieve circular economy targets. This significantly increases network complexity and will force ecosystems to accommodate diverse, sometimes conflicting stakeholder values. In order to successfully deal with sustainability demands and individual business goals in the long run, the ecosystem itself must be sustainable and agile to change. This presentation looks into ongoing activities in the Finnish manufacturing industry.

- Mr. Randy Zadra, Senior Advisor and Director, National Research Council of Canada

  Improving Resource Efficient Manufacturing with Digital Technology

  This presentation will focus on how digital technology can lead to more efficient use of resources and improved energy efficiency in the manufacturing process. It will focus on how digital technology can have an impact at three levels: (1) Efficiency in Assembly - through the twinning and virtual provisioning of assembly lines and also enabling manufacturing cells for customization of products creating savings in materials usage along the value chain, (2) Factory Building Energy Management - at a factory wide level the use of advanced sensors serving a continuous stream of data in the cloud can enable improved building and energy management, detailed process flow assessments / analytics, and (3) Materials Management - using digital technology solutions to manage the characteristics of materials (i.e. composites, ceramics) can predict the eco-footprint of new designs, manage regulatory requirements, improve light weighting, strength and durability. Using Artificial Intelligence (AI) and deep earning for materials characterization can lead to less toxic materials and more efficient use of scarce materials. Furthermore, this presentation will also generally discuss how digital technology can enable transformation from a linear production economy (take > make > dispose) to a circular production economy, which is restorative in nature and regenerative by design. The scope for collaborative R&D in these areas will also be discussed.

13:15 – 14:15 Networking Lunch

14:15 – 15:45 SESSION 5

New Business Models & Service Engineering

The distinction between products and services has blurred as they are integrated into global manufacturing value chains. This major evolution will continue to expand and innovate thanks to powerful digital networks transforming regional businesses to globally integrated enterprises, and global enterprises to reach regional resources. What are the requirements, standards and barriers for these new business models?

- Session Chair: Ms. Lidia Robles, Director, Technology Liaison Center, Chamber of the Industrial Transformation of Nuevo Leon State
- Mr. Željko Pazin, Executive Director, European Factories of the Future Research Associations (EFFRA)
  How Manufacturing Evolves: Products, Systems, Services, Platforms

  The future of manufacturing in Europe and in the world, it is a future built on progress and innovation. It is a future that is shaped by companies, research institutes, universities which are engaged in applied research and also by governments that try to accompany this process. In Europe, this future is, among others, shaped by the European Union's €1.25 billion advanced manufacturing research and innovation partnership, Factories of the Future (FoF). The European Factories of the Future Research Association (EFFRA), the association which represents the industrial and research community within the FoF Public-Private Partnership (PPP), develops the Roadmap which provides the basis for this work. EFFRA identifies these challenges that are to be overcome and the technologies and skills that are necessary to do so. During this presentation will provide insights into the future of advanced manufacturing Europe and the world, covering topics such as digitisation and servitisation, thus showing how the character of manufacturing is changing. There is an ongoing shift from products (up to now) to systems, related services and digital platforms (more and more in future). This presentation will also show how projects are providing solutions to challenges faced by industry and how this enables the realisation of Industry 4.0 due to the multi-sector nature of the partnership. Over 250 projects have been launched since the start of the PPP with many having exploited their results as solutions within the factories, whereas others led to spin-offs that were created.

- Prof. Andrew Kusiak, Professor of Mechanical and Industrial Engineering, University of Iowa, Iowa City, Iowa, USA

  Smart Manufacturing with Big Data

  Smart manufacturing is an emerging form of production integrating manufacturing assets with sensors, computing platforms, communication technology, and data intensive modeling, control, simulation and predictive engineering. It utilizes the concepts of cyber-physical systems, internet of things, cloud computing, service-oriented computing, artificial intelligence, and data science. Once implemented, these technologies will make smart manufacturing the hallmark of the modern industry. Increasing volumes of data and information are being collected on materials, products, and equipment. Data analytics and predictive computer models are being developed to anticipate failures ranging from individual components to disruption of supply chains. The key characteristics of smart manufacturing are the greater use of data, predictive capability, resource sharing, networking, and sustainability. Driven by big data, predictive engineering enables building high-fidelity models of manufacturing phenomena. Such models explore previously unseen spaces. Resource sharing leads to better utilization of the investment made in the enterprise transformation. The shape of all industries will change in decades to come. Some forms of manufacturing will become highly distributed, while other enterprises will be tightly integrated. Insights into incoming changes in manufacturing are provided. Emerging concepts that may define smart manufacturing are presented.

- Prof. Sergio Cavalieri, Vice-Chancellor for Innovation, Technology Transfer and Research Valorisation & Director, Center for Industrial Engineering, Logistics and Services Operations, University of Bergamo, Italy

Product-Service Systems in the Age of Digitalization

The saturation and commoditization of global markets, where companies strive for attracting and retaining customers, has pushed manufacturing organizations to rethink their traditional dominant logic based on the provision of artifacts. The development of differentiation strategies rooted on the Product-Service System (PSS) paradigm may represent a key element for a sustainable competitive advantage. Thanks also to the disruptive opportunities given by the digital technologies, firms that are embracing the servitization shift are thoroughly changing their business models, their organizational structure and operational processes as well as their relationships with the end-customers, moving from a supply chain perspective towards an overall value ecosystem model and encompassing the whole solution lifecycle in order to address the volatility and volubility of the customers' needs.

- Ms. Geraldina Iraheta, Director of Business Development, Digital Catapult Centre, UK

Driving the UK Economy through Digital Innovation

The role of the Digital Catapult into growing the economy by accelerating the adoption and application of digital technology in the UK. Covering key leading edge technologies, what can we deliver, driving actors, next 5 years and case studies around CR&D projects and Open Innovation. The presentation will cover engagement models, key leading edge digital technologies application and projects, as well as case studies.

15:45 – 16:15 Coffee Break

16:15 – 17:45 SESSION 6
Technology Trends for the Factory of the Future

New manufacturing technologies to enable production of innovative products, drive resource efficiencies to lower costs, and provide better communication and satisfaction with customers. What are these technologies, standards, materials, and processes on the horizon?

- Session Chair: Mr. Mark Carlisle, Manager, Systems Integration Division, National Institute of Standards and Technology, USA

- Dr. Martin Sanne, Executive Director, Council for Scientific and Industrial Research, South Africa

  The 4th Industrial Revolution: An African Perspective

  The 4th Industrial Revolution (4IR) refers to collective technologies and concepts of value chain organization drawing together cyber-physical systems. By enabling 'smart factories', the 4IR creates a world in which virtual and physical systems of manufacturing globally cooperate with each other in a flexible way. In a future in which production gets more networked, the complexity of production and supplier networks will grow enormously. Networks have so far been limited to single factories but in an Industry 4.0 scenario, these boundaries will be lifted to interconnect multiple factories across the globe. Such disruptive technologies will change the nature of manufacturing at industry and firm level. Specific technologies that have potential to fundamentally change the nature of business, work and society include, inter alia, cloud technology, big data, predictive analytics, cognitive computing, artificial intelligence, mixed reality, agile robots, collaborative industrial robots, robotic exoskeletons, 3D printing/additive manufacturing, autonomous vehicles, bio-based materials, nano-coating, bio-sensors, 5G, wearable electronics and the IoT. Of particular significance to the developing world is that new sources of value will also be unlocked by this new manufacturing paradigm, e.g. Product Lifecycle Management, Opportunities to extensively package services with products (using augmented reality), Sources of information on how products are used and age, drawing on embedded sensors and open data, Becoming a 'factory less' goods producer capturing value by selling technological know-how and leaving physical production to others, Remanufacturing end of life products to original specifications or better, Creating value from new strategic alliances within and between sectors, and Exploiting new technologies more rapidly. It is also well known that manufacturing activity is associated with good economic multipliers and an International Finance Corporation study has also shown that the job multiplier effect rises as the manufacturing becomes more sophisticated, from about two for traditional manufacturing to 15 for the most advanced forms of manufacturing. Advanced Manufacturing can be a key to growing South Africa's GDP and provide employment and is a reference case for developing countries.

- Mr. Francisco Betti, Lead of Future of Production, World Economic Forum

Country Readiness for the Future of Production

As the Fourth Industrial Revolution gathers momentum, decision-makers from the public and private sector are regarding the future of production. Rapidly emerging technologies, such asthe internet of things, artificial intelligence, virtual reality, robotics and 3D printing, are fundamentally transforming production systems. The unprecedented speed and scope of this transformation add a layer of complexity to the already challenging task of developing and implementing new industrial strategies to increase productivity and drive inclusive growth. Each country has a unique set of challenges and opportunities, and disruptions in production systems will change the way in which countries compete. The development of an entire new set of capabilities and new multi-stakeholder collaborative efforts will be required for countries and the global economy to prosper and ensure a more inclusive future. At the request of leading governments and businesses, the World Economic Forum launched, the Shaping the Future of Production system initiative in January 2016. Its goal is to help leaders from government, business, academia and civil society better understand and shape the ongoing transformations of production systems. By engaging in this global initiative, leaders can learn from the experience of peers, stimulate and test new ideas, and determine the best way to prepare for the future of production. Within the framework of the initiative, the Country Readiness for the Future of Production project provides a new diagnostic and benchmarking tool, based on a data-driven approach, to help leaders assess the level of readiness of their respective countries and monitor progress over time. The new tool is supported by a policy toolkit that identifies action levers and provide practical recommendations for leaders to define joint actions and prepare for an effective transition towards the future of production. Key findings and conclusions drawn from the results of the diagnostic and benchmarking assessment will be presented to highlight the opportunities and challenges that leading manufacturing countries will be facing as they transition towards the future of production.

- Prof. Dimitris Kiritsis, Ecole Polytechnique Fédérale de Lausanne, EPFL, ICT for Sustainable Manufacturing, Switzerland

  Transforming Traditional Industrial Environments using Cutting-edge Technologies

  A major trend today for the Factory of the Future is providing solutions for context-aware control and re-adaptation of industrial production facilities for increased productivity and flexibility in use of shop floor resources. Data are collected by a network of smart sensors, processed by a centralized analysis system and ultimately redistributed to the concerned operatives via augmented reality glasses and other connected interfaces. The elaboration of a collaboration platform will increase real-time knowledge sharing. Improved shop floor feedback enables a better decision making for gains in productivity, workers well-being and comfort. Manufacturing Industrial Ontologies will provide efficient Semantic Domain Modeling and preparation of Big Industrial Data for Intelligent Analytics and contribute to address Interoperability challenges. This set of cutting-edge technologies will provide decision makers and knowledge workers with real-time informational support for incident management, maintenance, training and other industrial operations.

- Dr. Arian Zwegers, Programme Officer, DG Communications Networks, Content and Technology, European Commission

  Digitising European Industry: From Industrial Platforms to Standards

  The Digitising European Industry initiative aims to reinforce the EU's competitiveness in digital technologies and to ensure that every industry in Europe, in whichever sector, wherever situated, and no matter of what size can fully benefit from digital innovations. To achieve this, a number of actions are being executed, for instance on Digital Innovation Hubs and Digital Industrial Platforms. Digital Innovation Hubs facilitate the take-up of digital technologies by SMEs. Digital Industrial Platforms integrate various functions implemented by different technologies via clearly specified interfaces, and make data available for use by applications. Standardisation of platform components and interfaces enables inter-operation within and among factories.

17:45 – 17:55 Closing Remarks

- Prof. David Romero, WMF Scientific Chairman, Tecnológico de Monterrey

17:55 – 18:15 Announcing WMF 2018

- Mr. Fabrizio Sala, Vice-President of Lombardy Region, Italy
- Mr. Alberto Ribolla, President, Confindustria Lombardia, Italy
- Prof. Marco Taisch, Politecnico di Milano, Italy
- Mr. Jack Harris, Incoming IMS Chairman 2017-2019

18:25 WMF Cocktail

- Mr. Paulo Carreño, Director General, PROMEXICO, Mexico

Thursday, 9 November

8:30 - 12:00 WORKSHOP

Shaping the Future of Production in Mexico by the World Economic Forum By invitation only.

12:00 -13:00 Networking Lunch

13:00 - 14:30 WORKSHOP

Additive Manufacturing (AM) Research Cluster by IMS

Horno^3 – Fundidora Park, Room Polivalente

The IMS Additive Manufacturing (AM) Project Clustering Platform facilitates on-going projects on AM to share knowledge, provide broader solutions in less time, reduce research costs, and expand networks through building of international coalitions. Possible outcomes include combining and collaborating project research activities.

14:30 - 17:00 WORKSHOP

Intelligent Manufacturing Systems (IMS), in collaboration with The United States-Mexico Foundation for Science (FUMEC), the Tecnológico de Monterrey and PDES Inc. Consortium, cordially invite you to join us and actively participate at the:

Industry 4.0 Technologies Explorative Workshop

Horno^3 – Fundidora Park, Room Polivalente

This is a value-added bonus event to the World Manufacturing Forum 2017. The Workshop will focus on providing its attendees:

- A better sense of how your peers are approaching Industry 4.0
- Grow your network of potential manufacturing partners for open innovation and collaborative research.
- Gain insights into which aspects of Industry 4.0 make the most sense to introduce in your own operations towards new efficiency gains. Based on your industry input prior to the Workshop, we will be focusing our attention on two or three Industry 4.0 technologies to be defined by the attendees by taking part of the following survey: http://bit.ly/IMSIndustry40, which will also act as the registration mechanism for the workshop. Any insight you can provide will help IMS to define the most appropriate areas for future project clusters for international collaboration.

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