



World Manufacturing Forum 2014

MILANO
1-2 July 2014

“The way forward to prosperity through
Global Manufacturing Collaboration”

PROGRAM

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World Manufacturing Forum 2014

Program



Milano, Palazzo Mezzanotte, 1-2 July 2014



“In this climate of uncertainty, what is the way forward to advance manufacturing and innovation and provide growth and prosperity for all?”

As the world continues to experience economic challenges, policy makers have recognized manufacturing’s contribution to economic success as a strategic pillar to economic health. In response, governments are working to create favourable conditions for growth while industry is faced with volatile and highly competitive market conditions. Investors are reluctant to jump into the high-risk marketplace, and manufacturers are not always willing to use reserves to expand their business.

Adding to the complexity of a globalized marketplace, countries struggle with local cries for stricter import regulations, raw material control, and limits on technology transfer. Does the focus to bring jobs home mean we must forgo international cooperation to solve manufacturing challenges and advance technology? As jobs do come home, what’s next for emerging economies?

The Forum intends to discuss the creation of a cooperative global environment for sustainable innovation and game changing key technologies, development of common platforms for standards and interoperability, securing essential data in a connected world, and finding innovative ways to leverage applied R&D investments. As innovation drives demand for skilled workers, the Forum will also discuss cooperation between educational institutions and companies to train the next-generation of workers.

The Forum aims to bring together high-level industrialists, policy makers and key societal stakeholders across the globe for a cross-exchange of ideas on major macroeconomic trends and on manufacturing innovation. The World Manufacturing Forum will be held at the Palazzo Mezzanotte, 1-2 July 2014 in Milan, Italy: registration is free of charge to our invited guests thanks to the support from the European Commission, the Intelligent Manufacturing Systems (IMS) international cooperation program and our sponsors.

Mauro Piloni, Whirlpool, Chairman of WMF 2014
Robert Kiggans, IMS International, Chair of WMF 2014 Executive Board
Marco Taisch, Politecnico di Milano, Scientific Chairman of WMF 2014

PROGRAM OVERVIEW - Tuesday, 1 July 2014

08:00 - 09:00

Registrations

09:00 - 09:30

Welcome to the Forum

Robert G. Kiggans, IMS International, Chairman of the WMF2014 Executive Board, United States

Mauro Piloni, Whirlpool Corporation, Chairman of WMF2014, Italy

Marco Taisch, Politecnico di Milano, Scientific Chairman of WMF2014, Italy

Introductory speech

Zoran Stančić, Deputy Director General, DG CONNECT, European Commission
"Europe's Digital Agenda Supporting Innovation in Manufacturing"

09:30 - 11:20

Session 1: "Industrial Policies for Global Manufacturing"

Chair: **Mauro Piloni**, President, Whirlpool R&D and Global Vice President Advanced Development and Cross Product Categories Whirlpool Corporation, Italy

Manufacturing value chains stretch across boundaries while policies are local. The session will explore manufacturing policies from various regions including support for innovation, sustainability, and the common good in hopes to identify areas for cooperation.

Katy George, Director, McKinsey & Company, United States - "Next-Shoring: a New Perspective on Global Manufacturing"

Guillermo Rafael Fernández de la Garza, CEO, The United States-Mexico Foundation of Science, Mexico - "Global Sharing of Best Practices for Regional Manufacturing Innovation Support Systems"

Göran Roos, Chair, Advanced Manufacturing Council, Australia - "The Future of Manufacturing on What Success Requires"

Garth Williams, Director Advanced Manufacturing Technologies, Department of Science and Technology, Republic of South Africa - "Research and Development for Advanced Manufacturing in South Africa: The Last Decade and Beyond"

Valerio De Molli, Managing Director, The European House - Ambrosetti, Italy - "European Manufacturing Between Structural Trends and Future Perspectives: Taking up the Challenge"

11:20 - 11:50

Coffee Break and Sponsor Exhibits

11:50 - 13:30

Session 2: "Challenges and Opportunities in Next-Generation of Manufacturing"

Chair: **Dan Nagy**, Managing Director, IMS International, United States

The session will explore current manufacturing challenges and how they may shape the direction of production innovation. This may require meeting customers' varying design and quantity requirements through flexible manufacturing systems; transitioning from large scale production to small runs and back again.

Philippe Charlès, CEO DELMIA, Dassault Systèmes, France - "Manufacturing Innovation in the Age of Experience"

Tomas Hedenborg, Group CEO, Fastems Oy Ab, Finland - "Future of Manufacturing Industries: a Finnish Perspective"

Dianne Chong, Vice President Materials, Manufacturing, Structures & Support, Boeing Engineering, Operations & Technology, The Boeing Company, United States - "Design and Manufacturing Challenges for Future Aerospace Vehicle Structures"

Charles W. Wessner, Professor Global Innovation Policy, Georgetown University, United States
"Addressing the Innovation Imperative: Policy Support for Advanced Manufacturing"



13:30 - 14:30 Networking Lunch and Sponsor Exhibits

14:30 - 15:50 Session 3 - "Workforce Education and Human-Centered Manufacturing"
Chair: **Thomas R. Kurfess**, HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control, Georgia Institute of Technology, United States

One of the key factors for manufacturers to succeed in the highly competitive global marketplace is the availability of an educated, flexible and knowledge-based workforce. Excellence in education and educational opportunities for manufacturing companies are very important to satisfy the demands of the global economy. The workplaces of the future will therefore have to give more and more importance to the human dimension. The new workplaces should also provide extended services to the workers in terms of safety, accessibility and overall satisfaction.

Arturo Molina, Vice President, Research, Postgraduate Studies and Continuous Education, Tecnológico de Monterrey, Mexico - "Education that Makes Sense for a Dynamic World"

Peter Frise, CEO and Scientific Director, AUTO21 Network of Centres of Excellence, Canada - "Workforce Education & Human Centered Manufacturing in Canada's Automotive Sector"

Jouko Suokas, Executive Vice President, Smart Industry and Energy Systems, VTT Technical Research Centre, Finland - "People-Centric Solutions for Future Attractive Workplaces"

15:50 - 16:20 Coffee Break and Sponsor Exhibits

16:20 - 18:00 Session 4 - "Venture Capital/Ecosystems for Manufacturing Start-ups"
Chair: **Herbert von Bose**, Director Industrial Technologies, DG Research and Innovation, European Commission (Retired)

Many small to medium sized enterprises have difficulty finding venture capital for start-ups due to typical long-term return on investment, high risk, and other factors. The session intends to review best practices of established programs and explore how governments might provide additional policy support while funding programs to bridge the gap from R&D to commercialization.

William Mahoney, CEO, South Carolina Research Authority (SCRA), United States - "Innovative Programs for Start-Up Investments"

Diana Saraceni, General Partner and Co-Founder, 360° Capital Partners, European Union - "European Ecosystem for Manufacturing Start-Ups"

Manuel Sandoval, Executive Director of Export Projects, Export Promotion Unit, ProMexico, Mexico - "The Mexican Strategy for Advanced Manufacturing"

José Fernando Figueiredo, Chairman/President, European Mutual Guarantee Association (AECM), European Union - "Is Europe Financing the Cycle from R&D to Market?"

18:00 - 18:05 Wrap-Up Day One

19:30 Gala Dinner

PROGRAM OVERVIEW - Wednesday, 2 July 2014

08:00 - 09:00 Registrations

09:00 - 09:05 Welcome to Day Two

Ji Oh Song, Executive Vice President and Senior Advisor, Samsung Electronics, Republic of Korea

09:05 - 10:40

Session 5 - "Robotics for SMEs"

Chair: **Khalil Rouhana**, Director, Components & Systems, DG CONNECT, European Commission

SMEs (small to medium enterprises) represent a large, untapped market for the robotics industry worldwide. SMEs represent a different market with respect to large manufacturing companies requiring lighter, lower cost and flexible robots, with easy-to-use human interfaces and programming, in order to strengthen SMEs competitiveness. In the coming years, robotic solution providers are expected to provide cost-effective and flexible automation solutions for SMEs to respond to shorter production runs and enable rapid product changeovers to deliver consistent quality while raising productivity. Robotics for SMEs should be seen as robots working alongside humans as a third-hand in many engineering jobs. This session will explore the challenges for robotics adoption in SMEs and current available solutions.

Enrico Krog Iversen, CEO, Universal Robots, Denmark - "Collaborative Robots"

Bernd Liepert, CTO, KUKA AG, Germany - "Intelligent and Safe Human-Robot Collaboration"

Riccardo Tarantini, CEO, COMAU, Italy - "From Large Factory Automation to SME Robotics"

10:40 - 11:10

Coffee Break and Sponsor Exhibits

11:10 - 12:30

Session 6 - "Global Standards for Products and Manufacturing"

Chair: **Don Hemmelgarn**, President, ITI TranscenData Business, United States

The session intends to discuss technical, social and environmental standards for products and manufacturing systems that contribute to fair trade and exchange of products, services, and information in global manufacturing-service networks. Standards will always be a key for industry to guarantee fit-for-purpose and improve a company's social and environmental credentials, but they are not always adopted universally. As we look to future manufacturing systems in an ever-increasing networked and crowd-sourced world, standards will need to be adopted at a faster pace and used on global interoperable platforms.

Jordan Brandt, Technology Futurist, AutoDesk, United States - "A Protocol for Trillions"

Manuel Montoya Ortega, CEO, Automotive Cluster of Nuevo León, Mexico - "Meeting New Cloud Manufacturing Standards in an Increasingly Competitive Market"

Howard Mason, Corporate Information Standards Manager, BAE Systems, United Kingdom - "Industrial Data Standards - a Key Tool in the Global Economy"

12:30 - 13:30

Networking Lunch and Sponsor Exhibits



13:30 - 14:40

Session 7 - "Cyber Security Issues for Manufacturing"

Chair: **Michael F. McGrath**, Vice President, Systems and Operations Analysis, Analytic Services Inc. (ANSER), United States

As computing power becomes faster and more sophisticated and software becomes more complex and integrated into the manufacturing process, so does the ability for hackers to penetrate vital manufacturing systems, models, and sensitive intellectual property. This session will explore new ideas and challenges for cyber security in manufacturing.

Galina Antova, Global Head Industrial Security Services, Siemens Industry, United States - "Cyber Security Challenges and Trends for Industrial Control Systems"

Andrea Rigoni, Executive Vice President, FINMECCANICA S.p.a. - Group Security and ICT, Italy - "Cyber Security Issues for Aerospace and Defense Industry"

Keith Stouffer, Project Leader Cyber Security for Smart Manufacturing Systems, U.S. National Institute of Standards and Technology (NIST), United States - "NIST Cyber Security for Smart Manufacturing Systems Project"

14:40 - 15:10

Coffee Break and Sponsor Exhibits

15:10 - 16:30

Session 8 - "Game Changing Key Technologies for Manufacturing"

Chair: **Clara de la Torre**, Director Key Enabling Technologies, DG Research & Innovation, European Commission

Industry is under constant pressure to innovate products and processes to bring desirable goods at a fair price to market. New products, materials, and technologies are vital to manufacturers' long-term success. The session will explore some of the latest innovations that are changing the manufacturing paradigm.

Maurizio Gattiglio, Chairman, European Factories of the Future Research Association (EFFRA), European Union - "Megatrends & European Manufacturing"

Anton S. Huber, CEO Industry Automation Division, Siemens AG, Germany - "Automation in the Context of Industry 4.0"

Matteo Marini, CEO ABB S.p.A., Country Manager Italy and Regional Manager Mediterranean - "Automation as a Key to Productivity and Competitiveness"

16:30 - 16:45

Wrap-Up and Close

08:00 - 09:00 Registrations

09:00 - 09:30

Welcome to the Forum

Robert G. Kiggans, IMS International, Chairman of the WMF2014 Executive Board, United States

Mauro Piloni, Whirlpool Corporation, Chairman of WMF2014, Italy

Marco Taisch, Politecnico di Milano, Scientific Chairman of WMF2014, Italy

Introductory Speech

Zoran Stančić, Deputy Director General, DG CONNECT, European Commission – “Europe’s Digital Agenda Supporting Innovation in Manufacturing”.

09:30 - 11:20

Session 1: “Industrial Policies for Global Manufacturing”

Chair: **Mauro Piloni**, President, Whirlpool R&D and Global Vice President Advanced Development and Cross Product Categories Whirlpool Corporation, Italy

Manufacturing value chains stretch across boundaries while policies are local. The session will explore manufacturing policies from various regions including support for innovation, sustainability, and the common good in hopes to identify areas for cooperation.

Katy George, Director, McKinsey & Company, United States – “Next-shoring: a New Perspective on Global Manufacturing”

As we settle into the “new normal” catalyzed by the global financial crisis, ensuing recession, and uneven global recovery, traditional models for determining global manufacturing footprints seem increasingly outmoded. As wages and purchasing power rise in emerging markets, their relative importance as demand, not just supply, centers is growing. Global energy dynamics are evolving along with the shale revolution. And technological advances are enabling operational innovations while boosting the importance of workforce skills. Rather than “offshoring” or even “reshoring,” today’s manufacturing strategies need to focus on what is coming next. A next-shoring perspective considers the growing need for regional product adaptation, embraces new technologies that may disrupt costs and processes, addresses skill gaps that could compromise new manufacturing techniques, and prioritizes the development of new supply ecosystems around emerging technologies. This presentation will touch on the economic forces affecting the global manufacturing landscape, examine technologies coming to the fore, and suggest principles for executives and government leaders operating in a world where proximity to demand and proximity to innovation are becoming increasingly important to manufacturing strategy.

Guillermo Rafael Fernández de la Garza, CEO, The United States-Mexico Foundation of Science, Mexico – “Global Sharing of Best Practices for Regional Manufacturing Innovation Support Systems”

Manufacturing is key to economic success and to job creation. Worldwide innovation trends in manufacturing are challenging countries to tap the new opportunities in manufacturing. The open innovation environment at the global level creates impressive opportunities for less developed regions, able to design adequate regional manufacturing support systems, incorporating education, technology transfer support, applied research and business technology networks that facilitate the application of advanced manufacturing technologies developed all over the world. The experience of the advanced countries in developing these regional manufacturing innovation support systems is of great value and should be understood and properly adapted by many regions looking for improved manufacturing capabilities. The World Manufacturing Forum should give high priority to enhanced international cooperation to map and share these experiences. This presentation describes some of the successful cases of regional manufacturing innovation support systems, the national programs that serve as a context for them and the challenge to apply the lessons from these cases in less developed regions.



Göran Roos, Chair, Advanced Manufacturing Council, Australia – “The Future of Manufacturing on what Success Requires”

Manufacturing is, like all economic activities, in a state of constant change. This change is driven by changes in four groups of forces: Technology, Consumer and Customer Preferences, Forces that drive towards the geographic concentration of activities & forces that drive towards the geographic dispersion of activities. This presentation will outline what these forces are and how they are likely to develop over the coming period. The presentation will further outline what we have learned relating to firms that are very successful in environments of this type as well as what we have learned from those that have failed.

Garth Williams, Director Advanced Manufacturing Technologies, Department of Science and Technology, Republic of South Africa – “Research and Development for Advanced Manufacturing in South Africa: The Last Decade and Beyond”

Adopted in 2003, South Africa’s Advanced Manufacturing Technologies Strategy (AMTS) sought to improve the competitiveness of the manufacturing sector through indigenous research and development (R&D) in several technology areas in support of priority sub-sectors. The Department of Science and Technology (DST) is currently undertaking an implementation and outcomes evaluation of the AMTS to assess progress with its implementation and to assess whether the intended outcomes of the strategy have been achieved. The DST is also presently conducting a series of technology roadmaps to identify the priority R&D investment opportunities in support of advanced manufacturing over the next decade. The presentation will provide an update on both these initiatives, and will also present the findings of a study regarding perceptions and trends in relation to advanced manufacturing and job creation.

Valerio De Molli, Managing Director, The European House – Ambrosetti, Italy – “European Manufacturing Between Structural Trends and Future Perspectives: Taking up the Challenge”

Over the past decades, European manufacturing has changed profoundly. Its contribution to global value added has decreased, while geographic distribution of producers has changed due to globalisation. The 2008 economic crisis has put the European industry under further pressure.

The decline is due to long-term developments related to labour savings technologies, global value chains and the growing servitisation of the economy. Such elements also represent key success factors.

To attract innovative and competitive firms, the EU must comprehend the role of global value chains and services in modern manufacturing and put in place an ecosystem for growth.

11:20 - 11:50

Coffee Break and Sponsor Exhibits

11:50 - 13:30

Session 2: "Challenges and Opportunities in Next-Generation of Manufacturing"

Chair: **Dan Nagy**, Managing Director, IMS International, United States

The session will explore current manufacturing challenges and how they may shape the direction of production innovation. This may require meeting customers' varying design and quantity requirements through flexible manufacturing systems; transitioning from large scale production to small runs and back again.

Philippe Charlès, CEO DELMIA, Dassault Systèmes, France – "Manufacturing Innovation in the Age of Experience"

Industry decision makers have to face global competition, in a context of unpredictable demand and fast technology evolutions. How can they manage to consistently deliver the right product experience to their end customers round the world? The speech will explain how Dassault Systèmes provides them with a business platform to discover, understand and navigate the future by accelerating collaborative innovation, letting engineers and customers virtually experience new products, organize and run their global manufacturing operations. Global manufacturers such as Boeing, Safran and Toyota have successfully deployed game-changing Digital Manufacturing and production solutions to run their global production systems at their peak performance.

Tomas Hedenborg, Group CEO, Fastems Oy Ab, Finland - "Future of Manufacturing Industries: a Finnish Perspective"

Finland's economy is strongly depending on its exports. Technology industries have played a major role in the post-war development and enabled the development of leading positions in certain segments, despite the unfavorable geographical position. The rise of Nokia had a major impact as has had the recent fall. Other major players have moved production closer to the markets and into Life Cycle Cost. This creates a major challenge for the future of the industry, especially impacting the SME sector. The knowledge-based economy must develop further its innovation capabilities and take a leading role in driving industrial internet into supporting new innovative business models. The transformation of the Finnish technology industry will largely depend on the successful development of these business models and their enablers.

Dianne Chong, Vice President Materials, Manufacturing, Structures & Support, Boeing Engineering, Operations & Technology, The Boeing Company, United States – "Design and Manufacturing Challenges for Future Aerospace Vehicle Structures"

As we move into the future of aerospace, the design and manufacturing challenges will be driven by improved understanding of the current and emerging systems. There is a greater need for an understanding of the life cycle of all products and for an understanding of systems architecture.

Charles W. Wessner, Professor Global Innovation Policy, Georgetown University, United States - "Addressing the Innovation Imperative: Policy Support for Advanced Manufacturing"

The community of nations faces a series of interrelated challenges that will require new, innovative solutions if they are to be effectively addressed. Many of these challenges concern energy and the environment, but almost all countries need to address the challenge of productive employment, not least in the manufacturing sector. So what are countries doing to encourage innovation to address these challenges? In particular, how do some leading countries support manufacturing, and how effective are their programs? How is policy evolving in the United States to address these needs, and the new opportunities presented by the new technologies that underpin advanced manufacturing? Moreover, when there are new technologies, and new companies ready to exploit them, how can public authorities help them cross "the valley of death", that is the early stage funding gap that often proves fatal even to quite promising companies and technologies. These questions are key to learning best practice from others and generating the public private partnerships to adopt and adapt those lessons for future growth and employment.

13:30 - 14:30

Networking Lunch and Sponsor Exhibits



14:30 - 15:50

Session 3 - "Workforce Education and Human-Centered Manufacturing"Chair: **Thomas R. Kurfess**, HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control, Georgia Institute of Technology, United States

One of the key factors for manufacturers to succeed in the highly competitive global marketplace is the availability of an educated, flexible and knowledge-based workforce. Excellence in education and educational opportunities for manufacturing companies are very important to satisfy the demands of the global economy. The workplaces of the future will therefore have to give more and more importance to the human dimension. The new workplaces should also provide extended services to the workers in terms of safety, accessibility and work satisfaction.

Arturo Molina, Vice President, Research, Postgraduate Studies and Continuous Education, Tecnológico de Monterrey, Mexico - "Education that Makes Sense for a Dynamic World"

Traditional education models are facing a challenge. Young people are looking for new ways to be educated without spending years in college and university studies, sometimes because education is not "paying-off" to find the right job. The concept of life long learning using Information Technologies (such as MOOCs: Massive Open Online Courses) is putting pressure on educational institutions and their continuing education programs. On the other hand, industries are reluctant to undertake workforce development based on-the-job training because: 1) It is too expensive to train people, 2) Managing the workload when people are continuously in training is impossible, 3) Employees take advantage of training investments and use them to get a better job elsewhere, 4) Employees do not always like training. The task for academic institutions and industry is to design and create innovative educational models that are customized for the needs of the future workforce that allows them to develop high value knowledge and skills, motivates them to achieve lifelong learning abilities and offers them an opportunity for career development in a dynamic world.

Peter Frise, CEO and Scientific Director, AUTO21 Network of Centres of Excellence, Canada - "Workforce Education & Human Centered Manufacturing in Canada's Automotive Sector"

The auto industry is Canada's largest business sector, employing more than 300,000 people including over 135,000 workers in vehicle and parts design and manufacturing. This \$110+B business is the largest source of exports for Canada and one of the largest providers of technical careers in the economy. The global auto sector is striving to enhance vehicle performance in three key technology drivers: green performance; safety and connectivity. As a result, even higher levels of technical education and development are necessary to develop competitive new products. The presentation will provide recent examples of each of the technology drivers plus how technical education in Canada is meeting these challenges and contributing to the economy.

Jouko Suokas, Executive Vice President, Smart Industry and Energy Systems, VTT Technical Research Centre, Finland - "People-Centric Solutions for Future Attractive Workplaces"

Manufacturing is increasingly challenged by economic, socio-political, and technological dynamics that influence products, production, and company processes. These dynamics include high-demand turbulence, short product life cycles, and demand for customized and adaptable products. Technology changes rapidly and new regulations and environmental values become more important in society. Work is changing, and factory work becomes more and more unwanted in the eyes of younger generations. High pressure on quality, costs, and delivery times change the competition edges. The dynamic environment is a remarkable challenge for future knowledge workers at factories. These challenges can be overcome with smart solutions that increase productivity, knowledge sharing, learning and work attractiveness. New tools of augmented and virtual reality can give new possibilities to get actual information from the operators and workers to be utilised in design of effective, safe, and ergonomic work places. New concepts integrating ICT enablers and advanced interaction methods will be presented and discussed.

15:50 - 16:20

Coffee Break and Sponsor Exhibits

16:20 - 18:00

Session 4 - "Venture Capital/Ecosystems for Manufacturing Start-Ups"

Chair: **Herbert von Bose**, Director Industrial Technologies, DG Research and Innovation, European Commission (retired)

Many small to medium sized enterprises have difficulty in finding venture capital for start-up due to a typical long-term return on investment, high risk, and other factors. The session intends to review best practices of established programs and explore how governments might provide additional policy support and funding programs to bridge the gap from R&D to commercialization.

William Mahoney, CEO, South Carolina Research Authority (SCRA), United States - "Innovative Programs for Startup Investments"

The session intends to share best practices and lessons learned of SCRA, an innovative revenue-funded, non-profit Applied R&D company that has been investing in technology start-ups since 2006. A variety of investment schemes and grants available to position companies for growth will be reviewed. Under the program Start-ups that meet prescribed milestones and due diligence requirements may be offered further investment opportunities. Additional resources such as financial management, human resources, marketing, training, and other services are integral to the program. Along with these services, mentoring and support provide an internationally recognized ecosystem for success.

Diana Saraceni, General Partner and Co-Founder, 360° Capital Partners, European Union - "European Ecosystem for Manufacturing Start-Ups"

Outlook for European Venture Capital is generally uncertain at the moment. On the one hand, the asset class is relatively poorly funded by traditional institutional investors (participation to private funds discouraged by all safety ratios recently introduced). On the other hand, corporate investors as well as governments, are backing the industry and are strongly active. In this context of semi-scarcity of capital, we will discuss how manufacturing based start-ups compete with other investment propositions, most often lighter in capital request.

Manuel Sandoval, Executive Director of Export Projects, Export Promotion Unit, ProMexico, Mexico - "The Mexican Strategy for Advanced Manufacturing"

Mexico is the most important manufacturing centre in Latin America. Currently, Mexico accounts for 2.16 percent of world trade and 2.20 percent of non-oil world trade. Thanks to its competitive advantages, Mexico is the leading exporter in Latin America; 80% of Latin American exports of high technology goods are manufactured in Mexico. On the other hand, even though this development model has managed to keep Mexico in a competitive position, in relation to its volume of exports, it has not generated a significant base of suppliers capable of providing endogenous innovation and nationally registered intellectual property, which, added to foreign investment, could increase the added value of its products and the strategic position of Mexico regarding the international innovation market. This becomes more relevant if you consider that Mexico today has more engineering students than any U.S. country and three times as many graduates per capita in this field. This unprecedented window of opportunity, as well as the country's comparative and competitive advantages, point to a privileged position for the development of an industry based on the innovation of high added value. This is even more surprising if you consider that the Index of Technological Sophistication of goods produced in Mexico (3.25) is higher than that of India (2.61) or Brazil (2.49). The ingredients are there; the only element missing is strategy. The development of a correlated value added network of design, engineering and advanced manufacturing capabilities is a clear challenge for the Mexican manufacturing ecosystem. The lack of capacity of this network hampers the local productions of non-complex products, thus creating a dependency on foreign suppliers and also favouring the development of merely assembling companies. Local design and engineering capacity should be harnessed and developed, attracting higher value and, above all, it should maintain control over capital goods and intellectual property. The strategy is mainly supported in the creation of an advanced manufacturing network of research centres, universities and companies with regional specialization according to specific sectors and niches of opportunity.



José Fernando Figueiredo, Chairman/President, European Mutual Guarantee Association (AECM), European Union - "Is Europe Financing the Cycle from R&D to Market?"

- : The idea is to present some examples of measures being taken at a European level to provide
- : better financing tools, particularly venture capital and guarantees, in order to help bridge the
- : gap from R&D to commercialization. New possibilities are opening with Horizon 2020 from
- : the EU. How is the relationship between private investors and public authorities evolving?

18:00 - 18:05

Wrap-Up Day One

19:30

Gala Dinner

08:00 - 09:00 Registrations

09:00 - 09:05

Welcome to Day Two

Ji Oh Song, Executive Vice President and Senior Advisor, Samsung Electronics, Republic of Korea

09:05 - 10:40

Session 5 - "Robotics for SMEs"

Chair: **Khalil Rouhana**, Director, Components & Systems, DG CONNECT, European Commission

SMEs (small to medium enterprises) represent a largely untapped market for the robotics industry worldwide. SMEs represent a different market with respect to large manufacturing companies requiring lighter, lower cost and flexible robots, with easy-to-use human interfaces and programming, in order to strengthen SMEs competitiveness. In the coming years, robotics solution providers are expected to provide cost-effective and flexible automation solutions for SMEs to respond to shorter production runs and enable rapid product changeovers to deliver consistent quality and raise productivity. Robotics for SMEs should be seen as robots working alongside humans as a third-hand in many engineering jobs. This session will explore the challenges for robotics adoption in SMEs and current available solutions.

Enrico Krog Iversen, CEO, Universal Robots, Denmark - "Collaborative Robots"

- View on the trend for robots and collaborative robots with fencing to the SME market. View on the new robot standard TS 15066. Challenges are seen on how to agree on criterias and measurements.

Bernd Liepert, CTO, KUKA AG, Germany - "Intelligent and Safe Human-Robot Collaboration"

- KUKA's latest product innovation – the lightweight robot LBR iiwa – is enabling a paradigm change in robot-based automation, not only in large scale manufacturing, but also for SMEs. Workers and robots can safely and productively collaborate and co-exist in the same workspace. The technological highlights of this new robot will be presented. SME manufacturing use cases will be explained. A few uses of the LBR iiwa technology will be exemplified to demonstrate how it will change the world of manufacturing.

Riccardo Tarantini, CEO, COMAU, Italy - "From Large Factory Automation to SME Robotics"

- One of the most important requirements today, both for large industries and especially for the SME, is to design manufacturing engineering production systems that are able to effectively respond to economic trends for the manufacturing of new products. COMAU's experiences and ability to respond quickly in order to achieve low-cost per unit goals will be described through a combination of the following driving factors for robotic systems: investment reduction, space reduction, high process quality and flexibility, easy programmability and integration (plug & play), as well as lean manufacturing concepts.

10:40 - 11 :10

Coffee Break and Sponsor Exhibits



11:10 - 12:30

Session 6 - "Global Standards for Products and Manufacturing"Chair: **Don Hemmelgarn**, President, ITI TranscenData Business, United States

The session intends to discuss technical, social and environmental standards for products and manufacturing systems that contribute to fair trade and exchange of products, services, and information in global manufacturing-service networks. Standards will always be a key for industry to guarantee fit-for-purpose and improve a company's social and environmental credentials, but they are not always adopted universally. As we look to future manufacturing systems in an ever-increasing networked and crowd-sourced world, standards will need to be adopted at a faster pace and used on global interoperable platforms.

Jordan Brandt, Technology Futurist, AutoDesk, United States - "A Protocol for Trillions"

What happens when machine instructions to manufacture your product are measured in petabytes? This might be manageable when a single item being mass-produced, but what about when each is entirely unique? In the coming decade, meta-materials will be optimized on the micron scale and customized per individual. 3D printing, distributed production, algorithmic design, and personalized demand are coalescing into an entirely new future for manufacturing. Leveraging these trends and technologies, start-ups and emerging markets will leapfrog the hegemony of centralized production to embrace a new distributed paradigm. This session explores the indicators of this shift and posits a strategy to manage digital supply chains of exponential magnitude.

Manuel Montoya Ortega, CEO, Automotive Cluster of Nuevo León, Mexico - "Meeting New Cloud Manufacturing Standards in an Increasingly Competitive Market"

The emergence of cloud manufacturing, virtualization, advanced computing technologies, integrated sensing, and the industrial internet, implies the requirement of new standards for massive data management, traceability, safety and productivity. This session will focus on the current and future regulations and standards required by the global automotive industry and the challenges envisioned to make this transition in an increasingly competitive global market.

Howard Mason, Corporate Information Standards Manager, BAE Systems, United Kingdom - "Industrial Data Standards: a Key Tool in the Global Economy"

Large organizations, like BAE Systems, continuously develop and change to meet new business, technology and product opportunities. To support these changes, the suite of industrial data standards that provide the foundation for our evolving business also needs to change and adapt. This presentation will provide a brief history of the evolution of product data standards in BAE Systems and its predecessor companies, from 1976 to the present day and looking forward to the implications for the future. It will be illustrated by applications where standards have had a significant and direct impact on business success.

12:30 - 13:30

Networking Lunch and Sponsor Exhibits

13:30 - 14:40

Session 7 - "Cyber Security Issues for Manufacturing"

Chair: **Michael F. McGrath**, Vice President Systems and Operations Analysis, Analytic Services Inc. (ANSER), United States

As computing power becomes faster and more sophisticated, and software becomes more complex and integrated into the manufacturing process, so does the ability for hackers to penetrate vital manufacturing systems, models, and sensitive intellectual property. This session will explore new ideas and challenges for cyber security in manufacturing.

Galina Antova, Global Head Industrial Security Services, Siemens Industry, United States - "Cyber Security Challenges and Trends for Industrial Control Systems"

Initiatives such as Industry 4.0 and the Internet of Things (IoT) enable near real-time access to manufacturing and device data in order to enhance productivity and empower business decisions. This rapidly expanding data interconnectivity, coupled with the rising number and complexity of cyber attacks, poses new challenges in securing the manufacturing shop-floor. It is widely recognized that enterprise cyber security solutions cannot be copied one-to-one to the Industrial Control System (ICS) security domain. Regulatory entities are in a race to provide practical frameworks, but the main challenge remains the limited global availability of expertise that combines the deep knowledge of process engineering with that of cyber security principles. We will present the unique challenges of securing ICS from various perspectives: automation vendors, end users and policy makers, and will drive towards a common view of the needed solutions.

Andrea Rigoni, Executive Vice President, FINMECCANICA S.p.a. - Group Security and ICT, Italy - "Cyber Security Issues for Aerospace and Defense Industry"

Aerospace and Defence (A&D) industry is on the one hand a provider of cyber security solutions for private or public entities, and on the other hand a target for hackers and other malicious activities.

The critical cyber threats to this sector are mainly of two kinds: data breaches implying the theft or violation of Intellectual Property, patents, or classified information; or attacks to the Industrial Control Systems (ICS), which may hamper the production activities. The former are more frequent than the latter. In our company we have had no incident related to ICS disruption.

Moreover, given the specific nature of A&D industry, which is closely linked to national security, data breaches are even more dangerous than other kinds of cyber threats. The reasons for stealing industrial information from A&D companies may include foreign intelligence services, industrial espionage or unfair competition. The ways to protect the data may involve the private company, the national Ministries of Defense, or intelligence agencies.

Keith Stouffer, Project Leader Cyber Security for Smart Manufacturing Systems, U.S. National Institute of Standards and Technology (NIST), United States - "NIST Cyber Security for Smart Manufacturing Systems Project"

The NIST Cyber Security for Smart Manufacturing Systems project focuses on developing a cyber security risk management framework with supporting guidelines, methods, metrics, and tools to assess and assure cyber security for manufacturing systems. The project is also developing a cyber security test bed for industrial control systems. The goal of this test bed is to measure how performance aspects such as timing, stability, reliability, and safety are impacted when security technologies are implemented in accordance with best practices prescribed by national and international standards and guidelines.

14:40 - 15:10

Coffee Break and Sponsor Exhibits



15:10 - 16:30

Session 8 - "Game Changing Key Technologies for Manufacturing"

Chair: **Clara de la Torre**, Director Key Enabling Technologies, DG Research & Innovation, European Commission

Industry is under constant pressure to innovate products and processes to bring desirable goods at a fair price to market. New products, materials, and technologies are vital to manufacturers' long-term success. The session will explore some of the latest innovations that are changing the manufacturing paradigm.

Maurizio Gattiglio, Chairman, European Factories of the Future Research Association (EFFRA), European Union - "Megatrends & European Manufacturing"

Challenges facing manufacturing must be seen against a background of megatrends - that is the global developments which confront all regions, peoples and economic activities. Such megatrends present both challenges and opportunities for European manufacturing. Europe's manufacturing research community has identified four overall challenges and opportunities which must be addressed. These are the manufacturing of future products, economic, social and environmental sustainability. In order to remain competitive, manufacturing in Europe must not only overcome such challenges but must also capitalise on the opportunities which they present. As an enabling technology, manufacturing will produce other enabling technologies which will provide solutions to the challenges identified. In Europe, a 'Factories of the Future' partnership is already addressing research and innovation priorities which will explore means by which technologies and enablers can be developed, applied and integrated to address the challenges and capitalise on results.

Anton S. Huber, CEO Industry Automation Division, Siemens AG, Germany - "Automation in the Context of Industry 4.0"

The Internet allows companies to reach their customers individually and instantly on a global basis. This capability accelerates competition amongst manufacturers significantly. Market share gains and saturation of markets happen in a fraction of the time known from the recent past. Constantly and significantly reducing time to market becomes the decisive factor for companies around the world.

In order to mitigate these challenges, manufacturers have to move to completely new manufacturing processes like mass machining, 3D printing and the application of autonomous robots. In addition the entire creation process of products from definition to maintenance must be accelerated by a seamless software support of the entire value-add process allowing extensive usage of digital mock-ups and systems simulation.

Automation providers battle the rising challenges and the ever increasing technological complexity with initiatives like Industrie 4.0 and Internet of things (IoT). The presentation illustrates the challenges and outlines possible solutions.

Matteo Marini, CEO ABB S.p.A., Country Manager Italy and Regional Manager Mediterranean, Italy - "Automation as a Key to Productivity and Competitiveness"

Lean, smart, flexible and efficient processes are key elements supporting the manufacturing industry in building its productivity and, as a result, its competitiveness and ability to cope with fast changing market requirements. The answer in a single word is automation - which permeates continuous and discrete manufacturing processes with solutions aimed at improving and optimizing the use of resources while maximizing quality and output of production flows. An overview through latest innovations in control and automation technologies as well as in robotics, with examples both from customer applications and ABB Italian manufacturing sites, where automation is deeply applied, will show how automation can contribute to improve the competitiveness of Italian manufacturers on the global markets.

16:30 - 16:45

Wrap-Up and Close

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The Organization of the World Manufacturing Forum 2014 consists of three groups. The EXECUTIVE BOARD, the PROGRAM COMMITTEE, the LOCAL ORGANIZING COMMITTEE.

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