

Forum on the Future of Manufacturing

March 4, 2015

Orchid Hall, Intercontinental Hotel, Seoul, Korea

Hosting organization

- College of Engineering Seoul National University, Korea
- The National Economic Advisory Council
- Chosun Daily

Participant organization

- Fraunhofer
- Massachusetts Institute of Technology (MIT)
- The Korea Chamber of Commerce & Industry



Schedule

Seoul National University

Date : March 4, 2015 :

Venue: Orchid Hall, Intercontinental Hotel, Seoul, Korea

Time	Content
09:00 ~ 09:20	Registration
09:20 - 09:40	Opening ceremony
09:40 ~ 11:00	Session I : The role of manufacturing for sustainable economic growth Keynote speech by Prof. Anthony, Brian.W. (MIT) Keynote speech by Prof. Pahk, Heui-Jae (Ministry of Industry, Trade, and Energy) Discussion
11:00 ~ 11:10	Coffee break
11:10 ~ 12:30	Session II : Status of manufacturing Keynote speech by Prof. Hardt, David.E. (MIT) Keynote speech by Dr. TCHA, Moonjung (KDI) Discussion
12:30 ~ 13:30	Lunch break
13:30 ~ 14:50	Session III : Future technologies for manufacturing Keynote speech by Prof. Sachs, Emanuel M. (MIT) Keynote speech by Prof. Cha, Sang Kyun (SNU) Discussion
14:50 ~ 15:00	Coffee break
15:00 ~ 16:20	Session IV : Action agenda for the future of manufacturing Keynote speech by Dr. Sauer, Olaf (Fraunhofer) Keynote speech by Prof. Han, Chonghun (SNU) Discussion
16:20 ~ 16:30	Coffee break
16:30 ~ 17:50	Session V : Prospects and recommendation for the future of Korean manufacturing Keynote speech by Prof. Lee, Jeong-Dong Discussion

Invitation

Seoul National University

The strong manufacturing sector is a foundation for the competitive economy and a source of decent jobs, and will ultimately lead to a sustainable economic growth. However, with shorter technology life cycles and less certain business environments, it becomes harder to plan appropriate strategies for improving the manufacturing sector. Specifically, in Korea, there have been ever increasing concerns for weakening industrial competitiveness therefore reducing the potential for growth. This calls for a national level consensus of upgrading the manufacturing sector and of preparing the economy for future challenges. Advanced countries including the United States and Germany also endeavor to find measures to improve future manufacturing. Recently, the Massachusetts Institute of Technology (MIT) in the United States suggested the important concept of “Production in the Innovation Economy (PIE)”, and published a report in 2013 titled, “Making in America.” The German government proclaimed its initiative for “Industry 4.0” which refers to the next-generation manufacturing combined with information technology. In this context, the College of Engineering at Seoul National University (SNU) invites distinguished scholars to the forum and shares the vision on the future of manufacturing in order to suggest initiatives for the Korean economy. This forum will provide an opportunity for the key experts in this field to acknowledge together the importance of manufacturing and build a consensus on a strategic action agenda.

Session Overview

Seoul National University

Session I : The role of manufacturing for sustainable economic growth

Development of manufacturing has played pivotal roles in the economic growths of many developed countries. Indeed, Korea has also seen the phenomenal economic growth by gaining export competitiveness in several key manufacturing industries. However, the Korean economy has recently been stuck in low-growth since the 2000s. At this point in time, the promotion of manufacturing can serve as an effective measure to overcome the economic slowdown since manufacturing is the root of innovation and can greatly affect the general economy by producing quality jobs and simultaneously driving the advancement of other economic sectors including the service industry. For this reason, countries around the globe are seeking measures to promote manufacturing. This session will examine various contributions of manufacturing to the economic growth.

Session II : Status of manufacturing and areas to be improved

Of the OECD countries, Korea shows the highest share of manufacturing to GDP of approximately 30 percent, which is showing a gradually increasing tendency. Yet, the share of overseas production in manufacturing has also continued to rise (18 percent in 2012) and is raising concerns over a “hollowing-out” in Korean manufacturing. Further, Korea’s manufactured exports are losing competitiveness due to Japanese firms’ recovery in price competitiveness through the weakening Japanese yen and Chinese firms’ fast pace of technological catch-up. Specifically in terms of structure, Korean manufacturing relies heavily on capital investments, and thus calls for structural transformation to a technology-intensive manufacturing structure. This session will look at the diverse challenges that manufacturing faces in terms of technological knowledge, business strategy, and human resources.



Session III : Future technologies for manufacturing

Manufacturing in the future will vary greatly from what we have witnessed heretofore. Advancements such as the introduction of smartphones and the widespread adoption of 3D technology have proven that the convergence of ICT with traditional manufacturing can create new values. It is expected that this convergence, of which enables the utilization of a gross amount of new information, will generate new demand by suggesting a novel paradigm. Meanwhile, incremental progression in innovation will continue in the field of platform technology such as the components and materials industry. Yet, the value of the products from such industries will be decided by the long-accumulated know-how and technical skills of the industries. This session will investigate the paradigm of technology which will govern the competitiveness of future manufacturing and explore the responsibilities of the industrial sector and academia in this respect.

Session IV : Agenda for the future of manufacturing

The future environment of the manufacturing industry will require change in various aspects. Businesses at the frontline of change will need to make efforts to seek measures to survive in a different environment from the past. However, business efforts are equally closely associated with governmental policies targeting the construction of an industrial ecosystem such as the promotion of small-and-medium sized ventures. In this respect, this session will examine the corresponding responsibilities of the industrial sector, government and academia in preparation for the future manufacturing industry.

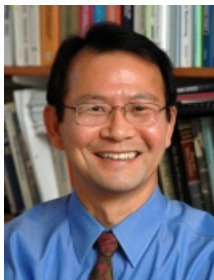
Session V : Prospects and recommendation for the future of Korean manufacturing

Seoul National University's College of Engineering is currently carrying out the task of suggesting and producing a summary of the pending issues for the Korean manufacturing industry in order to spur economic growth in the country. The in-depth opinions of experts from each field of industry will be assembled in an effort to diagnose the current state of the Korean industry and to further propose various measures of improvement for the industry's future assignments. During this session, the draft of the above-mentioned work will be presented in order to share opinions and receive feedback.

Participant

Seoul National University

— Moderators (TBA)



**Prof. Chun,
Jung-Hoon**

Professor and
Director,
Manufacturing and
Productivity, MIT,
USA

- 2005-present Fellow, International Academy for Production Engineering
- 2004-present Faculty Fellow of the Singapore-MIT Alliance
- 1984-1989 Vice president, Suteck Corporation

Dr. Chun is an expert in mechatronic engineering. Before joining MIT, he commercialized the Mixalloy process at Sutek Corporation producing dispersion hardened copper alloys for the automotive industry. His research focuses on the development of innovative manufacturing processes. Dr. Chun has also been instrumental in forming numerous industry-MIT research consortia and international collaborative research programs.



**Prof. Lee,
Kunwoo**

Professor and
Dean, College of
Engineering, SNU,
Korea

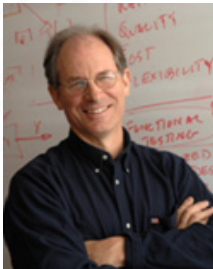
- 2013-present Fellow, American Society of Mechanical Engineers
- 2009-2013 Chair of International Affairs, The National Academy of Engineering of Korea
- 2004-present Editor-in-Chief, Computer-Aided-Design (Journal, Elsevier)
- 1998-present Founder, K&I Technology Co.

Prof. Lee is a pioneer who disseminated CAD/CAM technologies in the Korean industry. In 1990, he developed the three dimensional modeling system, SUNMOD, which was unique and the first of its kind in Korea. Then, since 1998, he further developed a human body scanning system, 3D Scanner & Simulation, and founded the K&I Technology Co. He had served as the president of the Advanced Institute of Convergence Technology and leads the research on technological convergence among NT, BT, and IT.

Participant

Seoul National University

Speakers (TBA)



**Prof. Hardt,
D. E.**

Ralph E. and Eloise
F. Cross Professor
in Mechanical
Engineering,
Massachusetts
Institute of
Technology

- 2011-2012 Advanced Manufacturing Partnership Workforce subcommittee
- 1999-2001 Chair, Integration Committee Next Generation Manufacturing Project (NST, NIST, DoD)
- 1985-1994 Director, Laboratory for Manufacturing and Productivity School of Engineering, MIT

Dr. Hardt has been a faculty member of MIT since 1979 and has also served as an expert in mechanical engineering and manufacturing in many important committees, symposiums, projects and journals. His disciplinary focus is system dynamics and control, as applied to manufacturing at both the process and system level. His current research includes an effort to use multivariable optimal control methods to better manage collaborative supply chains.



**Prof. Sachs,
E. M.**

Fred Fort Flowers
and Daniel Fort
Flowers Professor
of Mechanical
Engineering,
Massachusetts
Institute of
Technology

- 2007-Present Co-founder, Chief Technical Officer and Director, 1366 Technologies, Inc.
- 1994 Award Winner for his work on 3D Printing, Annual R&D 100 Awards

Dr. Sachs has been a faculty member of MIT since 1986 and specializes in the design of high-efficiency manufacturing processes. He co-invented 3D Printing, which is being commercialized in numerous fields-of-use. He is also known for his work in the area of Process Control of Very-Large-Scale Integration (VLSI) fabrication. Before joining the MIT faculty, he spent 7 years working in the photovoltaics industry.

Participant

Seoul National University



**Dr. Anthony,
Brian. W.**

Director of Master
of Engineering in
Manufacturing
Program, MIT, USA

- 2014-present Deputy Director, MIT Skoltech Initiative
- 2011-present Co-Director, Medical Electronic Device Realization Center
- 2006-present Director, Master of Engineering in Manufacturing Program

Dr. Anthony has been dedicated in systems analysis and design with over 20 years' experience. The focus of his research is computational instrumentation - the design of instruments and techniques to measure and control complex physical systems. In addition to his academic work, he has extensive experience in market driven technology innovation, product realization, and business entrepreneurship and commercialization at the intersection between information technology and advanced manufacturing.



**Dr. Sauer,
Olaf**

Deputy Head of the
Fraunhofer Institute
of Optronics,
System
Technologies and
Image Exploitation
(IOSB)

- 2012-present Deputy Head and Head of Automation Business Unit, Fraunhofer IOSB
- 2004-2011 Head of Business Control Systems, Fraunhofer ISOB
- 1999-2004 Director and member of the Executive, METROPLAN Produktion GMBH

Dr. Olaf specialized in production engineering and after working at Fraunhofer Institute for Production Systems Design Technology and Bombardier Transportation, he started his own business within the METROPOLAN group dealing with production and material flow planning, manufacturing control and logistics for DaimlerChrysler, smart, the GEA group, STILL and more. In 2004, he joined Fraunhofer IOSB and currently serves as the Deputy Head of the Institute and is in charge of business development, marketing & sales for IOSB's automation business at three sites.

Participant

Seoul National University



**Dr. Pahk,
Hewi-Jae**

Professor, and
President and
National CTO,
Ministry of Trade,
Industry, and
Energy, Korea

- 2013-present President and National CTO of the Office of Strategic R&D Planning, Ministry of Trade, Industry, and Energy, Korea
- 2001-present CEO, SNUPrecision Co.
- 1993-present Professor, Seoul National University

Prof. Pahk, regarded as one of Korea's top experts in the area of mechanical engineering and precision measurement equipment, wears many hats for the country: currently professor, entrepreneur, and the President and National CTO of the Office of Strategic R&D Planning, Ministry of Trade, Industry and Energy. He founded SNU Precision Co, a highly R&D-intensive and the first laboratory venture firm from Seoul National University in 1998, and successfully expanded the company in the global market. In addition to his academic and industrial work, he has taken the mission of leading the national R&D planning in the area of industrial technologies in Korea.



**Dr. TCHA,
Moonjung**

Director and Vice
President,
Department of
Industry and
Service Economy,
KDI, Korea

- 2011-present Director and Vice President, Department of Industry and Service Economy, KDI, Korea
- 2013-2014 Senior Advisor to Deputy Prime Minister and Minister of Strategy and Finance, Korea
- 1998-1999 Visiting Associate Professor, KDI School

Dr. TCHA has been a senior research fellow of KDI since 2005 and has also served as an expert in the area of industrial policy and industrial innovation strategy in many institutes and international organizations. Recognized for his expertise in industrial policy, he had served as a Senior Advisor to Deputy Prime Minister and Minister of Strategy and Finance of the Republic of Korea. He published a large number of professional papers, and authored/edited books in the fields including international economics, development economics, public sector economics, development cooperation, regulation, and the service industry.

Participant

Seoul National University



**Prof. Cha, Sang
Kyun**

Professor and
Director,
Engineering
Development
Research Center,
Korea

- 2006-2008 Director, Automation and Systems Research Institute, SNU
- 2005-present Founder and adviser, SAP Labs Korea, Inc.
- 2000-2005 Founder and CEO, Transact In Memory, Inc.

Dr. Cha is a professor, an innovator, and an entrepreneur. With his expertise in next generation in-memory database technology, he founded Transact In Memory, Inc. in 2000, and the company was successfully acquired by SAP in 2005. Since April 2014, he has served as the founding director of the Big Data Institute at Seoul National University and leads inter-disciplinary big data research.



**Prof. Han,
Chonghun**

Professor and
Director, SNU Big
Data Institute,
SNU, Korea

- 2013-present Director of Engineering Research Institute, SNU
- 2009-present Representative of Korea, Carbon capture and storage in OECD
- 2000-2002 CTO, ISYSTECH Co.

Prof. Han is an expert in the area of process design and energy process. Pursuing a field-oriented research that contributes to industrial developments, he has developed original process design and optimization technologies, and actively transferred these research outcomes and technologies to the industry. In 2000, he founded the ISYSTECH Co. himself and has served as a CTO. He has been awarded several national awards for his research including Minister Award by Ministry of Knowledge Economy of Korea and Young Engineer Award by National Academy of Engineering of Korea.

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