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Keynotes

Global Challenges in Industrial Engineering and Operations Management for the 21st Century

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Keynote Abstract

Key factors that play a major role in shaping the modern world include culture/politics, economics, and environment. While these factors have been important throughout the history of human civilization, globalization and the industrial age have accelerated the dynamic evolution of these forces and created a tighter coupling between them. In designing, producing, and distributing products today, it is essential that these factors be fully considered. In designing supply chains, risk management requires consideration of supply sustainability due to political and climate factors as well as labor and material availability. Economics requires consideration of market requirements and locations. Production flexibility is key for sustained organizational success in today's highly competitive, rapidly changing technology and demand environment. Countries and organizations that recognize and prepare for these factors will be most likely to sustain growth and prosperity.

Wealth generation from production will also come from leading the curve on emerging opportunities. While the traditional mechanical and maturing electrical industries will continue to account for a significant volume of manufacturing, their maturing technologies and commoditization of products will inevitably yield smaller margins and lower market power. Greater opportunities will likely come from the rapidly expanding technologies of nano, info, and bio and the economies of peso, won and yuan. Lessons learned in developing highly efficient mass production systems in the past century will need to be updated and modified to fit these new arenas. Assuming political stability and the availability of investment capital, emerging economies with expanding middle classes will then have the potential for increased economic growth.

Availability of affordable, clean energy poses another uncertainty on the future. Access to cheap energy facilitated globalization of supply chains. If the economics changes or societies choose to reduce carbon footprints, local production may become the norm. This would create a demand for new manufacturing technology with greater volume flexibility and flatter economies of scale. Without simpler, cheaper, more flexible automation, labor will reassert its importance.

In this talk, we explore these trends and their implications for the next generation. In addition, we discuss the impact to manufacturing of the Grand Challenges for Engineering defined by the United States' National Academy of Engineering. These challenges present new opportunities and indicate where governments may decide to invest. Production engineering has a major role to play in solving several of these grand challenges. Other challenges describe changes in the future that will impact production engineering. A key conclusion is that based on the current state of individual economies and national resources, opportunities vary somewhat between countries and regions. Those that recognize the opportunities and threats, carve out their niche and prepare accordingly will prosper.

Bio: Ronald G. Askin is Professor of Industrial Engineering and Director of the School of Computing, Informatics, and Decision Systems Engineering at Arizona State University. Dr. Askin received a BS in Industrial Engineering from Lehigh University, and an MS in Operations Research and a Ph.D. in Industrial & Systems Engineering from Georgia Institute of Technology. Prior to joining Arizona State University, he served on the faculties of the University of Iowa, and the University of Arizona. He has also been a visiting professor at North Carolina State University.

Dr. Askin is a Fellow of the Institute of Industrial Engineers (IIE), and a member of the Institute for Operations Research and Management Science (INFORMS), the Society of Manufacturing Engineers (SME), the Production and Operations Management Society (POMS) and the American Society for Engineering Education (ASEE). He has previously served as President of the IIE Council of Fellows, Sr. V.P. and member of the Board of Trustees for IIE, Chair of the Association of Chairs of Operations Research Departments (ACORD), Chair of the INFORMS Manufacturing and Service Operations Management Society (MSOM), Chair of the Operation Research Society of America's Technical Section on Manufacturing Management (TECMAN), and Chair of the Statistics Division of the American Society for Quality (ASQ). He is also a former editor of the IIE Transactions on Design and Manufacturing. Dr. Askin has authored or co-authored over 80 professional publications, primarily on the application of operations research and statistical methods to the design and analysis of integrated production control systems. Other research interests include project scheduling and decision analysis. Dr. Askin co-authored the texts Modeling and Analysis of Manufacturing Systems (1993) and Design and Analysis of Lean Production Systems (2002), both of which received the IIE Joint Publishers Book of the Year Award (1994 and 2003). Other awards include the IIE Transactions on Design and Manufacturing Best Paper Award (twice as coauthor), the Shingo Award for Excellence in Manufacturing Research, IIE Transactions Development and Applications Award (coauthor), the ASEE/IIE Eugene L. Grant Award (coauthor), and a National Science Foundation Presidential Young Investigator Award. Dr. Askin has

consulted with a variety of manufacturing and service industry companies in the areas of scheduling, facilities planning, inventory control, quality improvement, and performance evaluation.

The Importance of Equipment Predictability in Manufacturing

Ang Toon Yoon
KMCO Assembly & Finish Engineering
Intel Kulim Microprocessor and Chipsets Operations
Intel-Malaysia

Keynote Abstract

The keynote will address current challenging environment in semiconductor assembly & test manufacturing and describe what are the winning strategy and learning in high volume manufacturing to achieve world class performance. It will cover what are the practical challenges in manufacturing and working models to improve cycle time, product cost and equipment predictability from technology development towards high volume manufacturing and discuss how to build a lean manufacturing culture to consistently excel in rapidly changing and complex business environment.

Bio: Mr. Ang Toon Yoon is an Assembly Engineering Manager in Intel Kulim Microprocessor and Chipsets Operations in INTEL MALAYSIA. Mr. Ang received a BS in Mechanical Engineering from The Engineering Council, United Kingdom and MSc. in Manufacturing Systems Engineering from The Queen's University of Belfast, Northern Ireland, United Kingdom. Mr. Ang has 17 years of working experience in semiconductor industry; was the one of pioneer technology development team in wire-bond PBGA (Plastic Ball Grid Array) and various generations of Flip-Chip technology development which contributed to the significant technology breakthrough in product development and high volume manufacturing since 1995.His technology development experience consists of process and equipment development, technology platform integration and management, package quality & reliability, various problem solving methodologies, statistical process control, yield and new technology introduction and transfer. He moved from technology development division to high volume manufacturing division in 2006 and successfully started-up the largest assembly/test manufacturing facility in Kulim and currently in high volume manufacturing for latest chipset and microprocessor products. His current position is Senior Manager in Engineering Department.

Supporting the Economy based on Research and Innovation

Prof. Dr. Ahmad Faris Ismail
Deputy Rector (Research and Innovation)
International Islamic University Malaysia

Bio: Prof. Dr. Ahmad Faris Ismail is currently the Deputy Rector (Research and Innovation) at the International Islamic University Malaysia (IIUM). He obtained his B.Sc. in Chemical Engineering in 1988 from University of Houston, Texas before getting his Ph.D. in Engineering from Rice University, USA in 1993. He has more than 17 years of university teaching experience and he is currently a Professor of Engineering at the International Islamic University Malaysia (IIUM). He served as the Dean of Engineering from 1997 until 2009, and he was the Co-chairman of the Malaysia Council of Engineering Deans from 2007 until 2009.

Prof. Dr. Ahmad Faris Ismail received the FUIW (The Federation of the Universities of the Islamic World) Tribute to the "Personality Having Contributed to the Development of Islamic University Education" in March 2008. He has served as a member of the Evaluation Committee for the FRGS (Fundamental Research Grant Scheme) and Science Fund (Industrial Sector) since 2006. He served as an IDB (Islamic Development Bank) Consultant for the Development of Mussa Bin Bique University, Mozambique Master Plan in August 2003. He was a Visiting Scientist at Graduate School of Engineering, Kyoto University in December 2004.

He has been invited as a keynote speaker for various conferences and congresses in Jordan, Saudi Arabia, Sudan, Syria, Morocco, Iran and Turkey. He has conducted workshop on "Academic Self-Assessment" and "Strategic Plan and Balanced Scorecard", and he has delivered lectures on "Innovation Ecosystem", "Curriculum Planning and Management", "Professional Ethics", "Towards Outcome-based Education", and "Research Design and Instrumentation". He is also a co-inventor for at least eight filed patents of the research products at IIUM.

Apart from teaching he has been active in research in the areas of energy and environment, computational fluid dynamics, combustion, simulation and modeling, and engineering education. He has published more than 140 papers in refereed journals and conference proceedings.