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When

Wednesday August 15th 2018 from 11am-12pm EDT (3pm – 4pm UTC)

Topic

Joint INCOSE/IEEE SMCS Webinar: “Bridging the Gulf of Execution”

Speakers



Thomas McDermott, Jr, Sunil Bharitkar & Christopher Nemeth

Abstract

Research results routinely fail to survive into the development phase of Research and Development projects. This “gulf of execution” that blocks research findings from being realized in the development phase of many projects continues to bog down R&D practice.

Concurrent engineering was supposed to be a solution, but was it? Open innovation models were designed to bridge the gap, but have they? What is the “gulf,” and how did we get here? It might be a matter of professional focus: Research invests in understanding the problem, and Development invests in producing the solution. Innovation happens when these link up around people in a culture that promotes risk-taking. Or is it communication? Innovation happens when people from different disciplines or roles come together with common understanding. The issue spans multiple sectors. Large industries struggle to build an innovation culture when delivery of existing products and services is at the forefront. Universities have an innovation culture, but industry needs to adopt a systems approach to realize value from that culture. Industry / university partnerships are effective when both parties realize relationships across a broad range of university programs, from students to startups, and learn how to couple the university innovation system to the industry innovation enterprise.

Three examples from INCOSE and IEEE SMCS members will suggest ways to resolve this enduring issue.

Georgia Tech--We view this relationship as a system-of-systems model, where the industry product/service enterprise is coupled to the university innovation enterprise in a larger sociotechnical systems context, and where the relationship promotes all three innovation horizons (sustaining, disruptive, and transformational). Our experience in building such relationships at Georgia Tech indicates both parties can realize success when a range of enablers to industry/university interaction promote a range of innovation opportunities (basic and translational) over a long term partnerships. This systems-of-systems model will be presented as a general context, then generalized examples from Georgia Tech's industry partnership efforts will be discussed to illustrate the model.

Applied Research Associates--Our team developed a system for DoD over 3 years to support real time decision and communication support among Burn Intensive Care Unit clinicians. This example will describe collaboration among 35 members from military healthcare professionals, to cognitive psychologists and software and machine learning developers.

HP Labs--In the Emerging Computer Lab within HP Labs, among other research areas we are involved in the areas of speech analysis and interpretation, audio signal processing in conjunction with machine learning. In this part of the webinar we will explore one research topic in audio processing that we undertook, after identifying the deficiencies on HP devices, and the challenges encountered during development. We also present examples of the solutions to overcome these challenges which have helped contribute towards a scalable deployment of the technology (based off of this research).

Biography

Thomas A. (Tom) McDermott, Jr is a leader, educator, and innovator in multiple technology fields. He currently serves as Deputy Director of the Systems Engineering Research Center at Stevens Institute of Technology in Hoboken, NJ, as well as a consultant specializing in strategic planning for uncertain environments. He studies systems engineering, systems thinking, organizational dynamics, and the nature of complex human socio-technical systems. He teaches system architecture concepts, systems thinking and decision making, and the composite skills required at the intersection of leadership and engineering.

Tom has over 30 years of background and experience in technical and management disciplines, including over 15 years at the Georgia Institute of Technology and 18 years with Lockheed Martin. He is a graduate of the Georgia Institute of Technology, with degrees in Physics and Electrical Engineering. With Lockheed Martin he served as Chief Engineer and Program Manager for the F-22 Raptor Avionics Team, leading the program to avionics first flight. Tom was GTRI Director of Research and interim Director from 2007-2013. During his tenure the impact of GTRI significantly expanded, research awards doubled to over \$300M, faculty research positions increased by 60%, and the organization was recognized as one of Atlanta's best places to work. He also has a visiting appointment in the Georgia Tech Sam Nunn School of International Affairs. Tom is one of the creators of Georgia Tech's Professional Masters degree in Applied Systems Engineering and lead instructor of the "Leading Systems Engineering Teams" course.

Sunil Bharitkar received his Ph.D. in Electrical Engineering (minor in Mathematics) from the University of Southern California (USC) in 2004 and is presently the speech/audio research Distinguished Technologist at HP Labs. He is involved in research in array signal processing, speech/audio analysis and processing, biomedical signal processing, & machine learning. From 2011-2016 he was the Director of Audio Technology at Dolby leading/guiding research in audio, signal processing, haptics, machine learning, hearing augmentation, & standardization activities at ITU, SMPTE, AES. He co-founded the company Audyssey Labs in 2002 where he was VP/Research responsible for inventing new technologies which were licensed to companies including IMAX, Denon, Audi, Sharp, etc. He also taught in the Department of Electrical Engineering at USC. Sunil has published over 50 technical papers and has over 20 patents in the area of signal processing applied to acoustics, neural networks and pattern recognition, and a textbook (Immersive Audio Signal Processing) from Springer-Verlag.

Sunil is also a recipient of a Best Paper Award at the 2003 37th IEEE Asilomar Conference on Signals, Systems, and Computers, and the Dept. of EE (USC) TA Award for DSP. He is a Senior Member of the IEEE, member of the ILB of the IEEE Systems, Man, & Cybernetics Society, the Acoustical Soc. of America (ASA), European Association for Signal and Image Processing (EURASIP), and the Audio Eng. Soc. (AES). Sunil is a PADI diver & plays the Didgeridoo.

Chris Nemeth is a Principal Scientist with Applied Research Associates, a 1200 member national science and engineering consulting firm. His recent research interests include technical work in complex high stakes settings, research methods

in individual and distributed cognition, and understanding how information technology erodes or enhances system resilience. He has served as a committee member of the National Academy of Sciences, is widely published in technical journals. Dr. Nemeth earned his PhD in human factors and ergonomics from the Union Institute and University in 2003, and an MS in product design from the Institute of Design at Illinois Institute of Technology in 1984.

His design and human factors consulting practice and his corporate career have encompassed a variety of application areas, including health care, transportation and manufacturing. As a consultant, he has performed human factors analysis and product development, and served as an expert witness in litigation related to human performance. His 26-year academic career has included seven years in the Department of Anesthesia and Critical Care at the University of Chicago Medical Center, and adjunct positions with Northwestern University's McCormick College of Engineering and Applied Sciences (Associate Professor), and Illinois Institute of Technology. He is a Fellow of the Design Research Society, a Life Senior Member of the Institute of Electrical and Electronic Engineers (IEEE) and has served 8 years on the IEEE Systems, Man and Cybernetics Society Board of Governors. He retired from the Navy in 2001 at the rank of Captain after a 30-year active duty and reserve career.

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Regards,

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