## System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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## Accelerating System of Systems Engineering Understanding and Optimization through Lean Enterprise Principles

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**Abstract:**
A recent study of systems engineering processes used by system of systems engineering (SoSE) teams showed how these teams transformed traditional systems engineering processes to support systems engineering at the SoS level. A further analysis of these SoSE processes indicate that some of the changes from traditional systems engineering are well aligned with some key lean principles and practices. This presentation presents an analysis of SoSE processes from a lean perspective, shows the motivation for these lean practices, and provides insights for further optimization of SoSE through lean principles. This analysis is based on thirteen of the SoSE case studies identified in the DoD Systems Engineering for Systems of Systems Guidebook.

By understanding the role of lean principles on the evolution of systems engineering processes to better manage a set of systems across an enterprise, organizations can better apply lean thinking to further optimize the SoSE processes.

**Biography:**
Dr. Jo Ann Lane is currently a research assistant professor at the DoD-Stevens-USC Systems Engineering Research Center, conducting research in the area of systems engineering and system of systems engineering (SoSE).Current areas of research include SoSE processes, SoSE cost modeling, system development feasibility assessments, and innovation in systems engineering.Prior to her current work in academia, she was a key technical member of Science Applications International Corporation's Software and Systems Integration Group for over 20 years, responsible for the development and integration of software-intensive systems and SoSs.

Dr. Ricardo Valerdi is a Research Associate in the Lean Advancement Initiative and a Lecturer in the Engineering Systems Division at MIT. His current research interests include systems engineering cost estimation, system level metrics and models, dynamics in large-scale government system acquisition, and system-of-systems ontologies. His contributions to the field include the Constructive Systems Engineering Cost Model (COSYSMO), a model for estimating systems engineering effort. He is also a co-founder of the Systems Engineering Advancement Research Initiative (SEAri) which was launched in 2007. He received his B.S./B.A. in Electrical Engineering from the University of San Diego, and his M.S. and Ph.D. degrees in Systems Architecting and Engineering from USC. He is the author of over 70 technical publications which have appeared in IEEE, AIAA, and INCOSE conferences.