TUTORIAL

System Maturity Assessment for Decision Support in Life Cycle Acquisition

Presented by:
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Stevens Institute of Technology

Saturday, 03 October 2009 (8:30am – 3:00 pm)

Location: Kossiakoff Center
Applied Physics Laboratory Johns Hopkins University
11100 Johns Hopkins Road, Laurel, Maryland 20723

Tutorial: In theory, technology and system development follow similar evolution (or maturation) paths; a technology is inserted into a system (e.g. spiral development, life cycle acquisition) based on its maturity, functionality, environmental readiness, and ability to interoperate with the intended system. Although, the Government Accountability Office stated to the Department of Defense (DoD) that many of their programs plan to hold design reviews or make a production decision without demonstrating the level of technology maturity that should have been there before the start of development. This issue is not unique to the DoD but is fundamental to many government and industry acquisition programs. For some U.S. government agencies and many government contractors, Technology Readiness Level (TRL) is used to assess the maturity of evolving technologies (materials, components, devices, etc.) prior to incorporating that technology into a system or subsystem. While some have described TRLs as a method to make maturity decisions, TRLs do not address risk, integration, or life cycle maturity at the system level; which determines if the technology will result in successful development of the system. Based on these fundamental conjectures, a more comprehensive set of concerns becomes relevant when TRL is abstracted from the level of an individual technology to a system context which may involve interplay between multiple technologies and more relevant when these technologies are integrated through the life cycle acquisition process. Considerations relating to integration, interoperability, and sustainment become equally important from a systems perspective in an operational environment.

To address these concerns, this tutorial focuses on the development of a System Readiness Level (SRL) index that incorporates the maturity level of specific components, and the interoperability of the entire system. The resultant SRL can provide an assessment of overall system development and underscore potential areas that require further development. This maturity assessment can then be correlated to the decisions regarding the acquisition of systems which involve the dependency and interplay between performance, availability (reliability, maintainability, and supportability), process efficiency (system operations, maintenance, and logistics support), system life cycle cost, and system maturity (measured by SRL). This overarching perspective provides a context for the "trade space" available to a systems engineer or program manager along with the articulation of the overall objective of maximizing the operational effectiveness of systems.

Speaker: **Brian Sauser** holds a Ph.D. from Stevens Institute of Technology in Project Management. He is currently an Assistant Professor in the School of Systems & Enterprises at Stevens Institute of Technology. Before joining Stevens in 2005, Dr. Sauser managed an applied research and development laboratory in life sciences and engineering at NASA Johnson Space Center; was Program Director of the New Jersey – NASA Specialized Center of Research and Training, where he managed a multi-institutional, multi-disciplinary science and engineering research center; and was a Project Specialist with ASRC Aerospace responsible for managing technology utilization and assessment, and commercial partnership development at NASA Kennedy Space Center.

His research interest is in the management of complex systems. This includes system and enterprise maturity assessment and the advancement of a foundational science of systems thinking. His work in systems thinking with Dr. John Boardman has resulted in an insightful book, *Systems Thinking: Coping with 21st Century Problems* (see http://www.boardmansauser.com). His work on system maturity assessment has been nationally recognized and adopted as a decision support tool by organizations within NASA, U.S. Army, U.S. Navy, Northrop Grumman, and Lockheed

Martin. His work in System of Systems is also nationally recognized. He is currently the Director of the Systomics Laboratory (http://www.SystomicsLab.com), which seeks to define a science of systems thinking, and the Systems Development and Maturity Laboratory (http://www.SystemReadinessLevel.com) which seeks to advance the state of knowledge and practice in systems maturity assessment. In addition, he is a National Aeronautics and Space Administration Faculty Fellow, Editor-in Chief of the *Systems Research Forum*, an Associate Editor of the *IEEE Systems Journal*, and the Associate Editor of the *ICST Transactions on Systomics, Cybernetics, and e-Culture.*

Cost: Non-members: **$125;** INCOSE members: **$100** (includes continental breakfast and lunch). A subset of the slides (Key slides) will be available electronically for free. A hardcopy of the entire set of slides is available for **$25** extra.

Reservations: Seating is limited; reservations will be taken on a first come-first served basis. To register for the tutorial, e-mail Don York at **don.york@sage-mgt.net**. Indicate if you want to purchase a hardcopy of the key slides.

Payment: To pay by credit card or PayPal, visit our website: **http://www.incose.org/chesapek;** or to pay by USPS, mail checks (payable to INCOSE-CC) to:

Dave Griffith, PO Box 142, Linthicum, MD 21090-0142.

All payments must be received no later than Thursday, 1 October 2009, prior to start of tutorial!

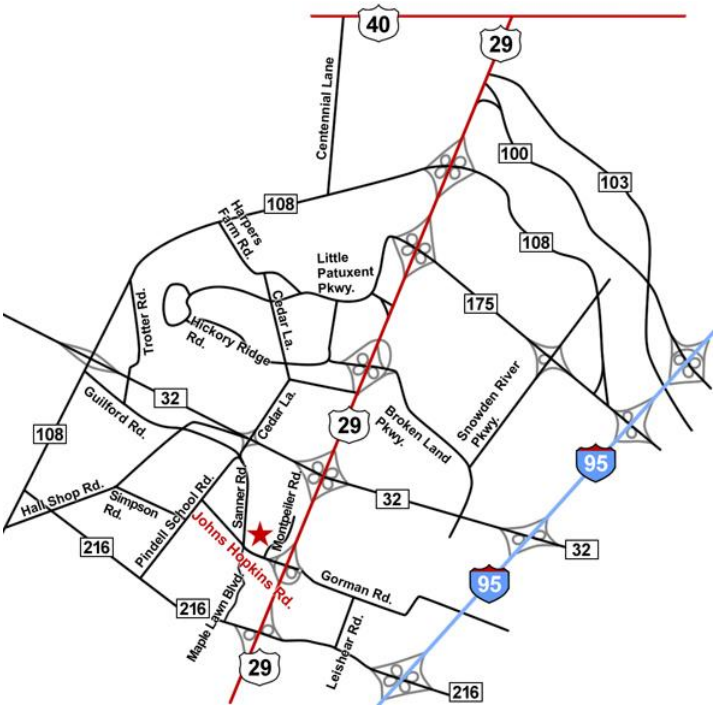
Cancellation Policy: If you make a reservation and then find that you will be unable to attend, please notify us not later than COB Monday, 28 September, to avoid liability for payment for the tutorial.

Corporate Sponsor: We wish to thank the Applied Physics Laboratory for supporting the systems engineering profession through use of their facilities.

Directions

JHU APL, 11100 Johns Hopkins Road, Laurel, Maryland 20723, Phone (443) 778-5000

See APL's Visitor Guide for more:
http://www.jhuapl.edu/newscenter/visitor/default.asp



From Washington DC and Capital Beltway (I-495):

Take I-95 North toward Baltimore, 10 miles to Columbia exit (MD Route 32 West),

Go 2.5 miles to the Washington DC exit (US Route 29 South).

Go 1.5 miles south and take Johns Hopkins Road exit (bear right at the top of the hill).

Or from the Capital Beltway (I-495):

Take US Route 29 North (Colesville Road) 10 miles and follow signs for the turn onto Johns Hopkins Rd.

From Baltimore and Baltimore Beltway (I-695):

Take I-95 South toward Washington DC.

Go 13 miles and take Columbia exit (MD Route 32 West).

Go 2.5 miles and take Washington DC exit (US Route 29 South).

Go 1.5 miles south and take Johns Hopkins Road exit (bear right at the top of the hill).

Once you're on Johns Hopkins Road:

APL is a half-mile west of US Route 29 on your right side. Turn left into first entrance, Pond Rd, continuing past the pond and take the right into Kossiakoff Center parking lot. Walk up stairs and across the road to the Kossiakoff Center.