An Introduction to Influence Maps: Foundations, Construction, and Use

James Smith
SEI

Abstract:

This presentation introduces influence maps (IMs), a graph-theoretic technique to identify potential programmatic interoperability issues within a system-of-systems context. This technique has been applied in several customer settings, and has helped to diagnose non-obvious interoperability issues. The foundations for IMs are briefly reviewed, and a simple example is presented to illustrate the construction of a set of IMs, and to demonstrate some of the ways they can be used to characterize critical inter- and intra-organizational relationships. Finally, the linkage to an accompanying reasoning framework is described. The theoretical foundations for this reasoning framework—drawing on relevant topics in legal theory and artificial intelligence—is shown to have the potential to inform program management decisions in situations where there are incomplete, inconsistent, and conflicting guidance, directives, and requirements.

Bio

Jim Smith is a Senior Member of the Technical Staff at Carnegie Mellon University's Software Engineering Institute, where he conducts research into the programmatics of large, complex, software-intensive "systems of systems." In addition to his research, Jim works closely with selected acquisition programs to pilot innovative governance and acquisition tools and techniques, and to transition these into practice.

Jim has over 20 years of experience developing, acquiring, fielding, and using a variety of United States Department of Defense systems. He has authored numerous technical papers, reports, and conference presentations, and is a co-developer of the SEI System-of-Systems Navigator™ process and the Interoperable Acquisition tutorials. Jim has a BS and MS in electrical engineering; he is an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), and is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and the Association for Computing Machinery (ACM).

For more information: http://www.acq.osd.mil/sse/outreach/sosecollab.html