Honourcode, Inc.

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Architecting with the DOD Architecture Framework (DODAF)

A Two-Day Course

Designing complexity demands many views.

Today's systems do not stand alone; each system fits within an increasingly complex system-of-systems, a network of interconnection that virtually guarantees surprise behavior. Systems science recognizes this type of interconnectivity as one essence of complexity. It requires new tools, new methods, and new paradigms for effective system design. The DOD Architecture Framework (DODAF) provides an underlying structure to work with complexity.

This course provide knowledge and exercises at a practical level in the use of the DODAF. You will learn about architecting processes, methods and thought patterns. You will practice architecting by creating DODAF representations of a familiar, complex system-of-systems. By the end of this course, you will be able to use DODAF effectively in your work.

***You should attend this tutorial if you are*:**

- A key member of a system or system-of-systems development team
- Concerned about how your system product fits into the larger context
- Looking for practical methods to use

The course is aimed at

- Systems engineers,
- Technical team leaders,
- Program or project managers, and
- Others who participate in defining and developing complex systems.

Practice architecting on two creative architectures: the "Mars Rotor" space system and the "Chemical Interdict" worldwide security system-of-systems. Define the operations, technical structure, and migration for each program.

The challenges today are changing, because technology advances are leading to more complex and more interconnected systems-of-systems. Operational users demand more capability, connectivity, and operational reliability than ever before. They demand connectivity so that systems can provide and respond to varied information from other systems.

Yet these same demands create a system-of-systems complexity that has never before existed. With more systems interconnected, and with each system offering greater artificial intelligence over a greater number of functions, the resulting network of systems inherently has emergent behavior that often surprises the designers. Emergent behavior is a natural result of complexity, because it is functionality on a system-of-systems level that may or may not have been designed. When appropriate, such emergent behavior is a powerful force multiplier. When inappropriate, however, emergent behavior often appears as "bugs" or "faults" in the higher-order system that can be nearly impossible to find and fix.

What You Will Learn

- Three aspects of an architecture
- Four primary architecting activities
- Eight DoDAF 2.0 viewpoints
- The entire set of DoDAF 2.0 views and how they relate to each other
- A useful sequence to create views
- Different "Fit-for-Purpose" versions of the views.
- How to plan future changes.

Architectures and Architecting – Understanding of the components of an architecture. Origin of the terms within systems development. Understanding of the components of an architecture. Architecting key activities. Foundations of modern architecting.

DODAF Overview – Methods to convey architectures. Overview of different architecture frameworks (TOGAF, FEAF, Zachman, etc.) Why frameworks exist, and what they hope to provide. DOD Architecture Framework (DODAF) basic concepts: Service-Oriented Architectures (SOA) and the DoDAF Meta-Model (DM2). Hierarchies of architectures. Viewpoints within DoDAF (All, Capability, Data/Information, Operational, Project, Services, Standards, Systems). How Viewpoints support models. Diagram types (views) within each viewpoint. DoDAF architecting methods.

DODAF Operational Viewpoint – Describing an operational environment, and then modifying it to incorporate new capabilities. Sequences of creation. How to convert concepts into DODAF views. Introduction and practical exercises on each DODAF OV product, with review and critique. Teaching method includes three passes for each product: (a) describing the views, (b) instructor-led exercise, (c) group work to create views.

DODAF Services and Systems Viewpoints – Converting the operational views into service-oriented technical architecture, while matching the new architecture with legacy systems. Sequences of creation. Linkages between the technical views and the operational views. Introduction and practical exercises on each DODAF SvcV and SV product, with review and critique, again using the three-pass method.

DODAF Migration Definition Processes – How to depict the migration of current systems into future systems while maintaining operability at each step. Practical exercises on migration planning using related CV, SvcV, SV, and OV products.

DoDAF Capability, Project, Data and Information Viewpoints – Definition of the largest systems-of-systems through examination of top-level capabilities. Definition of project plans and how they support migration of the architecture. The underlying data and information products of the DM2. Introduction and practical exercises on each DoDAF CV, PV, and DIV product

Dr. Eric Honour, CSEP, INCOSE Fellow, has been in international leadership of the engineering of systems for nearly two decades, part of a 40-year career of complex systems development and operation. His energetic and informative presentation style actively involves class participants. He is a former President of the International Council on Systems Engineering (INCOSE). He was selected in 2000 for Who's Who in Science and Technology and in 2004 as an INCOSE Founder. He has been a systems engineer, engineering manager, and program manager at Harris, E-Systems, and Link, and was a Navy pilot. He has contributed to the development of 17 major systems, including Air Combat Maneuvering Instrumentation, Battle Group Passive Horizon Extension System, and National Crime Information Center. BSSE (Systems Engineering) from US Naval Academy and MSEE from Naval Postgraduate School, PhD University of South Australia based on his ground-breaking work into the quantified value of systems engineering

Dr. Scott Workinger has led innovative technology development efforts in complex, risk-laden environments for 30 years in the fields of manufacturing (automotive, glass, optical fiber), engineering and construction (nuclear, pulp & paper), and information technology (expert systems, operations analysis, CAD, collaboration technology). He currently teaches courses on program management and engineering and consults on strategic management and technology issues. B.S in Engineering Physics from Lehigh University, M.S. in Systems Engineering from University of Arizona, and Ph.D. in Civil and Environment Engineering from Stanford University.