Research Task / Overview

• Technical leadership development is important in advancing the careers of systems engineers, building bench strength of the technical workforce in the government and commercial sectors, and ensuring that the U.S. continues to lead in technical advancement globally.
• This task creates a framework to enable organizations and systems engineers to progressively develop their technical leadership talent/competencies from entry through to senior-level positions. To do this, we build on our colleagues’ work:
  - Helix (Pyster, et al., 2013-16),
  - Technical Leadership Development Program (Gavito, et al., 2010-11),
  - Army Systems Engineering Development Model (Gavito and Pennotti, 2014-15),
  - SE Experience Accelerator (Wade, et al., 2013-16).

Goals & Objectives

• To build a technical leadership development framework, enabling a broad spectrum of the technical workforce (from engineers to IT specialists) to develop their technical leadership competencies;
• To leverage our SERC colleagues’ work in this area;
• To ensure such a framework can be applied by a technical person at all stages in their career, from the junior to senior level;
• To identify best practices in the government and commercial sector regarding technical leadership development programs;
• To recommend a career model to the DoD, based on the Framework and best practices identified.

Data & Analysis & Results

The Framework consists of the above 5 elements.

Career Stages

People
Programs
Knowledge

3 key stages of technical leadership development are defined in terms of people, program, and knowledge responsibility.

Technical Leadership Competencies

• 24 technical leadership competencies for each of the 3 progressive career stages, resulting in a 72 cell matrix. Each cell consists of key competency indicators.

Methodology

• Identified previous research, including systems engineering competency frameworks, technical career models, and leadership development assessment metrics;
• Defined the Technical Leadership Development Framework, including career stage definitions, technical leadership competencies, and development methods;
• Validated the Framework, including technical leadership competencies, with many technical leaders in the government and commercial sectors, across eight organizations;
• Interviewed technical leaders, in the government and commercial sectors, to benchmark technical leadership development programs, and gathered expert opinions on applicability of development approaches for competencies at each career stage;
• Developed Concept of Operations and Technical Leadership Development Guidebook to operationalize the Framework and Career Model.

Planned Future Research

• Additional benchmarking with best-in-class institutions;
• Experimental assessment of development methods;
• Experimental analysis of competency attainment metrics;
• Longitudinal study of target and control cohorts.

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