Due to extensive challenges to the efficient development and fielding of operationally effective and affordable weapon systems, the United States employs a complex management framework to govern defense acquisition programs. The Department of Defense and Congress recently modified this process to improve the levels of knowledge available at key decision points in order to reduce lifecycle cost, schedule duration, and technical risk to programs. This exploratory research study employed multiple methods to examine the impact of systems engineering reviews, verification of product maturity, and the application of a Modular Open Systems Approach on perceived program knowledge and risk levels on programs executed under this new paradigm.

In-depth case studies of two recent Major Defense Acquisition Programs were conducted to verify the existence of and the relationships among the proposed constructs and to identify potential barriers to program success introduced by the new process. The case studies included program document analysis and interviews with contractor personnel holding leadership roles on the programs. The second phase of the study included a questionnaire-based survey of contractor personnel from five programs to test the case study findings against a larger data set.

The study results indicate that while some changes adversely affected program risk levels, the recent modifications to the acquisition process generally had a positive impact on levels of critical knowledge at the key Milestone B decision point. Specifically, the implementation of early systems engineering and a Modular Open Systems Approach improved the perceived levels of knowledge and risk on the programs. Additionally, four of the five barriers identified by the case studies were confirmed by the survey results. Recommendations were provided to the Government and Industry for improvement of program outcomes and to academia for improving the reliability of the research instruments and augmenting available data directly measured on programs.

Major: Industrial Engineering

Educational Career:
Bachelor’s of Computer Engineering, BS, 2004, University of Florida
Master’s of Systems Engineering, MS, 2007, University of Florida

Committee in Charge:
Dr. Tim Kotnour, Chair, IEMS
IEMS, Dr. Waldemar Karwowski
IEMS, Dr. Mansooreh Mollaghasemi
Dr. John V. Farr, United States Military Academy

Approved for distribution by Dr. Tim Kotnour, Committee Chair, on April 3, 2012.

The public is welcome to attend.