



# New Research in **DEFENSE ACQUISITION**

Academics and practitioners from around the globe have long considered defense acquisition as a subject for serious scholarly research, and have published their findings not only in books, but also as Doctoral dissertations, Master's theses, and in peer-reviewed journals. Each issue of the *Defense Acquisition Research Journal* brings to the attention of the defense acquisition community a selection of current research that may prove of further interest.

These selections are curated by the Defense Acquisition University (DAU) Research Center and the Knowledge Repository. We present here only the author/title, abstract (where available), and a link to the resource. Both civilian government and military Defense Acquisition Workforce (DAW) readers will be able to access these resources on the DAU DAW Website: <https://identity.dau.mil/EmpowerIDWebIdPForms/Login/KRsite>. Nongovernment DAW readers should be able to use their local knowledge management centers and libraries to download, borrow, or obtain copies. We regret that DAU cannot furnish downloads or copies.

We encourage our readers to submit suggestions for current research to be included in these notices. Please send the author/title, abstract (where available), a link to the resource, and a short write-up explaining its relevance to defense acquisition to: Managing Editor, *Defense Acquisition Research Journal*, [DefenseARJ@dau.mil](mailto:DefenseARJ@dau.mil).



## The Effectiveness of Concurrent Design on the Cost and Schedule Performance of Defense Weapons System Acquisitions

*Randolph B. Robertson*

### **Abstract:**

This study investigates the impact of concurrent design on the cost growth and schedule growth of U.S. Department of Defense Major Defense Acquisition Programs (MDAP). It is motivated by the question of whether employment of concurrent design in the development of a major weapon system will produce better results in terms of cost and schedule than traditional serial development methods. Selected Acquisition Reports were used to determine the cost and schedule growth of MDAPs as well as the degree of concurrency employed. Two simple linear regression analyses were used to determine the degree to which cost growth and schedule growth vary with concurrency. The results were somewhat surprising in that for major weapon systems the utilization of concurrency, as it was implemented in the programs under study, was shown to have no effect on cost performance, and that performance to development schedule—one of the purported benefits of concurrency—was actually shown to deteriorate with increases in concurrency. These results, while not an indictment of the concept of

concurrency, indicate that better practices and methods are needed in the implementation of concurrency in major weapon systems. The findings are instructive to stakeholders in the weapons acquisition process in their consideration of whether and how to employ concurrent design strategies in their planning of new weapons acquisition programs.

**Citation:**

Robertson, R. B. (2017). *The effectiveness of concurrent design on the cost and schedule performance of defense weapons system acquisitions* (Order No. 10642876). Available from ProQuest Dissertations & Theses Global. (2013314827). Retrieved from <https://search.proquest.com/docview/2013314827?accountid=40390>

## Using Multi Criteria Decision Analysis Decision Support Systems to Conduct Analysis of Alternatives for Department of Defense Acquisition Programs

*David Matthew Mahalak*

**Abstract:**

Despite being a mandated requirement, the U.S. Government Accountability Office (GAO) found a lack of guidance across the Department of Defense (DoD) for conducting analysis of alternatives, which contributed to significant cost, schedule, and performance problems for defense acquisition programs. In 2008, 96 major weapon system programs were reviewed and findings showed cost growth of \$296 billion, average program delays of 22 months, and the delivery of fewer systems with reduced capabilities. Without specific guidance and criteria for how analysis of alternatives should be conducted, the DoD will continue to struggle to make informed trade-offs and start executable programs. This praxis presents a decision support system that enables decision makers to analyze cost, schedule, and performance ratings for multi criteria decision analysis problems. The decision support system provides interactive visualization tools that allow decision makers to execute sensitivity and uncertainty analyses, analyze the decision problem from multiple stakeholder-specific viewpoints, and synthesize results in a meaningful way. Although the

primary motivation of this praxis is to fill the gap identified by the GAO, the decision support system presented in this praxis can be modified and applied across multiple domains.

**Citation:**

Mahalak, D. M. (2018). *Using multi criteria decision analysis decision support systems to conduct analysis of alternatives for Department of Defense acquisition programs* (Order No. 10686509). Available from ProQuest Dissertations & Theses Global. (1994222536). Retrieved from <https://search.proquest.com/docview/1994222536?accountid=40390>

## U.S. Government Program Managers' Competencies to Manage Satellite Acquisition Programs

*Surinder Paul Sharma*

**Abstract:**

U.S. Government satellite acquisition programs have continually experienced large cost overruns, schedule delays, technology development problems, and performance shortfalls, which can potentially affect national security as well as the health and safety of civilians. Government program managers play a significant role in achieving organizational objectives through the acquisition life cycle of major U.S. Government programs. Prior researchers have explored the importance of program managers' competencies. Other researchers have identified key competencies of project managers to lead and manage the projects successfully in the aerospace industry. However, not enough research was conducted to assess the U.S. Government program managers' competencies to manage complex and challenging satellite acquisition programs in combination with other program context factors above and beyond program managers' competencies, which could moderate and affect overall program success. The purpose of this quantitative, nonexperimental survey research study was to examine the relationship and importance of U.S. Government program managers' perceived hard and soft competencies needed to achieve overall program success in managing major satellite acquisition programs. Additionally, the researcher examined how the program context factors moderated the relationship between program managers' competencies

and overall program success. A web-based survey, targeting aerospace and defense professionals, garnered 104 valid responses. Utilizing the competency theory framework, multiple linear regression, chi-square goodness-of-fit, and hierarchical multiple regression tests were used to analyze the study data. The survey results revealed that program managers' both hard and soft competencies predicted overall program success,  $F(2, 101) = 4.085$ ,  $p = .020$ ,  $R^2 = .075$ . Program managers' soft competencies were found to be somewhat more important than hard competencies in achieving overall program success,  $\chi^2(4) = 29.3$ ,  $p < .001$ . Of the four program context factors, resource availability positively moderated the relationship between program managers' soft competencies and overall program success,  $F(10, 93) = 2.116$ ,  $p = .031$ ,  $R^2 = .185$ . A future hypothesis-based study may be conducted for other major U.S. Government defense programs or private sector programs, which may provide senior management leaders insight into matching of program managers' competencies to specific program contexts and program types. A qualitative study to identify the causal reasons for unsuccessful U.S. space acquisition program outcomes may provide in-depth personal and professional perspectives of other program context factors, which may influence overall program success.

**Citation:**

Sharma, S. P. (2017). *U.S. Government program managers' competencies to manage satellite acquisition programs* (Order No. 10603364). Available from ProQuest Dissertations & Theses Global. (1952046650). Retrieved from <https://search.proquest.com/docview/1952046650?accountid=40390>

