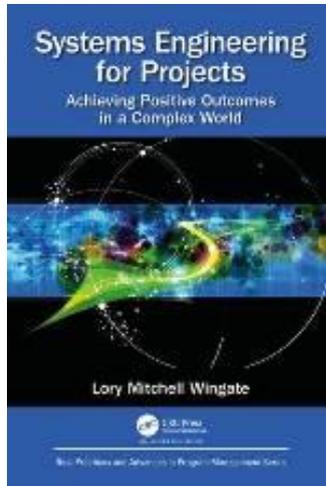


## PM WORLD BOOK REVIEW



**Book Title: *Systems Engineering for Projects: Achieving Positive Outcomes in a Complex World*<sup>1</sup>**

**Author: Lory Mitchell Wingate**

**Publisher: CRC Press, Taylor & Francis Group**

**List Price: \$150.00    Format: Hard cover, 318 pages**

**Publication Date: 2019**

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**Reviewer: Marc Crotty**

**Review Date: December 2022**

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### Introduction

The intersection of Systems Engineering (SE) and Program Management (PM) is seen in complex development efforts. These disciplines are key to “System of Systems” development. Less ambitious project management efforts employ SE and PM methodology, yet without the same degree of formality.

In response to complex development budget-breaking programs, the U.S. Department of Defense (DoD) was an early adopter for SE methods. DoD utilizes its “Systems Engineering Guidebook,” most recently revised in February 2022. Likewise, NASA’s system engineering handbook supports their space missions that include man-rating criticality. The U.S. Department of Homeland Security (DHS) derived its SE methodology from DoD. The DHS approach frames SE in the context of acquisition. They created the DHS 102-02 “Acquisition Management Directive”.

Each of these agencies’ guidebooks describes SE for product concept, development, test, deployment, and operation. System decommissioning is described as well.

These detailed SE processes are summarized and overlaid with Project Management Institute (PMI) concepts as presented in Lory Mitchell Wingate’s book, “System Engineering for Projects: Achieving Positive Outcomes in a Complex World”.

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## Overview of Book’s Structure

The author’s creativity and imagination are evident throughout this work. Seven of eight chapters use a Case Study to outline SE and PM processes. These studies include a Trans-Greenland and open sea expedition, robot competition, art and music endeavors, personal coaching, and creating a custom soap business. Endeavors of this sort are not what first come to mind for SE and PM. And yet, Ms. Wingate effectively overlays the described methodologies on the conduct of each case study.

## Highlights

The Systems Engineering Life Cycle (SELC) framework identifies activities for a structured and disciplined technical effort. Through this framework, products, processes, and the roles of people are defined and developed. A series of event-based technical reviews are identified to assess system technical readiness. Reviews are event driven, that is, conducted when system development (or acquisition) demonstrate sufficient maturity for progress review. Established entrance and exit criteria are review gatekeepers. The selected development methodology (waterfall or cyclical/iterative) and SELC activities to be performed determine required reviews.

An outline of the DHS SELC framework is shown in the following table.

**Table: The Acquisition Lifecycle Framework (DHS Management Directive 102-01)**

<b>Need</b> (Requirements Definition)	<b>Analyze / Select</b> (Planning)	<b>Obtain</b> (Solution)	<b>Produce / Deploy Support / Dispose</b> (Operate & Maintain)
Identify problem	Identify alternatives and resource needs	Develop and evaluate capabilities	Produce and maintain capabilities
Collection of gaps and needs	Validate needs	<ul style="list-style-type: none"> <li>• Approve program</li> <li>• Approve supporting projects / contracts</li> <li>• Approve production</li> </ul>	Maintain as-built and as-maintained configuration

The described framework is tailored around a “Complex Systems Methodology” (CSM<sup>TM/SM</sup>). CSM is a Trade & Service Marked creation of the author. This context is “to achieve positive project outcomes” with PM and SE processes. A Google search shows that industry has not picked up the CSM moniker since its introduction in 2019.

The experienced PM will recognize that staffing and budget required to implement the many described roles can happen only on a Program with commensurate funding and scope. Small projects operate, perhaps, with a project manager, business analyst, scheduler, and risk manager. The SE structure suggested in this work requires a fully staffed Program Management Organization (PMO).

## Highlights: What I liked!

The inclusion of non-traditional case studies is captivating. These unconventional stories are not expected in what might be a dry technical work. System engineering

methods are “back-filled” for most cases. The projects may not have been planned around an explicit methodology, and yet SE processes and practices are “a natural controlling mechanism” (p13). Wingate demonstrates that a well-run project operates on the logic and principles of system engineering.

Providing a complex DoD or industry product development study would enhance this book. Most folks are not traversing Greenland or starting a custom soap company. A multitude of program and engineering personnel develop DoD, NASA, and industry products. Parsing out a complex program is within the scope of this book yet would devolve into a level of detail that the author could present in a stand-alone work.

The “working-manual” structure plainly states what to expect from each chapter. The “Roadmap” further details chapter objectives. Each subsequent chapter describes the content to follow with bulleted details. A “Key Point Summary” and “Apply Now” section offer the reader a working exercise to incorporate lessons learned.

Project Management Institute’s “Triple Constraint” for project cost, schedule and scope is reiterated throughout the book. The author brings processes back to this central concept for both project and technical management. And this is critical because without this focus a project will go “bust.”

### **Who might benefit from the Book?**

Those who are PMP (or other PMI credential) certified and have experience in major program development will benefit the most from this book. Incorporating the intersection of PM and SE takes time. This comes from hands on work in handling both disciplines. For example, the DHS Acquisition Lifecycle Framework contains 23 artifacts across Acquisition, System Requirements, and System Engineering and Program Management. Assimilating this wide-ranging material requires time and effort most gained from working in program development.

### **Conclusion**

Obtaining fluency in the areas of SE and PM provides a path to career growth in a high value, demanding career area. Those who navigate in this environment bring value added to any project or program that they support. “System Engineering for Projects” provides a gateway into the larger world of program management and system engineering.

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## About the Reviewer



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Prior Silicon Valley electronic products and GPS development. Marc Crotty is currently consulting with Booz Allen Hamilton to the Veterans Administration “Electronic Health Record Modernization” Program for Infrastructure Site Readiness. He can be contacted at [mrcrotty@gmail.com](mailto:mrcrotty@gmail.com)

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For more about this book, go to the CRC Press web site at:

[https://www.routledge.com/Systems-Engineering-for-Projects-Achieving-Positive-Outcomes-in-a-Complex/Wingate/p/book/9780815362951?utm\\_source=cjaffiliates&utm\\_medium=affiliates&cjevent=a8e1cf92a19511ed80bc00530a1eba22](https://www.routledge.com/Systems-Engineering-for-Projects-Achieving-Positive-Outcomes-in-a-Complex/Wingate/p/book/9780815362951?utm_source=cjaffiliates&utm_medium=affiliates&cjevent=a8e1cf92a19511ed80bc00530a1eba22)

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