Rocket System Characterization: A Statistical Engineering Case Study

Discussion and QA Session

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1st International Statistical Engineering Association Summit
West Palm Beach, FL
October 2, 2018

Introduction

- A brief discussion on…
  - Engineers and Statisticians
  - Academia/Industry/Government

- Common themes:
  - “Complex” problems
  - Historical component(s)
  - New “breed” of SMEs
  - Large teams
  - Limited resources

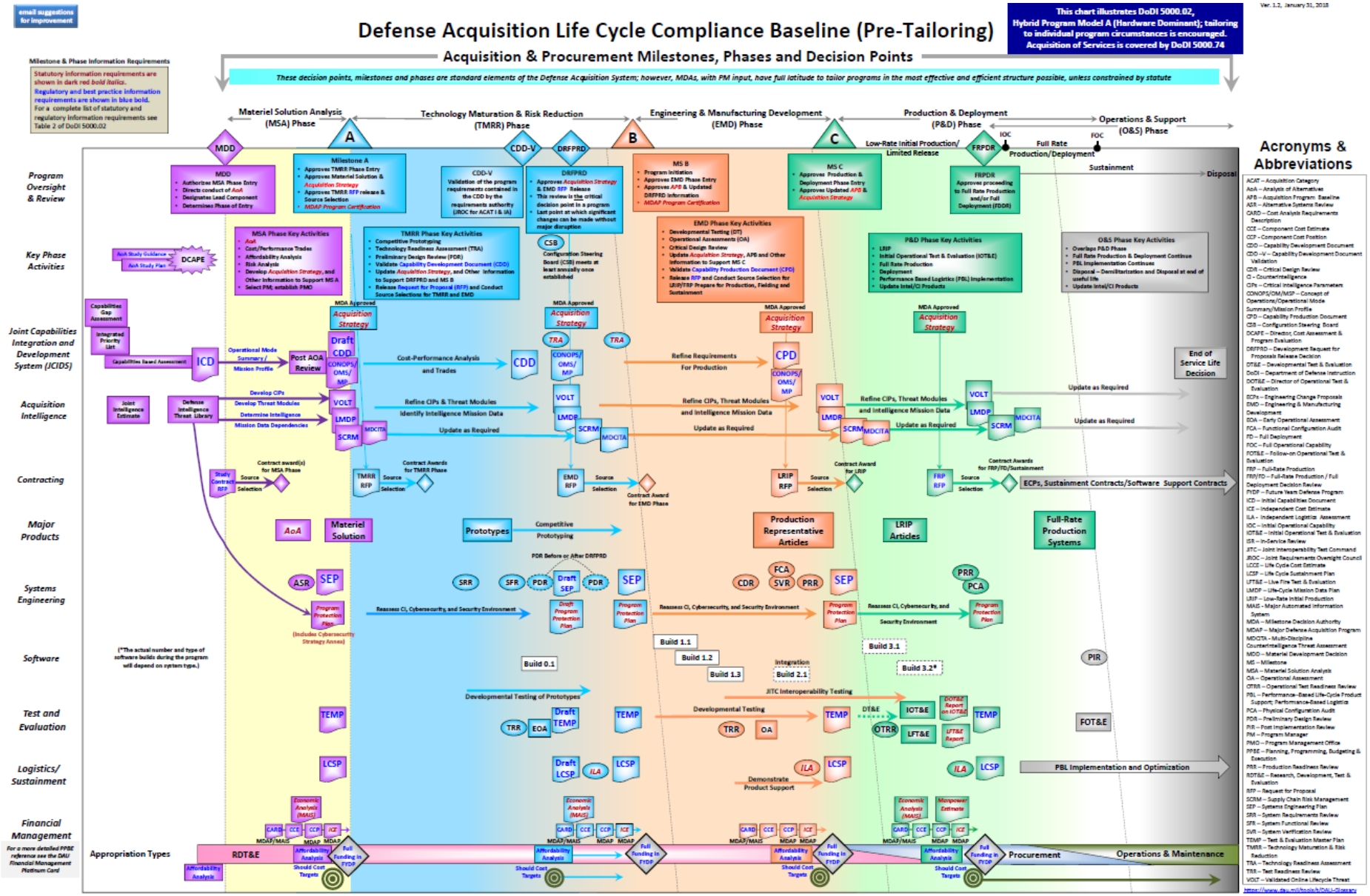
Case Study Highlights

- Demonstrated aspects of SE
  - Strategic planning and “nested experimental designs”
  - Objective presentation of results to SME
  - Non-traditional application of RSM
  - Leverage/combined multiple disciplines/tools
- Consequences of a non-SE approach
  - OFAT
  - Scope creep and churn
- Challenges
  - Precise objective

Case Study Extension – A Sales Pitch

- How can the solution to the “current” problem be structured to support future efforts?
- What was the total reduction in resources for OFAT/SME approach vs. SE approach?
- What obstacles were overcome to reach the solution?
  - Technical
  - Organizational

SE in DoD acquisition



SE in DoD acquisition

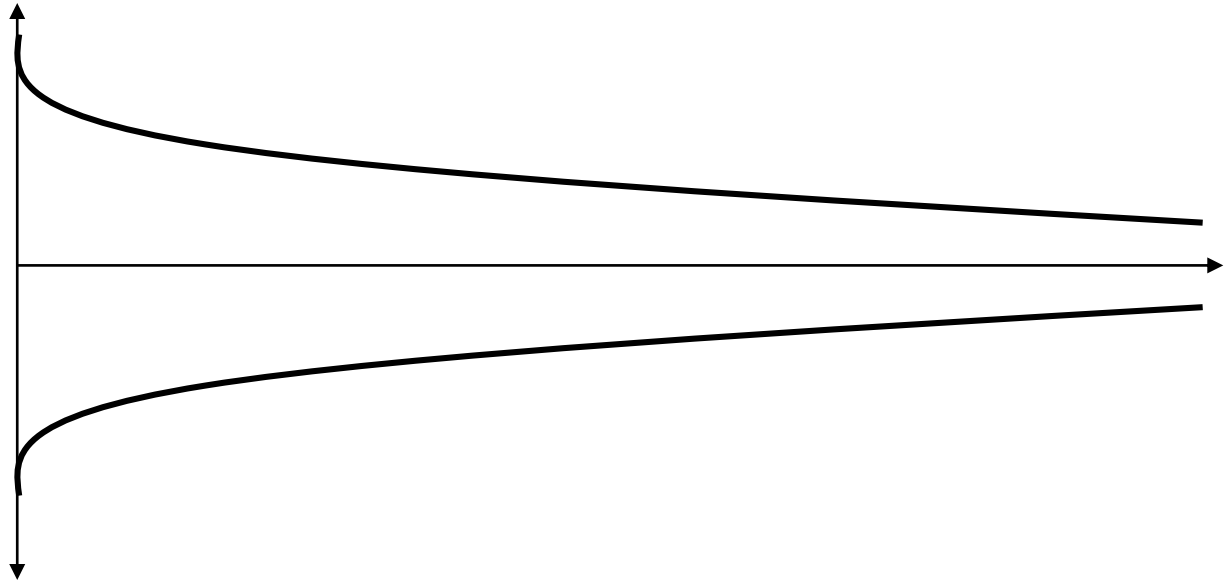
- Minimal Resources
- Many Stakeholders
- Rapid Acquisition/Immediate Need
- Legacy Procedures and Processes
- Push to leverage M&S in lieu of physical testing
- Data Management Challenges

Thoughts on SE: "The big picture"

- My Opinions/Topics for Discussion
  - SE is about **problem solving not statistical tools**
  - "Confounding" is the most important topic for the SE community to address and socialize.
    - and now a word on "Big Data"
  - SE practitioners cannot feel as though they "saved the day" if the primary contribution was highlighting what cannot be done or claimed
    - Opportunity has been missed
  - True measure of success for the SE initiative is…
    - having leadership select SE practitioners to lead projects

Thoughts on SE: "The big picture"

- So what exactly does a statistical engineer do?
  - Develops and implements statistically based management strategies that continuously refine uncertainty estimates and promote a multi-dimensional understanding of the system(s) in question.



Discussion