Maturing Cost Estimation in Rapid Acquisitions

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Research Idea

- Agencies are searching for ways to deliver critical mission functionality more quickly and with less risk.

- Generating confident and credible cost estimates is a challenge when programs may have less definition, greater uncertainty, and fast timelines.

Research Goals:

- Provide a deeper understanding of cost implications in rapid acquisition environments.

- Develop methods of costing rapid acquisition projects in a consistent and repeatable way.
Rapid vs. Deliberate Planning

“Rapid” generally entails reduced documentation, empowered decision making, and less oversight to meet shortened schedules

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Case Studies Methodology*

- Applied research design and methods specific for case study research
  - Established theoretical framework to guide research and map findings
  - Standardized data process and collection tools
  - Removed unintentional bias; ensured recommendations and findings are applicable to the broader community

- Theoretical Framework is based on best practice in cost estimating community

GAO Cost Estimating and Assessment Guide¹

Steps:

1. Define the Estimate’s Purpose
2. Develop Estimating Plan
3. Define the Program
4. Determine the Estimating Structure
5. Identify Ground Rules & Assumptions
6. Obtain the Data
7. Develop the Point Estimate and Compare it to an Independent Cost Estimate
8. Conduct Sensitivity
9. Conduct Risk & Uncertainty Analysis
10. Document Estimate
11. Present Estimate to Management
12. Update Estimate to Reflect Actual Costs/Changes

Analysis, stakeholder review, can lead to repeating previous assessment steps

*Adapted from Case Study Research Design and Methods by Robert Yin (2014)

¹ References: GAO Cost Estimating and Assessment Guide (GAO-09-3SP) (March 2009)

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Findings: Cost Estimating in a Rapid Environment

- Findings identified rapid acquisition characteristics that impact cost methods
  - Rapid acquisition emphasizes delivery of a capability quickly which causes very short acquisition timelines
  - In order to achieve these shortened timelines, rapid programs operate at a fast pace and have a great concurrency of efforts
  - Schedule is the top priority; cost and capability are flexible to support desired schedule
  - There are many rapid acquisition approaches that vary in solution maturity, size, type, timeline, and acquisition strategy

- Rapid acquisition compressed timelines pose unique challenges to the cost estimating process

- Recommendations were made to specifically address these challenges while considering the constraints of rapid environments
Findings: Cost Estimating Challenges

- Little time to collect data
- Quick turnaround initial estimates
- Adjusting for abbreviated processes
- Fast pace
- Increased uncertainty/risk
- Many trade-offs required
- Technical baseline maturity
- Documentation not top priority
- Transition planning varies
Recommendations by GAO Step

- Number of key recommendations counted for each of the 12 GAO Steps

The Twelve Steps of a High-Quality Cost Estimating Process (GAO)
- Step 1 – Define estimate’s purpose
- Step 2 – Develop estimating plan
- Step 3 – Define program characteristics
- Step 4 – Determine estimating structure
- Step 5 – Identify ground rules and assumptions
- Step 6 – Obtain data
- Step 7 – Develop point estimate and compare it to an independent estimate
- Step 8 – Conduct sensitivity analysis
- Step 9 – Conduct risk and uncertainty analysis
- Step 10 – Document the estimate
- Step 11 – Present estimate to management for approval
- Step 12 – Update the estimate to reflect actual costs and changes

- Step 8, Step 3, and ‘All Steps’ had greatest number of key recommendations
Recommendation Summary

Ensure tight coupling of cost and technical SMEs
Reflect abbreviated rapid efforts

Breakout life cycle phases and high level WBS

Develop cost estimate ranges to reflect uncertainty and risk

GAO Cost Estimating and Assessment Guide

Follow GAO process – even if high-level
Use trained cost analysts and ensure adequately resourced

Know cost drivers and trade-offs

Document, but be light and allow flexibility

Recommendations specifically address rapid acquisition costing challenges while considering the constraints of rapid environments

Steps:

1. Define the estimate’s purpose
2. Develop estimating plan
3. Define the program
4. Determine the estimating structure
5. Identify ground rules & assumptions
6. Obtain the data
7. Develop the point estimate and compare it to an independent cost estimate
8. Conduct sensitivity
9. Conduct risk & uncertainty analysis
10. Document estimate
11. Present estimate to management
12. Update estimate to reflect actual cost changes

Analysis, stakeholder reviews can lead to repeating previous assessment steps

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Application Considerations

- Consider the following factors when applying recommendations:
  - Rapid acquisition approach
  - Size of program ($)
  - New program start vs established program
  - Timeline
  - Solution maturity
  - Solution complexity
Summary

- Multiple programs and SMEs were interviewed across a variety of rapid acquisition program types and solutions.

- **Key recommendations include:**
  - Apply the GAO 12 step process – even if high-level.
  - Use trained cost analysts and engage them early and ensure they are adequately resourced.
  - Develop cost estimate ranges to reflect uncertainty and risk in rapid acquisitions.
  - Know cost drivers and trade-offs.
  - Understand and reflect abbreviated acquisition and technical efforts.
  - Document, but be light and flexible.

- Recommendations are easily applied and adaptable to the variety of rapid acquisition approaches.

- Recommendations align with established cost estimating best practices that help ensure confident, credible, and reliable cost estimates are developed.