ESS 2008 Poster Session

Characterizing the Enterprise of Military Systems Acquisition

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Research Group: Lean Product Development, Lean Advancement Initiative

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Motivation / Problem

Chronic execution problems for large, complex, systems acquisitions
- Department of Defense Acquisition
  - A systemic issue: 30% - 40% cost and schedule overrun on average (Source: Summary Selected Acquisition Reports, last 30 years; Biery, Miller & Lessard, others)

Literature suggests Risk is part of the problem
- Risk is underappreciated in large, complex projects (see Megaprojects and Risk by Flyvbjerg)
- The GAO, RAND, IDA and other groups have recently told DoD this too.

Risk
- For some, it means "almost anything that can go wrong"
- Others see opportunities in Risk
- Still others specify it further: political risk, technical risk, organizational risk, technology risk, etc.

Key Question(s)

Is Risk at the Heart of Acquisition Problems?
> Is risk really the problem? If so, we should manage risk better, right?
> And how do we manage risk better? What is the answer?
> Would using portfolio theory help manage Enterprise risk?

A Representation of the Enterprise of "Cradle to Grave" Acquisition in the US Air Force

Swim Lane	Pre-MS "A" (Concept Refinement)	Pre-MS "B" (Technology Development)	Pre-MS "C" (System Development & Demonstration)	Pre-Full Rate Production (Production & Deployment)	Operations and Sustainment
User					
Requirements	Scope of Model				
Money					
Acquisition					
Contractor					

Time →

Methodology

Conducting grounded research using Social Science Research methods to characterize the AF Acquisition system. Over 50 interviews of key players within system talking about risk and portfolios of systems
> Borrowed ideas and concepts from Value Stream mapping
> Using commonly accepted understandings of risk; probabilities and occurrence
> Represented activity in frame of reference understandable to target audience: military and civil servants in AF
  – Main unit of measurement is a "program"
  – Restricted to ACAT I, II, and III programs; Limited to Milestone C and earlier in Acquisition phase parlance

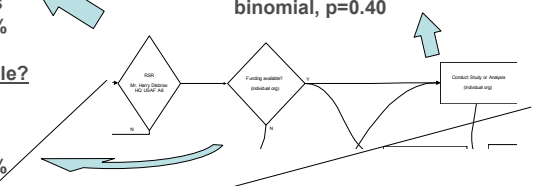
The Research

Model Design: Every decision point, every process task, where possible, is thoroughly documented and sourced

RSR – Decision Point
-Sources: Official Docs, Interviews
-Probability: 98%

Funding Available? – Decision point
-Sources: Interviews
-Probability: 80%

Conduct study or analysis – Task
-Sources: Official docs, Interviews
-- Time Distribution: 45 to 180 days; binomial, p=0.40



Preliminary Results

•Interview analyses suggests <u>many root causes of Acquisition anomalous behaviors originate outside of the formal Acquisition system</u>
•Concept of managing through portfolios is immature and portfolio risk understanding is primitive outside Acquisition as well

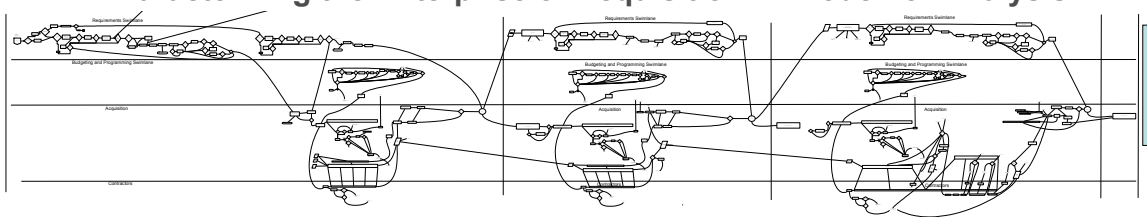
Remaining Research

•Finish the model Verification and Validation, program the model; run and debug
•Examine 2 or 3 key questions using the model with priority given to questions dealing with portfolios and risk
- For example: What is the overall process yield? What fraction of time spent is value-added? What is the cost of waiting? What interventions require the least disturbance to the existing system?

Wrap Up

•Model tacitly accounts for portfolio "interdependencies" – a problem identified in all interviews but deemed impossible to quantify
•Model reflects "things as they really are", not theory
•Model can be programmed and will lend itself to simulation exercises and sensitivity analyses
•Work represents first Enterprise Systems Analysis for Military Systems Acquisition using this methodology

Characterizing the Enterprise of Acquisition: A Model for Analysis



Swim Lanes are used to show key processes. A "rectangle" is a task with a time distribution associated with it (represented by a binomial distribution and a designated p-value)
A "diamond" is a decision point with a branching probability to "yes" or "no". A "oval" is information and serves to connect processes between swim lanes. A "parallelogram" shows the product of a process

"This ain't rocket science. It's much, much harder than that." BGen in Acquisition

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