



Calhoun: The NPS Institutional Archive
DSpace Repository

NPS Scholarship

Publications

2007-05-01

**AEGIS and Ship Self-Defense System (SSDS)
Platforms: Using KVA Analysis, Risk Simulation
and Strategic Real Options to Assess
Operational Effectiveness**

Housel, Thomas; Tarantino, Eric; Uchytel, Scott; Mun, Johnathan

<https://hdl.handle.net/10945/33213>

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>



Acquisition Research Program: Creating Synergy for Informed Change

Managing Acquisitions in an Open Architecture, Open Business Model Environment

Dr. Thomas J. Housel

Managing Acquisitions in an OA/Open Business Model Environment: Tracking Management Performance



Problem

- Open business acquisition models are more complex to manage requiring greater innovation from acquisition managers.
- Managers are supposed to make “change” happen: How well do individual managers do this?
- Establishing a relationship between management performance and organizational outcome (e.g. revenue, capability, productivity, output)
- Need a common objective metric to measure management performance



Previous Approaches for Structuring Problem

- There are no comprehensive objective approaches to valuing individual managers
- Majority of previous research focuses on qualitatively *improving* management's performance
- Most prior research agrees that management adds value to the organization but does not quantify the amount of value each manager adds



Management Value Added Approach (MVA)

- What is MVA?
 - An approach to objectively valuing individual managers contributions to organizational outcomes
 - It is an extension of the knowledge value added (KVA) theory designed to account for non-algorithmically definable processes
 - such as management
 - The focus is on managers' outputs, not currently accounted for by standard KVA theory
 - These “dark matter” outputs are management messages that focus on: innovation, predictions, future thinking/non-algorithmically definable processes/creativity/etc.
 - MVA assumes that managers are supposed to use their “dark matter” outputs to positively influence organizational outcomes (e.g., revenue, capabilities)



Management Value Added Approach (MVA)

- Operationalization: Strict KVA extension and Correlational approach
- Preliminary tests of the concept: Does it make sense?
 - Strict KVA approach—CMA—Ship Track Management
 - Research Question—Can we objectively measure management dark matter outputs? (e.g. Job description approach)
 - Hypothesis Test of correlational approach
 - ARCI Open Business Model Example (in progress)



Results: Strict KVA Approach

- Ship tracking process: Role of Track Manager
 - **6% of total track management output was dark matter output**
- Proof of concept operationalization: expanding traditional KVA approach was relatively painless
- Appeared that this management assignment could be automated over time
- Due to relatively minimal management contribution, risk and uncertainty could be “managed” by the team—cost reduction



Correlational Approach: ARCI example

- First order hypothesis: There will be a greater amount of management dark matter outputs in the ARCI message sample than in the proprietary message sample.
 - Preliminary results: dark matter management messages 4 times as long as routine management messages
- Algorithm development (see paper)
 - Delta in “dark matter” management outputs can be categorized and tracked over time
 - Delta in this management output can be shown to correspond to changes in organizational outcomes (e.g., revenue, capabilities)
- Comparing management outputs in ARCI example with management outputs in proprietary system acquisition example.
- Data collection and analysis is continuing



Implications

- Open Business Acquisition Models place more demands on managers: Dark Matter Outputs must increase
- Performance Monitoring, Feedback, Transparency, Accountability, and Reward Structures must reinforce managers to use their Dark Matter capabilities to:
 - Recognize options
 - Improve organizational outcomes
 - Mitigate risks and recognize uncertainties
 - Avoid catastrophic failures
- MVA performance results will:
 - Identify those managers who lead change in a positive direction
 - Help weed out those managers who cannot adapt
 - Provide an objective basis for increasing fairness



Limitations and Future Research

- Correlational Approach: Need data on cycle time conversion ratio for introduction of innovation-change to implementation-production among organizations
 - Conversion ratio: dark matter output/organizational outcome
 - Need to collect data on dark matter outputs over time
- Developing a practical non-semantic approach to quantifying dark matter output
 - Calibration is an issue—attempt to get common units of dark matter outputs
 - Need to move from correlations among deltas to coefficient that converts deltas to absolute values



Backup slide

- Using the strict KVA approach, managers contribute to total output, including their dark matter outputs, can be quantified objectively
- Strict KVA approach for measuring MVA can be easily incorporated into existing software and data modeling
- Helps to quantify management performance when dealing with complex issues
- Management may be consumed with routine activity that inhibits them from utilizing their dark matter



