Engineering the Business of Defense Acquisition: An Analysis of Program Office Processes

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Overview

- Background, "The Fog of More…"
- Research Approach
- The Problem
- Methodology
- Proposed Model
- Conclusion

The Fog of More…

A Quest for Excellence

Final Report to the President

by the President's
Blue Ribbon Commission
on Defense Management

June 1986

Removing <u>bureaucratic inefficiencies</u> in our acquisition of major weapon systems ⋯. The [PM] finds that, far from being the manager of the program, <u>he is merely one of the participants</u> who can influence it. An army of advocates for special interests descends on the program ⋯. (Packard Commission)

- *"We surveyed 24 program managers that held a milestone B or C decision since 2010 and found that it took them <u>over 2 years on average to complete</u> the entire set of documents needed for the milestone decision. The program managers, as well as other acquisition officials we surveyed, considered on average about half of the information requirements as <u>not highly valued</u>."* (GAO, 2015)

United States Government Accountability Office
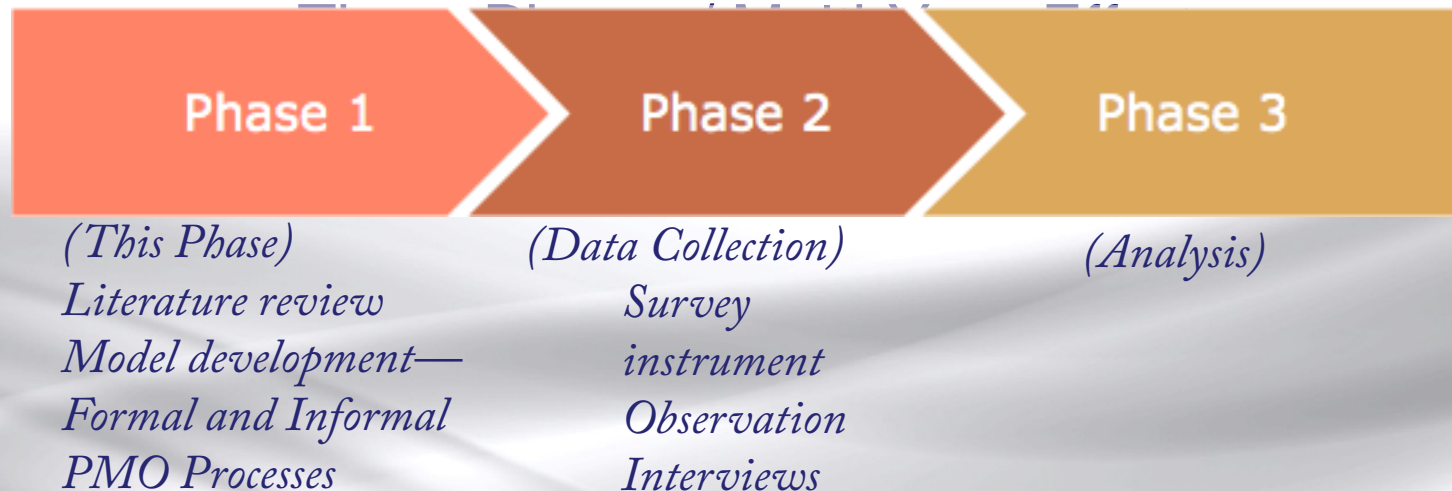Report to Congressional Committees

GAO

February 2015

ACQUISITION REFORM

DOD Should Streamline Its Decision-Making Process for Weapon Systems to Reduce Inefficiencies

GAO-15-192

The Approach

- Multi-phased Effort to address acquisition reform at the PM level—where projects are actually managed

- Using Enterprise Systems Engineering (ESE) develop a system model of Program Management Office (PMO) functions

  - ESE links systems management to process execution

Phase 1

(This Phase)
Literature review
Model development—
Formal and Informal
PMO Processes

Phase 2

(Data Collection)
Survey
instrument
Observation
Interviews

Phase 3

(Analysis)

The Problem

- *"Curiously despite the enormous attention project management and analysis have received over the years, the track record of projects is fundamentally poor, particularly for the larger and more difficult ones. Overruns are common. Many projects appear as failures, particularly in the public view. …[W]hy does the record so consistently show project overruns to be the norm? Is this the indictment of project management that it seems?* (Morris & Hough, 1988)
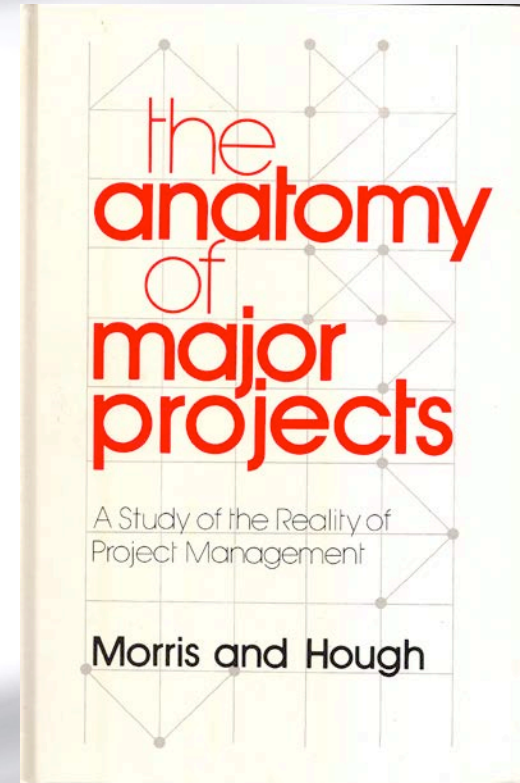
Is this a policy or management problem?
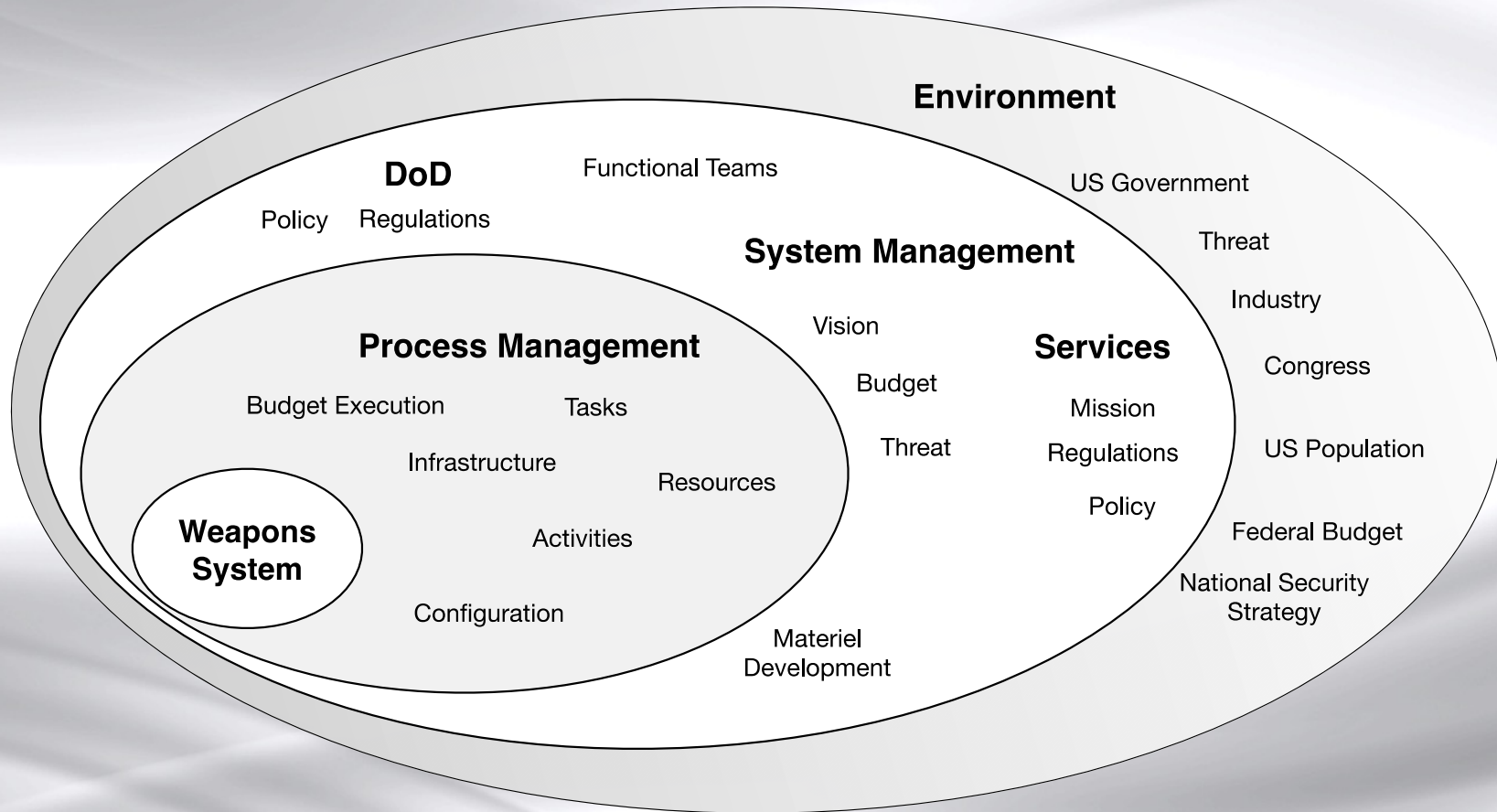
Project Management as System

- An enterprise system consists of a <u>purposeful combination</u> (e.g., a network) of <u>interdependent</u> resources (e.g., people, processes, organizations, supporting technologies, and funding) that <u>interact</u> with each other to <u>coordinate</u> functions, <u>share</u> information, <u>allocate</u> funding, create workflows, and make <u>decisions</u>, etc.; and their environment(s)

- A network of many variables in casual relationships = incomplete knowledge*
  - Interdependent
  - Dynamic
  - Unstable
  - Opaque
  - Uncertain

*D. Dorner; P. Nixon; S. D. Rosen, Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, Vol.327, No. 1241, Human Factors in Hazardous Situations. (Apr. 12, 1990), pp. 463-473.

Acquisition as Enterprise System

Environment

DoD

Functional Teams

Policy   Regulations

US Government

System Management

Threat

Industry

Process Management

Vision

Services

Congress

Budget Execution   Tasks

Budget

Mission

Infrastructure

Threat

Regulations

US Population

Resources

Policy

Weapons System

Activities

Federal Budget

Configuration

National Security Strategy

Materiel Development

Process, Functions & Management
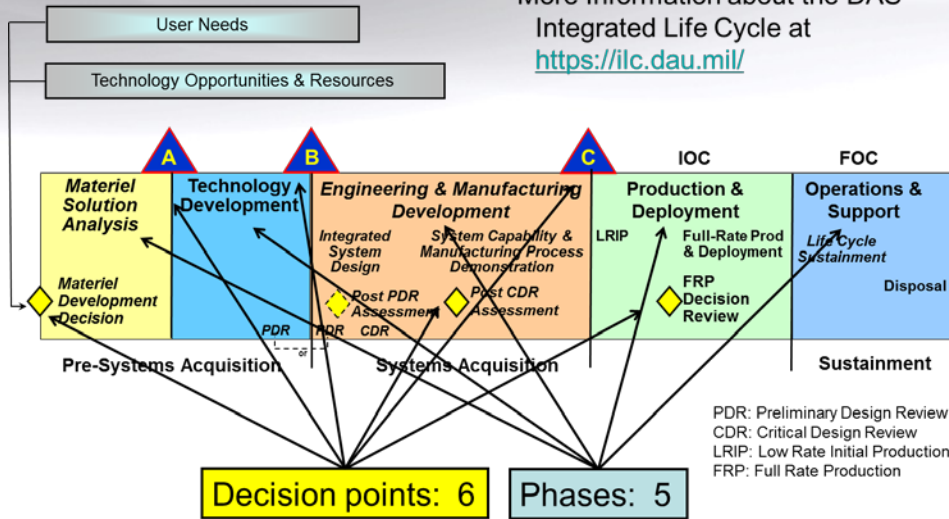

Enterprise System Engineering

- Interdependence
- Processes
- Social
  - People
  - Optimized for Job satisfaction
- Technical
  - Procedures
  - Technology
  - Optimized for efficiency

Project Management Tasks

- Activity Management
- Configuration Management
- Resource Management

Process Growth Through Life Cycle

More Information about the DAS Integrated Life Cycle at https://ilc.dau.mil/

PDR: Preliminary Design Review
CDR: Critical Design Review
LRIP: Low Rate Initial Production
FRP: Full Rate Production

Decision points: 6   Phases: 5

- Acquisition Decision Memorandum (ADM)
- Analysis of Alternatives (AoA) (update)
- Acquisition Strategy
- Affordability Assessment
- Acquisition Program Baseline
- Acquisition Information Assurance Strategy
- Benefit Analysis & Determination
- Capability Production Document (CPD)
- Title 40/Clinger-Cohen Act (CCA) Compliance
- CIO Confirmation of CCA Compliance *(for MDAPs & MAIS, DoD CIO confirms)*
- Consideration of Technology Issues (ACAT I & II)
- Competition Analysis
- *Component Cost Estimate (CCE)*
- Cooperative Opportunities
- Core Logistics Analysis/Source of Repair Analysis
- Cost Analysis Requirements Description (CARD) (MDAP & MAIS)
- *Corrosion Prevention Control Plan*
- *Data Management Strategy (in acquisition strategy)*
- Exit Criteria
- Initial Capabilities Document (ICD) (if program initiation)
- Independent Cost Estimate (ACAT I)

- Independent Technology Readiness Assessment (TRA) (ACAT ID)
- Information Support Plan (ISP)
- Industrial Base Capabilities (MDAP)
- *Item Unique Identification Plan (SEP annex)*
- Life Cycle Sustainment Plan (LCSP)
- *Life Cycle Signature Support Plan*
- Manpower Estimate (MDAP)
- MDA Program Certification (if program initiation)
- *Military equipment valuation (in acquisition strategy)*
- Net-Centric Data Strategy (in ISP)
- Operational Test Agency OT&E Report
- Program Protection Plan (PPP)
- Programmatic Environment, Safety, & Occupational Health Evaluation (PESHE)
- Selected Acquisition Report (SAR) MDAP (if rebaselined)
- Spectrum Supportability Determination
- *Systems Engineering Plan (SEP)*
- *System Threat Assessment Report (STAR)(ACAT I)*
- System Threat Assessment (ACAT II)
- Technology Readiness Assessment (TRA)
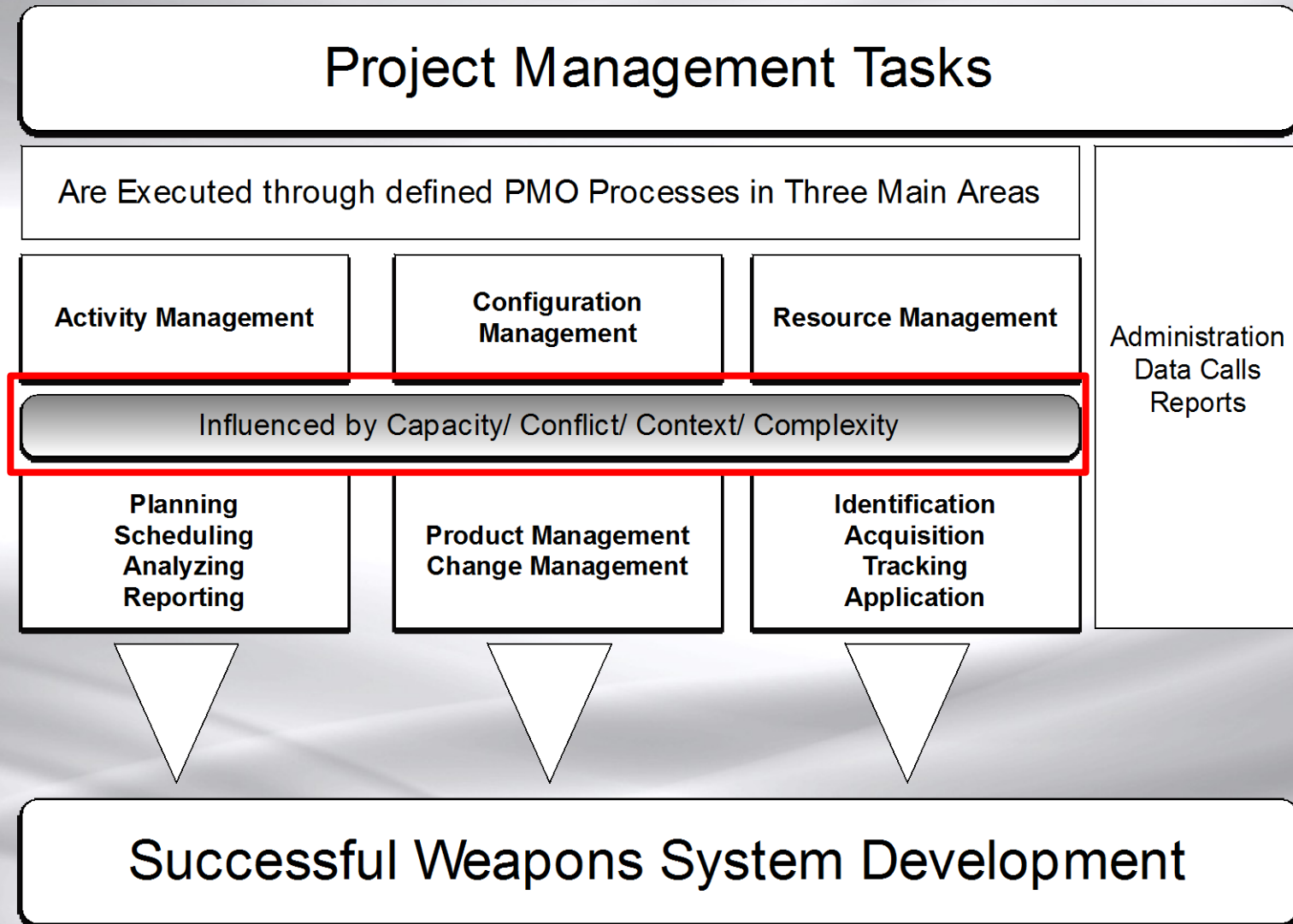- Test & Evaluation Master Plan (TEMP)

- Acquisition Decision Memorandum (ADM)
- Analysis of Alternatives (AoA)
- Acquisition Information Assurance Strategy
- Clinger-Cohen Act (CCA) Compliance
- CIO Confirmation of CCA Compliance *(for MDAPs & MAIS, DoD CIO confirms)*
- Consideration of Technology Issues
- *Component Cost Estimate (CCE)*
- Economic Analysis (MAIS)
- Exit Criteria

- Initial Capabilities Document (ICD)
- *Item Unique Identification (IUID) Implementation Plan*
- *Life Cycle Signature Support Plan*
- Market Research
- *MDA Program Certification*
- Program Protection Plan (PPP)
- *Systems Engineering Plan (SEP)*
- Technology Development Strategy (TDS)
- Test & Evaluation Strategy (TES)

- Initial Capabilities Document (ICD)
- *AoA Study Guidance (AoA Plan due immediately following the MDD)*
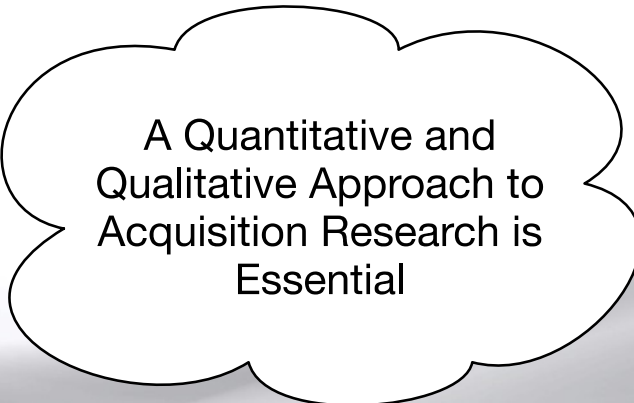
Project Management is Accomplished by Processes

Project Management Tasks

Are Executed through defined PMO Processes in Three Main Areas

Activity Management	Configuration Management	Resource Management	Administration Data Calls Reports

Influenced by Capacity/ Conflict/ Context/ Complexity

Planning Scheduling Analyzing Reporting	**Product Management Change Management**	**Identification Acquisition Tracking Application**	

Successful Weapons System Development

Characteristics of Process*

- Define how the work of the organization is done
- Logical organization of people, materials, energy, equipment and procedures into work activities designed to produce a result.
- Set of processes lead to the accomplishment of a task
- Cross organizational boundaries (between tasks and organizations)
- Process Entities
  - Interorganizational
  - Interfunctional
  - Interpersonal
- Process Activities
  - Operational
  - Managerial

A Quantitative and Qualitative Approach to Acquisition Research is Essential

*Davenport, T. (1990). The New Industrial Engineering: Information Technology and Business Process Redesign | MIT Sloan Management Review. MIT Sloan Management Review. Retrieved from http://sloanreview.mit.edu/article/the-new-industrial-engineering-information-technology-and-business-process-redesign/

Analytical Framework

- ## Systems Engineering
  - Enterprise Systems Engineering
  - Business Process Reengineering
  - Socio-political
  - PMO process classification
  - PMO process categories

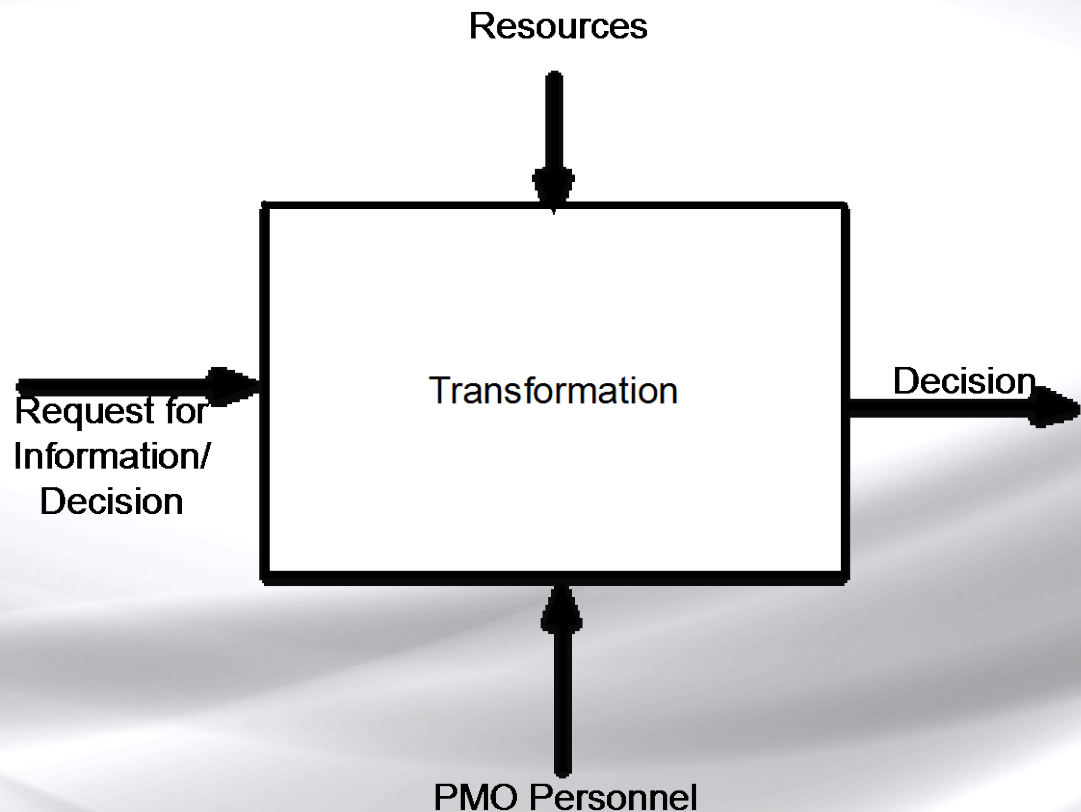- ## Management Science
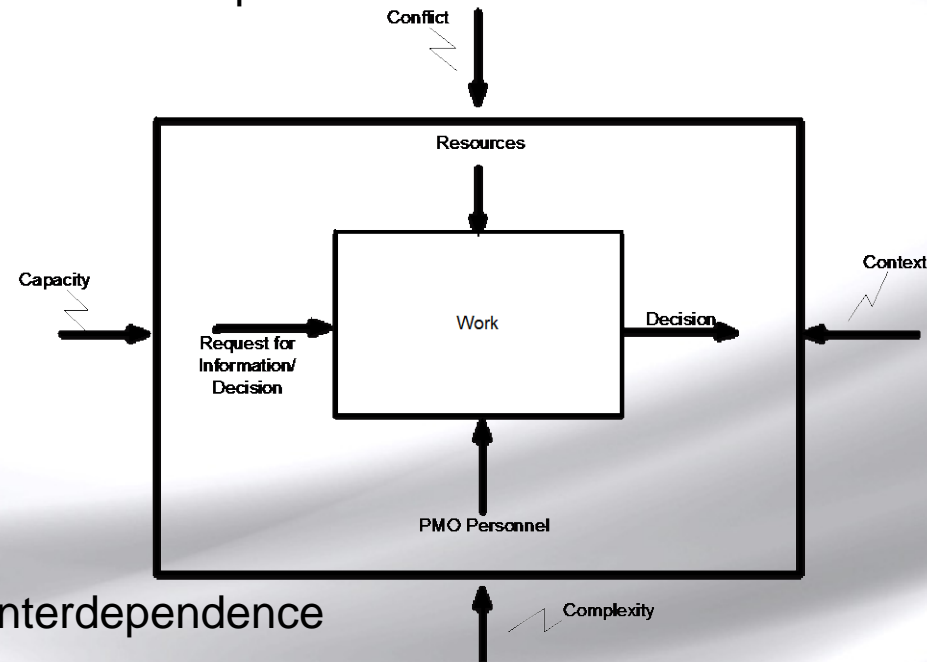 - Decision making
  - Change

IDEF0 Modeling Approach

Control

Transformation

Input

Output

Mechanism
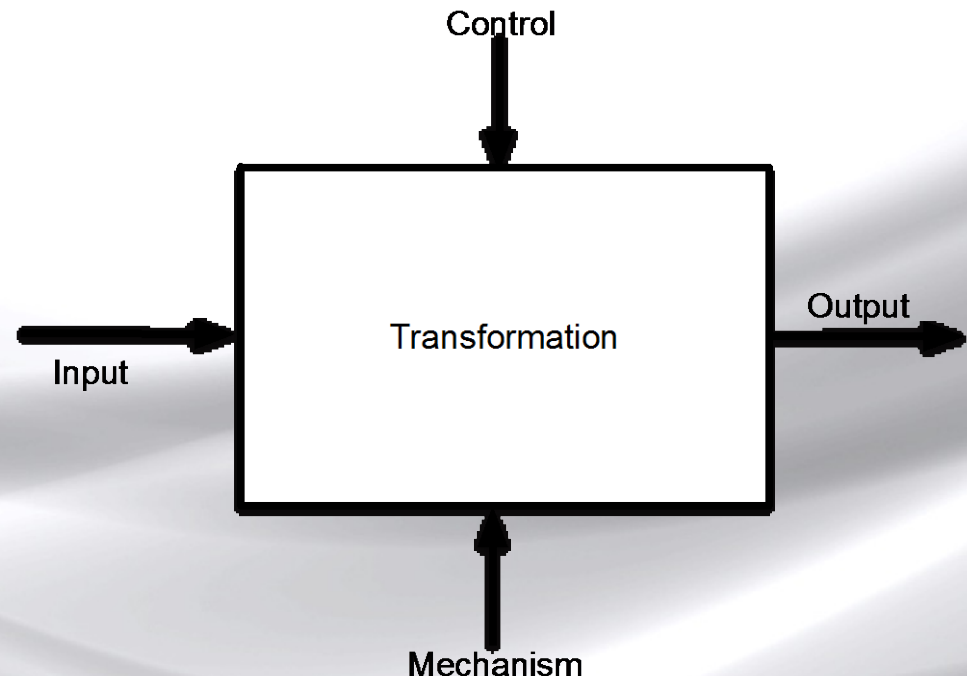
Process Elements

- Work
- Resources
- Information
- Decision

Decision = Information + Resources + Work

Resources

Transformation

Decision

Request for
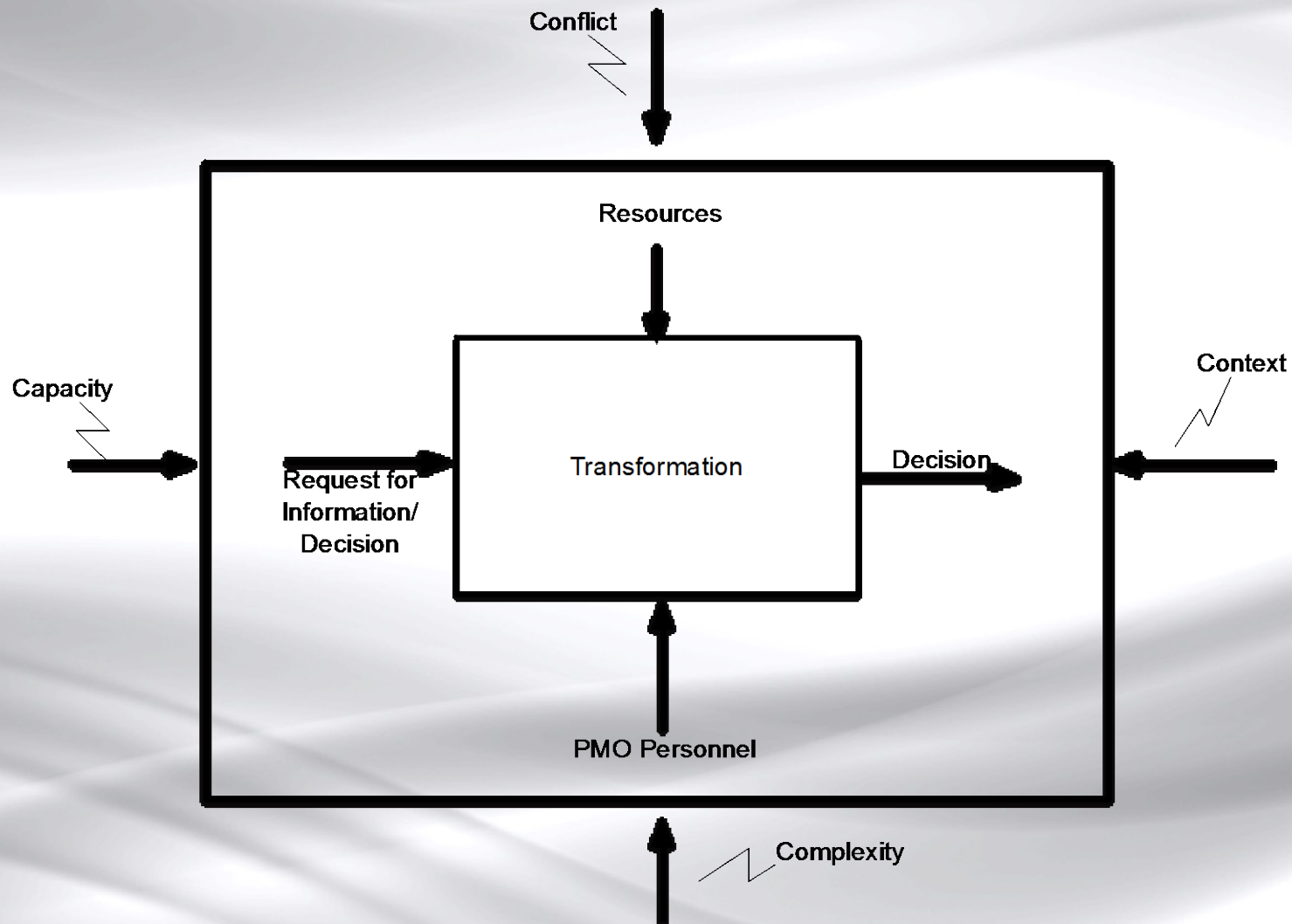Information/
Decision

PMO Personnel

Process Category Level

- Capacity/ Scope
  - Amount of work that can be performed by the PMO in a set amount of time
  - Finite measure—internally generated capacity or externally contracted
  - Metrics = actions, processes, decisions and completed tasks
- Conflict
  - People, system and organization
  - Matrix environment challenges
- Context
  - PMO ecosystem
  - Stakeholders
  - Communication
- Complexity
  - System focused
  - Structural, Dynamic, Socio-political, interdependence
- Value

Process Categories

Process Model
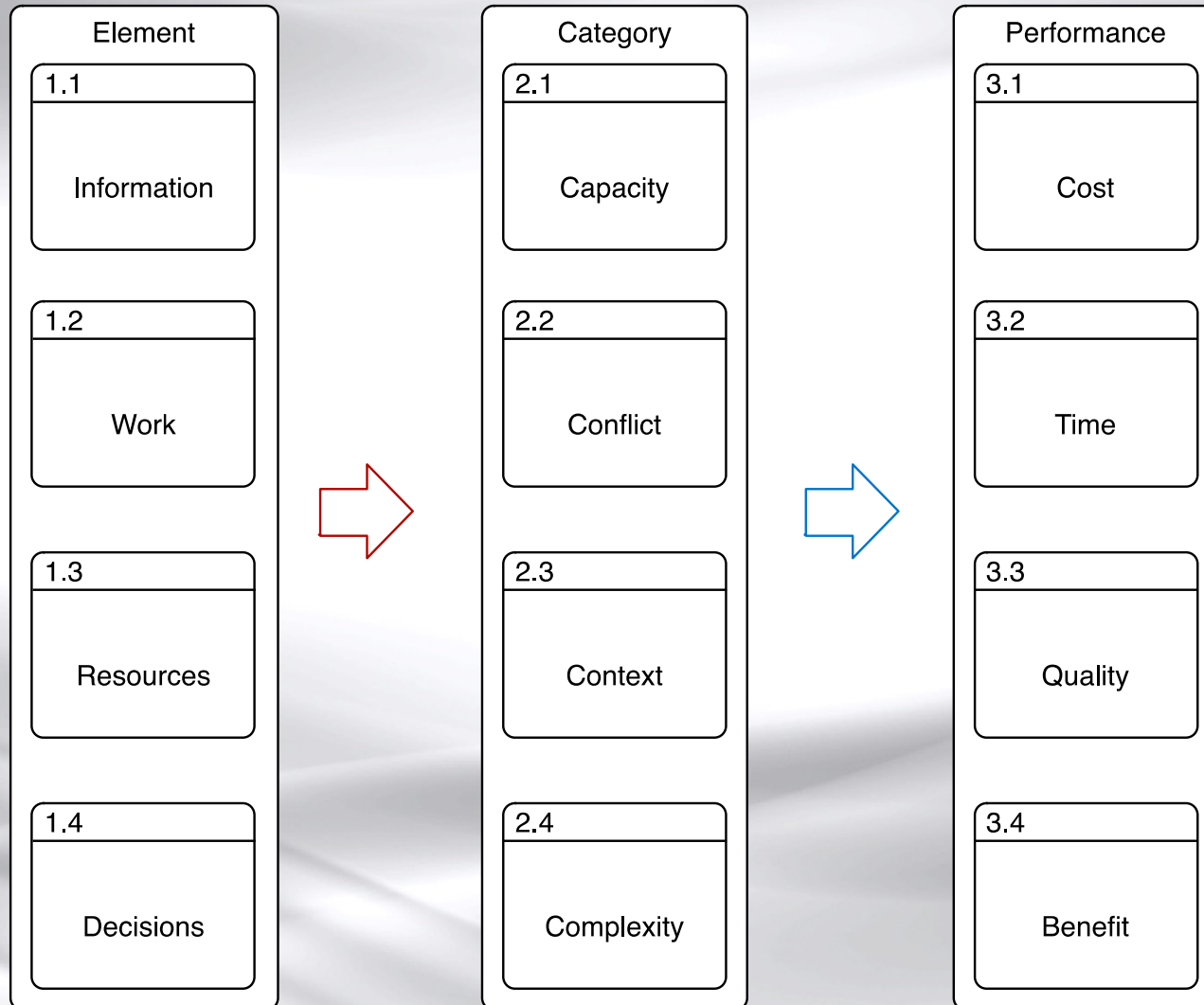

PMO Business Process

Element
- 1.1 Information
- 1.2 Work
- 1.3 Resources
- 1.4 Decisions

Category
- 2.1 Capacity
- 2.2 Conflict
- 2.3 Context
- 2.4 Complexity

Performance
- 3.1 Cost
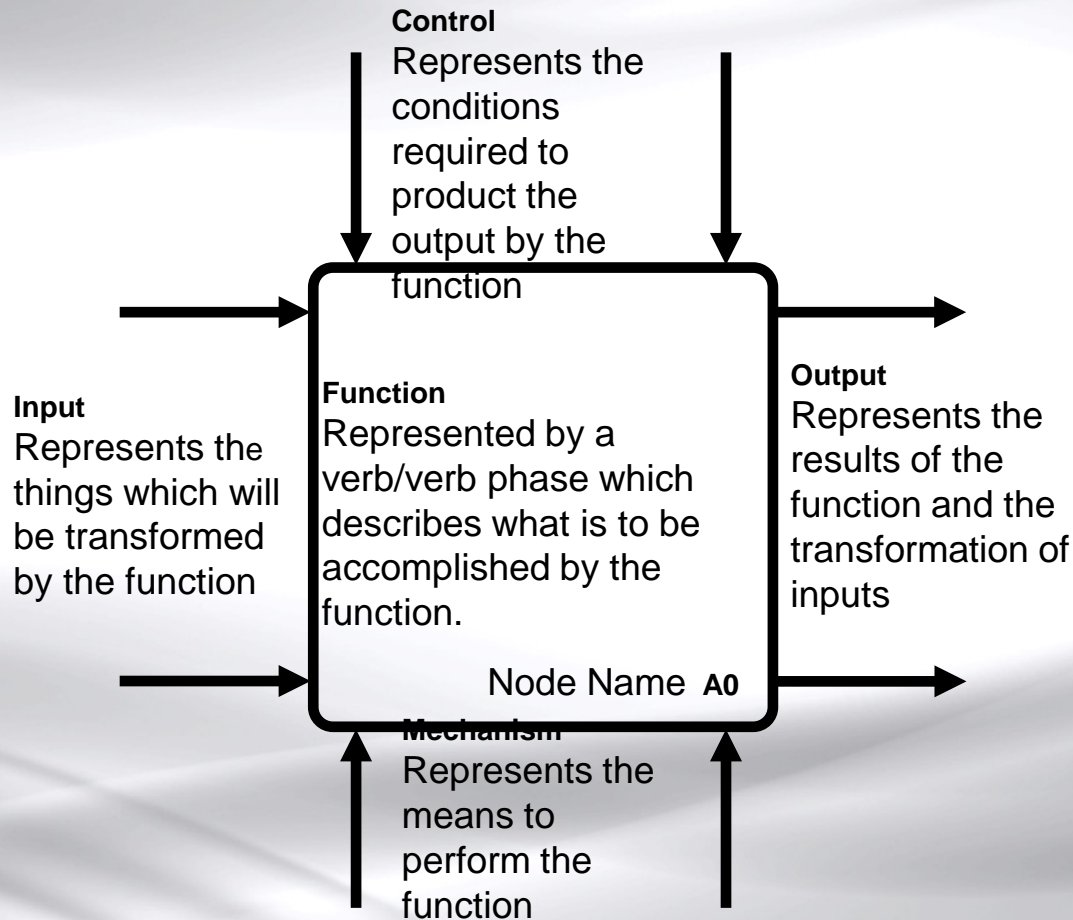- 3.2 Time
- 3.3 Quality
- 3.4 Benefit

Conclusion

- Reform will not come from top-driven initiatives alone—A systems approach that links the systems management level to PMO processes can help identify best practices

- An enterprise systems engineering approach provides a framework for examining PMO activities and decisions

- Process Level analysis will help extend research beyond policy adjustments to get at the heart of acquisition change

- Process focused analysis will identify those value adding and key decision process activities in the PMO

- A broad systems approach to the entire acquisition system will ensure a more complete understanding of the challenges and lead to better solutions

BACKUP

IDEF Modeling Norms

Control
Represents the conditions required to product the output by the function

Input
Represents the things which will be transformed by the function

Function
Represented by a verb/verb phase which describes what is to be accomplished by the function.

Output
Represents the results of the function and the transformation of inputs

Node Name **A0**

Mechanism
Represents the means to perform the function

Definitions

- <u>System:</u> A set of interacting or interdependent components forming an integrated whole.

- <u>Reengineering</u>: The fundamental rethinking and radical redesign of core business processes to achieve dramatic improvements in critical performance measures such as quality, cost, and cycle time.

- <u>Process</u>: a structured, measured set of activities designed to produce a specific output for a particular customers or market.