

10th International Command and Control Research and Technology Symposium The Future of C2

Application of Agency Theory to Transform Government Business Enterprise Governance

Topic: Policy

Authored By: Michael D. Nueslein

Point of Contact:

Michael D. Nueslein

The MITRE Corporation
7515 Colshire Drive
McLean, VA 22102-7508
703.883.2674
703.883.6435 (fax)
mnueslein@mitre.org

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Abstract

A concept of net-centric governance is being proposed for major Department of Defense (DoD) programs e.g. ACAT. This treatise begins to examine ways to improve governance over large DoD programs, to reduce or protect against spectacular losses to the taxpayer and warfighter. Agency theory addresses many subtle under-pinnings leading to program failure. These include incompetence and the many problems associated with self-interest and conflict-of-interest. Michael Jensen of Harvard Business School, a thought leader in this area, is cited often herein. He argues “conflicts are so ubiquitous and so familiar that they almost become invisible”, and “the universality of conflict leads to a danger of taking it for granted rather than seeing it at all.” This subtly, as an example, is one of many that can contribute to the de-escalation of programs. The goal of this paper is to plant the seeds for governance policy change, especially applied to Major Defense Acquisition Programs. Offered are new ideas for a very proactive Board of Directors (BoD), program due diligence, and new incentive policy for long-term program success. Techniques proposed include Enterprise Architecting (EA) and Theory of Agents to construct actual net-centric governance to the tactical edge of program performance and program integrity.

Introduction

Problem Statement

Joint-level DoD acquisition demands an agile and collaborative enterprise to satisfy the real warfighter needs at their organizational edge [16]. Alberts and Hayes Power to the Edge [16] posits the need for net-centric transformational change, and cites the persistence of hierarchical organizations blunting effectiveness, efficiency and innovation in institutional processes. Agile edge-organizations by their nature avoid creating stovepipes. However, no formal policy exists articulating how one should proceed in creating the edge-organization¹ [16]. With no clear path forward, the persistence of hierarchy remains along with the ostensible resistance to transformational change. In a February 2, 2005 Federal Computer Week article titled “Cebrowski stresses net-centric war”; Retired Vice

¹ Edge organizations are organizations where everyone is empowered by information and has the freedom to do what makes sense. They are organizations that embody a “*power to the edge*” approach to command and control. See Alberts and Hayes for details [16]

Admiral Arthur Cebrowski, former director of DoD's Office of Force Transformation, 'warned in his Feb.1 speech against the enemies of change and transformation, which he identified as Pentagon and Services' program offices, "where the first causality is truth"[23]. Agency theory is one forward mechanism for understanding and developing a net-centric organizational framework to especially address joint acquisition programs.

Proposed Assertions

Governance of edge-organizations can be determined and assessed using agency theory, within the domain of enterprise architecture. Agency Theory, as a body of knowledge, prescribes a set of tradeoffs for organizing relationships/contracts between principals, agents and stakeholders. The principals determine the work for agents in the face of maligned goals and imperfect behaviors. Conditions of incomplete information and uncertainty are sources of moral hazard and adverse selection, measured as sunk cost [9]. Proactive steps taken to monitor and select agents are measured as a governance cost. Agency theory cleanly maps within mandated DoD business operations; 'shareholders' may be benefactors (warfighters), 'agents' are executing managers, and 'principals' are other stakeholders (Congress, OSD, tax payer...). The objective in agency theory is to minimize agency and governance costs of the principals, while protecting the interests and benefits of the benefactor stakeholders. It will be shown that when applied to DoD business enterprise, legacy hierarchical structure can be displaced with a measurable net-centric accountability structure. An agency orientation builds in communication channels and accountability to effect outcome-based tangible results. This topic promises to be insightful, juxtaposing theory and practice of publicly traded firms against large joint DoD endeavors. Hence, interesting causal behaviors emerge when DoD hierarchical organizations are viewed through the lens of agency theory.

The paper is organized to apply Agency Theory precepts to business enterprise architecture governance. The approach taken provides an agency theory overview, introduces a governance framework, and proposes a methodology to construct a net-centric governance structure. The basic corporate governance framework serves as a starting point in deriving a transformational DoD governance structure. Agency theory and

Enterprise Architecture aid to instantiate net-centric edge-organizations, and a new policy for Government business enterprise. Lastly, thought provoking areas for further research will be covered such as: 1) mathematically economizing agency costs, 2) incentive structures, 3) performance measures & governance failures and 4) risk-reducing intervention frameworks.

This new policy is expected to have strong beneficial impact on Joint acquisitions especially those initiatives listed in the Joint Transformation Roadmap [15].

Agency Theory Overview

Key terms and concepts are first defined. '**Agency Theory**' is about organizing relationships in which the principal determines the work, which the agent undertakes [18]. Agency theory postulates self-interest leads to Conflict-of-Interest (COI) in the face of cooperative endeavors for the firm [2]. The central proposition is that rational self-interested people always have incentives to control COI in order to reduce the losses conflicts engender. The response therefore: 1) alters policy, contracts and informal arrangements to reduce this conflict, and 2) governs relationships by increasing the extent of cooperation [2]. '**Principals**' are owners or primary stakeholders. '**Agents**' are directors, managers, employees, and subcontractors retained for their professional skills, by the principal, to increase value to the firm [3]. The two "primordial agency problems" are '**moral hazard**' and '**adverse selection**' [9]. Both arise from information asymmetry and opportunism. Asymmetry refers specifically to access, quantity, and quality of information [14]. '**Moral Hazard**' stems from the agents "hidden action" (unobservable) thereby making reward/punishment incentives inefficient [9]. Moral hazard, or shirking, is failure of integrity, in an attempt to reap reward when acting unfaithfully or not putting forth maximal effort [18]. '**Adverse Selection**' stems from the agents "hidden information" - innate abilities difficult to fully ascertain, or failure of the agent to accurately represent his/her ability to do the work [18], [9]. "Hidden information" is the leading cause for creating two errors in management retention: '**deficient discipline**' and '**distorted discipline**'. In '**deficient discipline**' the poor manager faces too low a probability of firing

and strives to undermine monitoring. In '**distorted discipline**' the good manager faces too high a probability of firing. Distorted discipline results in maximizing over the short-term at the detriment of the long-term [9]. Imperfect information and informational asymmetry both make it difficult to design an incentive scheme to deter agency problems [9].

Next, an overview of agency theory interspersed with comments regarding the application and construction of net-centric governance architecture for DoD major defense programs. The intent is to inject attributes of proven corporate governance structures to improve governing policy for major DoD programs. Corporate governance structures tend closer to net-centric.

Background

In the year 1776 Adam Smith published a seminal work entitled "The Wealth of Nations". He was considered in his time the kind of forward thinker similar to today's thought leaders Michael Porter and Peter Drucker. In his book he identified complexity and continually changing business operations occurring in foreign trade much like "a species of warfare". From this he concluded, without being a state granted monopoly, the joint stock company could only succeed if "all operations are capable of being reduced to what is called a routine, or to such a uniformity of method as admits of little or no variation". [4, pp. 461] [2]. He recognized, "**unremitting exertion of vigilance and attention**, as cannot long be expected from the directors of a joint stock company" [4, pp. 460], as governance failure that led to the demise of many a stock company in his day [2]. The topic of governance has a long history and continues to be the supreme leverage point in determining success or failure, from small projects to billion dollar enterprises.

Agency theory formally emerged in the aftermath of the industrial revolution. The impetus for corporate governance resulted from a need to acquire the 5M resources: management, money, manpower, machines, and materials, thus leaving very little time for managing day-to-day operations [8]. Greater complexity led to the introduction of "the firm" [2]. Agency Theory draws from two kindred topics: 1) Organizational Economics and 2) Organizational Psychology and Sociology. The first topic is concerned with

reducing or forestalling sunk costs associated with two opportunistic behaviors: 1) Shirking or moral hazard and 2) Indulging in excessive prerequisites at the expense of shareholder interests [10], [13]. Countervailing opportunism, ‘Organizational Psychology and Sociology’ suggests motivational sources as:

- The need to achieve
- A gain of intrinsic satisfaction from performing challenging work
- Exercise in responsibility and authority
- Gain of recognition [20], [21]

‘Stewardship theory’ was coined to account for the motivation to be a good steward over corporate assets [13]. Cyert and March put forth "the critical switching factor between agency and stewardship might be whether the fundamental organizational coalition is secured or jeopardized" [11]. Threats to stability in the organization lead to agency effects to protect ones self-interests [13]. For government DoD, both theories offer new policy clues about long-term interests for management, program viability, and incentives to achieve real accomplishment. Both theories have merit and should be considered together when devising a governance policy.

Behavioral Considerations

‘Organizational Psychology and Sociology’ was cited to account for favorable motivations, and being a ‘good steward’. The discussion next further amplifies on the theme of behavioral characteristics. Jensen puts forth two models of people, the Resourceful, Evaluative Maximizer Model (REMM) and its complement, the Pain Avoidance Model (PAM). The first model describes the ideal rational agent, while the second captures non-rational behavioral components. The basis for PAM is fear avoidance, such as the “pain” in recognizing and admitting personal error which can knowingly lead to greater pain [17] (i.e. criminal cover-up). Both models provide strong explanatory value of peoples' behavior, in that, "the dualistic rational/non-rational coexisting together in inherent contradiction is integral to the normality of people itself" [2]. Treatment of both aspects is thus required [2]. The most interesting to this author are the non-rational behaviors next discussed.

Non-rational behavior is the crux of self-control problems besetting all humans. Two dominant sources of agency costs arise from conflicts-of-interest between people and personal self-control [2]. Non-rational behavior is defined to systematically harm the individual and others from dysfunctional or counter-productive actions. In the extreme, malfeasance and criminal behavior associated with governing can be cited in spades. Instead, the less obvious encounter of normal underlying non-rational behaviors is considered. For example, studies have shown that people systematically over-rate themselves in ranking with their peers; almost no one ranks themselves in the lower 50% [6], [19]. LeDoux 1994 attributes "fight or flight" response for the systematic rejection of new ideas, new data, and the reluctance to learn or change to improve oneself [5]. His rationale is as follows. When contrary evidence/theories (to ones own belief system) threatens to change the very lens through which reality is viewed, to include ones world-view and view of oneself, a non-rational fear-response occurs. Violations of ones own principals and beliefs threaten individual self-esteem thereby causing anxiety. The brains fear response mechanism severely limits human perception, when the very theories and beliefs espoused about ones own behaviors are shown to be false [2].

Futurist Joel A. Barker points out the "paradigm effect" and the "going-back-to-zero rule". He defines the "paradigm effect" as a mental blindness that occurs among rational people when incoming data does not fit the paradigm of their own mental models and experience. Paradigms filter incoming experience, and data that does not fit is deemed invalid. Changing ones paradigm is a choice. When your paradigm becomes thee paradigm, paradigm paralysis then becomes a terminal disease of certainty. The "going-back-to-zero rule" refers to a paradigm shift that negates previous understanding. Everyone essentially starts over, except for the one who initiated the paradigm shift. These are large reasons why change is so often loathed inspite of the self-evident good it engenders. For effective governance, acceptance of change, recognition of mistakes, learning, and

revelation of hidden information and action are all crucial elements that must be "designed in rather than inspected out"².

Dr. Mark Keil, of Georgia State University, outlines other forms of non-rational behavioral factors dealing specifically with projects [7]:

- 1) "Escalating commitment to a failing course of action" - throwing good money after bad, without monitoring and control chances for escalation increase by 20-times
- 2) "Sunk Cost Effect" - "having too much invested to stop now"
- 3) "Completion Effect" - strong pull of assumed proximity to a goal, and the persistence of maintaining the same course of action (similar to sunk cost)
- 4) Groupthink - collective belief that systematically reinforces: merits of a project [1], or problem solving routines that do not address root causes
- 5) Cognitive bias and alignment issues among stakeholders

These behaviors can contribute to program "de-escalation". Program "de-escalation" is dwindling support that without correction rapidly leads to precipitous re-direction, or outright termination/abandonment. Keil cites three phases of de-escalation. Phase one is the often subtle "drift, confusion, lack of consensus, and lack of shared understanding in objectives and scope". Phase II manifests in "difficulties, incremental adaptation, small reactive measures on symptoms, and periods of rationalization, justification and defense." Phase III is characterized by "true problem recognition, search for alternatives and finally an exit strategy" [7]. Subtle non-rational behaviors may produce systematic de-escalation.

This author identifies "micromanagement" as another behavioral manifestation. "Micromanagement" is a consequence from the inability to comprehend the big picture, or lacking a vision, thereby induced to take the default position of managing everything without regard to relevancy or priority other than time. It can be accidental, managing incompetently by failing to recognize the big picture. Many times agents change the power distribution and organizational topology [16] to limit exposure to incompetence. As for moral hazard, micromanagement is the risk-adverse response of failing to discharge

² Favorite expression of Dr. Michael Stankosky Professor at The George Washington University

and take responsibility to avoid "failure". Its presence exposes failure in leadership, by not recognizing delegation as a positive force multiplier. Micromanagement is symptomatic of the agency problems: moral hazard - hidden action, and adverse selection - hidden information.

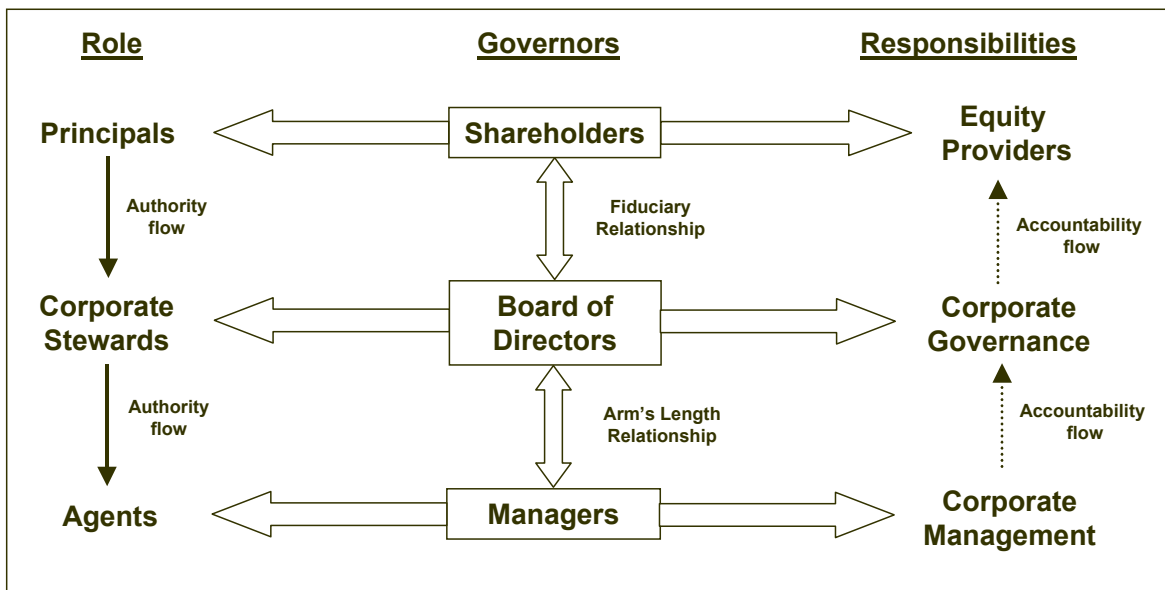
A correct agent behavior posited by Jensen is accomplished by maximizing the normative REMM model of behavior by incentivizing positively (reward) and negatively (punishment). The perfect agent is one who makes decisions with no concern for personal preferences but only for those of the principal (owner) or stakeholders. Self-interest is satisfied with pecuniary award, honor, self-esteem, recognition and pride. Jensen and Meckling [2] discuss ‘**altruism**’ as a trap in assuming its makes perfect agents for others. Both altruism and self-interest can legitimately coexist. Mother Theresa is cited by Jensen as a prime example of someone who would not devote time and energy to arbitrary ends of an employer [2].

In closing, non-rational behavior is inevitably intrinsic to the governance problem, and a serious consideration for devising governing policy. An incentive policy, later discussed, proposes sanctioning rights and awards in direct proportion of practicing behaviors with regard to the interest of the principals. The agents and managers are therefore taking on a risk of culpability for failing DoD projects, insofar as their behavior is concerned. The goal is not so much looking to punish, but taking proactive measures to raise the bar for improved governing.

Theory of Agents Framework and Net-Centric Governance

The corporate framework of Figure 1.0 is based in the Theory of Agents [8]. This is the classic governance structure for large public or private firms. Here, roles and responsibilities exist in a checks-and-balances structure. Shareholders or owners are the principals of the firm. The Boards of Directors are agents having a fiduciary responsibility to the shareholders. Executive managers are accountable to the board. The board may institute sanctions with respect to the agents. Lower-level managers and employees ultimately impart shareholder value by their knowledge and actions. The relationships

between agent and principal are enacted, when the principal transfers decision rights to the agent. Governance then springs forth in a “nexus of contracts” between principal and agent [3]. A checks-and-balances structure facilitates accountability, plus identifies points where governance failure may emerge. A corporate framework can be an edge organization by way of accountability and authority. For example, ‘relational investors’ are shareholders such as large holding institutions, venture capitalist, or Warren Buffet. They impact governance as a result of holding majority equity positions [8], [9]. Their influence reduces agency cost by increasing the principals' incentive to acquire information, and foster a monitoring reputation with respect to long-term commitment with the firm's agent-managers. Rationally ignorant atomistic shareholders do not have the same monitoring incentive or influence [9]. Third party relational investors therefore exert great pressure to mitigate moral hazard [9] downward into lower management. This framework amounts to net-centric governing to the ‘tactical edge’.



Source: Karim S. Rebiez, "Strategies for Corporate Governance in Engineering Corporations", *IEEE Transactions on Engineering Management*, Vol. 49, No. 4, pp. 399 November 2002.

Figure 1.0 Net-Centric Governance Structure

Translating the above to DoD programs yields the net-centric governance framework shown below in Figure 2.0. Here it gets somewhat complicated by the fact that there are no owners whom derive free cash flow benefits as with a firm. The 'owners'

become both direct benefactors (warfighters) and indirect benefactors (public and taxpayer entities). These stakeholders, the principal stakeholder being the warfighter, absorb most of the liability when programs fail.

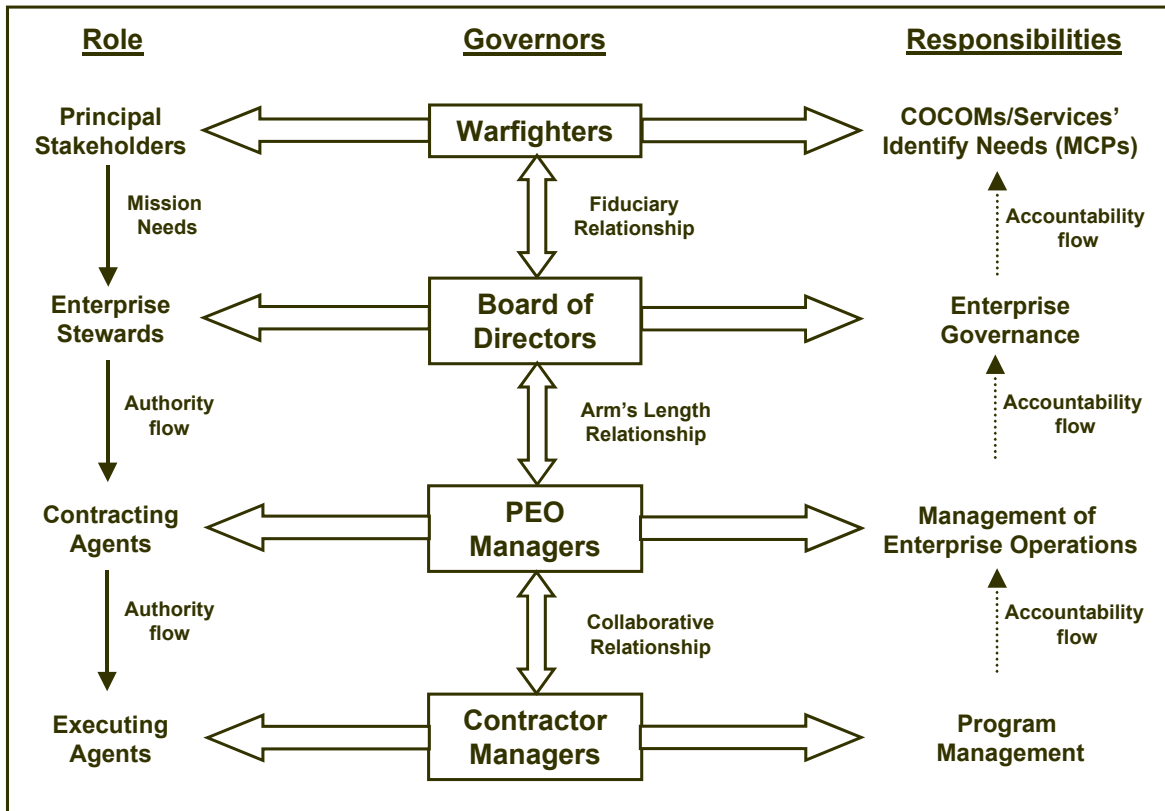


Figure 2.0 Net-Centric Governance Structure for DoD Programs

For large DoD Programs, principals include: Office of the Secretary of Defense (OSD) executives, taxpayers, warfighters, and other stakeholders (such as Congress) whom gain from the endeavor. All agents play a key role in provisioning the warfighter with capability. Extrapolating the corporate framework (Figure 1.0) into the domain of DoD programs expects to be: 1) less costly via checks-and-balances, and 2) more collaborative, inherent with edge organizations [16].

Policy for Governors

The governors discussed here pertain to the BoD and the Program Executive Office (PEO), since contractors are incentivized in the contracts they are awarded for large programs.

Incorporating a proactive program BoD is a key precept being proposed here to improve governance. Board size for firms range from 5 to 13 members, with 7 being the statistical mode [8]. This allows for value-added diversity while enabling easier consensus. The goal is to achieve a diverse and intelligent board to cover as many important bases as possible. A decisionmaking presence of mind is achieved with multidimensional: knowledge, experience, creativity, and perspective. To get this condition, both inside and outside directors are considered. Each type of director has a specific leadership role. Inside directors generally take leadership of:

- Approving high-level budgets prepared by the executives
- Implementing and monitoring business strategy
- Approving core initiatives
- Providing internal perspective to the Board as a whole

Outside directors also assist in the above, but provide unbiased and impartial perspective on issues brought to the Board. Outside directors could include technologist to identify weaknesses and threats for example. Board compensation may be based on timely directors' meetings, timely decisionmaking and willingness to make difficult governance decisions in the best interests of the warfighter. The Board serves to enforce governance and take necessary action, not be a passive observer. They are accountable to both warfighter and taxpayer, answering to Congress, the Government Accounting Office (GAO) or possibly some other assigned party. The policy recommendation is to include an active part-time board for large program oversight.

Executors of the Program comprise of the PEO and its officers. These may include the CIO, the chief project controller, and a chief engineer/scientist. They have responsibility of day-to-day operations with strong governance over contractors. They report from within the program on short-term and long-term status. Typically contracts are

drawn up to impose award and sanctions in accordance with hard metrics with contractors. The same could apply to the PEO and its officers with respect to the BoD.

A Methodology for a New Net-Centric Governance Policy

Now the question is, how does one go about building a governance structure with a policy of enforcing shift in some liability to agent-managers? The seven-step method, given below, outlines specifics for the devising the similar net-centric governance framework back in Figure 2.0. In Figure 3.0 the boxes denote the seven steps or activities with attributes listed next to each activity. This section covers the first three activities and subsequent sections will elaborate agency costs, due diligence policy, incentives and limited liability.

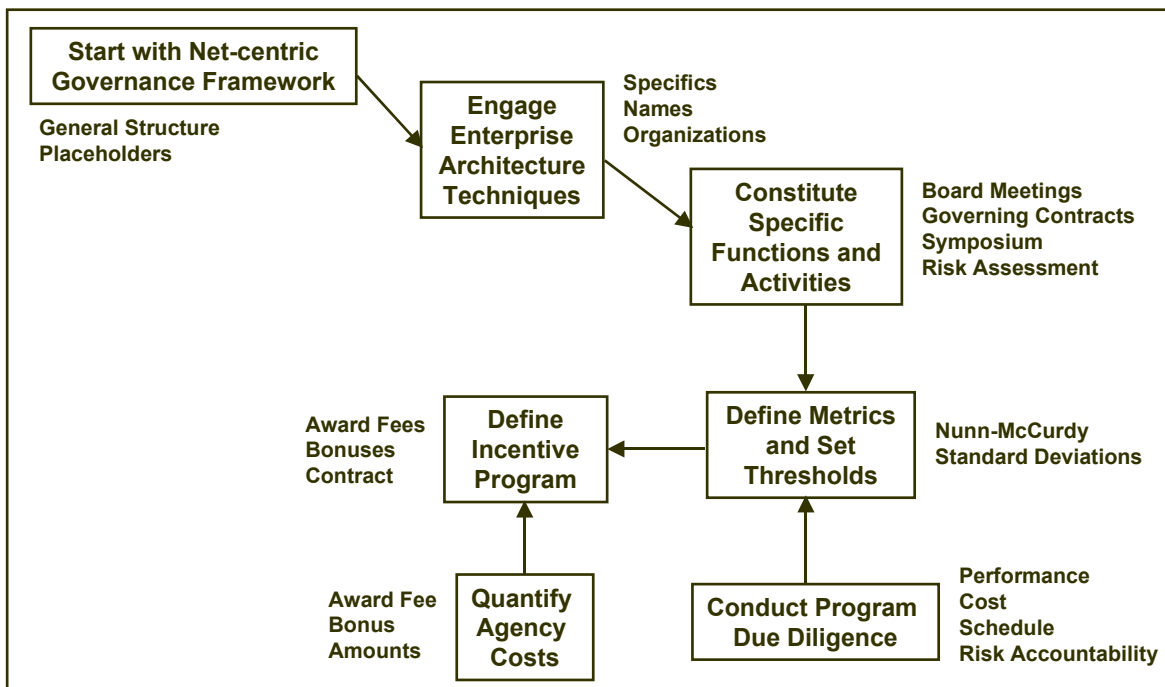


Figure 3.0 Steps for Building Net-Centric Governance

Enterprise Architecture (EA) methods provide an effective organization building framework. EA is about organizationally structuring an enterprise to include functions, roles and activities. Enterprise Architecture methods will not be reviewed here. The starting net-centric organizational framework is an Operational View described by nodes

and need-lines. Nodes compose of individuals, and need-lines serve as sources of accountability. Roles and responsibilities can be fully accounted in other operational views. Additionally, the functions and activities by the nodes fit nicely with other OV views. Some tailoring to meet governance objectives such as metrics and performance is likely to be necessary. The EA approach is very well suited for capturing governance specifics. Theory of agents injects rules, guidelines and bounds subservient to the mechanics of EA construction. Bounding to behavioral considerations helps define performance metrics. This approach does shift liability on the executive managers and directors as it should, but must be tempered within reasonable agency costs.

Agency Costs

The widely accepted goal of corporate governance is to economize on agency costs borne of moral hazard and adverse selection [10]. These are potential sunk costs from poor governance. On the otherhand, there is cost associated with imposing a monitoring and governing policy. These costs may include auxiliary areas as governance and management training, along with liaison function. For the hierarchical organization governing cost rapidly increases as the number of stovepipes increases. A liaison function insures collaboration among stovepipes, or perhaps monitoring, and is itself a source of this increased cost. Stovepipes are not all bad when they concentrate talent, but when they become ends in themselves they incur higher cost from either monitoring, or agency problems. Given the problems of moral hazard and adverse selection it seems governance elements must include a degree of monitoring and accountability. Accountability by way of checks-and-balances achieves self-monitoring, thus potentially lowering the cost of monitoring. These savings can be passed along as long-term monetary award. Jensen argues monetary incentives are easy to control and desirable because of its "claim on all resources". However, monetary awards are not the best motivators; people are motivated by things other than money [2]. Monetary awards are most effective when combined and timed to context of reaching milestones, preferably those longer-term. Lastly, the intent of superlative governance should eclipse program success. Programs are not guaranteed to succeed. Awards for superlative governance are paramount in signaling a willingness to accept risk and difficult challenges inspite of the possibility of failure. Failure can lead to

future successes and other unanticipated positive effects. The key is rewarding for behavioral governance integrity, and for taking measures in consonance with important stakeholder interests.

A Proactive Due Diligence Policy

In the area of metrics, the Nunn-McCurdy³ breach is defined by escalation in program acquisition and procurement costs exceeding 15% and 25% respectively. A Nunn McCurdy breach also leads to reporting process and investigations by the OSD/PA&E Cost Analysis Improvement Group (CAIG). When basing awards and sanctions on hard metrics, deliberate cost, schedule and performance metrics must be articulated up front. A policy of conducting regular independent due-diligence throughout the program asserts program-metrics to contractually bind agents to measurable objectives. This puts the PEO at increased risk since they are now held to accountability. Regular due diligence places a greater discipline on the program expectations and thus devises an agent-contract to bind the agent to specific expectations. The governance goal now appears to be proactive and not wait until the phases of de-escalation begin to entrench or become potent. The point is never getting to Nunn-McCurdy in the first place while being fair to the governors.

Escalation in cost and or re-baselining multiple times as a result of exceeding available resources can be mitigated with regular due-diligence. This means only re-baselining when unknown factors begin to influence degradation of project. This is not necessarily governance failure. Re-baselining is recognition that more information has come forth, or learning has occurred. Perhaps the project was flawed at the outset and new understanding has come to light. Independent Cost Analysis (ICE) by the CAIG needs to be continually understood over the long term, and proactively control cost escalation risk. This is not a passive activity conducted once in the beginning, or after cost escalates out of control. Periodic program-wide reviews, akin to Selected Acquisition Reports (SARs), provide real-options to take sooner corrective actions than would occur when the program is in deep trouble. Valuable information from a proactive due-diligence policy informs the board for imposing necessary strategic action on the program.

Issue of Incentives

Incentives play a key role in governance performance. Incentives strike at the heart of maximizing and optimizing. Thus the very core of what it means to choose. A choice is rationally made to make one better off as they see it. Purposeful action attempts to accomplish some end with better outcomes. If no incentives or conflict-of-interest are in place, then all alternatives promise equal degree of utility as viewed by the individual [2]. Incentives can be classified into two groups, passive and active. Passive incentives exist endogenous and exogenous to the organization, and include: internal sphere of influence, national imperative, prestige/notoriety and scope. Passive incentives can do both good and bad. A strong “bad” passive incentive recently occurred with a contract to supply air-refueling tankers, and a deal to be hired in return for favorable influence. Active incentives come in two varieties, award and punishment. Developing a governance structure needs to identify, then trade-off among all acting incentives. The incentive goal is to encourage good behavior and discourage bad behavior [2] with positive award and negative sanctioning. The “good” and “bad” behavior relates to the REMM model posited by Jensen [2].

Incentives are doled out through a nexus of contracts both implicit and explicit [3]. It is these contracts that yield impact and influence more than an individual's tendency to opportunism. If the incentive scheme fails to eliminate moral hazard, economic theory suggests the rational manager will succumb. Thus replacing the shirking manager will not solve the problem if the new manager faces the same incentive scheme. The issue rests with the quality of the incentive structure that circumscribes management's job-performance [9]. A DoD policy for longer governing contracts and lucrative long-term incentive helps reduce moral hazard effects from short-term opportunism. Fixed wage contracts, typical of DoD compensation, create some incentive to shirk - compensation is effectively the same regardless of work quality [18].

³ Nunn-McCurdy Amendment Report No. 97-311 DoD Authorization Act, 1982

Explicit contracts define 'sufficient conditions' for discharge such as theft, but few explicitly define 'necessary conditions' due to adverse selection or moral hazard [9]. For DoD, the Nunn-McCurdy Amendment is one mechanism to "discharge" projects based on management failure. Nunn-McCurdy states, "...and the management structure for such major defense system is adequate to manage and control total program unit acquisition or procurement unit cost." In short, management has to be deemed competent to service the program. Program termination levies punishment on contracting agents, taxpayers and warfighters. Clinger-Cohen Act and GPRA provide mandates and guidelines to control certain items associated with adverse selection by provisioning frameworks to aid in the decisionmaking process. Other mechanisms include fraud, waste and abuse hotlines, and whistle-blower laws, along with the free press, in serving to police against the most egregious behavior. The policy changes suggested herein attempts to curtail a greater scope of problems with a more proactive incentive policy than after-the-fact punishment.

Issue of Limited Liability

For government DoD programs, limited liability resting with the individual program agent almost fully protects from sanctioning, while punishing all important stakeholders. The liability is pronounced with the taxpayer, though diluted by the sheer number of tax-paying entities. The loss to the warfighter is most acute. They, as the taxpayer, are in a sense victimized. The current concept of limited liability strikes deep with the policy of protecting the individual public servant. More must be done to select and govern projects by taking into account interests of the taxpayer, and especially the warfighter. Limited liability creates fertile ground for 'deficient discipline', previously defined. The BoD has the responsibility to protect the interests of taxpayer and warfighter by protecting against spectacular losses to each with regards to the program of record. Liability should decisively shift to responsible and accountable program agents. Conversely, increased liability with its risk should also afford greater award opportunities to program agents.

Policy Summary

The policy conclusion and conclusions herein includes the following recommendations:

- Explore and experiment with net-centric governance structures for improved and disciplined accountability
- Introduce a proactive Program BoD composed of internal and external directors
- Institute an ongoing program due diligence activity to determine specific program metrics with associated progress enabling sooner proactive change
- Incorporate an incentive structure to award both long-term program success and governance integrity
- Censure against individual agents for persistent adverse behavior against the best interests of the primary stakeholders

Future Advanced Topics

Lastly, thought provoking areas for further research include the following topics:

- Mathematically economizing agency costs
- Incentive structures
- Performance measures for governance
- Risk-reducing intervention frameworks

A foundation of mathematical axioms in utility theory covers areas such as maximizing agent-utility and pricing agent-principal contracts. This area is wide-open to Agency Theory, and has application in pricing Government DoD governance “contracts”. A recent source is Axiomatic Foundations of Agency Theory by Edi Karni⁴.

Incentive structures can be difficult to devise due to the inescapable need to make trade-offs. Incentives operate at many simultaneous levels. At the board-level incentives are expected to be quite different from those of the PEO and contractors. Incentive also considers many operating variables. These variables include: timing, period-of-performance, and non-financial metrics. Limited resources can create tradeoff opportunities between monetary and non-monetary award. Tradeoffs between sunk agency-cost, versus reduced incentive-award, given program size, is another research

⁴ Department of Economics, Johns Hopkins University, Baltimore, MD 21209, USA, July 27, 2004

topic. Here the issue is how much to invest in governance given limited budget to do “real” work.

Performance-measures for governance, given highly complex programs, expect to be very difficult to engineer. Based on a survey, the main impediment to boardroom effectiveness in engineering corporations is ‘complexity of information’ [8]. This complexity can greatly mask the truth from the board (hidden information), thereby leading to erroneous conclusions about board performance. The same can also be said of the PEO. Complexity includes: information deficit, paltering with the truth, and information dependence from program managers. Board effectiveness is not solely linked to program performance, but also must account for good procedural conduct: meeting preparation and attendance, setting agenda’s and priorities then keeping to them, covering program processes, obtaining/leveraging resources, reviewing information, asking relevant questions, making timely and sound decisions, evaluating/rewarding/replacing executive managers or contractors, acting swiftly and decisively in a crisis [8]. This is all much to consider especially for larger programs. Other research considers selection of directors & competent executive managers, to include their training.

Risk-reducing intervention frameworks open up the possibility of including ‘Real-options Analysis’. ‘Real-options’ recognizes risk and offers a flexible and strategic decisionmaking framework. It makes use of simulation and real-options pricing methods. For a complete treatment see Johnathan Mun’s recent text on Real Options Analysis [22]. ‘Real-options’ is about a strategic way of thinking regarding long-term risky endeavors, rather than solely a financial method. The right, not obligation, to make strategic governing decisions, from shutting a program down to rapidly expanding in scope, makes real-options appealing. The strategic approach of using real-options thinking and methods, for long-term intervention, may integrate well with strategic governance.

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