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A THEORETICAL FRAMEWORK FOR

DEFENSE ACQUISITION ANALYSIS

THESIS

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A THEORETICAL FRAMEWORK FOR

DEFENSE ACQUISITION ANALYSIS

THESIS

Presented to

the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Systems Management

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Abstract

This study develops a theoretical framework for conducting analyses of the defense acquisition process. The framework consists of three parts or levels of analysis. It links the symptoms of poor productivity noted by major defense studies to weaknesses in social decision making processes.

Using a transactional perspective, this study analyzes major program manager activities as organizational agreements. It also reviews the findings of major defense studies from this framework perspective. Key findings, based upon an application of the framework, are: (1) Program manager weaknesses in management integration explain a majority of the causes for poor productivity such as cost and schedule overruns; (2) There are indications that the demand for such integration is increasing; and (3) Further, there are indications of a program manager skill deficiency in social, or group, decision making including: (a) Weaknesses in developing and maintaining agreement, (b) A lack of awareness as to what program constraints are negotiable, and (c) Difficulties bridging a gap between authority and responsibility.

A THEORETICAL FRAMEWORK FOR

DEFENSE ACQUISITION ANALYSIS

I.   Research Problem

Chapter Overview

This chapter introduces the research problem, discusses the scope of the effort, and describes the methodology that is used.

Introduction

The Department of Defense (DOD) has a problem with the way it acquires equipment. It has experienced particularly large cost and schedule overruns, and an erosion of public, Congressional, and top DOD management confidence in its acquisition effectiveness. Cost and schedule overruns were found to average 50% and 36% respectively with many of the larger overruns occuring on the major programs (33:33,34). The sum total of cost increases by 1981 in eleven major programs was more than $ 107B (33:29). In 1980 the Government Accounting Office (GAO) found that in a sample of nine programs the length of time from concept development to initial deployment ranged from 11 to nearly 20 years. A DOD Inspector General revealed that 9750 spare engine parts, or 65% of 15,000 parts studied, had at least 50% cost growth in two years (33:33). This contributed to a "spate of horror

stories" on overpriced parts such as hammers, ashtrays, toilet seats, and stool caps (65:1-2).

In addition to cost and schedule overruns, at least six Congressmen expressed their dissatisfaction with the defense acquisition process between 1981 and 1985. Rep Joseph Addabbo (D-NY), Sen William Cohen (R-ME), Sen Barry Goldwater (R-AZ), Sen Sam Nunn (D-GA), Sen Charles Grassley (R-IA), and Rep Les Aspin (D-WI) all concluded that the process is plagued by waste and inefficiency (33:34,35). This dissatisfaction echoed an erosion of public confidence revealed by a Harris survey in 1985 (33:36). Furthermore, even key defense figures such as Frank Carlucci, David Packard, Robert Costello, and William Perry acknowledged the existence of a problem in defense acquisition (1:26).

Not only does a problem exist, but its consequences are significant and may seriously impact the ability of the DOD to support national objectives. Cost overruns, for example, represent an increasing portion of a budget constrained in part by the Gramm-Rudman-Hollings Act. As this study was being completed both the President and the Secretary of Defense indicated that they have elevated the priority of this problem and intend to apply greater resources toward its resolution. The details of their plans have yet to be formulated (15:1).

However, the track record on treatment has been poor for these past forty years. While program baselining and enhanced multiyear procurement are two recent successes,

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there have been many more less than effective approaches. Congress introduced nearly 400 bills on defense acquisition between 1984 and 1986 creating an onslaught of fragmented laws and regulation (33:37). Zero Based Budgeting (ZBB) was an unsuccessful attempt to apply a successful industry tool to the Department of Defense (72:22-23). Another popular technique is reorganization: shifting organizational boundaries on a responsibility terrain, but the symptoms of the problem remain (5:434).

Longitudinal studies of the defense acquisition process spanning twenty years, report that the situation has gotten worse (33:336). Some observers fault the treatment for being too shallow or for addressing only symptoms (61:198-201). Others find some solutions, such as the Acquisition Improvement Program (AIP), complex and diverse spreading management attention too thin. The GAO reported in 1986 that 27 of 54 program managers believed that AIP made little or no difference (37:14). Still others felt that management commitment was lacking or that many of the initiatives required managers to use skills that they did not possess (33:44,49). One thing is certain, despite more than a dozen major studies over forty years, and many attempts to redress this problem, it continues to defy treatment (33:42).

This situation is further clarified with an analogy that likens the defense acquisition system to a large, unpredictable river. In this setting the acquisition process

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represents the journey that a barge makes up the river. If the barge is a weapon system program, then the program manager is the captain of the program office tug. Below the surface of the river lie shifting sand bars which can thwart the progress of the barge. The consequences of this pitfall symbolizes the problem symptoms in defense acquisition such as cost or schedule overruns.

Historically, top defense management supervising the river's activities have tried to streamline the flow by dredging the river's bottom. For example, defense reform has consistently sought to improve the acquisition system through reorganization. Despite many attempts, the nature of the river resists the change, redepositing sand bars within a short time. Some key individuals, like William Perry and Robert Costello, believe the system is incorrigible (1:26).

Another method, which minimizes the problems that may be encountered on the journey, is to set buoys for the tug captain marking shallow spots. The buoys represent policy and regulation to guide the program manager. Both buoys and regulation share two common weaknesses. They typically cannot anticipate the dynamic changes of the system nor can they be applied effectively in large numbers. This analogy provides a baseline that helps to clarify the problem or situation.

Perspective

If the terms "problem" or "this situation" appear somewhat ambiguous, it is intentional, because this study contends that the problem is the problem. The problem lies with the definition of the problem, not with the treatment. This contention is not completely new. Dr Willoughby Jr., Chairman of the 1982 Defense Science Board, demonstrated that some of the symptoms observed stemmed from technical issues. This technical perspective led to the development of the template approach outlined in DOD 4245.7M (27:1-3,1-4). Some of the symptoms do not appear to neatly fit in to this approach, but his redefinition of the problem brought the DOD closer to a solution. How one views a problem can determine the success of the solution. In a sense views are theories. "Theories represent various ways in which observers see their environments..." (59:13). Abraham Kaplan writes:

> The formation of a theory is not just the discovery of a hidden fact; the theory is a way of looking at the facts, of organizing and representing them... (51:309).

This study seeks to build theory so that better hypotheses can be developed and tested.

The perspective used in this study is the result of a blend of concepts from conflict science, organization theory, negotiation, social science, open systems theory, and transaction theory. Its focus is on the processes that involve the integration of interests in an organization through transaction. This perspective is discussed in the methodology section and developed throughout this thesis.

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Problem Statement

The objective of this study is to:

1. Define a unique framework from which defense acquisition activities can be viewed, and

2. Explore the applications and implications of this framework.

Management Question: How can a change of perspective reveal greater information and better explain observed problem symptoms?

Research Question 1: What is the link between the symptoms of poor productivity observed in defense acquisition and human interactive processes?

Research Question 2: What are the implications of this perspective or framework? Does it reveal fundamental causes to the problem? Does it better define the problem?

Scope

Rather than testing hypotheses, the intent of this study is to fit a theory, framework, or perspective to a set of data from published sources. These sources include defense studies and observations from creditable individuals.

In addition, it should be noted that this study does not

solve the problem or problems which the Department of Defense is currently experiencing, nor does it pursue a broad brush approach as most studies have done. What it does pursue is a more in depth examination at the very beginning of the problem solving process, leaving further development and testing of the framework for future investigation.

This study focuses on the program manager in the defense acquisition process for two reasons. The position represents the center of acquisition activity at the fundamental responsibility center of the organization. Also, the program manager's perspective is underdeveloped in many major studies which are written from the top looking down rather than the bottom looking up.

Methodology

This study is accomplished in four tasks described below as the next four chapters:

1. Literature Review. The objective of this task is to define key concepts in open systems theory, social science, conflict science, and transaction theory. The focus is on the linkages within a system and on the types of social decision making processes. The product of this task is a perspective on which the framework is based.

2. Basic Framework. The objective of this task it to assemble the key concepts defined in the literature review into a basic framework. This develops the concept of integration from the program manager's perspective. It

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further discusses the social decision making processes and defines the concept of agreement. This framework will form the foundation for this study.

3. <u>Framework Revision I</u>: <u>Task Analysis</u>. This task expands the basic framework by applying it to a number of major program management tasks in defense system acquisition. It explores its implications for explaining difficulties that are experienced in program activities.

4. <u>Framework Revision II</u>: <u>Defense Study Analysis</u>. The objective of this task is to expand the revised framework by examining the findings of several defense studies. This task reviews several major defense study findings, compares and discusses the implications of the framework in light of these findings, and expands the framework to include them.

These four tasks: Literature Review, Basic Framework, Framework Revision I, and Framework Revision II, together represent the body of the analysis for this study for answer research questions 1 and 2. Implications from this analysis are summarized in the chapter on Conclusions and Recommendations.

Chapter Summary

This chapter introduced the research problem, discussed the scope of the effort, and outlined the methodology used in this thesis.

II. <u>Literature Review</u>

<u>Chapter Overview</u>

The purpose of this chapter is to define key concepts related to the processes of social interaction and describe the basic perspective used in this study. This chapter:

1. discusses the concept of linkages using organization and system theory,

2. highlights concepts in conflict science,

3. describes a classification of basic processes for integrating interests, and

4. presents the perspective used to develop the basic framework.

<u>Linkages</u>

Systems theory is a revolution in thinking that began after World War II. It has invaded theory in nearly all disciplines, because it provides a perspective that is both simple and useful (52:44-45). The systems approach cleaves a complex item or entity into two elements: constituents or parts and the linkages that bind them together. One example is a brick wall. As a system, the bricks are the parts and the mortar is the linkage. Another example is the distinction in Physics between particles and forces, such as protons and nuclear forces. Systems theory has also been applied to the study of organizations. Individuals or groups

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are the parts of the organization, and the processes of individual or group interaction are the linkages (78:166-167).

This thesis focuses on the linkages, because they represent a significant portion of management activity. In a study conducted by Mintzberg, three of the ten management roles are related to linkages. They are liaison, disturbance handler/internal integrator, and negotiator (62:71-78). Quinn found that three of eight management roles are related to linkages. They are coordinator, facilitator, and broker (73:116-118).

One the more important concepts of linkages in systems theory is the distinction between open and closed systems, because it describes the relationship between systems just as linkage describes the relationship between parts. The terms "open" and "closed" imply a gate analogy which permits or restricts interaction between parts or systems. A completely closed system has no interaction with its environment and usually refers to physical and non-life systems. Biological and social systems exhibit some degree of openness or exchange with their environment to survive and grow (53:5-6). The open/closed model is similar to the system/summation model. A summation model represents a collection of parts that are independent; a system model represents an integration of parts that interdependent. This comparison is provided for clarity, but both sets of models are considered simple binary models in which an organization is either open

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or closed, summation or system (52:50-51). Some research has been conducted to develop these models further. The next several paragraphs review some of the key findings on the concept of interdependence, since interdependence determines the magnitude of the bond between parts or systems.

Interdependence. Four studies related to interdependence are discussed. In brief, James Thompson studied the workflow in an organization and defined three types of interdependencies. Bart Victor and Richard Blackburn reviewed interdependence theory and discussed its applications. Andrew Van de Ven and Gordon Walker studied the relationships among health and child care organizations in their report entitled, Dynamics of Interorganizational Coordination. Charles Lindblom, drawing together political and social science, describes the consequences when an organization structures itself without considering the interdependent character of its linkages in his book, Politics and Markets.

1. Thompson found that the extent of interaction depends primarily upon the interdependence of the task or workflow with an organization. He defined three types of workflow, each representing a different degree of linkage between tasks. With an increasing degree of interdependence they are referred to as pooled, serial, and reciprocal. Pooled interdependence has no workflow. Independent task work is an example performed by a staff of bank tellers or

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:anitors. Tellers require little interaction among themselves to do their job. Serial interdependence represents a one way workflow, like an assembly line, where one individual's output is another's input (83:483). The greatest interaction among parts of the system is referred to as reciprocal interdependence. Concurrent design and production activities on a weapon system exhibits reciprocal interdependence. According to Thompson, mutual adjustment is the appropriate integrating mechanism for reciprocal interdependence. Further, he predicts an increasing need for lateral coordination as tasks become more interdependent (80:58).

2. Victor and Blackburn interpret the work of Thompson. They suggest that a form of bounded rationality occurs in organizations. When interdependency increases, organizations respond by localizing interaction, clustering interdependent groups, and/or ignoring some of the interdependencies in order to minimize the cost of coordination. This method is similar to satisficing in which decision makers, confronted with more information than they can process, simplify decision making by ignoring information. By assuming autonomy, the organization attempts to avoid coordination. Victor and Blackburn recommend the application of interdependence theory to explain intergroup conflict and the coordination difficulties of a division of labor. They assert that interdependency is a fundamental construct (82:486,493-494).

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3. Van de Ven and Walker found two noteworthy items in their study of health and child care organizations. They found that the perceived need for resources is the primary reason for interdependency, and consequently interorganizational relationships. In addition, they found that a latent conflict emerged with an organization that is interdependent with another. This conflict resulted from two competing internal needs: one to increase interdependency seeking a greater mutual exchange of influence, and one to decrease dependency to become more autonomous and self sufficient (82:26-27). Fundamentally, this conflict is a struggle of defining each party's perception of dependency and his role in the relationship (44:27). For example, this conflict is apparent when the Government seeks to sanction a contractor for various wrongdoings when the contractor has a valuable capability in a shrinking defense industrial base.

4. Lindblom studied political movements using social science. He found that countries that used centrally planned authority system, like communism or socialism, experience extensive failure in coordination and communication, and at the same time cannot centrally process all the information it receives. He describes this system as having the characteristics of a mechanistic structure which restricts interaction and impedes integration (58:67). Kuhn extends Lindblom's insight. He claims the difference between political movements, such as capitalism and socialism, is the way the parts of the organization interact (54:194-195). If

this is true, then linkages play a much larger role than indicated by current research on the subject.

In summary, interdependency plays a large role in determining the nature of linkages between parts. When two or more interdependent parts or parties of an organization "perceive incompatible goals, scarce rewards or interference", then the linkage displays intergroup or interpersonal conflict (44:23). Since conflict occurs at the linkages, it is further discussed.

Conflict

The subject of conflict is related to interdependence and linkage. The construct is defined, its relationship to integration is briefly discussed, and conflict handling styles are identified.

Definition. Interdependence between parts or systems is a necessary, but not sufficient condition for conflict. Conflict also depends on the attributes of the interdependent parts. Examples of attributes are goals, opinions, feelings, attitudes, behaviors, actions, or resources. When two goals differ, such as when two individuals, planning to eat together, prefer two different restaurants, conflict exists. Oddly, when two individuals share the same goal, such as when two individuals seek the same public office, they are in conflict. A popular definition of conflict is any situation

in which an individual or group perceives that he or they are being blocked or challenged by another (22:504).

Many views of conflict exist. Some researchers maintain that how individuals view conflict is the key to both understanding the situation in which it occurs and regulating it. Two sources describe several different metaphors of conflict. Most of the metaphors, which follow, project a negative view.

1. Conflict is war. Conflict is an argument or battle. Terms such as "attack competitors, wage public relations campaigns, launch diversionary attacks, retreat, fall back, regroup, wait for an opening, or marshall the troops for a counterattack" are used to describe business conflict (44:13).

2. Conflict is explosive. Conflict is a release of pressure, like Mount Saint Helens. It represents a build up of pressure with the feeling that something soon will blow. Conflict is an explosive situation out of control (44:15).

3. Conflict is an upward struggle. It is the process of gaining height over others. If you can get high enough, or "on top of things", then you can exercise control over your opponents. Conflict is one-upmanship and involves the struggle to the top of the heap, or a power play (44:15).

4. Conflict is trial. Conflict is a process not unlike that which occurs in a court with a judge and jury who will make the ultimate decisions based upon law and

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precedent. Phrases such as "he's got the best case, or the jury is still out on that one, or the program manager is going to judge the outcome of this discussion" are examples of how conflict can be perceived as a trial (44:15).

5. Conflict is a mess. It is a "can of worms". Messes are difficult to manage because they tend to spill over into other areas. Phrases such as "We've uncovered a real mess, It's all out in the open, or Let's tie up some loose ends at this meeting" portray conflict as a mess (44:16).

6. Conflict is a ballgame. It is a sport. Rules define the game and the interaction of players. People "bat around" ideas, "toss the ball in his court" and "strike out". There are foul, team players, referees, and negotiation volleys (44:16).

7. Conflict is a bargaining table. The concept of a table is a central feature to conflict structure. since it is a spatial metaphor defining the relationships of the conflict participants. A round table symbolizes equal discussion. "Tabling a motion" stops movement toward a decision. If the "tables are turned", a person feels an unexpected lack of support. "Under the table' refers to a secret agreement (44:17).

8. Conflict is friction. It cannot be eliminated, just reduced. Rubbing is a metaphor for interaction as "he is rubbing me the wrong way" or "there is

considerable resistance". If conflict is friction, the integrating mechanism is the lubricant (54:310).

Relationship. Conflict can be productive or unproductive. Unproductive conflicts result from either very high or very low conflict intensity. War is an example of very high intensity conflict. Groupthink, in which individuals choose to suppress their personal interests and expertise in order to maintain the cohesion of a group, is an example of very low intensity conflict. Groupthink has been found to cause "a deterioration of mental efficiency, reality testing, and moral judgement..." (46:9). The task of the program manager to achieve productive conflict depends on how well he can escalate, regulate, and integrate views and interests. This task is called conflict management.

Styles. Five conflict handling styles dominate conflict management literature. They are Integrating or problem solving, Obliging or smoothing, Dominating or forcing, Compromising or sharing, and Avoiding or withdrawl. Many studies have sought to determine a contingent model prescribing where and when to best use each style (85:14). If conflict management is similar to negotiation, then any given interaction may involve more than one of these styles and appears to depend more on the situation than on preplanned styles. This logic suggests that a style analysis is not likely to provide useful information. These styles

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are provided for comparison to the interaction processes described in the next section.

Classification of Processes

The mechanism by which interests are integrated or conflicts are regulated is called social decision making. There exists three basic categories of social decision making: negotiation, dominant coalition, and intervention (87:68). The key difference between these categories is the amount of interaction between conflicting parties. Each is defined below:

Negotiation. Negotiation is a process in which two or more parties seek to reach agreement independent of those parties not involved in the process. In reality all negotiations consider passive interests, which represent implicit agreements, such as laws, ethics, social norms, and traditions. In addition, negotiation regulates the exchange between conflicting parties so that agreement can be achieved.

Negotiation has been traditionally associated with a bargaining table for external interaction such as management-labor contracts, international treaties, consumer purchases, such as homes or autos, mergers, collective bargaining, and defense contracts (57:11; 85:70). However, this perception of negotiation has masked the perspective of negotiation as a social decision making process internal to

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the organization. Oddly, only recently has this internal perspective been explored. Literature on negotiation is diverse and diffuse, and has assumed a broad spectrum of meanings, similar in variety to conflict. Negotiation means many things to many people. There exist at least seven views, in addition to bargaining externally and internally, which together nearly characterize the concept.

a. Negotiation is simple norm following. It represents bilateral or multilateral adherence to a pre-existing norm. An example is the rotation of an additional program office duty like office security manager among company grade officers (71:4).

b. Negotiation is a tacit agreement between two cooperative parties. When the intensity of conflict is low, negotiation may be referred to as simple discussion. A example is when neighbors discuss the placement of a fence. Parties prefer not to use the term negotiation, because it connotes to some a formal positioning on an issue or a high level of conflict (44:172).

c. Negotiation is reciprocity. This is a form of credit system or market system in which favors are exchanged for favors past, present, or future. Reciprocity is one method of exchange (71:7). This view includes both the negative connotation in "I scratch your back, you scratch mine" and the positive connotation that reciprocal exchange is a natural process separate from personal gain.

d. Negotiation is a charade. It is based upon the belief that the range of possible agreements is very narrow and negotiation is staged for the sake of appearances. Negotiation is nothing more than an expensive fraud. This is the view taken by Lemuel Boulware of General Electric who computed a "fair" deal for the labor union and refused to negotiate on the ground that it truly represented the optimal result. While the offer may have been technically sufficient for agreement, it was not socially sufficient as evidenced by a series of strikes that ensued (20:30).

e. Negotiation is a game of chance or skill, like poker or chess. It is viewed as a test of skill where there are good moves and bad moves, strategy and tactics. Negotiation is haggling in a foreign shop as a sport (20:31).

f. Negotiation is an allocation process. It is a mechanism for dividing up the fruits of cooperation among participants. It goes by many names in the literature: Distributive Process, Concession Exchange, Compromise, Value-Claiming, Fixed Pie, and Zero Sum (57:13; 71:91,138; 56:117-118; 20:30). The entire set of possible agreements is known to all parties.

g. Negotiation is a search for a solution. Parties presume that the best solution is not currently known and must be found. This process also goes by many names in literature: Problem Solving or collaboration, Integrative Process, Bridging Formula/Detail Approach, Non-Zero Sum in

Game theory, Expanding Pie, Value-Creating, and Win/Win (71:91; 57:13; 87:84-86; 70:37; 56:88-89).

Dominant Coalition. This process applies to a group of individuals where a hierarchy does not exist. Unlike negotiation, group agreement is usually accomplished by majority rule or some other method determined unanimously ahead of time. Majority rule is a zero sum or distributive process, because at least one individual will lose, unless the organization seeks unanimous agreement as court juries. While interaction is generally unlimited within a group, the formal method of decision making is confined to a binary indication of volition. This definition could include armed conflict as means for social decision making, but this is beyond the scope of this investigation.

When dominant coalition methods do not apply, and negotiation does not lead to the mutually desired agreement, the conflicting parties can agree to permit some form of intervention.

Intervention. If, for example, two conflicting parties cannot reach agreement, or they realize that they lack essential information or skills, they can agree to seek assistance from an outside or third party. There are many types of intervention spanning from consultation at one end of the spectrum, where the intervener has no authority, to adjudication at the other end, where the intervener is a

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fully empowered judge whose decisions are binding on the parties (44:180-181). See figure 1 which lists various types of intervention.

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┌─────────────────────────────────────────────────┐
│                                                   │
│           Types of Intervention                   │
│                                                   │
│                                                   │
│      High                    Consultation         │
│                                                   │
│       ↑                      Facilitation         │
│       │                                           │
│       │                      Mediation            │
│  Interaction between                              │
│       Parties                Organizational       │
│                                Development         │
│       │                                           │
│  Influence of Parties        Conciliation         │
│     on Decision                                   │
│                              Informal Tribunals   │
│       │                                           │
│       ↓                      Arbitration          │
│                                                   │
│      Low                     Criminal/Civil       │
│                                Justice System      │
│                                                   │
└─────────────────────────────────────────────────┘
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Figure 1. An Ordinal Listing of the Types of Intervention Based on the Level of Interaction Permitted Between Conflicting Parties and on the Amount of Influence that Conflicting Parties have in the Outcome of a Decision (Adapted from Hocker and Wilmot -- 44:199)

From the perspective of the conflicting parties, moving down the list means a decrease in the degree to which the parties can determine the solution. It also means a decrease in the interaction between conflicting parties (44:199).

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Since the differences in the types of intervention on the list are subtle, two are selected to represent the extremes on the list. Mediation and arbitration are discussed.

Mediation. Mediation includes aspects of both facilitating and counseling. A mediator can bring a new perspective, more information, or the skill in addressing only substantive or key issues to a negotiation. However, the conflicting parties have the prerogative to disregard or edit the mediator's contribution (44:204). A variant is the "interested" mediator who has an indirect stake in the outcome. He is not a negotiating party because his interests are secondary or are satisfied by the fact of agreement. President Carter's role in the Camp David Accord between Egypt and Israel was an interested mediator. A program manager can also be considered an interested mediator. For example, he can mediate the conflicting interests between what the using command, like Tactical Air Command, wants and what the defense contractor believes is technically possible. As an interested mediator his concern is that agreement be achieved without breaching other agreements such as cost and schedule. Some refer to this as "trades" or "trade offs" (74:6). In summary, the program manager is an interested mediator both within the program office and within the larger organization.

Arbitration. When conflicting parties agree to abide by the decision of a third party, the process is arbitration. In arbitration, the conflicting parties no longer interact with one another. Interaction occurs exclusively with the arbitrator. Arbitration guarantees a solution or decision, since it is binding. A variant is the "interested" arbitrator who has an indirect stake in the outcome. This variant occurs in the bureaucratic hierarchy of an organization where the executive or supervisor is a judge (87:69). For example, when an unresolvable conflict occurs between two program offices in a multi-program, matrixed office, the two program managers can agree to elevate the conflict to the next highest supervisor they both share for arbitration. The supervisor is under no obligation to return an unbiased decision as a third party judge may be. Consequently, the supervisor is an interested arbitrator.

Each of these processes involves human interaction. How interaction is defined determines the perspective of the linkages between the parts of an organization. This is examined under the topic of perspective.

Perspective

The perspective used in this study is based upon a transactional view of human interaction in contrast to a communicational view. Both are described below.

Communication Theory. Communication is a complex
process. One researcher reviewed human communications
literature and found fifteen different constructs of
communication (59:7). Many of these constructs equate
communication with interaction and transmission of messages,
and appear to define communication as the intentional
"transfer of pattern from one brain to another" (54:160).

This thesis does not attempt to describe the multitude
of communication theories. This can be found in Stephen W.
Littlejohn's Theory of Human Communication. What is
important about communication theory is that relational
communication is becoming more popular among researchers. As
communication theory is applied to new situations, it
evolves. Many times older, previously discarded theories are
re-examined under the premise that they had been prematurely
judged. This seems to be the case with relational
communication.

Relational communication was first developed by an
anthropologist named Gregory Bateson in the early 1950's and
has recently been challenging some of the more traditional
theories (59:165). One team of researchers commented that

> one of the shortcomings of the traditional communication
> model is the inadequate emphasis it places on the
> motivation context of an exchange process (12:160).

Others suggest that this theory has greater potential
than previously thought, but it is fundamentally limited by
defining human interaction as only a communication process
(54:158-159; 79:172; 81:274). The late Alfred Kuhn, once a

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leading organizational theorist, suggested that how one views human interaction is the key to understanding the logic of organization. He claimed that failures in organizations are due to the current perspective of equating interaction with communication. He asserts that transaction, not communication, is the heart of human interaction (54:178). This assertion, together with the fact that relational communication theory approximates transaction theory, indicates a new path to take.

Transaction Theory. Transaction is the transfer of things valued between the parts or systems. Things valued can be commodities, services, or information. Note that transaction theory is different form transactional analysis which is a tool of psychology (53:133). The purpose of communication under this view is to insure that transaction occurs. Communication assumes a subordinate role to assist the transaction and is defined as the transfer of information between the parts of the system. When information is valued, communication is part of the transaction. Furthermore, a discussion, according to this theory, is an exchange of views or perceptions and is also, by definition, a transaction involving communication.

In other words, communication facilitates transaction which exchanges and motivates interaction. This perspective is the foundation for the basic framework developed in

chapter III and in analyzing organizational and management
activities.

This transactional perspective does, however, have
limitations which do not affect its application in this
thesis. Altruism, for example, is not easily explained by a
transactional approach. One may argue that military
operations, in general, place a high value on self-sacrifice,
an attitude that does not necessarily favor a transactional
perspective. However, the political arena of weapons
acquisition requires extensive human interaction and the
integration of a large diversity of resources. It is similar
to a market system where there is no standardized currency,
an environment that appears to lend itself to a transactional
perspective.

Summary

This chapter reviewed some of the key concepts related
to linkages and the processes of social interaction. It
examined the current understanding of linkage and integration
that spans several separate fields such as law, business,
organizational behavior, communications, conflict and social
science. This chapter concluded with a description of a
transactional perspective. Chapter III assembles these
concepts using this perspective into a basic framework.

III.   Basic Framework

Chapter Overview

The purpose of this chapter is to assemble the key concepts defined in chapter II. into a basic framework. This chapter:

1. Examines several options that a program manager has when confronted with a need to integrate program activities.

2. Reviews the process by which integration is accomplished, and

3. ˥ scusses the product of this process.

Throughout this thesis the terms integration and coordination are interchangable. This follows the lead set by Lawrence and Lorsch who are well known in management research circles. Both terms refer to an interactive process which links the parts of the system or organization. For example, both can refer to the process of linking, fusing, reconciling, or integrating conflicting interests (55:144-145).

Basic Decision Classification of Options

As the parts of the organization become more interdependent upon one another, the need for integration increases as discussed in chapter II. For example, a

division of labor, which seeks to simplify a complex

organizational task, requires integration when the resulting

subtasks are interdependent. A similar example is the work

breakdown structure (WBS) specified by DOD Directive 5010.2

and MIL-STD-881. The WBS subdivides a program into several

levels of standardized categories according to function and

configuration. In many cases the integration of these

categories and subtasks is itself an identified task in the

work breakdown structure. Confronted with this task of

integration, a program manager has three options: redesign

the structure of the organization, seek to relax certain

constraints, or improve the linkages between the parts of the

organization. Reference figure 2.

Basic Decision Classification

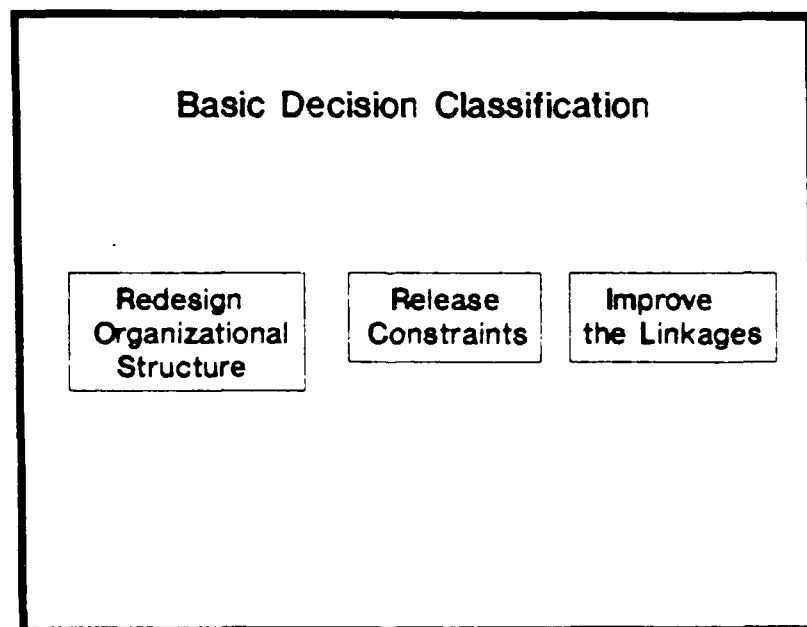| Redesign Organizational Structure	Release Constraints	Improve the Linkages

Figure 2. Three Basic Ways of Satisfying
a Need for Integration.

Redesign the Structure. By moving the organizational boundaries, redistributing tasks, changing lines of authority, or co-locating activities or workers, the manager can attempt to minimize interdependencies and encourage more effective integration. This is a popular approach in the Department of Defense, but it has not been fully effective (27:1-3,1-4; 5:ᴧ34). One of the reasons is that defense acquisition involves very complex and highly interdependent activities. Consequently, no matter where the boundaries are drawn in the organization, boundary spanning coordination is still a requirement.

As mentioned in the problem statement, the Department of Defense has had a poor track record using this approach. DoD 4245.7M asserts that the major reason for its failure is that it continues to segregate design, test, and production activities. In effect the approach treats these activities as generally independent, or at best, serially interdependent, when in fact they are reciprocally interdependent. This mismatch between perceived and actual interdependency is not corrected by a redesign of the structure.

In addition, this approach may have limited utility to the program manager, since he may not have the discretion to redesign the structure of his parent organization, such as Air Force Systems Command. In summary, the redesign of the organizational structure appears to have limited

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effectiveness and utility to the program manager. It appears
to be too coarse a tool to fine tune the organization.
Another major option is to seek to relax or release a
constraint.

Release a Constraint. This approach seeks to
renegotiate constraints. One common technique is referred to
as "Expanding the pie". For example, instead of negotiating
a tighter integration of interests within budget constraints,
the Congress has had a history of resolving Congressional
conflict by increasing revenues through taxation. In effect,
Congress released a self-imposed budget constraint. The
Gramm-Rudman-Hollings Act of 1987 made it more difficult for
Congress, as well as the Executive Branch, to renegotiate a
budget ceiling.

There are several indications that this option will be
less successful in the future. Concurrency, design to cost,
and R&M 2000 are three of the most visible examples of a
trend toward less negotiable constraints.

Concurrency. One way to avoid program turbulence
is to complete the program in the least amount of time
to minimize its vulnerability to external change. Schedule,
therefore, becomes an overriding constraint, and concurrency
is the method of overlapping or eliminating steps in the
acquisition process to shorten the time required to initial
deployment (8:5-14). The Government Account Office (GAO)

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indicates through its status report on 23 programs, that concurrency is already applied to a large and growing number of defense acquisition programs (35). In summary, concurrency indicates a greater emphasis on schedule, meaning that as a constraint, schedule is less likely to yield when integration is difficult. Design to cost is similar.

Design to Cost. Design to cost is a concept which establishes cost as a design constraint. It legitimizes cost as a constraint and makes relaxing the constraint difficult (8:5-28).

R&M 2000. Concurrency indicates a tight schedule constraint, design to cost is a locked-in cost constraint, and R&M 2000 is an attempt to legitimize the status or importance of two performance considerations. R&M 2000 seeks to "institutionalize the Air Force commitment to accelerated reliability and maintainability improvements in new and fielded systems" (6:1). This researcher passes no judgement, but observes that activities and initiatives, like R&M 2000, Design to cost, and concurrency, make integration more difficult and the option of releasing constraints less successful. The other option which shows some promise for resolving integration needs is to improve the linkages.

Improve the Linkages. The linkages can be improved by one or a combination of three methods. The program manager

can address the linkages personally, delegate the task to his
agent(s), or upgrade the skills of individuals in his
organization. Reference figure 3. In addition to these
methods there are three types of mediums of interaction that
any of these methods can employ. This analysis separates
methods from mediums.

Improving the Linkages

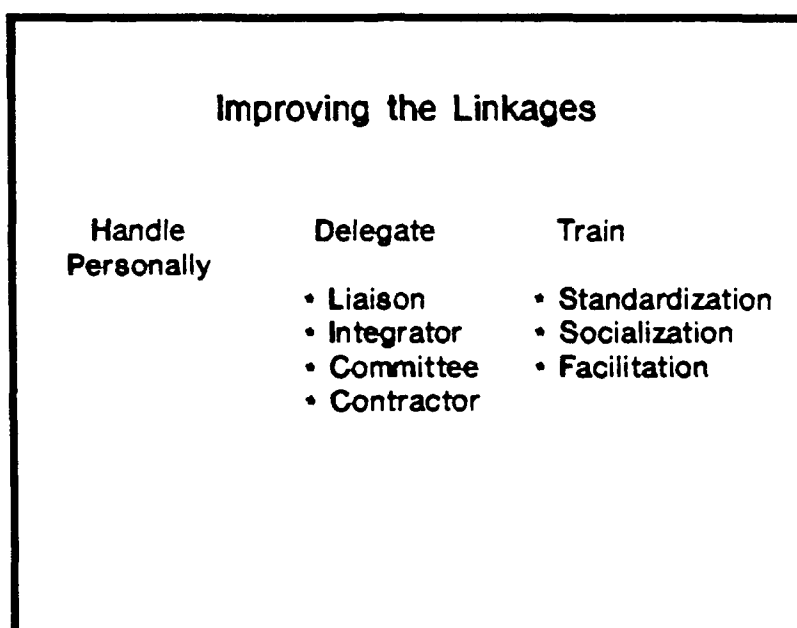| Handle Personally	Delegate	Train
	• Liaison	• Standardization
	• Integrator	• Socialization
	• Committee	• Facilitation
	• Contractor	

Figure 3. Three Basic Methods for Improving
Organizational Linkages

Methods.

Handle Personally. The program manager can
handle the interaction personally. One example is writing a
memo to the program office. Another is assuming the
responsibility for the integration task on the B-1 instead of
delegating it to the contractor.

Delegate. Delegation refers to assigning authority and responsibility for integration to a liaison, integrator, ad hoc or standing committee, or contractor (31:152). The selection of agents can depend upon the complexity, duration, and importance of the integration task.

Upgrade Skills. There are three types of training that improve the linkages of an organization: standardization, socialization, and facilitation.

The ability of an air traffic controller and a pilot, or a surgeon and nurse, to interact at peak efficiency is due to standardized training. Each is trained to sychronize his actions with another using standard procedures and language.

When applied to a large organization, the concept is a socialization process to infuse an organizational culture into its members (31:153). The Total Quality Management (TQM) concept, currently being implemented by DOD, is an example of cultural training for a large organization. The objective of this training can be understood using Thompson's typology of interdependence described in chapter II. TQM attempts to alter the perceptions held by the members of the organization from a pooled perspective to a serial or reciprocal one. In other words, it seeks to force its members to recognize internal and external linkages or interdependencies that had been previously overlooked. The TQM slogans, "Know the user" and "Establish a customer orientation" attest to this approach (49:10).

Another type of training is the development of
facilitation skills for a few individuals in each
organization. This approach is gaining appeal in most of the
large business schools which have, within the last five
years, developed adjunct courses in their graduate management
programs as well as seminars and full degreed programs. Some
800 non-labor courses were counted in 1986, forty percent of
which are taught in business programs (14:201).

Facilitation and conflict resolution skills are
developed through unique interdisciplinary programs. These
programs are an advanced mix of law, sociology, economics,
public policy, negotiation, psychology, and business. Some
sample topics developed in these programs are listed below:

Agreements: Drafting, concluding, and enforcing.

Representation: The role of agents and proxies.

Administrative Law: Policy, rulemaking, and
delegation of authority.

Decision Theory: Quantitative skills to support
negotiation planning models and
analysis of alternatives.

Interpersonal Behavior: Social decision making
processes, tactics, and
behavioral responses.

Warfare: Applying high intensity conflict and
battle management methods to non-warfare
settings.

Conflict Science: Escalation and de-escalation
techniques.

Organizational Change: Networking and politics.

Intervention: T̶e̶c̶h̶n̶i̶q̶es, fact finding, and
ation (41:209-210).

Mediums. A medium is a means by which interaction
can occur; it is part of the process of communication. There
are three types which differ only the degree of interaction
they permit. For consistency, the terms: pooled, serial, and
reciprocal are used to reflect low to high interaction
respectively. Examples of pooled mediums are standards,
regulations, policy statements, and shared databases which
provide little or no interaction. Serial mediums are
generally plans, schedules, letters, memos, and telefaxes.
Reciprocal mediums are face-to-face interactions, or
meetings, teleconferencing, and computer networking (59:258;
22:388-391). Reference figure 4.

In summary, there are three methods to improve the
organizational linkages and there are three types of mediums
that are used in any of these methods. The next two sections
discuss the process and product of the basic framework
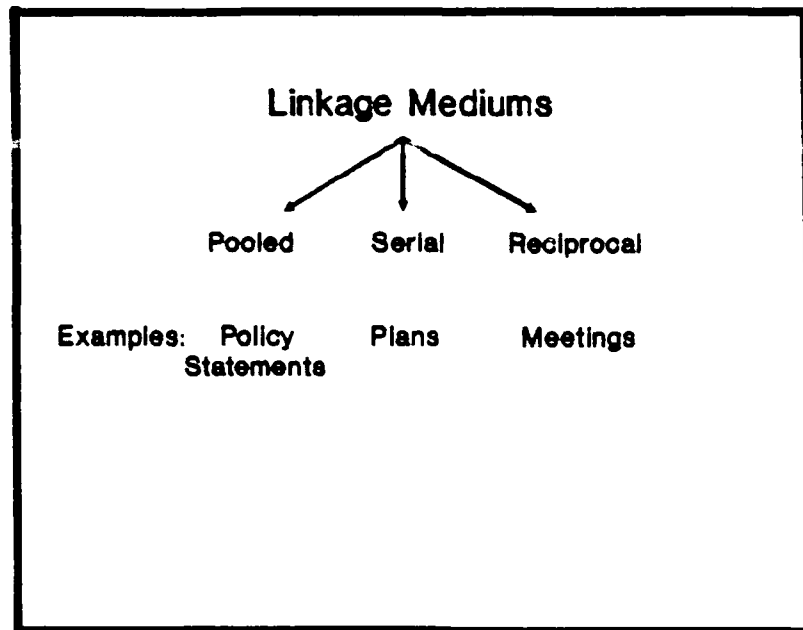focusing on improving the linkages.

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+--------------------------------------------------+
|                                                  |
|              **Linkage Mediums**                 |
|                                                  |
|                     /|\                          |
|                    / | \                         |
|                   /  |  \                         |
|                  v   v   v                        |
|                                                  |
|         **Pooled    Serial    Reciprocal**       |
|                                                  |
|                                                  |
|   **Examples:  Policy      Plans      Meetings** |
|                Statements                         |
|                                                  |
+--------------------------------------------------+
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Figure 4. Three Types of Mediums Based on
Degree of Human Interaction

Process

Chapter II described three social decision making

processes to accomplish integration: negotiation, dominant

coalition, and intervention. Reference figure 5. All

three involve differing types and amounts of interaction

which consists primarily of transaction activity facilitated

by communication. The actual process used depends upon the

skill of the conflicting parties to conduct their own

negotiations without intervention, the number of parties

involved, and the intensity of the conflict. Negotiation is

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usually the starting point in most interaction. Low skill,
many parties, or high intensity conflict tend to lead away
from negotiation. For example, a high intensity conflict,
such as war, is associated with dominant coalition as
mentioned in chapter II. The same is true for many
conflicting parties. When negotiating skill is low, more
intervention is likely (83:494). Whether the method of
social decision making is negotiation, dominant coalition, or
some form of intervention, the resulting product is
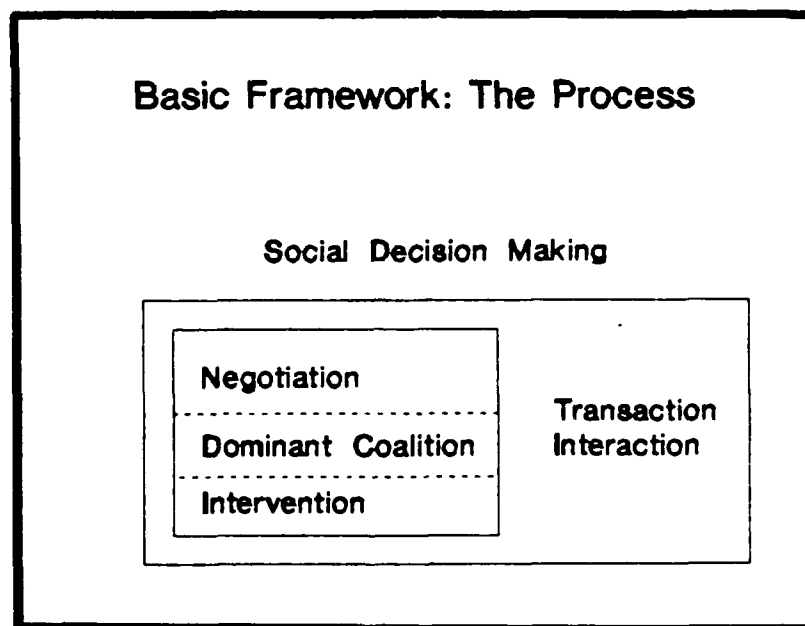agreement.

Basic Framework: The Process

Social Decision Making

Negotiation	
---	Transaction
Dominant Coalition	Interaction
Intervention	

Figure 5. The Contents of the Process
Element of the Basic Framework

<u>Agreement as a Product</u>.

Successful social decision making results in an agreement based upon a mutual promise (76:1; 32:67). In general, the term agreement is used to describe both simple social arrangements and legally binding obligations. In this study agreement refers to organizational agreement, which is not court enforceable, however it does contain four key elements similar to contracts that can make it either organizationally enforceable or productive. The legal elements of a contract are mutual assent, competent parties, consideration, and valid subject matter.

1. Mutual assent occurs when an offer, which is seriously intended and clearly stated, is unconditionally accepted (76:1). For example, when the Air Force accepts a proposal from the US Navy to exchange certain technical information, this constitutes mutual assent.

2. Competent parties are those who possess an organizational authority to enter into organizational agreements (76:5). A program charter is a way of identifying these competent parties and is further examined in chapter IV.

3. Consideration refers to the benefit and sacrifice terms of the transaction (76:7). If nothing is exchanged, then technically agreement cannot exist or is

tenuous. Consideration is related to reciprocity in the positive sense. If friendship is valued, it is valid consideration for a transaction.

4. Valid subject matter represents a set of constraints (implicit agreements) imposed by the organization in the form of non-negotiable policy statements, standards, or regulations (76:8). A program manager who discovers that the test agency failed to accomplish a test is likely to have a weak case if the funding he provided was illegally reprogrammed.

A multiyear procurement is an example of a productive agreement containing these four elements. In this agreement Congress provides uninterrupted funding for a specified time to the system program office in return for a cost reduction or savings which results from a more efficient production. This is examined in chapter IV.

Chapter Summary

This chapter began with a discussion of the integration needs confronting a program manager and his options to satisfy them. One option, which is underdeveloped in management, is to improve the linkages of the organization. This objective is accomplished by an integrating mechanism, the basic framework, which contains a process and a product shown in figure 6 on the next page. This integrating mechanism is applied in two analyses, chapter V and VI, to further develop and revise the basic framework.

Basic Framework
Integrating Mechanism

Process: ⟶ Product:

Social Decision Making   Integrative Agreement

* Mutual Assent

* Negotiation

* Competent Parties

* Dominant Coalition

* Consideration

* Intervention
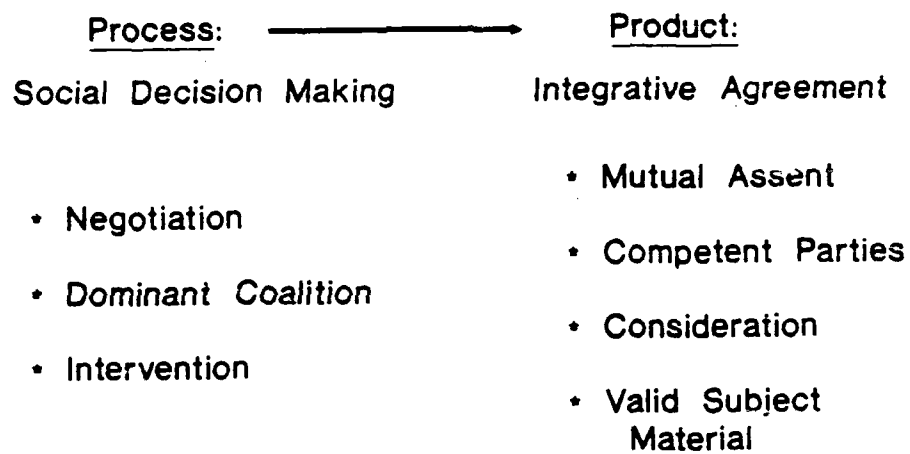
* Valid Subject
  Material

Figure 6.   The Process and Product of the Basic
Framework

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IV.   Framework Revision I:

Task Analysis

Chapter Overview

One vision of an organization is that of a complex
network of agreements that span both internal and external
organizational boundaries (56:88). This chapter extends the
theoretical analysis of the basic framework translating major
tasks of the defense acquisition program manager into related
tasks of securing, maintaining, and applying an
organizational network of agreements. Reference figure 7.
This chapter presents research observations, a revised
framework, and supporting analysis.

Observations

The basic framework revealed four issues concerning
defense acquisition program management.   Each is described
below.

1.   Program manager authority stems primarily from a
series of negotiated agreements with interdependent agencies
and offices.   The program charter provides the basic
organizational warrant to enter in and administer
organization agreements. However, program managers tend to
rely on delegated authority which encourages them to ignore
legitimate interests in the organization.   An approach
related to delegated authority is streamlining which seeks to

Figure 7. An Organizational Network of
Agreements from the Program Manager's
Perspective

reduce the diffusion of authority in an organization and

subsequently vested interests. The issue is that a mismatch

between perceived and actual interdependency within an

organization is the source of organizational problems.

Solutions which aggravate this mismatch perpetuate the

problem.

2. There is an indication that program managers and

contracting officers are unclear on what is negotiable in

organizational agreements. Program integration becomes
more difficult or impossible when constraints, such as
user requirements, are presumed to be non-negotiable.

3. There are increasing demands placed on integration
in defense acquisition. The number of interests and concerns
is growing as well as the number of advocates that have
legitimate interests (1:27). In addition, some
organizational structures now widely used, such as the
matrix, escalate conflict so that there is more productive
interaction placing greater demand on regulating skills.
Furthermore, there are indications that demands exceed
capabilities of the program manager.

4. This study suggests a correlation between program
activities that have been troublesome and program activities
that are poor agreements. For example, Zero Based Budgeting,
Work Authorization in a matrix, and Basic Multiyear
Procurement all violate basic precepts that make sound
agreement and all have been identified as a source of
difficulty in the program office.

Revised Framework I

This analysis examines program manager tasks as
agreements, and agreements as processes leading to certain
products which satisfy the needs of the program. For
example, one such product of agreement is stability, a
quality that buffers the program from disrupting influences.
Reference figure 8. This analysis links agreement to a

set of products, or boundary spanning functions, which represent the consideration part of the transaction. Eight such products are identified in the analysis of program manager tasks: conditional authority, stability, balance, technical expertise, interoperability, advocacy, information, and trust.

Revised Framework

Basic Framework

Process	Product

Social Decision Making	Agreement	Boundary Spanning Functions

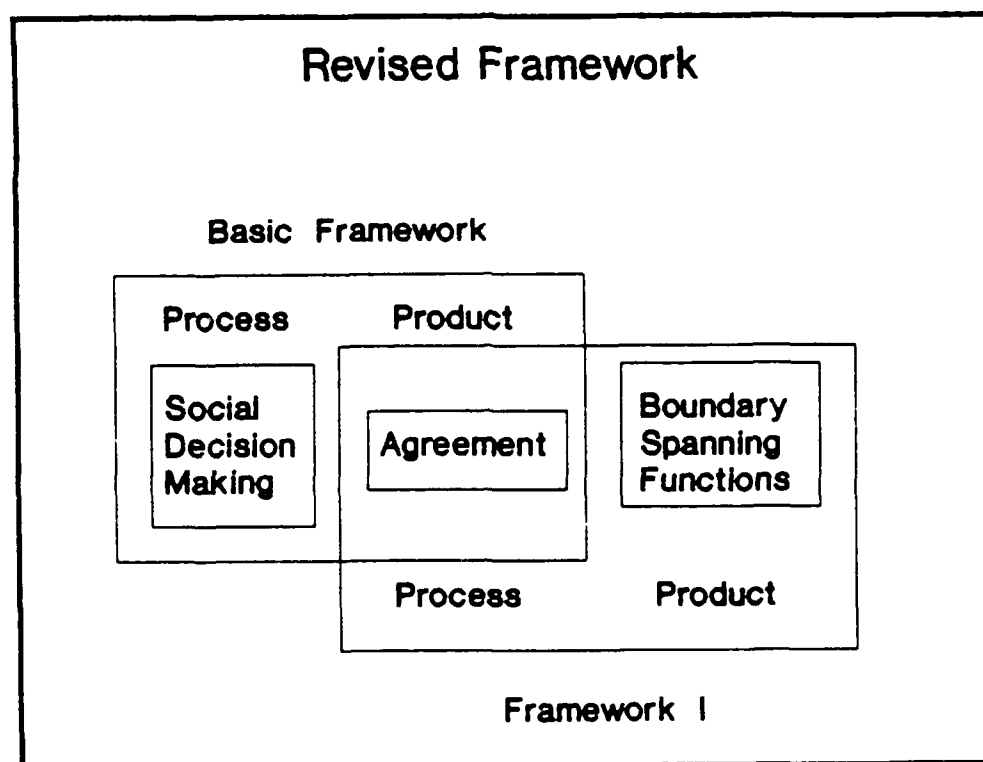| Process	Product

Framework I

Figure 8. The Revised Framework Showing the Relationship between the Basic Framework and Framework I

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This list of products can be simplified by using an empirically derived classification used in boundary spanning analyses. Reference figure 9. David Jemison, Professor of Management at Stanford University, describes three fundamental roles of boundary spanning:

1. "Information acquisition and control" is the management of information exchange. Technical expertise and information fit this function.

2. "Domain determination and interface" is the management of relationships and their domain. Advocacy, stability, conditional authority, trust and interoperability apply to this function. It also includes the coordination of boundaries and responsibilities.

3. "Physical input control", or balance, is the management and integration of interests, views, concerns, and/or constraints (47:133-136).

In summary, this revised framework in figure 8 depicts agreement as both a product and a process depending upon the perspective. As a process, agreement leads to three basic types of products, or boundary spanning functions which satisfy the needs of the program. Furthermore, this revised framework links the process of social decision making to these boundary spanning functions.

Boundary Spanning Functions

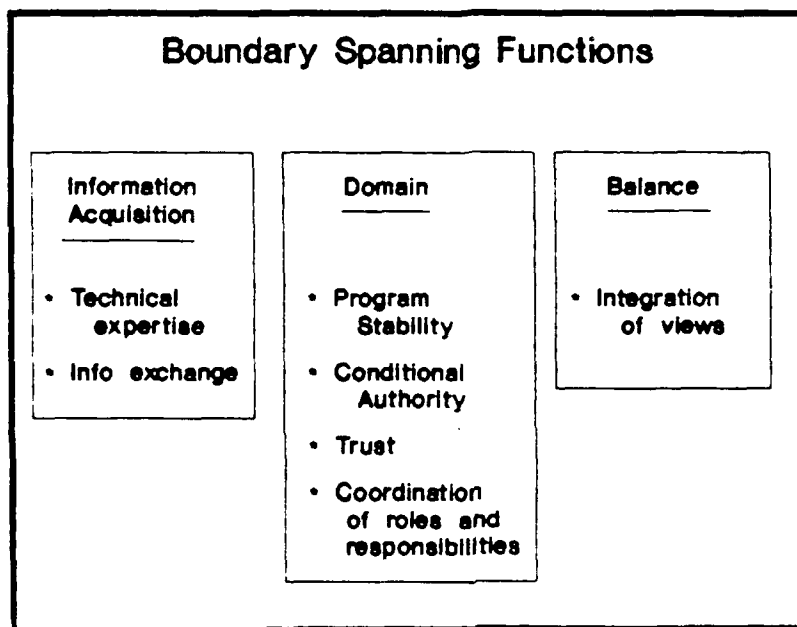| Information Acquisition	Domain	Balance
• Technical expertise	• Program Stability	• Integration of views
• Info exchange	• Conditional Authority	
	• Trust	
	• Coordination of roles and responsibilities	

Figure 9.   Three Types of Boundary
Spanning Functions

Supporting Analysis

Introduction

Contents. This chapter examines nine categories of organizational agreements accomplished and maintained by the program manager:

Format. In general most tasks or agreements are divided into the following four topics, where data was available.

Traditional View. This is the view that appears in guides and handbooks. It is assumed to represent the commonly held view, especially because it often emanates from policies and regulations. For each section this view is briefly summarized. In some cases it is similar to the transactional view.

<u>Transactional View</u>. This view perceives
agreement as a tool of management. It describes the nature
of the agreement focusing on the parties involved and the
elements of consideration that form the transaction.

<u>Analysis</u>. This topic explores
and analyzes problems related to the section using the
transactional view.

<u>Implications</u>. This topic describes
observations based upon the transactional view.

PROGRAM CHARTER

Introduction

The charter is the foundation of a program. and as such is the first subject for application and analysis of this theoretical framework. This section answers the following questions: What are the indications that the current or traditional view used by program management is unrealistic? How does this new framework differ from the traditional view regarding the charter? What are the implications for program management based upon this redefined charter?

Traditional View

The prime function of the charter is to grant the program manager "permission to perform". It vests the program manager with the right to accomplish a specific task within specified constraints (4:3-7; 25:26-27). In this view all program authority stems from one source and is considered adequate if the program manager can:

    a. Make trade-offs between cost, schedule, and
        performance,

    b. Identify program funding needs and control
        allocation,

    c. Determine and control system configuration,

    d. Communicate with other agencies, and

e. Manage the program office military and civilian
    workforce. Authority is expected to approximately
    match responsibility (24:2-2).

    Issues. Contrary to the traditional view of a balanced
alignment of authority and responsibility, several defense
studies of program management have noted a significant gap
between authority and responsibility. These studies found
that while the program manager is held responsible for the
full breadth of program performance, authority for key
decisions is diffused among many influential program
participants. In 1984 one study found that a program
manager's actual authority falls short of his designated
authority (33:156).

    Two years later the Packard Commission confirmed this
finding when a majority of program managers surveyed reported
that their authority ranged from marginally adequate to very
inadequate. The Commission concluded that the program
manager is merely one of the many participants, and is
confronted by many special interest advocates who can
influence the program (68:46,47).

    Testifying before the US Senate as an acquisition
expert, Gen Henry A. Miley, USA (ret) remarked that

        according to the charter of the project manager,
        he (the program manager) is vested with total
        responsibility and authority for his project.
        In reality, he does not enjoy that authority
        and control. He cannot, unilaterally, make
        any substantive changes in schedule, cost, or
        performance characteristics of his system. Hence,

the Army should recognize this real world situation and reorient its perception (and charter) of the project manager to recognize his actual role (33:154).

Traditional Solutions. In an attempt to correct this situation, these defense studies recommended two initiatives: streamlining and greater emphasis on controlled decentralization, which is a policy of delegating authority and accountability to match responsibility. Streamlining seeks to reduce and clarify the reporting chain. The Acquisition Executive System, described in AFR 800-1, represents the thrust of this streamlining initiative. These studies argue that by streamlining and delegating more authority, the program manager would gain greater autonomy and freedom from external influences. This autonomy insulates the program from the forces of an unstable environment and declares it independent.

However, this declaration of independence appears to ignore legitimate interdependencies among diverse elements of the organization and may encourage the program manager to override what may be legitimate concerns, interests, or inputs based solely upon his discretion. This delegated autonomy is artificial, if there are interdependencies that are not integrated into program decisions. In a recent article, Gen Robert T. Marsh USAF (ret) refuted the claim that such an autonomy could even exist. He pointed to more than a dozen oversight and supporting functions external to the program office which he believes are essential. Marsh

states that there are not enough of these essential resources to make every program office comprehensive and self-supporting. Consequently, despite the objectives of streamlining, a diversity of essential oversight and supporting functions will need to participate in the program (61:200). Marsh suggests that there is a reason for the diffusion of authority which is observed in DOD studies.

This logic indicates that the traditional view is unrealistic because it does not consider the interdependencies among organizations within the Department of Defense. These interdependencies are caused by resource constraints and the nature of the work flow. This logic challenges the value of these specific initiatives which appear to be based upon this traditional view. Rather than change the organization to fit the traditional view, change the view to fit reality. A new perspective is needed.

New Perspective. This new perspective is based upon a combination of analyses from Kuhn and Dehner which apply some theory of interpersonal behavior.

Kuhn defines the employer-employee relationship as a fundamental transaction of authority and responsibility. The employer offers rewards, loosely defined, based upon his authority, or "ability to grant or withhold rewards in return for performance or non performance of instructions" (54:276). The employee offers to accept the responsibility, or "obligation to perform as instructed based upon the

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conditions of receiving the rewards" (54:277). The result

constitutes a basic agreement. When refering to the

delegation of authority, Kuhn further defines authority as a

necessary tool to perform. He describes a situation where a

man offers another a reward for hauling water using a

specific bucket, but the bucket has no bottom. Consequently,

while agreement can be made, "only a fool would accept such

terms" according to Kuhn's perspective. With this analogy he

concludes that an employee is not likely to accept the

liability of responsiblity if it does not match the authority

(54:285).

According to Packard's findings, program managers do

accept responsibility that does not match authority. This

begs the question of whether the officers are accepting the

position of program manager fully aware that they can

leverage what little authority the charter vests them, or are

blindly stepping up to the challenge because of their

dedication and energy. Considering that Packard found that

program managers complain about their authority rift and that

the Secretary of Defense has made the issue an action item in

his 12 June 1989 report to the President (15:9), the latter

situation appears to be case.

This suggests two things. First, this suggests a skill

weakness rather than an structural flaw in the organization.

Training may better prepare the program manager to reap his

conditional authority from the diffused sources. Secondly,

with respect to this framework development, Kuhn's model is incomplete, because it does not account for authority that emanates from other than one source. Dehner provides some insight to revise Kuhn's perspective.

Dehner's analysis of program manager authority is based on his observation of more than 100 program manager briefings. He concluded that program manager authority has two parts: an initializing aspect and a sustaining aspect. The initializing aspect is the formal authority, or the "license to perform" and represents a minor part of the program manager's total authority. The sustaining aspect is the "ability of the program manager to perform the task", and is larger than the initializing aspect. Dehner's analysis is based upon a variation of the traditional view. In his view there is an authority spectrum that spans from a conservative extreme to an entrepreneurial extreme. The primary difference between the two is how program managers interpret their "permission to perform" and how much emphasis they place on the sustaining aspect of their authority. At the entrepreneurial extreme, for example, a risk-taking program manager would assume that he has all the authority except that which his charter specifically excludes. Further, Dehner suggests that authority problems that program managers experience are due to their misinterpretation of their charter and/or their inability to accomplish the sustaining aspects of authority (25:27). By itself the utility of this analysis is limited, because Dehner does not examine this

sustaining aspect. However, Kuhn's transactional perspective can explain this sustaining aspect.

The charter is an agreement in which the vested authority is a warrant. This warrant is Dehner's initializing aspect which by itself is insufficient to execute a program, but is sufficient to leverage the proper authority. Under this perspective the burden of securing the necessary "sustaining" authority rests solely with the program manager. Instead of seeking it only from the charter, he defines a natural autonomy through a series of negotiated agreements with the diversity of organizations that exercise any relevant influence. The redefined charter is described below.

Transactional View

The program charter vests the Program Manager with the initial authority to establish a new program. It defines the basic objectives and identifies the key organizational players and their intended relationships.

Parties. The charter represents a bilateral agreement between the Program Manager and the Program Executive Officer (PEO), the Service Acquisition Executive (SAE), the Defense Acquisition Executive (DAE), or their agents.

Consideration. The Program Executive Officer, Service Acquisition Executive, Defense Acquisition Executive or their agents extend an invitation to perform. The Program Manager accepts transfer of responsibility and accountability in exchange for a basic warrant. This warrant grants just enough authority to permit entry into any of the organizational agreements described in this framework analysis.

Implications

There are three implications based on this interpretation of the program charter.

1. The first is that negotiation is a critical activity in establishing sufficient authority to execute a program. In a survey study which strengthens this implication, Hodgetts determined which of four techniques program managers relied on to overcome an authority gap: Negotiation, persuasive ability, competence, or reciprocal favors. He found that 35 of 46 program manager respondents (77%) indicated that negotiation was very important in closing the authority gap. This compares with 35%, 41% and 0% for persuasive ability, competence, and reciprocal favors, respectively (45:216). In his survey program managers were given a choice of very important, important and not important. Hodgetts did not investigate what role negotiation played, but this framework suggests that negotiation is a basic social decision making process used by

program managers to secure conditional autonomy, or
authority, to execute the program. The charter provides the
organizational warrant that identifies the program manager as
a legitimate or competent agent of the organization to
conduct negotiations.

2.   There is a need for increased emphasis, not on
correcting what from the traditional view appears to be an
organizational flaw, but on altering the program manager's
perspective to match the interdependency that exists.
Authority achieved from delegation is likely to be artificial
in the sense that it encourages the program manager to ignore
interests that may be relevant.

Delegated authority is to program management as
satisficing is to decision making. It is a bounded
rationality technique that enables the program manager to
manage and more easily integrate interests, concerns, and
constraints levied on the program.   Delegated authority
permits the program manager to ignore interdependencies
within the organization that would otherwise make the task of
management integration difficult.   The penalty for
eliminating certain interests from the integration equation
is the same for the satisficing manager, reduced
effectiveness.   When the actual interdependency is low, there
are no problems.   However, when there is a mismatch between
perceived and actual interdependency, then the program
usually experiences high instability as the interdependent

parts of the system exercise their discretion on the program. An example is described in the next paragraph.

Significant cost growth and schedule delays have been found to occur frequently during the transition process from development to production. The Army suffered more than 50% growth in unit procurement costs for its Copperhead projectile and only received half of the 2100 units on time. Many of the problems remained undetected until the design had completed full scale development, surfacing as excessive failure during test, and high redesign, rework and scrap costs. While these problem occurred during test and production, they have been attributed to an incomplete design or rather a design that had not recognized the interdependency that exists between design, test, and production (39:44-48). In addition, the National Security Industrial Association (NSIA) recently published their survey findings on producibility in the defense industry. They reported a lack of emphasis on producibility. Of 26 defense contractors, only 25% indicated that they incorporated production considerations into the development process more than 75% of the time (75:212,213). A majority indicated a lack of mutual understanding between design and manufacturing functions citing poor communications as a part of the problem. In addition, they found that delaying the manufacturing design considerations until just before the critical design review significantly escalated the cost any design change.

Therefore, a mismatch between perceived and actual interdependency in this case between design, test, and production departments causes cost growth, reduced effectiveness, and schedule overruns, all symptoms of poor productivity.

3. Another issue is diffusion of authority. When an organization considers certain interests to be important and unavoidable, it legitimizes them by permitting the advocate a degree of authority. The consequence of this advocacy in a non-profit large organization with a high degree of interdependency is a diffusion of authority. Gen. Marsh's comments suggest that the current diffusion of authority is an inherent characteristic of the organization. There are many interests that must be considered in a program that are not resident in most program offices. According to Marsh there are not enough manpower resoures to create independent or autonomous program offices. Consequently, resources are shared and authority is diffused (23:13-7,13-8).

Packard's streamlining initiative seeks to reduce this diffusion of authority by removing layers of hierarchy. Based on this framework the streamlining initiative appears to be creating the illusion of autonomy or artificial autonomy. It purports to solve the defense management problems by eliminating participants in the process that champion interests legitimized by the organization. The implication

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is that streamlining will minimize the need for integration
by either eliminating interests or screening them at levels
detached from the working level.

ACQUISITION STRATEGY

Traditional View

The current view is similar to the transactional view, but there tends to a a greater emphasis on planning It has been defined in the past as the "conceptual basis for an overall plan" (8:3-1).

Transactional View

The acquisition strategy is both a process and a final product. As a process it seeks to identify and integrate strategic, technical, and resource concerns. Strategic concerns include national policy, military threats, service needs, program objectives, and priorities. Technical concerns include design, test & evaluation, production, and deployment considerations. Resource concerns include personnel and organizational structure, schedule, financial, management information, and facilities considerations. These elements define the acquisition community that is unique to each program (8:3-2 to 3-9). As a product it is the Program Manager's memorandum of agreement with the acquisition community, and it represents a general framework for developing detailed plans. The acquisition strategy "assures development and establishment of a consensus and advocacy ... early in the acquisition process" (24:4-2). The key concepts here are integration and agreement.

Parties. The acquisition strategy represents an integrated set of interrelated bilateral agreements between the Program Manager, or his/her agent, and the representatives of the acquisition community.

Consideration. The Program Manager performs the role of an interested mediator integrating sometimes conflicting strategic, technical, and resource concerns in an attempt to define the program. He uses his warrant from the charter to develop these basic bilateral agreements, and in return for satisfying these concerns the program gains a greater measure of stability and authority. This is true for the functional plans that stem from the acquisition strategy. The difference is the detail.

Analysis

In figure 10, each of the functional plans, like the Test & Evaluation Master Plan (TEMP) or Integrated Logistics Support Plan (ILSP), represent separate, but interdependent agreements (8:4-6). These agreements provide the Program Manager with two things: more definitive functional autonomy and technical expertise. This functional autonomy is what the Program Manager needs to execute his program and is the same as the natural autonomy described in the section on Program Charter. Furthermore, in exchange, the functional representative gains two items: greater

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information and visibility into the program as well as
regulated influence to define the program as it satisfies
narrow, functional interests.

These functional plans lead to the development of both
the acquisition plan and a form of work authorization in a
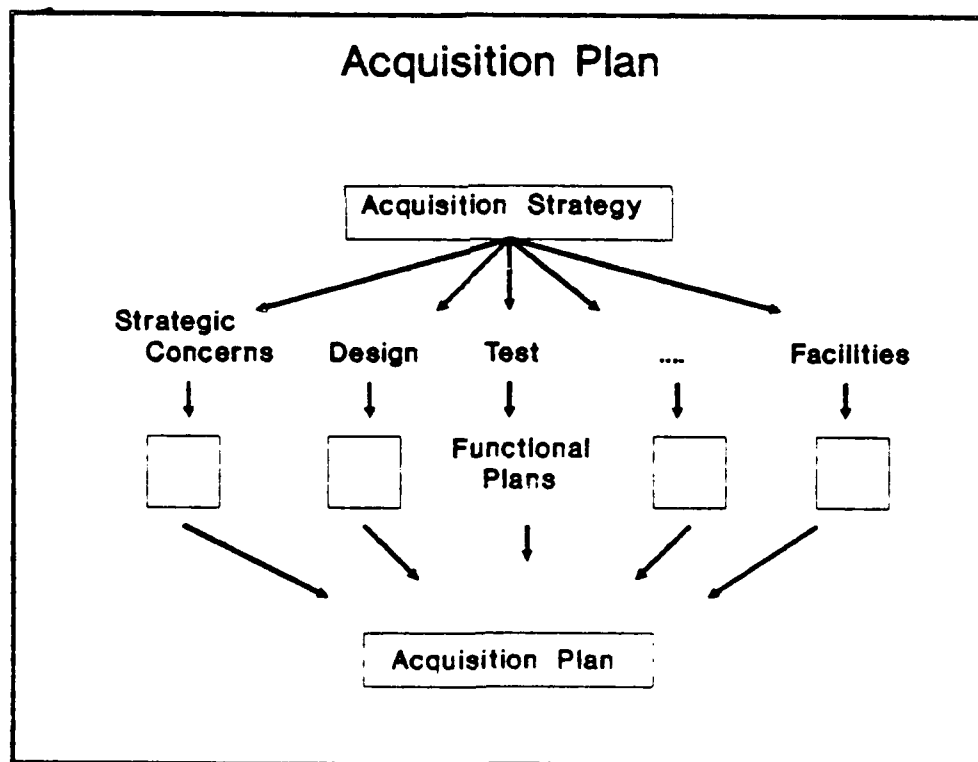matrix organization. Both are discussed in the next several
sections.

Acquisition Plan

Acquisition Strategy

Strategic
Concerns   Design   Test   ....   Facilities

Functional
Plans

Acquisition Plan

Figure 10. The Acquisition Plan

WORK AUTHORIZATION

Task Order, Tasking Letter, or Job Order

Traditional View

From the program manager's view the work authorization is a means of delegating an ad hoc or long term task to the functional department in a matrix organization. The work authorization has also been called a task order, tasking letter, and job order (33:158).

Transactional View

From a transactional view it is an agreement that integrates the interests of the program office and the functional department.

Parties. The work authorization represents a bilateral agreement between the program manager and the functional manager or his agent. Typical functional departments in a matrix for which this applies are engineering, program control, contracting, configuration, logistics, and manufacturing (10:122).

Consideration. This subject is discussed under implications.

Analysis

Traditionally, in a matrix organization there is an implicit agreement between the program manager and functional manager regarding this work authorization. The program manager typically specifies what is to be accomplished and when, whereas the functional manager is permitted the discretion to determine the how and with whom (16:15). This tasking arrangement oversimplifies the relationship and overlooks two substantive issues:

1. Greater complexity leads to greater negotiability of terms. The functional department holds a monopoly on specialized manpower in the matrix. Further, since the sum of all work planned exceeds the sum of all manpower available, there is significant competition both within the program office and between program offices for these resources. The result is a more complex arrangement in which the traditional boundaries of this relationship overlap. For example, there is some indication that both the program and the functional managers consider skill level, level of effort, priority, schedule, and quality as negotiable terms in order to successfully integrate the task and the manpower (9:167).

2. A highly dynamic environment requires continual maintenance of the work authorization agreement. The design of the matrix forces conflict to the surface to optimize the use of scarce resources. Task work are under continuous or periodic review in an environment where priorities change.

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Barker describes the matrix as "a system based upon deliberate conflict between the project and functional managers who must continually negotiate the use of organizational resources" (9:2).

Implications

Youker describes the program manager as a "frustrated diplomat" in trying to secure a work authorization agreement. Patterson also indicates that this task is difficult. This perspective suggests two reasons for this difficulty: a lack of consideration and a lack of skill in integrating interests (86:133).

Lack of Consideration. From the traditional perspective the relationship between the project and functional managers appears to be one way. Since the functional department is a not a service center, like civil engineering, it does not charge a fee for services. The issue is that the functional department does not appear to get anything in return. This appears to violate the consideration element of an agreement resulting in weak agreement. Perhaps this explains some of the difficulties that program managers experience in a matrix organization.

If consideration is the issue, then the solution is to rigorously define more equitable consideration. For example, in the matrix the program manager can offer the functional department greater visibility, interesting work, an

opportunity to excel and other elements of a deeper psychological contract. Much of this consideration is a matter of perception, but if it is valued, it is valid consideration.

Lack of Integrating Skill. In a study comparing theory and application, Crouch found that many managers in his sample lacked the confidence to escalate, regulate, and focus interaction productively in a group. He linked it to a skill deficiency which correlated to poor group performance or high performance costs. Some skill deficient managers relied on one-on-one interaction, but were able to achieve results which only equalled the minimum achieved by the skilled managers. Because conflict is both pervasive and normal in a matrix organization, Crouch indicated that this skill deficiency is a significant training issue. He recommends management training in conflict management. Conflict management is a subset of integration (21:395).

ACQUISITION PLAN

Traditional View

This plan specifically addresses immediate contracting action. It describes the method by which contractual action will be accomplished. Reference figure 10 on page 64. Input for this plan comes from all functional plans developed under the acquisition strategy. The format and content are prescribed by the Federal Acquisition Regulation (FAR). It is also called the Procurement Plan, Advanced Procurement Plan, or Contracting Plan. Typically, the plan is prepared by the contracting officer (CO) prior to each major contract (8:4-5).

Transactional View

The acquisition plan contains two parts: the Acquisition Background/Objectives, and the Plan of Action. The first part represents a summary of the acquisition strategy, described in section 2 of this chapter. The second part contains twenty elements which integrate the functional plans toward a contracting objective (27:Sec VII,105). This reinforces, verifies, and refines the agreements made initially in the acquisition strategy. Therefore, the acquisition plan is an integrative agreement of all functional elements while satisfying standard contracting specifications. The plan gives the contracting officer full

discretionary power to exercise his Congressionally
authorized warrant, which has definite terms and limits.
More importantly, it integrates the program manager and the
contracting officer.

Parties. The acquisition plan represents two primary
agreements: a bilateral agreement between the program manager
and the contracting officer, and a bilateral agreement
between the contracting officer and the Heads of the
Contracting Agency (HCA) of their agents.

Consideration. The agreement between the program
manager and the contracting officer is an agreement on roles,
such as who will take the lead in reviewing requirements,
developing the source selection plan, developing requests for
industry proposals, and formulating strategy. The program
manager empowers the contracting officer with an
organizational warrant to enter into and administer
organizational agreements specifically with the contracting
community. The agreement between the contracting officer and
the Head of the Contracting Agency (HCA) is an application of
this organizational warrant. In return for satisfying HCA
interests and standard contracting specifications, the
contracting officer is granted the authority to implement the
plan.

Analysis

The contracting officer has two warrants. The primary warrant is formally assigned, legal authority to enter into and administer court-enforceable contracts for the US Government, however it provides little or no authority within the organization (27:Sec I,201). The secondary warrant is similar to that of the program manager. It permits the contracting officer to establish organizational agreements and stems primarily from the program manager (as his/her agent) and the primary warrant. This secondary warrant is minor compared to the primary warrant, but it is critical to the accomplishment of the acquisition plan and contractual action. This second warrant can also be viewed as the the projection of the first warrant onto the internal organization. Fox noted several observations in which weak contracting officer authority within the organization "made it difficult for the contracting officer to manage contractor activities effectively" (33:167). The Government Accounting Office (GAO) provides some insight.

The GAO found that although regulations intend the contracting officer to take a lead coordinating role in developing the Request For Proposal, only in 3 of the 16 programs examined, did the contracting officer assume a lead role. The number was even less in the development of the Source Selection Plan (36:34,35). Further, they found that in only 7 of 17 programs, did the program manager and contracting officer work jointly in formulating a competitive

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strategy. Nearly 90% of the competition strategies were adversely affected by external influences (36:26).

Implication

This implies that the contracting officer is not fully developing and exercising his secondary warrant, a situation similar to that noted of the program manager. This implication is not unique to the Department of Defense. Hidden behind the formal process of negotiation usually associated with treaties, management-labor contracts, and defense contracts, is a subtle, but equally important set of interactions that occurs between the negotiator, or contracting officer, and his organization. These interactions are the reason the secondary warrant is important. They occur because each side in a negotiation may not be unified, either initially or as the negotiation proceeds. Therefore, the negotiator may find it necessary to negotiate with individuals in his organization to achieve this unity and integration of interests. Thomas Colosi developed a Core Model of Negotiation that includes these interactions, and has found from his experience that these can demand more of the negotiator's skill than the formal, more conventional confrontation. He states that as the negotiation proceeds new information is introduced which is likely to be different from that maintained by the organization which the negotiator represents. New views and interests are expressed during the negotiation which may not

have been conceived of when the organization was solidifying its negotiation goals. According to Colosi the negotiator should recognize this gap between his organization and the development at the bargaining table and further integrate and unify his organization. Colosi refers to this process as quasi-mediation (18:231).

This is relevant to the acquisition plan, since it involves these interactions to achieve a unified Government position. It suggests that to avoid planning difficulties and conflicts in contract administration the contracting officer should exercise his organizational warrant.

MEMORANDUM OF AGREEMENT (MOA)

including Memorandum of Understanding

Program Management Responsibility Transfer

Product Performance Agreement

Traditional View

The current view is similar to the transactional view;
an exchange is more explicit in these management activities
than in the others in this chapter.

Transactional View

This section discusses these four related program
activities.

Parties. The Memorandum Of Agreement (MOA) is a general
term for any documented agreement. Agreements between the
System Program Office (SPO) and other SPO's, the Defense
Contract Administration Service (DCAS), or Air Force
Operational Test and Evaluation Center (AFOTEC) are usually
referred to as MOA's. The Memorandum of Understanding (MOU)
usually refers to international agreements between
Governments concerning mutual weapons acquisition. Program
Management Responsibility Transfer (PMRT) is an agreement
between the implementing command, like Air Force Systems
Command, and the supporting command, like Air Force Logistics

Command during the production phase of a program. The Product Performance Agreement is a warranty agreement between the program office and the contractor.

Consideration. The MOA establishes policies for implementing program management, assigns responsibilities, and defines procedures and reporting channels. It defines specific tasks and the process of acceptable daily interaction. The MOU is an MOA with many additional considerations such as patent interchange, data exchange, and security agreements. Countries in an MOU arrangement are together able to accomplish greater technological collaboration and greater economies of scale. Other joint benefits are standardization and interoperability. The costs are a longer acquisition process and greater interdependency.

In the PMRT the supporting command accepts the responsibility for management of a specific program under conditions that it determines, such as level three engineering drawings. The implementing command, agreeing to these conditions, transfers the responsibility and gains the release of its acquisition personnel for reapplication to other programs (2:28-1).

The Product Performance Agreement is a warranty. In return for compensation the contractor guarantees, or provides assurance, that the system will meet certain performance specifications. The agreement also includes a

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penalty clause should the system, under specified conditions, fail to perform as promised (3:5).

Analysis

This analysis describes one situation in which weak linkages between Government agencies have created problems. In their studies, both J. Ronald Fox, a former Deputy Assistant Secretary of the Air Force, and David Packard, a former Deputy Secretary of Defense, have revealed a significant problem between the program office and various contract auditing and oversight agencies. One such agency is the field office that performs full-time government contract administration at the major contractor facility. Field offices managed by the Defense Logistics Agency (DLA) are called the Defense Contract Administration Service Plant Representative Office (DCASPRO). Service-managed offices are called the Navy or Air Force Plant Representative Offices (NAVPRO/AFPRO). Their function is to provide the oversight and administration on location of all contracts with the contractor.

The relationship between this field office and the program office has been characterized as symbiotic. The program office ma⁻ the major issues, while the field office handles the technical details related to monitoring and assessing the contractor's performance. The strength of the relationship and the integration of interests between theses two government offices are critical in effectively

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managing the program. Both offices need to synchronize their communication and actions in order to present a single voice to the contractor. This optimal relationship, however, has not been the norm.

Fox discovered a discordant relationship in his first study in 1974 which was verified by a 1982 House Special Panel on Defense Procurement Procedures. In recent follow-up interviews Fox found little had changed since 1974. Many program offices bypass the field office dealing directly with the contractor without coordinating or informing them. Further, he describes a role conflict between the program office and the field office. Despite the MOA between these offices, there are, according to Fox, many instances of overlapping responsibilities. He suggests that a poorly defined relationship may also leave gaps in their oversight responsibilities. (That is, each thought the other was responsible for it.) In addition, he suggests that some of the cost and schedule overruns could be attributed to this role conflict (33:290-296).

The Packard Commission examined 15 Government-contractor relationships and found a significant lack of coordination among government oversight agencies, including DCAA, DCAS, IG, GAO, DIS, and NSA. They discovered duplicative, overlapping, and inefficient government auditting and oversight activities. The Commission found that agencies did not completely trust one another even though they shared a common domain, such as security. One indication is that

nearly 80% of all information requests were found to be redundant. The consequence of this lack of coordination is an unwarranted increase in contractor and government costs according to the Commission (65:354-355).

Implication

The findings above indicate a failure of the Government agencies to interact effectively, and consequently, a failure of the Memorandum of Agreement that bridges these offices. It appears that agreement is not maintained and interaction is constrained to a medium that does not account for a more interdependent linkage. Fox commented that "in most cases, program offices considered the MOA merely one more document to prepare and subsequently forget" (33:294). Packard's findings indicate that the MOA is incomplete by not coordinating all government activities related to the contractor. This analysis indicates a weak process for securing, maintaining, and applying agreement.

ACQUISITION PROGRAM BASELINE

Traditional View

The baseline is considered to be an agreement. This analysis develops this view further.

Transactional View

The acquisition program baseline briefly summarizes factors critical to program success such as functional specifications, costs, and schedule objectives, as well as requirements against which the program will subsequently be evaluated. It forms the basis for other agreements such as the Decision Coordinating Paper and the Acquisition Strategy. As the program matures, so does the baseline. The Development Baseline and the Production Baseline refer to more refined and more constrained agreements prior to Full Scale Development and prior to production respectively (29:1-1).

Parties. The baseline coordinates both vertically and horizontally representing a multilateral agreement signed by the program participants at the command level (the user, developer, trainer, and supporter), HQ USAF, and the program manager (29:1-1).

Consideration. The program manager secures three items:
program advocacy from the signed participants; greater, but
bounded autonomy which translates to significantly less
intervention and micromanagement review; and agreement on the
direction, definition, and expectation of the program. In
exchange, the signatories are permitted to influence the
limits of authority, performance thresholds, general schedule
milestones, and cost ceilings giving them more effective
controls.

Analysis

AFR 800-25 considers the baseline "a management
technique used to enhance stability and control cost growth
of selected Air Force weapon and information system
acquisition programs." (29:1-1). The baseline includes
change control procedures for renegotiating these bounds and
thresholds. It also promotes mutual understanding, provides
a reference point for measuring and tracking changes, and
supports Planning Programming Budgeting System (PPBS)
analyses, all typical aspects of an agreement (29:1-2).

While the baseline is described in AFR 800-25 and DODD
5000.1 both recently issued, the concept is not new. What is
new is the consolidation of several separate baseline
agreements into one integrated baseline thereby reducing the
burden on the program manager to mediate as well as to
negotiate these highly interdependent agreements (74:6).

Issue. Echoing Packard's concern for the excessive
length of the acquisition process in his June 1986 report,
Fox describes a vicious cycle of events. Users, fully aware
of the time needed to acquire and deploy equipment, translate
long-term threat forecasts into conservatively demanding
requirements tending to err on the side of the overstating
the need. This need tends to invite high technology
solutions which breed higher than usual complexity and cost,
lengthening the process and perpetuating the cycle (33:29).

One of the causes of this vicious cycle appears to be
the perspective the program manager chooses to use. There
are indications that the program manager is not aware of what
is and what is not negotiable. For example, describing his
second of eight basic tasks for successful program
management, Hansen made the following statement in 1974.

> In the past, many Service Program Managers have
> considered the operational capability requirements to
> be sacred and uncontestable, regardless of difficulty
> or cost. While the SPO Director (or Program Manager)
> cannot change the requirments or objectives of the
> program unilaterally, it is his primary responsibility
> to identify and recommend proper revisions (as well
> as) attempt to sell them to the proper authoritie·.
> (42:14,15)

In addition, twelve years later in a study of program
managers and contracting officers in DOD acquisition, the
Government Accounting Office (GAO) found that uncertainty
existed among the interviewed sample as to whether stated
requirements are negotiable. Further, they found evidence of
role ambiguity. For example, program managers interviewed by
the GAO believed that they should review the military

statement of need only for background. According to the GAO these program managers did not indicate it was their responsibility to screen requirements to prevent:

1. unnecessary restrictions on design freedom,

2. nonessential requirements, and

3. too narrowly defined requirements which preclude sufficient competition (36:20-23,44,45).

Furthermore, the GAO found that the program manager's role ambiguity in the overlap between requirements and contracting was exacerbated by the ambiguity in the contracting officer's role (36:3).

Implication

This role ambiguity suggests that the program manager and contracting officer are either not aware of the constraints on their program or are not aware of the negotiability of these constraints. In collective bargaining the negotiability of terms and constraints is both important and controversial. If the integration of program interests is similar to the integration of management and labor interests, then negotiability deserves greater attention in program management.

By ignoring the nature of these constraints or assuming them non-negotiable, the program manager and/or the contracting officer limit their options. The role of the program manager is as an interested mediator or active

integrater challenging and negotiating interests and
constraints in light of all other interests and constraints.

DECISION COORDINATING PAPER (DCP)

System Concept Paper (SCP)

Traditional View

Although initially the Decision Coordinating Paper was created by Deputy Secretary of Defense David Packard in 1971 to serve as a "contract", it has been more commonly viewed as a reporting requirement to support each milestone in the acquisition process. Both the System Concept Paper and the Decision Coordinating Paper usually contains information on progress made since the last milestone, the acquisition strategy, and the program baseline (33:25).

Transactional View

The SCP is the term used to describe the bilateral agreemen' at milestone I, while the DCP is used thereafter.

Parties. The DCP/SCP represents a series of vertical bilateral agreements that bridge the Office of the Secretary of Defense (OSD) and the Service System Program Office (SPO) (33:44). Reference figure 11.

Consideration. OSD agrees to waive its organizational right to intervene, oversee, and review at any time limiting such `ctivity to specific milestone events. In exchange, the SPO agrees to integrate OSD's interests into the program and

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┌─────────────────────────────────────────────┐
│          Decision Coordinating Paper          │
│                                               │
│    ┌───────────────────────────────────┐     │
│    │  Office of the Secretary of Defense│     │
│    └───────────────────────────────────┘     │
│                    ↕                          │
│              ┌──────────┐                     │
│              │  Agents  │                     │
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│                    ↕                          │
│            ┌────────────────┐                 │
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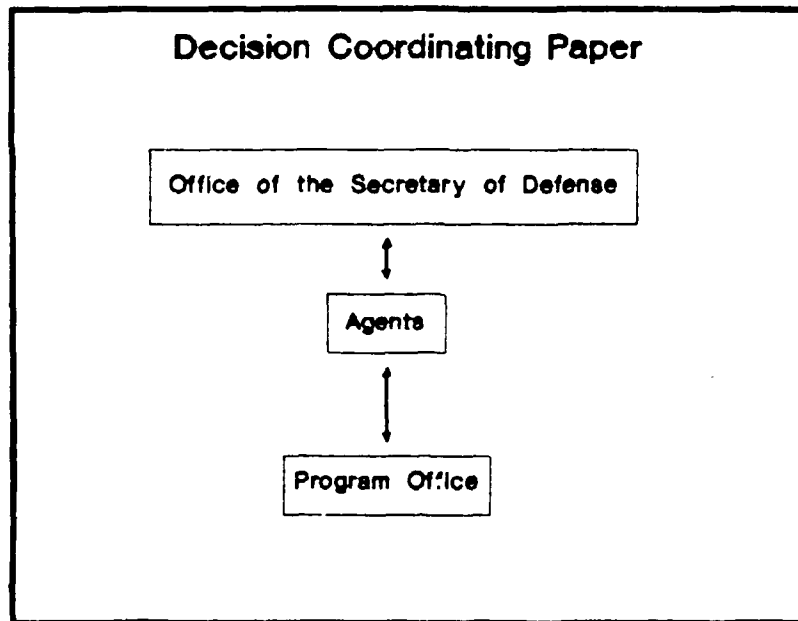
Figure 11. The Framework View of the
Relationship between the Program Office
and the Office of the Secretary of Defense

permit OSD to influence the development of other

organizational agreements that the SPO maintains. This

provides OSD greater control and the SPO with greater

stability. Since the DCP is a general document. neither

analysis nor implication is relevant.

JOINT SERVICE AGREEMENTS such as:

Multi-Service Required Operational Capability (MROC)

Joint Program Charters

Joint C3 Architecture

Joint Operating Procedures

Traditional View

The terms "joint", "multi-service", and "inter-service" imply agreement. The current view is similar to the transactional view described below.

Transactional View

Joint agreements seek to integrate Service needs to achieve greater economy, simplicity of logistics operations, and improvement of combat effectiveness (24:2-1). The MROC integrates the diversity of Service acquisition requirements. The JOP outlines the relationship between the Services during the development of a system including procedures for resolving conflicts. The Joint Program Charter is similar to that described in the first section on Program Charter. The Joint C3 Architecture represents an attempt to standardize communication systems that support joint operations (39:22).

Parties. Bilatal or multilateral agreements occur with nearly every mix of the Army, Navy, Air Force, and

Marine Corps. They can be accomplished at any level from that of the Service Secretary to the program manager, however, the selection of the appropriate level can affect the execution of the program. According to The Management of Joint Service Programs, a handbook for managers, the general rule is to delegate this agreement to the lowest level possible. This handbook argues that program managers are more likely to be successful when they have personally made the agreement. However, conflicts over requirements, funding, and priorities are not likely to be easily resolved at the program manager's level and may delay the program when higher headquarter intervention is solicited. The alternative to risking this instability is to seek inter-Service agreement ahead of time at the headquarters level even though it may require a sizable time investment to fully staff (24:2-2). The selection of parties to the joint agreement may represent a separate agreement.

Consideration. The Joint Tactical Information Distribution System (JTIDS) is an example of a program based upon a joint agreement between the Air Force and the Navy. Both Services receive several benefits from this program in return for several joint sacrifices.

Both Services gain:

1. Improved combat capability through interoperable communications equipment.

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2. Cost savings in development by sharing costs and reducing duplication of effort.

3. Cost savings in production through larger quantity buys which mean lower unit costs, and

4. Cost savings in logistic support by standardized equipment and maintenance.

Both Service sacrifice program simplicity:

1. Integration is more difficult. Engineering tasks involve greater complexity and technical risk. This situation is caused by an increase in design constraints imposed by a more diverse set of requirements.

2. Review and coordination is more difficult. Single Service program offices already find their own review and reporting requirements a burden. This is part of the reason why Packard recommended "streamlining". Joint program offices operate in a more demanding environment where review and reporting requirements are compounded. Further, a joint program office experiences a greater diffusion of authority. More influential participants in the program have vetos, oversight, and steering discretion. The consequence is higher risk of program turbulence or rigid inflexibility.

Analysis

One of the major objectives of joint Service agreement is communications interoperability, or the ability of one Service force to exchange information in combat with another

Service force. However, the Government Accounting Office (GAO) recently reported that the Services lack effective interoperability, a condition that has existed for over twenty years. During the US intervention of Korea, Vietnam, Dominican Republic and Grenada, the lack of communications interoperability significantly degraded combat effectiveness (38:8,9). In addition, eighty interoperability problems relating to equipment, procedures, doctrine, and training were cited in joint exercises from 1979 to 1985 (38:10). The GAO found that, as of 1987, encryption equipment, radios, and satellite terminals were still incompatible across the Services (38:11.13).

Problem. LTC Lyman, a USMC telecommunications expert, studied this condition in 1988 and found that the lack of interoperability observed in combat was only part of a much larger problem. He reveals that the Services have had difficulty coordinating the development of joint communication systems. He points to fifty interoperability deficiencies in communications acquisitions that were identified late in the acquisition process, and he examines five systems which, for various reasons, failed to achieve interoperability (60:6,7). In addition, he found that joint coordinating agencies and program offices have had a fair to poor track record. Ground and Amphibious Military Operations (GAMO), JINTACCS, TRI-TAC, and JTIDS, for example, have had either very limited progress or have experienced

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coordinating difficulties which have dominated management attention (60:12,13; 38:24-26).

This problem is well recognized. In a March 1985 testimony before the Senate Armed Services Committee, the Assistant Secretary of Defense for Command Control Communications Intelligence (C3I) admitted the difficulty the Services were experiencing in integrating the diversity of views for interoperability (38:23-26). In 1986 Congress passed the Defense Reorganization Act to better integrate combat resources. This act provided greater authority to the Chairman of the Joint Chiefs of Staff as well to the unified and specified commanders (38:27). While Lyman observed problems in 1988 it is too early to judge the effectiveness of this act. The next section examines the causes of this problem and their relation to joint agreement.

Cause. The GAO and LTC Lyman attribute this problem, described above, to:

1. An overly decentralized management structure which permits each Service program office to enjoy a large degree of autonomy (38:13),

2. A lack of agreement of standards, such as the Joint C3 Architecture, and a lack of agre ﹍nt on requirements early in the acquisition cycle (6U. .; 38:14),

3. A priority for interoperability that is lower than other design considerations (60:8), and

4. A lack of enforcement authority. The GAO

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indicates that the OSD and JCS staffs have limited capacity to resolve acquisition conflicts and accomplish integration of Service interests. They suggest that "clear mechanisms are needed to resolve conflicting Service demands" (38:15).

The second and fourth causes are directly related to the integrating mechanism. Agreement as a process is not being successfully used, if it is consistently cited as a cause. The underlying process of social decision making must also be weak. This is also apparent in the fourth cause listed implying that the method of intervention being used is not adequate to resolve the demands for integration. The first and third causes are further explored in the next section, implications, since their relationship to the integrating mechanism is more subtle.

Implications

Artificial Autonomy. The Department of Defense is organized into four functional Services and, like any bureaucracy, relies on decentralized operations to manage complex problems. This arrangement encourages the Services to presume their independence in achieving National defense. McNamara supported this arrangement, because it also encouraged the Services to be competitive and more efficient (50:24,90). It also permitted redundancy in overlapping responsibilities which is potentially more effective than inefficient. However, one aspect that appears to be overlooked is the fact that this arrangement allows the

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Services to ignore interdependencies such as the coordination
of forces and the exchange of information. In contrast to
the program manager's dilemma of insufficient autonomy,
described in Section 1 Program Charters, this oversight gives
the Service program office greater autonomy than is
warranted.

Large Integration Demands. Both the GAO and LTC
Lyman indicate that the Services have a bias against forming
a joint program office which partly explains the third cause
stated above. From a transactional view the lack of
consideration in an agreement is likely to be the cause. This
suggests that the sacrifices each Service must make outweighs
the benefits promised. The implication is that the
requirements for technical and management integration of the
program make the agreement unattractive. It also suggests
limits on the organization's ability to accomplish
integration. If this ability could be developed and expanded
at a cost that is less than the difference between the
promised joint benefits and the new integration cost, then it
warrants further investigation.

Skill Deficiency. An organization that avoids tasks
that involve large integration demands, despite the promise
of large joint benefits, recognizes its own limits in
accomplishing integration. The implication is that the
organization lacks capacity to meet this demand. Section

section on Work Authorization discusses a study by Crouch which indicates that managers who do not have the skills to integrate conflicting interests in the work place result in significantly less effective organization than those of managers who do. Crouch's finding together with the implication that the organization has a limited capacity for integration suggest a management skill deficiency.

BUDGET AGREEMENTS

Budget Enactment

Enhanced Multiyear Procurement

Milestone Budgeting

Introduction

These three budget related activities are examined as budget agreements, beginning with Budget Enactment.

Traditional View

Budget enactment permits federal agencies to incur financial obligations and make payments. In defense acquisition it permits the system program office to conduct transactions based on monetary currency, or contracts, in order to execute the program. Budget enactment is also the conversion of a financial plan into law (17:1-2; 32:72).

Transactional View

Parties. Budget enactment represents bilateral agreement or acceptance of the proposals made by the executive branch, and the transfer of conditional budget authority. There are at least two possible views on who the primary parties are:

First View Enactment constitutes a primary bilateral agreement between the legislative branch, Congress, and the executive branch, the president. The subsequent

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agreements, which further distribute this budget authority, are between the president and the Office of Management and Budget (OMB), between OMB and the Department of Defense (DOD), between DOD and their agents, etc. Appropriation, apportionment, allocation, and allotment are the terms given to this segmented transfer of budget authority by this sequence of agreements from Congress to the manager of the responsibility center, such as the program manager (30:1,2).

Second View. From the program manager's view the primary bilateral agreement is between Congress and the program manager. Therefore, budget enactment is a package of bilateral agreements. Because this package contains a large number of transactions, the primary agreement, including the transfer of budget authority, is accomplished with the assistance of a series of agents or intermediaries. The fact that each agent in the series further defines the terms (consideration) of the transaction is a consequence of the distributive process. Whichever view is used, the budget process is simplified by defining it in terms of a transaction (69:29-33).

Consideration. The program manager promises to accomplish progress toward a specific national objective in return for limited budget authority from Congress.

Analysis

The budget process contains three phases: Budget Development, Budget Enactment, and Budget Execution.

Budget Development. In the Department of Defense the Planning, Programming, Budgeting System (PPBS) identifies the fiscal resources needed to accomplish program activities that support specific national objectives. From a transactional perspective, the PPBS is a process which defines a package of offers. Each offer seeks budget authority in return for a promise of progress toward a certain national objective. The substance of each offer is itself the result of planning, programming, and budget development activities internal to the Department of Defense. These activities involve complex negotiations to determine a unified position. This package of offers is presented through the Office of Management Budget to the Congress for consideration.

Budget Enactment. Congress reviews this package of offers in two stages: Authorization and Appropriation. First, it examines the substance of each offer or group of related offers. If Congress agrees on the nature and purpose of the offer proposed, then the offer becomes part of the authorization act, otherwise it is rejected or revised through negotiation. Authorization both legitimizes the offer and sets a limit on the amount of budget authority. Second, the offers are further considered in light of all

other offers from a financial perspective. These offers or revised offers, when and if accepted, become legal agreement documented in an appropriation act of Congress (69:30). Appropriation concludes budget enactment and constitutes agreement.

Budget Execution. In this last phase the budget authority is distributed to the program manager who accomplishes the terms of the agreement. In addition, the program manager provides information to Congress demonstrating that the terms of the agreement have been fulfilled. The process by which the information is generated is referred to as the Resource Management System (23:13-5).

Sequestration as Arbitration. In 1985 Congress agreed to set limits on their spending to curb the budge deficit. This agreement is referred to as the Gramm-Rudman-Hollings Act (17:54-72). This act meant that conflicts within Congress and between Congress and the president could. for the duration of the act. no longer be settled by "expanding the budgetary pie". It forced a more distributive, fixed pie process. Recognizing that this would increase the intensity of conflict and make reaching agreement within the time constraints difficult, Gramm-Rudman-Hollins devised an arbitration process. This process, called sequestration, underwent several challenges and revisions before it was accepted. If the legislative and executive branches can not

agree on a budget contrained by a ceiling, then the budget will be determined by a preset formula. As in an arbitration, sequestration applies pressure to the conflicting parties to reach agreement through negotiation and guarantees that a decision will be made that satisfies the Gramm-Rudman-Hollins ceiling constraints.

ENHANCED MULTIYEAR PROCUREMENT

Traditional View

The enhanced multiyear procurement is currently viewed as an agreement. This analysis develops this view further.

Transactional View

Multiyear Procurement is a generic term for several contractual arrangements which seek to acquire more than one year's production requirement in order to achieve up to a 30% cost savings in weapon system acquistion. It includes multiyear contracting, block buys, and advance economic order quantity procurement (63:30; 79:125-126). A program must meet

six criteria in order to obtain a Multiyear Procurement. It must:

1. Demonstrate a significant cost savings to the Government,

2. Be entering the production phase,

3. Have relatively stable requirements,

4. Have relatively stable configuration,

5. Have a high degree of confidence in cost estimates, and

6. Have a high degree of confidence in contractor capability to meet the terms of the contract (79:129).

Parties. The Multiyear Procurement is a bilateral agreement between Congress and the program manager. The two views expressed in 'Budget Enactment' apply here as well. but not change this analysis.

Consideration. By this agreement Congress promises to provide uninterrupted budget authority for as many as five years in return for cost savings. According to the Government Accounting Office, Congress gains an average of 21% with an estimated savings of up to $ 3B per year with this agreement (63:30). In return Congress sacrifices budget flexibility, locking in portions of the budget; changes are subject to a penalty referred to as the cancellation charge. The program office gains funding stability which permits production economies of scale and entices contractor investment, both of which result in greater production efficiencies.

Analysis

MYP vs Enhanced MYP. When Multiyear Procurement first came out, defense contractors were reluctant to enter into multiyear contractural agreements. The reason was that the consideration that the Government offered apparently had not justified the risks according Robert Moran. In 1982 Congress enhanced the Multiyear Procurement agreement by raising the cancellation charge ceiling from $ 5M to $ 100M and by covering recurring in addition to non-recurring

costs (79:116-117). The Congressional Budget Office (CBO) indicated in 1986 that the enhanced Multiyear Procurement agreements for nearly 46 programs were successfully meeting their goals (19:5).

Zero Based Budgeting (ZBB). Zero Based Budgeting is interesting. because its objectives and consequences were completely opposite to that of the Multiyear Procurement. ZBB was developed by Texas Instruments in 1969 and was implemented by President Carter in the late 1970's. It is a method for prioritizing and aggregating resources for a small to medium size company. The method required the program office to fully justify their budget authority request to the Office of the Secretary of Defense (OSD), creating a competitive environment. According to Puritano. ZBB created program turbulence and a paperwork overload which outweighed any benefits of Congressional budget flexibility. As an agreement it lacked mutual assent and consideration. President Reagan discontinued it in 1980 (72:22-23).

MILESTONE BUDGETING

Traditional View

Milestone Budgeting is another budgeting technique similar to Multiyear Procurement to improve efficiency in the acquisition process. Unlike Multiyear Procurement, the program does not have to meet the six criteria. According to the Congressional Budget Office (CBO), milestone budgeting is an experiment in alternatives to the annual budgeting process. The primary purposes is to seek a cost savings and increase program stability. It was recommended by the 1986 Packard Commission (19:2).

Transactional View

Parties. Milestone budgeting represents a bilateral agreement similar to Multiyear Procurement between Congress and the program manager as described in 'Budget Enactment'.

Consideration. Milestone Budgeting provides Congress some cost savings estimated similar to Multiyear Procurement, and up to a 75% reduction in the budget review workload (19:16,17). For this Congress sacrifices budget flexibility, but unlike Multiyear Procurement, Milestone Budgeting has no penalty breaching the agreement. With Milestone Budgeting the program manager can reduce his budget review workload and can gain some measure of program stability. The CBO indicated

that Congress is only considering providing authorization,
not appropriation stability. Therefore, Congress promises
uninterrupted authorization between major milestones; review
will be based on planned stages rather than ad hoc review,
unless the program breaches a threshold or triggering event.
Milestone Budgeting is a scaled down version of Multiyear
Procurement.

Milestone Budgeting is the result of the 1987 Defense
Authorization Act in which select programs were labeled
Defense Enterprise Programs (DEP). The results of this test
help resolve several outstanding issues of this agreement.
The most important issue is the number of programs it can
support. The CBO pointed out that the budget variability
will most likely be borne, more severely, by those programs
which do not have a Milestone Budgeting agreement (19:23).
There still exists some debate as to what milestones are to
be included. Since the risks over the life of a program
differ between programs, the CBO recommends tailoring the
agreement on a case-by-case basis (19:xiv). In addition,
Congress is still considering the appropriate manner and
duration of funding. These terms are ripe for investigation
both for future AFIT studies and sound program management
agreement.

V.   Framework Revision II:

Defense Study Analysis

Chapter Overview

Chapter III assembled key constructs into a basic framework, or integrating mechanism, linking social decision making processes to agreement. Chapter IV examined several program management activities using the integrating mechanism and described agreement as a means to accomplish boundary spanning functions. This chapter further extends this framework to demonstrate a link between boundary spanning functions and productivity in the defense acquisition process. This chapter contains a summary of findings, a description of the revised framework II, and the supporting analysis.

Findings

1. There is evidence to indicate that a weakness in boundary spanning functions is linked to poor productivity in defense acquisition.

2. Weaknesses in integration and/or boundary spanning functions account for the majority of symptoms observed in major defense studies.

3. This analysis suggests that integration plays a much larger role in management activities than anticipated by other studies. For example, while nearly all of the major

issues identified in Packard's 1986 study share a common

source, the study appears to have missed an opportunity to

distill and tie together the problems and solutions.

Revised Framework II

These findings permit an extension to the framework

developed in chapter IV. Reference figure 12. The

boundary spanning functions are not only the result of the

process of agreement, but are also a process by which

organizational productivity can be secured. It links

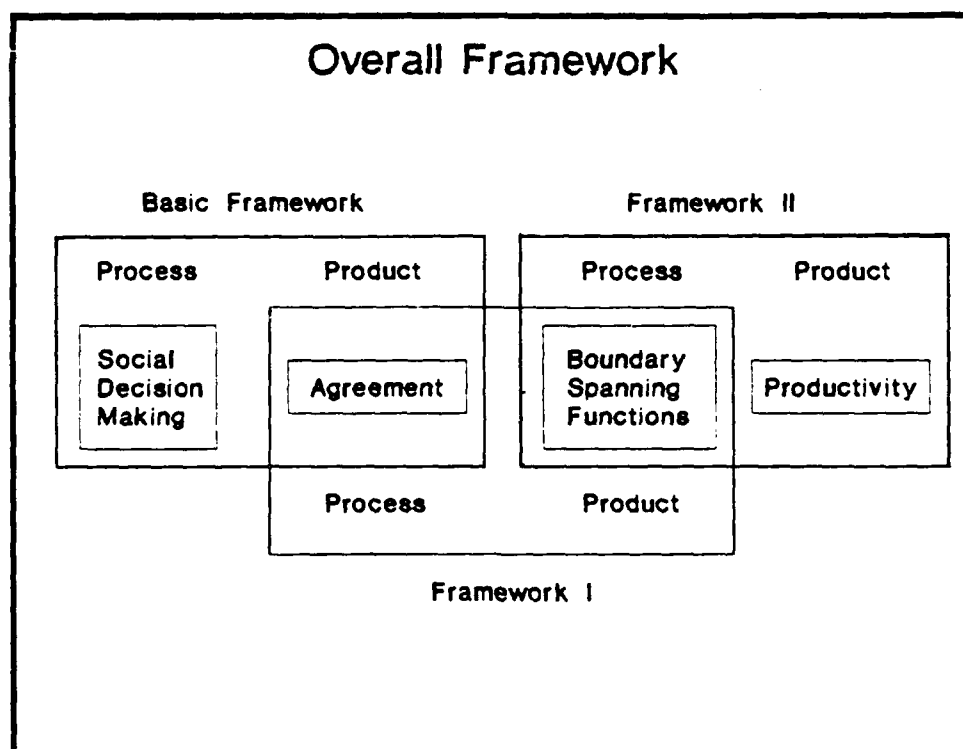agreement with the symptoms of poor productivity.

Figure 12. The Overall Framework Showing
the Relationships Among the Basic Framework,
Framework I and Framework II

This extension reveals a different aspect of the framework. Boundary spanning functions are a necessary, but not a sufficient condition for productivity. For example, an organization may be well integrated, but lack technical maturity. In addition, agreement is a necessary, but not a sufficient condition for achieving boundary spanning functions. For example, an agreement made in bad faith, one that is voidable or fraudulent, may not yield the boundary spanning functions sought. In social decision making, however, two of the three processes are a necessary and sufficient condition for agreement. Negotiation does not guarantee an agreement except when there is an effective threat of escalating the conflict to a dominant coalition process like a vote or an intervention process like arbitration. As discussed in chapter IV, sequestration, a form of intervention, guarantees an agreement between the Executive Branch and the Legislative Branch of Government.

These conditions can be clarified by examining them from the opposite direction or as negatives. For example, weaknesses in the boundary spanning functions appear to guarantee a decease in productivity. A lack of agreement appears to preclude boundary spanning functions, and a lack of social decision making interaction will apparently preclude agreement, boundary spanning functions, and productivity where parties are interdependent. These are logical deductions derived from this framework. Chapter VI

discusses the complete framework. The next section presents the analysis to support these findings.

Supporting Analysis

Introduction. This analysis is divided into two parts. It defines two key terms and then reviews the findings of seven studies of productivity, five of which pertain to the Department of Defense.

Definitions. There are two terms that are used in this analysis: symptom and boundary spanning function. One is a term borrowed from a metaphor of medical diagnosis, and the other is the name of a construct described in chapter IV.

Symptom. A medical doctor, who seeks to diagnose the cause of a medical problem, examines the overt symptoms as well as information from studies and tests. Similarly, this analysis reviews available data from various studies from the framework perspective in search of a common source for the symptoms. The term, symptoms, refers to those manifestations of poor productivity in defense acquisition. The following list identifies major symptoms of poor productivity:

1. Variances, such as cost and schedule overruns, and performance shortfalls (65:1).

2. Excessively high costs, such as spare parts overcharges (33:33).

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3. Excessively long acquisition schedules,
    especially where technological development
    outpaces the acquisition process (33:28).

4. Excessive test deficiencies (65:1).

5. Contractor or program manager frustration
    (48:30-36,54).

6. Diminished Congressional, public, and DOD
    management confidence in acquisition
    effectiveness (1:26; 33:34).

7. User dissatisfaction, reduced readiness, and
    military capability (33:45).

8. Inefficiency, fraud, and abuse (33:36; 65:5).

Some of these symptoms can be the cause of other
symptoms. For example, high cost variances can lead to
diminished Congressional confidence in acquisition
management. In general, though, these symptoms represent the
more overt indications of poor productivity.

Boundaty Spanning Functions. Boundary spanning
functions represent a logically developed grouping of
integration related activities. As mentioned in chapter IV,
there are three types of boundary spanning functions:
Balance, Domain, and Information Acquisition.

Balance is the harmonious integration of interests,
views, concerns, or constraints. An imbalance refers to
unproductive conflict, fragmentation, or a lack of

unity. Domain is the coordination of organizational boundaries, responsibilities, or authority. An ill-defined domain refers to overlapping authority, a duplication of effort, or program instability. Program instability, for example, encompasses as many as eight separate categories: requirements, funding, technological, scheduling, external management, personnel, political, and defense industry (13:2). These categories are further sub-divided in appendix 1. Information acquisition is communication or the exchange of information. A lack of information acquisition is a lack of communication.

An imbalance, ill-defined domain, or a lack of information acquisition describe a weak boundary spanning function. This weakness is shown below to be the primary cause of symptoms of poor productivity.

Defense Study Findings. Each of these seven studies is summarized and formatted into two parts: symptoms observed, and causes found to lead to these symptoms as cited in the study.

1. Air Force Systems Command study, 1983.

Symptoms: Cost and schedule growth.

Causes: Dominant causes in post-1970 programs are external management influences and funding instability. This study examined 55 programs, 27 pre-1970 and 28 post-1970. It reveals that external management influences and funding

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instability together account for nearly half of the instances

of cost and schedule growth, up from a third in pre-1970

programs. Both dominant causes are weaknesses in boundary

spanning functions. External management influences were

responsible for these symptoms in 19 of 28 programs, and

funding instability contributed to these symptoms in 18 of 28

programs. Table 1 displays some of this study's key

findings.

Table 1.

Air Force Systems Command Study

| | PERCENTAGES | | |
Major Factors Examined	Pre-1970 Sample	Post-1970 Sample	Change
Technical Problems	70	36	down 84
Technical Advances	67	46	down 45
Technical Complexity	52	61	up 17
Funding Instability	48	64	up 30
External Management	41	68	up 65

Column one lists the major factors contributing to

cost and schedule growth that were examined. Column two and

three display the percentages of pre-1970 and post-1970

programs experiencing these factors, respectively. Column four displays the percentage change from the two samples. For example, external management contributed to cost and schedule growth in 68% of the post-1970 sample, up 65% form the pre-1970 sample (34:3.4).

2. Army Material Command study, 1985.

Sypmtoms: Cost and schedule growth.

Causes: This study examined nine Army programs and found that fourteen factors contributed to cost and schedule growth. Seven of these fourteen represent weaknesses in the boundary spanning functions and are shown starred in table 2 on the next page. These seven factors account for 22 of a possible 37 instances (60%) of the symptoms in these nine programs (34:5).

3. Walsh and Kanter, a non-defense study, 1988.

Symptoms: Project failure.

Causes: Walsh and Kanter, as consultants, examined a large company that experienced project failure. Surveying 30 managers, they found the perceived relative causes of project failure as shown in table 3 on page 113. The starred factors represent weaknesses in the boundary spanning function and together constitute 63% of the perceived relative contribution to project failure (84:18,19).

Table 2.

Army Material Command Study

Major Factors Examined	Number of Programs Affected in Sample
* Requirements Change	7
* Funding Instability	4
Technical Problems	4
* External Management	3
Low Cost Estimates	3
* Multiple Program Interfaces	3
Technical Complexity	3
* Engineering Instability	2
* Concurrency	2
Application of RAM	2
Test Requirements	1
* Lack of High Level Support	1
Short Acquisition Cycle	1
Logistics	1

Table 3.

Walsh and Kanter Study

	Perceived Causes of Project Failure	Relative Importance in Percentages
*	Lack of Communication	19
	Unreasonable Schedules	17
*	Lack of Coordination	15
*	High Workflow Interdependence	12
*	Unstable Requirements	10
	Ineffective Project Leadership	9
*	Inadequate Baseline Plan	7
	Inconsistent Application of Resources	5
	Inadequate Monitoring and Control	2
		100

4. Grace Commission study, 1984. Three cases are discussed.

A. Symptoms: Inefficiency

Causes: The Grace study examined the entire Executive Branch and found fragmented responsibility for property, financial management, human resources, data processing management, and policy. This caused duplication of effort, unproductive conflict, and blurred lines of authority leading to this symptom. They found that the Federal structure lacked integration. The study recommended the establishment of a new Office of Federal Management, thereby delegating the integration task to a new department (40:25,26).

B. Symptoms: DOD health care cost growth.

Causes: The Grace study attributed these symptoms to a lack of coordination between direct care systems and Champus for civilian dependents, retired personnel, and their dependents. The study did not elaborate further (40:431).

C. Symptoms: Reduced readiness.

Causes: The Grace study found an under-utilization and shortage of trained personnel in designated skill areas. They attributed this situation to a lack of coordination between Army training programs and training requirements (40:416).

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5. Government Accounting Office study, 1986.

    Symptoms: Inefficiency.

    Causes: The Government Accounting Office (GAO) studied 17 programs, four Army, six Navy, and seven Air Force. They found three external influences, which represent weaknesses in boundary spanning functions, that negatively affected 12 programs in the sample. The three external influences are:

    Unstable commitment or requirements instability,

    Insufficient up-front funding or funding
       instability, and

    External management direction (36:48).

6. President's Blue Ribbon Packard Commission, 1986.
    Six cases are discussed.

    A. Symptoms: Cost growth.

    Causes: Program instability. The study attributes the source of this instability to a weak process of integrating interests between the branches of Government. The study states that

> there is no rational system whereby the Executive
> branch and the Congress reach coherent and enduring
> agreement on national military strategy, the forces to
> carry it out and the funding that should be
> provided...(66:4)

This represents a clear weakness in the domain and balance aspects of the boundary spanning function. The study recommends several actions, such as biennial budgeting,

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milestone budgeting and long range planning, all of which can be viewed as internal organizational agreements. Consequently, this recommendation seeks to improve the linkages of the acquisition process without recognizing it in the report (66:5).

B. Symptoms: Lack of a unified military position.

Causes: Lack of integration of Service views and integration of Commanders in Chief (CINC) views. The study further indicates that part of the cause is the inability of the Chairman of the Joint Chiefs of Staff to integrate conflicting views. The fact that interoperability in tactical communications has not been fully realized despite the needs identified by unified commanders indicates that their views are not being fully integrated. The study proposes to delegate the integration task to a new position, Vice Chairman of the Joint Chiefs of Staff (66:7). This appears to be an imbalance issue.

C. Symptoms: Reduced mission effectiveness and unity.

Causes: Overlapping authority of unified commanders. Study reveals actual mission or functional boundaries do not match the authority boundaries of unified commanders. In other words, missions and threats cross geographical boundaries that define the limits of authority for unified commanders (66:8). This appears to an

ill-defined domain issue.

D.   Symptoms: Reduced readiness and effectiveness.

Causes: Study reveals that there is an
inability to effectively allocate strategic air lift
resources among competing decentralized lift needs. Air lift
resources are managed by decentralized operations (66:8).
This also appears to an ill-defined domain issue.

E.   Symptoms: Excessive test deficiencies.

Causes: According to this study development
and operational testing have been treated as independent
tests, lacking integration (66:12). Apparently,
interdependencies between sets of tests are not fully
recognized. This is an imbalance issue. The study
recommends tighter concurrency.

F.   Symptoms: Cost growth and inefficiency.

Causes: Excessive and duplicative oversight of
defense contractors is cited as another cause. A study of 15
contractors revealed a lack of coordination among government
audit and oversight agencies, such as DCAA, DCAS, IG, GAO,
DIS, DLA, and NSA. Many of the agencies performing reviews
refused to rely on similar investigations by other agencies.
The Packard study found that up to 80% of information
requests were duplicative (67:354). This appears to be an
ill-defined domain issue.

7.   Kuhn, non-defense study, 1981.

   Symptoms: Weak productivity.

   Causes: Kuhn attributed weak productivity to a lack
of integration.   He analyzed two commercial organizations,
one Japanese and the other American.   He found that the
integrating mechanism is a major factor contributing to the
more productive Japanese organization.   A large part of the
difference is due to the perspective that the organization
has of itself.   Kuhn describes the American organization as
containing two parties: stockholders, and employees where the
primary objective is profit for the stockholders.   The
customer tends to be a passive force in this organization.
Further, he describes the arrangement between the parties as
pooled or serial interdependence, in which the stockholders
at the top dictate their interests through top management to
employees as agent managers and eventually to the customer as
recipient of the product or service. This shown in figure
13.   Kuhn then describes the Japanese organization revealing
a more reciprocal interdependence among parties which include
stockholders, employees and customers.   All three parties
have equal status as shown in figure 14.   This approach,
unlike the American approach, Kuhn contends, results in a
smooth and spontaneous coordination in a single operation
(54·420).   This finding agrees with an earlier finding made
by Baker, Murphy, and Fisher who found that

>   coordination and relations pattern explained 77% of the
>   variance of perceived project success where success
>   included two items: satisfaction of all participants and
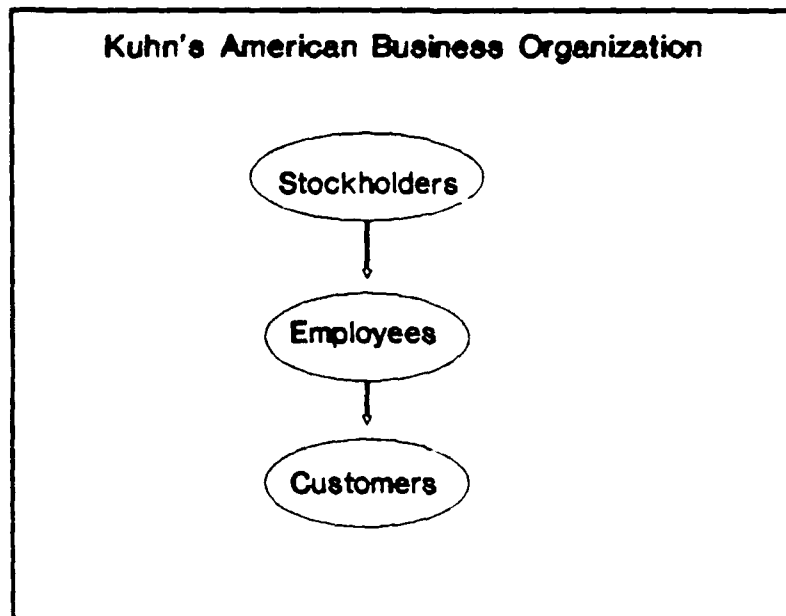>   technical performance. (7:27)

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Figure 13. Typical Perspective of an American Business Organization (Adapted from Kuhn and Beam -- 54:420)
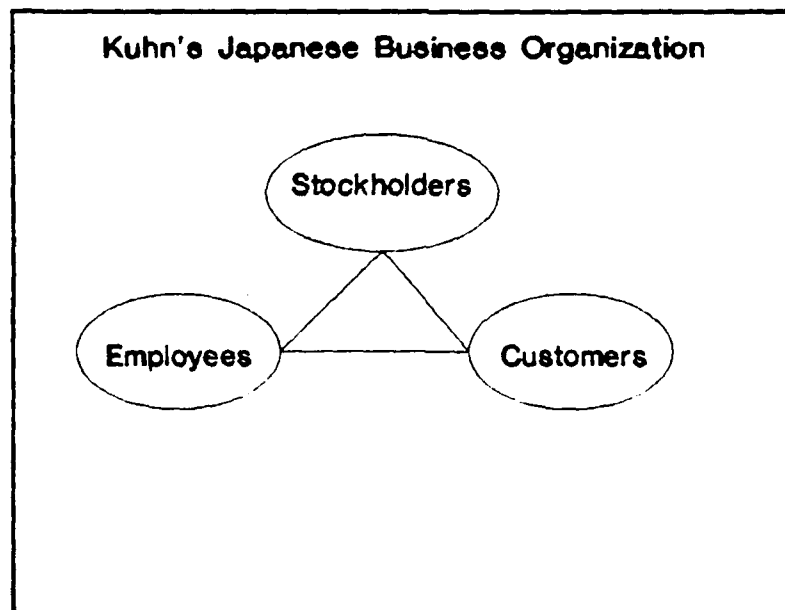

Figure 14. Typical Perspective of a Japanese Business Organization (Adapted from Kuhn and Beam -- 54:421)

The significance of these two studies as well as the others summarized above is that they indicate that integration activities are a significant contributor to organizational productivity. Further, a lack of integration or a lack of boundary spanning functions causes a majority of symptoms of poor productivity in defense acquisition.

VI. Conclusions and Recommendations

Discussion

This study began by painting a grim picture of the defense acquisition process which, according to many well-known figures, closely portrays reality. The poor productivity that the Department of Defense is experiencing is a well established fact. Further, there is substantial evidence that previous studies to resolve this persistent situation have been too shallow and that trial and error reforms have been either too complex to implement or too cosmetic to provide a viable solution. Forty years of study and reform with little success, suggests that the problem is a management failure to align authority and responsibility, and to effectively negotiate the interests of all concerned parties in the acquisition process.

After all, how one views a problem determines to a large extent the nature of the solution and whether that solution will be successful. This thesis began with the premise that the current perspective of the acquisition process is somehow askew from reality. The key to solving this dilemma is in defining the problem. This study differs from other defense studies in several ways:

1. It applies a greater interdisciplinary approach, bringing to bear concepts systems theory, organizational science, conflict science, negotiation theory,

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social science, and interdependence theory, not just management theory.

2. This study examines the situation in greater depth than other studies. It examines, summarizes, and links the symptoms of poor productivi y of the defense acquisition process to weaknesses in basic human interactive processes.

3. The most significant difference is the perspective. This study views program management activities as transactions in a social decision making process. This perspective and the subsequent framework provide greater simplicity by clarifying and integrating a previously large set of complex problems.

The objective of this study was to:

1. Define a unique framework from which defense acquisition activities can be viewed and analyzed, and

2. Explore the application and implication of this framework.

The two sections to follow discuss answers to the research questions stated in chapter I and recommendations suggested by this analysis.

Conclusion

This study found that a transactional perspective better reveals behavioral and outcome patterns and better

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explains problem symptoms observed in defense studies. The two research questions are answered below.

Research Question 1: What is the link between human interactive processes and the symptoms of poor productivity in defense acquisition? Reference figure 15 containing three linked frameworks. Each framework is divided into a process element and a product element, where the product is the result of the process. Each are explained below.
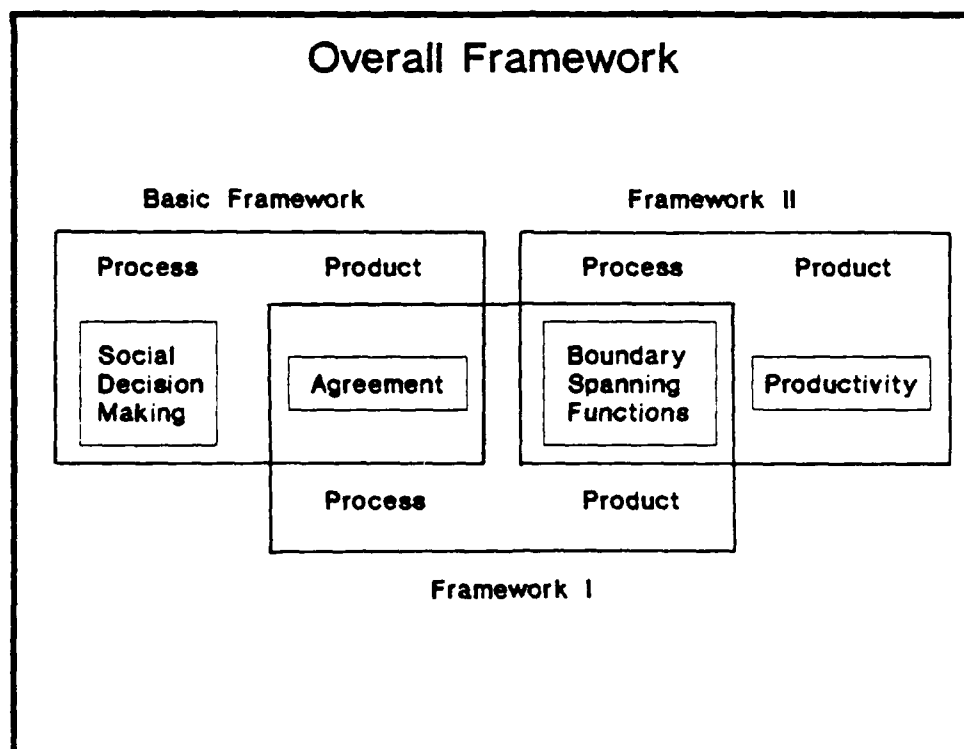

Figure 15. The Overall Framework in Summary

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Basic Framework. This framework is referred to as
the integrating mechanism, because it integrates the
interests of two or more interdependent parties through a
process called social decision making. This process consists
of three types: negotiation, dominant coalition, and
intervention. The important differences between these
processes are the degree to which conflicting parties can
influence their own outcomes and interact with one another.
Each of these social decision making processes is based upon
a transactional interaction supported by communication. In
other words communication supports a series of exchanges that
describe the program manager's activities. The product of
these processes, if successfully accomplished, is integration
of all relevant interests, concerns, and constraints referred
to in this study as agreement. The value of this basic
framework is that it ties together and simplifies several
overlapping disciplines that have individually faired poorly
in explaining management activities and difficu·¨ies.

Framework I. In this framework the term,
agreement, to the program manager is the process by which
certain items, such as program stability, greater authority,
program advocacy, and technical expertise, are accomplished.
These items are referred to as boundary spanning functions
which perform three basic tasks. They integrate interests
for a more balanced program; they coordinate boundaries,
responsibilities, and authority domains, and acquire

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information. These three basic tasks are called balance, domain, and information acquisition in this study.

This thesis translated several program manager activities into agreements and examined the consideration elements of the exchange. These elements represent the boundary spanning functions. The value of this framework is that it ties human interactive processes to boundary spanning functions through agreement.

Framework II. This framework links weaknesses in boundary spanning functions, like funding instability, to poor productivity in the defense acquisition process. Most defense studies to date have focused on this third link. If figure 15 were rotated 90 counter-clockwise, framework II would represent the first level of investigation shown in figure 16. Boundary spanning functions are the process that leads to productivity in the organization. Similarly,weaknesses in the boundary spanning functions leads to the symptoms of poor productivity. This was shown by a review of the findings of several major defense acquisition studies. The value of this framework is that it links productivity or the lack of productivity to basic human interactive processes two levels below most major defense studies. Overall, the framework extends greater insight into why poor productivity occurs. The implications of this framework are summarized in the next section.
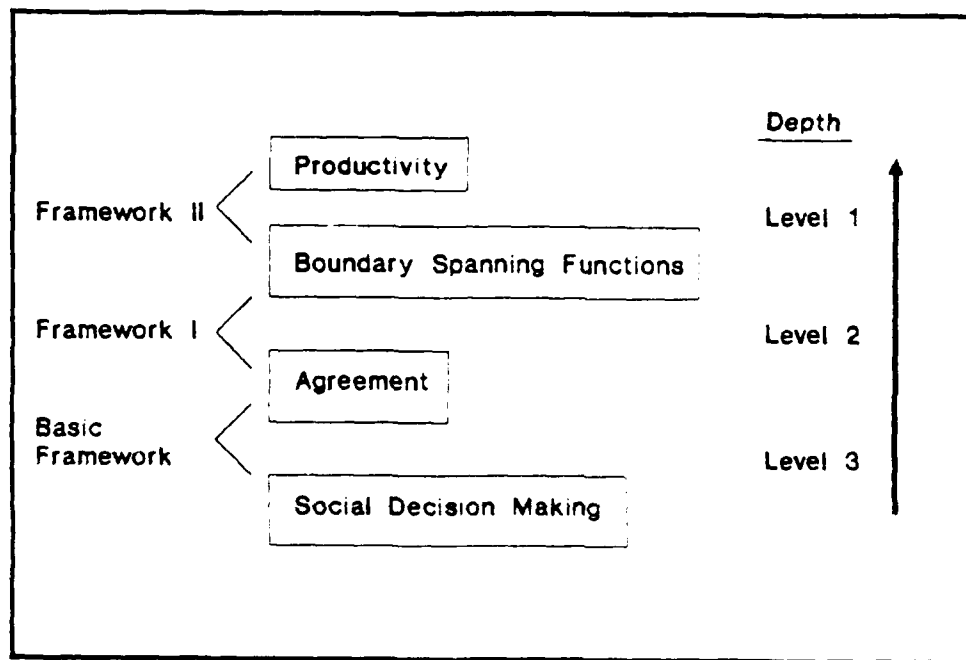
Figure 16. The Overall Framework, Turned
90 Degrees, Showing the Depth of Analysis

Research Question 2: What are the implications of this
framework? This thesis discusses five important
implications.

1.   Integration is a common denominator. The lack
of integration in defense acquisition, and similarly the
mismatch between actual and perceived interdependency, is a

prominent source of problems. It ties together many of the causes of poor productivity cited in major defense studies. In other words many diverse issues stem from the same source: a lack of integration.

2. Delegated authority is a form of satisficing which narrows the scope of a decision. In other words, when the demands for integrating a large set of program interests exceed the capacity of program managers, they resort to bounded rationality which reduces the number of interdependent interests so that integration is feasible. What this suggests is that Packard's streamlining proposal to provide program managers with commensurate authority will encourage them to satisfice rather than integrate. A greater delegation of authority is not likely to work in a large non-profit organization for the same reasons that Zero Based Budgeting was not a transferrable technique (72:20-25). This study indicates that the solution lies not in challenging the diffusion of authority, but in developing techniques for the program manager to reap conditional authority from it in order to execute his program.

3. Sound agreement is sound management. In examining some of the program manager's activities, this study suggests a correlation between activities that constitute sound agreement and activities that are highly successful. By the same token, activities that constitute poor agreement, because an equitable exchange is not apparent, appear correlated to activities which historically

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have been a source of difficulties in the program office. Zero Based Budgeting, work authorization in the matrix, and basic multiyear procurement are some examples discussed in the body of this report.

4. Demand for integration is increasing. There are indications that the number of interests, concerns, and constraints is growing, and that the negotiability of many of these constraints is decreasing. Concurrency, design to cost, Gramm-Rudman-Hollings Act, and R&M 2000 are examples of both tighter constraints and more legitimized interests. There is also an indication of a general lack of awareness as to what is and is not negotiable. An incorrect presumption may make integration difficult. The consequence is that the demand for integration may exceed capacity of program managers to accomplish it without resorting to bounded rationality.

5. Many of these implications mentioned also imply a skill deficiency in resolving role ambiguity as well as securing, maintaining, and applying agreement. This thought is further developed in the next section.

As mentioned in Chapter I, the acquisition system can be likened to a river. River activities are supervised by top DOD and weapon system programs are barges conveyed up the river by program office tugs. The journey up the river represents the acquisition process from concept development to full deployment, and encounters shifting sand bars which

symbolize the issues that can beach or destabilize the barge.
Traditionally, the river supervisors have tried to streamline
the flow by dredging the river bottom. This has had limited
success, but despite many different attempts, the nature of
the river resists the change, redepositing sand bars within a
short time. Studies of the problem have resulted in various
dredging techniques, but all recognize that the river is
either too wide or the flow is too fast to effect lasting
change.

This analogy characterizes many of the reform methods of
the acquisition process. One method which has not been
coherently developed and applied is an approach to provide
the program manager with the skill, tools and information to
more smartly navigate the river when confronted with shifting
sand bars. Similarly, this framework suggests a more
productive approach is to better equip the program manager
with certain integration skills so that he can negotiate his
way, integrating his objective with the dynamic and turbulent
nature of the process.

Recommendations

The following areas are recommended for consideration
and/or action:

1. Recommend the Air Force consider developing a
training program or adjunct curriculum to treat a skill
deficiency in management integration. Integration,
facilitation, and negotiation skills appear to have an

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important impact upon productivity in an organization. Three reasons for pursuing this training are discussed below.

a. This type of training and this approach to satisfying an organization's integration needs have been underdeveloped in the Air Force. For example, while some programs dedicate a class session to negotiation, the content is limited to the narrow terms of formal contract negotiation activities, rather than organizational negotiation. Further, there are no graduate or professional continuing education (PCE) courses at the Air Force Institute of Technology (AFIT). Only negotiation workshops are offered to contract negotiators.

In addition, this study discussed indications that interest in this approach is growing. More than 800 non-labor related courses have been developed recently in American business schools. Forty percent of these courses are offered in business and public administrative disciplines. The remainder is in law, sociology, and communications. Nearly 126 courses are dedicated to government or political science. A listing of course titles from various business schools is attached in the Appendix.

In a recent survey major industry CEO's revealed a general dissatisfaction with the abilities of MBA graduates. The survey claims that there is insufficient emphasis on qualitative skills, social sciences, writing, speaking, interpersonal skills, and integrating or negotiating skills

(77:18). This view has been expressed by the Business-Higher

Education Forum. A May 1985 report states that

> the rigor applied to financial and quantitative
> techniques can, and should, be applied to people
> management. Such courses should include the skills of
> interviewing, coaching, counseling, negotiating,
> motivating and disciplining. (77:18)

In addition, Ford and Carnegie Reports on this issue discuss

the need further.

> Being imaginative in business means having the ability
> to visualize systematic interconnections among business
> events and to think counterfactually, that is, to see
> things not as they are, but as they might be...The key
> decisions in business are non-programmed and often
> multidisciplinary. (77:18)

    b. In addition to testimony by informed

individuals, two empirical studies reveal that process

expertise in negotiation yields greater group effectiveness.

Comparing the performance of expert negotiators to that

of amateur negotiators in a novel task, one study found that

expert negotiators achieved a higher joint outcome, because

they started with a more integrative perspective. Amateur

negotiators usually adopted a more distributive, fixed pie

or win-lose approach (64:317). Several other studies found

that the content and nature of group interaction processes

determine whether the group decision making is effective or

ineffective. This research suggests that the skills of group

members to interact on procedural as well as substantive

matters has a significant impact on the effectiveness of the

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decisions made by the group. Results were based upon a 26 category coding scheme to analyze interaction within a group as they solved a case problem (43:312-321).

    c. A training program in this subject has appeal, because it offers educational efficiency. Since many of the symptoms of poor productivity stem from integration processes, fewer courses are needed to address organizational weaknesses.

    2. Recommend the Air Force consider further application of this framework. These initial indications show promise and warrant further consideration. Four research areas are suggested:

    a. Curriculum development. This study constitutes the need for skill development, but does not develop a quantitative measure. Follow-on efforts should apply several existing tools to measure the integration ability of program managers. This effort seeks to determine, analyze, and resolve educational needs.

    b. Networking analysis. One subject related to integration is networking in an organization. How does networking relate to this framework? How does the program manager in defense acquisition manage and maintain his network? Is there a correlation between the size of the

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network and management or program effectiveness? How quickly does a program manager develop his network?

c. Perception of interdependence. By what manner does the program manager determine the interdependencies of his program? Is satisficing the basis for a short term perspective? What is the optimal balance between treating everything as reciprocally interdependent and everything as independent? Can a mismatch between actual and perceived interdependence be anticipated?

d. Verification of this framework. Another follow-on study to this thesis is to examine a larger sample of defense study findings perhaps as far back as 1950 to determine quantitatively whether a lack of integration as defined by this framework explains a significant majority of the problems cited.

Together these research questions suggest that much work is still needed in order to make the perspective and framework presented here a more effective tool in understanding and correcting problems in the acquisition process.

Appendix: Sample of Negotiation Courses

Business School	Course	Course Director
Boston U.	Competitive Decision Making	W. Samuelson
	Managing Conflict and Change	L. David Brown
Columbia U.	Managing Conflict	M. K. Chandler
Duke U.	Dynamics of Bargaining	Roy Lewicki
Harvard U.	Competitive Decision Making	David A. Lax
MIT	Power and Negotiation	Max H. Bazerman
NYU	Management of Organizational Conflict	Thomas Gladwin
Northern U.	Organization Behavior Negotiation	Jeanne Brett
Temple U.	Power Plays for MBA's	Stuart Schmidt
U. of Illinois	Bargaining and Group Decision Making	J. K. Murnigham
U. of Iowa	Group Behavior in Organizations	Peter Carnevale
Virginia Polytechnic Institute	Organizational Politics	Anthony Cobb
Yale U.	Negotiation and Competitive Decision Making	P. C. Cramton

(Derived from Neale, Margaret A. and Gregory B. Northcroft.
Bargaining & Dispute Resolution Curricula: A Sourcebook
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This study develops a theoretical framework for conducting analyses of the defense acquisition process. The framework consists of three parts or levels of analysis. It links the symptoms of poor productivity noted by major defense studies to weaknesses in social decision making processes.

Using a transactional perspective, this study analyzes major program manager activities as organizational agreements. It also reviews the findings of major defense studies from this framework perspective. Key findings, based upon an application of the framework, are: (1) Program manager weaknesses in management integration explain a majority of the causes for poor productivity such as cost and schedule overruns; (2) There are indications that the demand for such integration is increasing; and (3) Further, there are indications of a program manager skill deficiency in social, or group, decision making including: (a) Weaknesses in developing and maintaining agreement, (b) A lack of awareness as to what program constraints are negotiable, and (c) Difficulties bridging a gap between authority and responsibility.