3-2001

Evaluation of Strategy-Structure Fit of Space and Missile Systems Center Detachment 11

Tommy M. Gates

EVALUATION OF THE STRATEGY-STRUCTURE FIT OF SPACE AND MISSILE SYSTEMS CENTER DETACHMENT 11

THESIS

Tommy M. Gates, Captain, USAF

AFIT/GAQ/ENV/01M-06

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government.

AFIT/GAQ/ENV/01M-06

EVALUATION OF THE STRATEGY-STRUCTURE FIT OF SPACE AND MISSILE SYSTEMS CENTER DETACHMENT 11

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Acquisition Management

Tommy M. Gates, B.S.

Captain, USAF

March 2001

AFIT/GAQ/ENV/01M-06

EVALUATION OF THE STRATEGY-STRUCTURE FIT OF SPACE AND MISSILE SYSTEMS CENTER DETACHMENT 11

Tommy M. Gates, B.S.
Captain, USAF

Approved:

Michael T. Rehg
Michael Rehg (Chairman)

01 Mar 01
date

David Petrillo
David Petrillo (Member)

01 MAR 01
date

Alan Heminger
Alan Heminger (Member)

1 March 2001
date

Acknowledgements

First and foremost, I wish to thank the men and women of Space and Missile Systems Center Detachment 11 for their contributions to this thesis effort. In particular, the commitment of Mr. John Walsh, Major Quentin Dierks, and the respondents deserve special recognition. Their work in sponsoring and facilitating this learning experience for me, as well as other AFIT students, did not go unnoticed. To the extent that this thesis adequately portrays many of the difficult issues confronting the Detachment, they deserve the credit. In wrestling with these issues, the guidance of Major Michael Rehg proved beneficial. His knowledge of organizational behavior was only surpassed by his patience. The professional and personal relationships represent the most enriching, and perhaps lasting, part of my AFIT education. To my classmates, thank you for making the AFIT experience enjoyable. Finally, I would like to thank Erin for her encouragement and support in all aspects of my life.

Tommy M. Gates

Table of Contents

Page

List of Figures

List of Tables

Abstract

Activated June 1,1998, Space and Missile Systems Center Detachment 11, located in Colorado Springs, integrates system support management for the Satellite Launch Control System (SLCS), MILSTAR, the Defense Meteorological Support Program (DMSP), the Space Based Infrared System (SBIRS), and the Global Positioning System (GPS). The Detachment performs operational software maintenance, satellite systems engineering, space testing and evaluation, and technology master planning.

Contemporary management theory asserts that the appropriate match of strategy and structure determines an organization's level of performance. The Detachment is currently organized programmatically. The current programmatic organizational structure reflects the influence of Air Force Materiel Command's Integrated Weapons Systems Management (IWSM) philosophy. By organizing along product lines, this strategy seeks to avoid false procurement savings by holding the System Program Directors accountable for the total life cycle cost of a weapon system. The current programmatic organizational structure represents the physical manifestation of the IWSM strategy and facilitates the vertical integration of all processes necessary to field, deploy, and maintain weapon/space systems. The rigid implementation of this strategy and the resulting structure impedes horizontal integration of similar processes and equipment across the various programs. However, the charter of the Detachment is to provide central integrated support for space systems. This strategy seeks to capitalize on opportunities for horizontal integration in the ground support of space systems. This

study finds that the macro-strategy of Air Force Materiel Command may create friction with the Detachment's micro-strategy of providing central integrated support for space systems.

EVALUATION OF THE STRATEGY-STRUCTURE FIT OF SPACE AND MISSILE SYSTEMS CENTER DETACHMENT 11

I. Introduction

General Issue

Space and Missile Systems Center Detachment 11, located in Colorado Springs, Colorado, at Peterson Air Force Base in the Centralized Integration Support Facility, provides integrated space system support for the Satellite Launch Control System (SLCS), MILSTAR, Defense Meteorological Support Program (DMSP), Space Based Infrared System (SBIRS), and Global Positioning System (GPS). Detachment 11 is organized along these product lines. This structure, some suggest, precludes meaningful integration between programs. Yet this organization is consistent with the Integrated Weapon System Management (IWSM) philosophy which has its roots in the early 1980's when the Department of Defense acquisition process became the subject of considerable attention due to cost overruns. In 1985, the President's Blue Ribbon Commission on Defense Management undertook a comprehensive review of the defense acquisition process (Intro to Defense Acquisition Management, 1995: 35). The Commission recommended streamlining the reporting chain to allow no more than two levels of oversight between the single manager and the Milestone Decision Authority (MDA) so

that a clear line of authority exists. After the Defense Management Review (DMR) echoed this recommendation in 1989, this soon became policy and infiltrated lower levels of management in the form of a philosophy often referred to as Integrated Weapon System Management (IWSM). "It empowers a single manager with authority over the widest range of decisions and resources to satisfy customer requirements throughout the life cycle of the product" (AFMC Pamphlet 800-60, 1993: 12). Essentially, this philosophy complements the decision to increase centralization of authority by entrusting responsibility for the total life cycle cost in one individual, the System Program Director (SPD). This centralization (made possible by the 1992 consolidation of Air Force Systems Command and Air Force Logistics Command into Air Force Materiel Command) mitigates the temptation to achieve false savings during the acquisition phase of the weapon system life cycle only to incur greater expenses during the sustainment phase. In short, IWSM seeks to avoid sub-optimization by focusing on the process, as opposed to sub-processes, and identifying a process owner to hold accountable. This implementing philosophy is designed to capture cost savings associated with vertically integrating the acquisition and sustainment organizations. Vertical integration is defined as the consolidation of authority for two or more functions of a process previously performed by two organizations into one organization, in this case acquisition and sustainment. Porter provides a similar definition. "Vertical integration is the combination of technologically distinct production, distribution, selling, and/or other economic processes within the confines of a single firm. As such, it represents a decision by a firm to utilize internal or administrative transactions rather than market transactions to accomplish its economic purpose" (Porter, 1980:300). Yet, vertical integration can be

accomplished without co-locating the sustainment portions of each program. In fact, vertical integration between procurement and sustainment might be accomplished better without the geographical separation that currently exists between the system sustainment managers (SSMs) and their respective SPDs. The purpose behind co-locating the ground sustainment portions of each program appears to be horizontal integration. "Several studies between 1984 and 1986 concluded that space and warning systems would benefit from maintaining normalized system logistics support, rather than 'individualized' contractor maintenance, distribution and materiel support" (McGiveney, 1998: 7). According to Lieutenant General Ronald T. Kadish, Detachment 11 was created "to increase [the] efficiency and focus of our support" (McGiveney, 1998: 7). On June 1, 1998, Detachment 11 was activated with a vision of "delivering the full potential of integrated space, ground segment, and air technology to America's warfighters" (Mission Briefing, undated).

Specific Problem Statement

Although the concept of IWSM represents a management philosophy as opposed to an organizational structure, it unquestionably manifests itself physically in the form of organizational structures. Detachment 11, in accordance with Air Force policy, practices the IWSM philosophy and, not surprisingly, its organizational structure exhibits

characteristics consistent with IWSM. The organizational structure for the Detachment is represented in Figure 1.

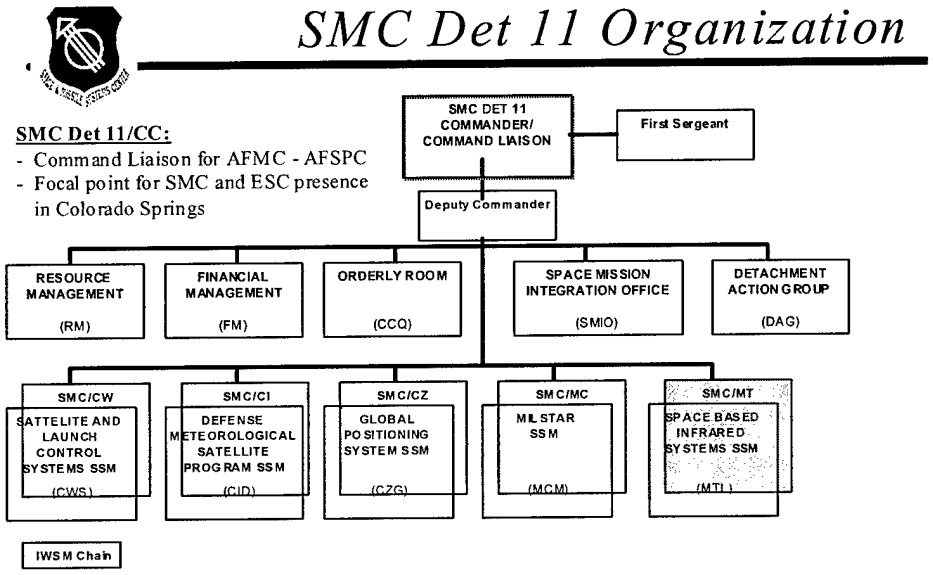

Figure 1. Detachment 11 Organizational Structure (Taken from Mission Briefing, undated)

This organizational structure achieves vertical integration of the acquisition process for each program in that each SPD remains accountable for all phases of the acquisition life cycle, beginning with the identification of the need and concluding with demilitarization and disposal of the weapon system. This thesis explores whether such an organizational structure alone provides for sufficient horizontal integration between programs. In essence, is the Central *Integration* Support Facility integrated in form—or name and building only?

Investigative Questions

The investigative questions to be addressed in this research endeavor stem from the problem statement. These include:

1. Does the Detachment's current organizational structure fit its strategy of providing integrated system support management?
2. If there is a mismatch, what causes the disparity between strategy and structure?
3. What formal or informal organizational mechanisms currently exist to facilitate integration between programs?
4. What improvements can be made in the organization's integration mechanisms?

Scope of Research

This study examined the current organizational structure of Detachment 11 in an effort to determine its ability to facilitate meaningful horizontal integration. The data included a review of successful integration through Reduction in Total Ownership Cost (R-TOC) initiatives as well as situations where horizontal integration failed and why. While such examples provided evidence of future potential in this area, the focus remained on the organizational structure as opposed to identifying, defining, and reengineering the processes currently carried out by the Detachment.

Thesis Organization

Chapter I provided the necessary background information, defined the potential problem, and outlined the scope of this thesis.

Chapter II reviews the relevant literature pertaining to organizational strategy and structure from both a pragmatic and theoretical perspective.

Chapter III contains the methodology followed in exploring whether deficiencies exist in the strategy-structure match for Detachment 11.

Chapter IV addresses the primary issues and offers insight into how these issues of strategy-structure influence the performance of the Detachment.

Chapter V states the findings of this thesis by answering the research questions while providing potential remedies for deficiencies.

II. Literature Review

Pragmatic Literature Review

Historical Context. The book *Acquisition of Defense Systems*, edited by J. S. Przemieniecki, provides a concise history of the defense acquisition process dating back to the establishment of the Department of Defense in 1947. During this early time, "the emphasis was on simplicity, reliability, and producibility. The DoD lacked any formal authority to control the acquisition process, having been designed to be a loose confederation of the three military departments that was designed to provide loose guidance to each department" (sic) (Przemieniecki, 1993: 13). This individuality in the acquisition process continued into the 1950s but saw a shift in emphasis towards customization. "The emphasis moved from an industry like the automobile industry, to an industry that was more custom design and development, where contracting played a major role" (Przemieniecki, 1993: 13). Toward this end, the Air Force saw fit to separate the research and development of weapon systems from its support. They re-organized to accomplish this division by splitting Air Materiel Command into (1) the Air Research and Development Command responsible for research and development and (2) the Air Materiel Command which assumed responsibility for the acquisition and support of systems (Przemieniecki, 1993: 13). This increase in weapon system complexity perpetuated a corresponding increase in customization and lead to the services adopting a project management organization. In 1961, the Air Force created Air Force Systems Command to focus on development and acquisition and Air Force Logistics Command to

focus on sustainment. Under the leadership of Robert McNamara, an advocate of centralized control, defense acquisition organizations reverted back to an organizational structure similar to that prior to the division of Air Materiel Command when program managers received responsibility for both developing and producing weapon systems (Przemieniecki, 1993: 14). In 1968, David Packard, an advocate of decentralized management, began divesting more responsibility to the individual services. In doing so, Packard created DoD Directive 5000.1 which was based on his view "that successful development, production, and deployment of major defense systems are primarily dependent on competent people, rational priorities, and clearly defined responsibilities" (Przemieniecki, 1993: 15). Problems within the defense acquisition process began receiving increased scrutiny during the 1980's with such scandals as the perceived overpricing of spares on the B-1 bomber. Acting to correct such problems, a commission, chaired by David Packard, studied such inadequacies of the system and provided several recommendations for improvement to include: (1) creating the position of Under Secretary of Defense for Acquisition, (2) creating service acquisition executives who report directly to the Under Secretary of Defense for Acquisition and their Service secretaries, (3) creating Program Executive Officers to manage specified types of programs, and (4) creating the role of the Vice Chairman of the Joint Chiefs of Staff as the chairman of the Joint Requirements and Management Board (Blue Ribbon Report, 1986: 57). Such recommendations were largely ignored until the Defense Management Review of 1989 undertook the effort of implementing the Packard Commission's recommendations. Consistent with the Packard Commission's emphasis on the need for program managers to have clear responsibility over their programs, in 1992 the Air Force

consolidated the responsibilities of Air Force Systems Command and Air Force Logistics Command by merging the two commands to create Air Force Materiel Command.

Regulatory/Policy Guidance. Air Force Policy Directive (AFPD) 38-1, entitled "Manpower and Organization," and AFPD 63-1, entitled "Acquisition," outline the guiding principles of Air Force organizational structure. Air Force Instruction (AFI) 38-101 and AFI 63-101 implement these policies, respectively. In addition, Department of Defense (DoD) Directives 5000.1 and 5000.2R provide guidance with respect to the management philosophy of Integrated Product and Process Development (IPPD).

AFPD 38-1 succinctly outlines the principal characteristics of Air Force organizations. These characteristics include mission orientation, unambiguous command, decentralization, agility, flexibility, simplicity, and standardization. The first characteristic, and most germane to this discussion, is mission orientation. "Organizations should have a reason to exist *and should be designed to achieve the outcome* defined in the applicable mission directive" [*emphasis added*] (AFPD 38-1, 1996: 1). Although not explicitly stated, this definition engenders the idea of creating an organizational structure that complements the organizational strategy of the unit.

AFPD 63-1, AFI 63-101, as well as DoD Directives 5000.1 and 5000.2 provide specific guidance pertaining to the structuring of acquisition organizations. However, they differ from AFPD 38-1 and AFI 38-101 in that they offer less concrete examples of acceptable organizational structures. Whereas AFI 38-101 actually mandates standardized organizational structures for most Air Force organizations (and notably excludes the structuring of acquisition organizations), the others only speak in abstract terms of the IPPD management philosophy. This management philosophy stresses both

the importance of holding one individual responsible for the life cycle management of a weapon system and the use of multidisciplinary teams from the "first through the final milestones of the program" (AFI 63-101, 1994: 2). Thus, the instruction emphasizes the importance of vertically integrating the acquisition and sustainment processes as well as horizontally integrating functional disciplines *within* the specified programs. However, all guidance appears void of encouraging integration *between* acquisition program offices.

Air Force Materiel Command Pamphlet 800-60 reinforces this idea. The pamphlet stresses the importance of vertically integrating the acquisition and sustainment processes.

> Over the last four decades, Air Force Systems Command and Air Force Logistics Command pursued textbook concepts of product management and organizational design. Each optimized its strategies towards its assigned mission. Air Force Systems Command focused on the front end of the weapons system life cycle and stressed the technology and acquisition elements, while Air Force Logistics Command focused on wartime readiness and sustainability for the long haul. Bridging organizations were often established to cross the "seams" created along mission boundaries. (AFMCP 800-60, 1993: 35)

In an effort to create a seamless organization, Air Force Systems Command and Air Force Logistics Command merged in July 1992.

Theoretical Literature Review

Structure and Strategy—Defined. The concept of an organizational structure engenders much more than the lines of authority represented on an organizational chart. Many authors choose to define an organizational structure in the context of the argument being advanced while ignoring other aspects of an organization. For instance, Weber's studies focused heavily on bureaucratic organizations and, not surprisingly, he viewed organizations largely in terms of lines of authority (Weber, 1946). This bureaucratic model is only one of a myriad of models that help conceptualize an organization and its behavior. Katz and Kahn (1969) viewed structure in terms of the intent of the organizational architect stating that "the common sense approach to understanding an organization is to regard it simply as the epitome of the purposes of its designer, its leaders, or its key members" (Katz and Kahn, 1969: 15). They advance a systems theory approach whereby managers are "basically concerned with problems of relationships, of structure, and of interdependence rather than with the constant attributes of objects" (Katz and Kahn, 1969: 18). Despite these and other competing models, organizational theorists generally provide similar definitions for organizational structure. Galbraith's concept of organizational structure captures the prevalent characteristics found throughout the relevant literature by defining organizational structure in terms of four characteristics: specialization, shape, distribution of power, and departmentalization (Galbraith, 1995: 20). Specialization refers to the division of labor among tasks. It reflects the degree to which the tasks are broken down into subunits. Organizational shape is the concept more commonly referred to as span of control and gives an

indication as to the number of management layers in the organization. Distribution of power encompasses two concepts: (1) vertical and (2) horizontal distribution of power. Vertical distribution refers to the degree of centralization or decentralization of power between managers and non-management personnel. Horizontal distribution of power, however, refers to the relative influence of each department or work unit. Finally, departmentalization refers to the "choice of departments to integrate the specialized work and form a hierarchy of departments" (Galbraith, 1995: 24). Departmentalization options include functional, product-oriented, geographical, process-oriented, and customer oriented. The following excerpt from a contemporary management textbook lends credibility to the assertion that Galbraith's perspective reflects the norm.

> Organizations create structure to facilitate the coordination of activities and to control the actions of their members. Structure itself is made up of three components. The first has to do with the degree to which activities within the organization are broken up or differentiated. We call this complexity. Second is the degree to which rules and procedures are utilized. This component is referred to as formalization. The third component of structure is centralization, which considers where decision-making authority lies (Robbins, 1993: 487).

Thus, Galbraith's definition provides a suitable framework for understanding what constitutes organizational structure.

The concept of an organizational strategy tends to be more simplistic and straightforward. Mintzberg and McHugh refer to strategy as the trend or pattern in both the decisions and actions of organizations (Mintzberg and McHugh, 1985: 161). They further argue an organization's intent is largely irrelevant. While organizations generally undertake some formal or deliberate strategy initiatives, sometimes strategies emerge despite a lack of deliberate planning and are referred to as emergent strategies. This

provides a more robust definition than earlier ones that only addressed the deliberate dimension of strategy (Tilles, 1963; Newman and Logan, 1971; Andrews, 1980).

Differentiation and Integration. Lawrence and Lorsch provide a definitive framework for viewing differentiation in organizations. Their book *Organization and Environment: Managing Differentiation and Integration* is the preeminent study in the field of organizational differentiation and defines differentiation as "the difference in cognitive and emotional orientation among managers in different functional departments." (Lawrence and Lorsch, 1967: 11) Lawrence and Lorsch undertook a study of six companies competing in the plastics industry to determine how they react in their "diverse and dynamic environment" (Lawrence and Lorsch, 1967: 23). They contend that organizational growth necessarily requires differentiation and specialization making integrative mechanisms an imperative. They use the simple analogy of the human body to convey their point. The human body consists of many highly differentiated organs and systems. Organizations consist of differentiated functions, processes, or programs. The ultimate success or demise of the human body or organization, however, depends on the overall integration of these subunits (Lawrence and Lorsch, 1967: 7). They provide essentially four perspectives for viewing differentiation within an organization: goal orientation, temporal differentiation, interpersonal differentiation, and structural differentiation (Lawrence and Lorsch, 1967: 9-10). "Differentiation is the degree to which departments differ in structure (low to high), members' orientation to a time horizon (short to long), managers' orientation to other people (permissive to authoritarian), and members' views of the task environment (certain to uncertain)" (Hellriegel, 1998: 525). These dimensions of differentiation,

however, do not necessarily represent an organizational evil. In fact, some conflict is inevitable and, when handled appropriately, is beneficial to the organization.

> It is our view, given the need for differentiated ways of working and points of view in various units of large organizations, that recurring conflict is inevitable. The important question which we have tried to answer is how the specifics of each conflict episode can be managed and resolved without expecting conflict to disappear. In other words, how can integration be facilitated without sacrificing the need for differentiation (Lawrence and Lorsch, 1967: 13).

Managers too often view differentiation and integration in dichotomous, polar terms. This may be the result of the inverse nature of the two. Organizations with such managers react by re-organizing to focus on one or the other. Instead, managers should view the organizational choice as a continuum where they must find the most appropriate balance between the two for a given situation. A difficult decision even for simple organizations, the choice becomes more complicated as the technical complexity of the industry increases (Lawrence and Lorsch, 1967: 25).

Structural Alternatives and Integration. Galbraith provides a comprehensive list of the various structures along with the advantages and disadvantages associated with each design. He also suggests some criteria for choosing the appropriate structure for a given situation. As previously mentioned, the most common designs include: functional, product line, customer-aligned, geographical, and process-oriented. Table 1 synthesizes Galbraith's work.

Table 1. Structural Alternatives

Structure	Criteria	Advantages	Disadvantages
Functional	Modestly-sized companies focusing on a minimal number of technically similar products	(1) Facilitates communications *within* a specialty thereby stimulating cross-flow of ideas between projects (2) Provides a high level of specialization (3) Can provide economies of scale or leveraging of requirements (4) Promotes standardization (5) Reduces duplication	(1) Cannot effectively manage a diverse product line (2) Fails to facilitate communication between functions
Product	Larger companies focusing on multiple products	(1) Facilitates cycle time reduction (2) Provides greater focus and specialization (3) Manages cost as a system	(1) Fails to facilitate communication between products which leads to redundancy (2) Loss of economies of scale and leveraging (3) Presents multiple faces to customers using more than one of the organization's products
Customer	Buyers insist on dedicated organizational units to satisfy their needs	(1) Increases customer focus (2) Facilitates communication with customer	(1) Often results in duplication of function (2) Loss of economies of scale and leveraging
Geographical	Large companies operating across vast territories	(1) Increases focus on regional concerns	(1) Often results in duplication of functions (2) Loss of economies of scale and leveraging
Process	Companies who have identified a few stable processes	(1) Facilitates total quality initiatives (2) Facilitates cross-functional communication (3) Often leads to cycle time reduction (4) Eliminates redundancy while minimizing safety stock	(1) Fails to remove all "seams" in an organization (2) Currently fashionable which leads to the suppression of adverse comments

Galbraith, however, acknowledges that despite the apparent prescriptive nature of his taxonomy, many times the situation facing a manager fails to provide a discrete or single solution. Walker and Lorsch suggest the same in stating that "of all the issues facing a manager as he thinks about the form of his organization, one of the thorniest is the question of whether to group activities primarily by product or by function" (Lorsch and Lawrence, 1970: 36). Using a case study approach, they found that organizations often "oscillate between the two choices" due to the complexity of the issues involved. Eventually, organizations move away from a polarity management concept and try to affect a compromise between differentiation and integration.

Given the inverse relationship that exists between differentiation and integration, how does a manager achieve high levels of both? Lawrence and Lorsch address this paradox specifically and conclude that the answer lies in integrative mechanisms, in general, and the personnel or integrators, in particular (Lawrence and Lorsch, 1967: 53). Walker and Lorsch offer three methods for achieving integration: (1) cross-functional teams, (2) use of integrators, and (3) matrix organizations (Lorsch and Lawrence, 1970: 52). Regardless of the method, those charged with integration must possess two principal personality qualities or traits. First, the integrator must demonstrate a high level of collegial leadership. Differentiation between products is often demonstrated in the form of conflict between managers or peers. Integrators, therefore, must possess an ability to lead among peers. Second, they must have a strong but broad technical background in the areas in which integration is sought. Integrators must possess both referent and expert authority. Although these are the two most significant determinants of success,

legitimate authority is important as well. Most organizations formally designate and assign responsibility for integration to an individual, team, or office.

Burns and Stalker (1971) suggest that sometimes integration is best achieved through de-differentiation. In their study of the electronics industry, they appear to reach the conclusion that such integration mechanisms noted by Lawrence and Lorsch represent dysfunctional aberrations of mechanistic or bureaucratic organizations.

> Enlarging the commitment of the individual to the concern in such a way as to admit of the adaptation of the working organization to its own larger commitment to the new situation confronting it, proved only partially possible to most firms [particularly those with bureaucratic ideologies]...In these concerns the effort to make the orthodox bureaucratic system work (because it was seen as the only possible mode of organization, and because the enlargement of commitments to the concern was abandoned as hopeless or never seriously contemplated) produced dysfunctional forms of the mechanistic system (Burns and Stalker, 1961: ix).

Jacobson captures this idea in stating that "a tension exists between coordination and specialization in organizations, one which bureaucracy tends to resolve in favor of specialization" (Jacobson, 1998: 89). Jacobson suggests that such a preference explains critical reviews of under-performing bureaucratic organizations. Bureaucratic organizations exhibit high levels of differentiation to include: "segmented labor processes, functional departments, hierarchical levels, and narrow organizational purviews which discourage inter-organizational collaboration" (Jacobson, 1998: ix). This segmentation results in narrowly defined objectives that encumber integration efforts. "Organizational theorists have long noted how the bureaucratic compartmentalization of functions and the separation of conception and execution result in a number of problems, including the displacement of ends by means and conflict between different

organizational units" (Jacobson, 1998: ix). In lieu of such aberrations, Burns and Stalker suggest expanding the roles of workers beyond mere specialists, as perpetuated by the segmented roles of bureaucracy, towards generalists. In short, Burns and Stalker advocate organizational change away from mechanistic organizations towards organic ones when the organization operates in an unstable environment.

Galbraith, however, fails to go as far. Instead he finds a middle ground that compromises between the two. Galbraith proposes interdepartmental programs to broaden the professional knowledge of employees. Such programs promote an awareness of lateral processes allowing for the development of inter-departmental relationships that lead to improved communication and coordination (Galbraith, 1995: 50). Such a program cultivates individuals capable of assuming the role of integrator. The integrator role is a necessity if a concern is to create a "truly multidimensional organization. There is a need for these roles when a company wants to attain excellence, generate new products and services, and be responsive to customers" (Galbraith, 1995: 67). To achieve such excellence, Galbraith outlines eight important factors essential to creating an appropriate *power base* for integrators: "structure of the role, staffing choice, status of the role, information systems, planning process, reward systems, budget authority, and dual authority" (Galbraith, 1995: 69). Within the organization, he advocates that the integrator report directly to the general manager or equivalent to signify the importance of the role. Galbraith's recommendations for staffing choice is similar to that previously described for Lawrence and Lorsch. The importance of interpersonal skills cannot be overstated. Technical expertise is important but secondary. The status element involves assigning a rank commensurate with the position. Since the lead integrator should report

directly to the general manager, a high-ranking individual should fill the position. Multidimensional information systems offer the integrator greater insight across products. Information systems gain added importance considering the need to permit integrators to participate in the planning process. Budget and dual authority place the bite in the dog allowing the integrators to control at least some portion of the personnel and budget. Finally, the reward system must be structured so as to promote integrators at the same rates as other positions to demonstrate organizational commitment.

Strategy and Structure—The Relationship. Alfred Chandler's book *Strategy and Structure: Chapters in the History of the Industrial Enterprise*, first published in 1962 and again in 1990, represents the seminal work in this area. In his book, Chandler demonstrated through empirical study of well known companies such as Du Pont, General Motors, and Sears that changes in strategy demanded subsequent changes in structure. For instance when a company decided to pursue a strategy of product, market, or geographical diversification, they normally altered their corporate structure to reflect greater departmentalization. This led to attempts by others to document the link between strategy and structure. In a series of doctoral dissertations emanating out of the Harvard Business School, Chandler's study was replicated for Britain (Channon, 1973), France (Pooley-Dias, 1972), and Germany (Thanheiser, 1972).

The preceding literature focused predominantly on the macro-level of the strategy and structure of the firm. In contrast, Herman Boschken argues that the more appropriate link between strategy and structure occurs instead at the microstructure. He maintains that his results not only re-confirm Chandler's original findings but serve as a better predictor of performance. He found that at the sub-unit level, the three variables labeled

differentiation, strategic competence, and integration influence the strategic behavior of a firm. The model he developed is depicted in Figure 2.

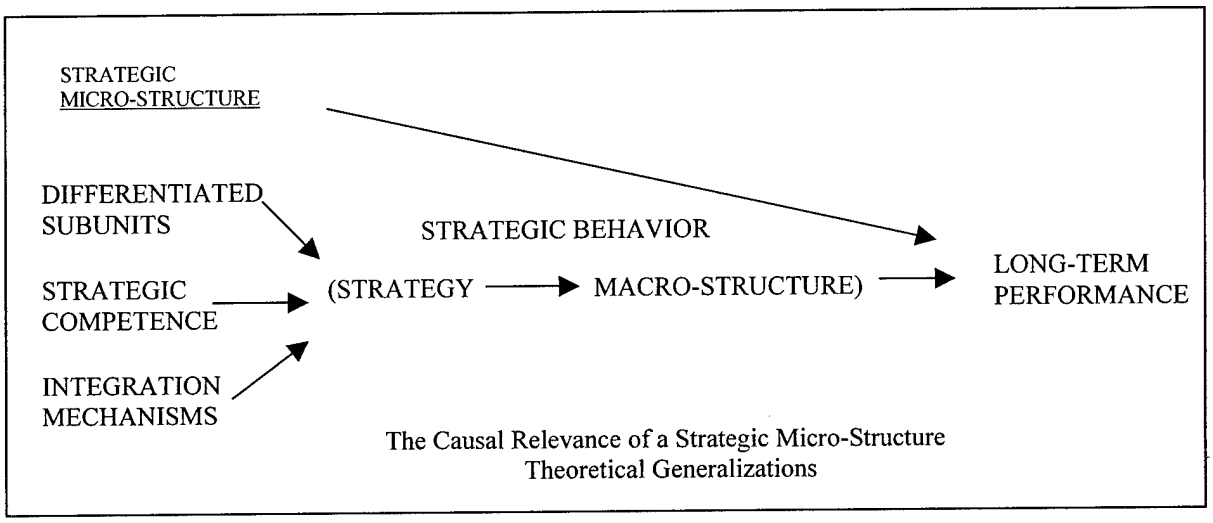

Figure 2. Microstructure Relationship to Strategy (Taken from Boschken, 1990: 149)

Chakravarthy (1982) asserts more than a mere correlation between strategy and structure. Instead, he emphasizes the importance of matching a strategy with an appropriate organizational structure in order to achieve optimum performance. This, however, constitutes an iterative rather than a one-time process as an organization must continually adapt to its ever-changing environment. The manager seeks to modify his or her organization because an "optimum strategy-structure match yields a superior performance" (Jennings and Seaman, 1994: 459). Also noteworthy of Chakravarthy's work is his discussion of the causal direction. Many contend strategy influences structure or vice versa. However, Chakravarthy offers an alternative view to the "chicken and egg question" (Chakravarthy, 1982: 42). He suggests that the two are interrelated and influence each other as a firm adapts to its environment.

Although different studies suggest a causal relationship in one or both directions between strategy and structure, the issue of temporal precedence is not one that affects the issue facing Detachment 11 and the diagnostic approach of this study. The notable theme that emerges from all the literature is that an organization's strategy and structure must complement each other if a firm is to optimize its performance. To a large extent, structure constitutes a physical manifestation of strategy. Incongruence can only lead to sub-optimal results. Richard Nelson succinctly conveys this with the following example:

> Structure involves how a firm is organized and governed, and how decisions actually are made and carried out, and thus largely determines what it actually does, given the broad strategy. A firm whose strategy calls for being a technological leader that does not have a sizeable R&D operation, or whose R&D director has little input into firm decision making, clearly has a structure out of tune with its strategy (Nelson, 1991: 67).

Therefore, an organization's strategy must complement its structure if it is to achieve its organizational goals.

Although such assertions seem tautological in nature, the issue becomes less definitive in complex organizations. Such organizations frequently have subunits that are structured in a different way than that of the whole. However, Fredrickson provides a suitable answer to this problem. In considering this issue, Fredrickson focuses on "the structure that best describes the whole organization" which he terms the dominant structure (Fredrickson, 1986: 281). This dominant structure and the accompanying dominant strategy, affect the strategic direction of the organization.

Summary

The relevant literature provides a consistent framework for considering the organizational issues of integration and differentiation as well as strategy and structure. A consensus of the literature suggests that the level of integration and differentiation represents a common source of frustration in most organizations. Such frustration typically stems from viewing the two in polar, dichotomous terms. Instead of adopting an either-or approach, successful organizations create mechanisms such as cross-functional teams and formal integrators to defy the magnetic field and achieve high levels of both.

The literature on strategy and structure is also consistent. Although some disagreement exists as to the placement of strategy and structure, the literature is clear that a disconnect between the two results in poor performance. The issue becomes more difficult in complex organizations that have subunits with plural organizations. Despite such plurality, a dominant structure and strategy exists. This strategy and structure significantly affects the strategic direction of the organization.

III. Methodology

Overview and Justification

The type of research undertaken in this study lended itself to a qualitative approach, in general, and a case study approach, in particular. This approach was adopted in an effort to determine whether an appropriate strategy-structure match for Detachment 11 currently exists. "Case studies can be used to accomplish various aims: to provide description (Kidder, 1982), test theory (Pinfield, 1986; Anderson, 1983), or generate theory (e.g., Gersick, 1988; Harris & Sutton, 1986)" (Eisenhardt, 1989: 535). Pursuant to Eisenhardt's approach, the basic research questions were established up front to focus the research and limit the amount and types of data collection required. In doing so, however, the frame of reference necessarily narrows thereby limiting the generalizability of any potential findings and conclusions.

Robert Yin confirmed Eisenhardt's findings in his book *Case Study Research: Design and Methods* and provided examples of when case studies are appropriate to include "organizational and management studies" and "the conduct of dissertations and theses in the social sciences—the academic disciplines as well as professional fields such as business administration, management science, and social work" (Yin, 1994: 1).

Yin asserts that in determining whether to use a case study approach or some other methodology, the researcher should consider three conditions:

> (1) the type of research question posed
> (2) the extent of control an investigator has over actual behavioral events,
> (3) and the degree of focus on contemporary as opposed to historical events (Yin, 1994: 4).

The case study methodology lends itself to research questions that ask how and why. Such questions provide a more effective method for answering contemporary organizational relationships in a non-experimental environmental context where the researcher lacks control over confounding factors. The contemporary nature of the issue precluded the researcher from simply surveying historical documents. Although a historical analysis might have provided a starting point, two additional sources of evidence needed to be considered: (1) direct observation and/or (2) interviews (Yin, 1994: 8). Yin's table, incorporated here as Table 2, helped determine the appropriate research strategy to use.

Table 2. Research Method Selection (Taken from Yin, 1994: 6)

strategy	form of research question	requires control over behavioral events?	focuses on contemporary events?
experiment	how, why	yes	yes
survey	who, what, where, how many, how much	no	yes
archival analysis	who, what, where, how many, how much	no	yes/no
history	how, why	no	no
case study	how, why	no	yes

The nature of the research question addressed in this thesis complies with the conditions and criteria established by Yin. Assessing the current level of integration while attempting to identify how it occurs by examining facilitating and inhibiting integration mechanisms was a task best undertaken through a case study approach.

Data Sources

The research data for this case study came from a variety of sources, both qualitative and quantitative in form (Eisenhardt, 1989: 534). Given that the research attempted to understand the evolution of Detachment 11's strategy-structure fit in an attempt to provide future guidance, process theory served as an appropriate heuristic in structuring data collection. "Process research is concerned with understanding how things evolve over time and why they evolve in this way (see Van de Ven & Huber, 1990), and process data therefore consist largely of stories about what happened and who

did what when—that is, events, activities, and choices ordered over time" (Langley, 1999: 691). The graphical representation of Langley's theory is presented in Figure 3.

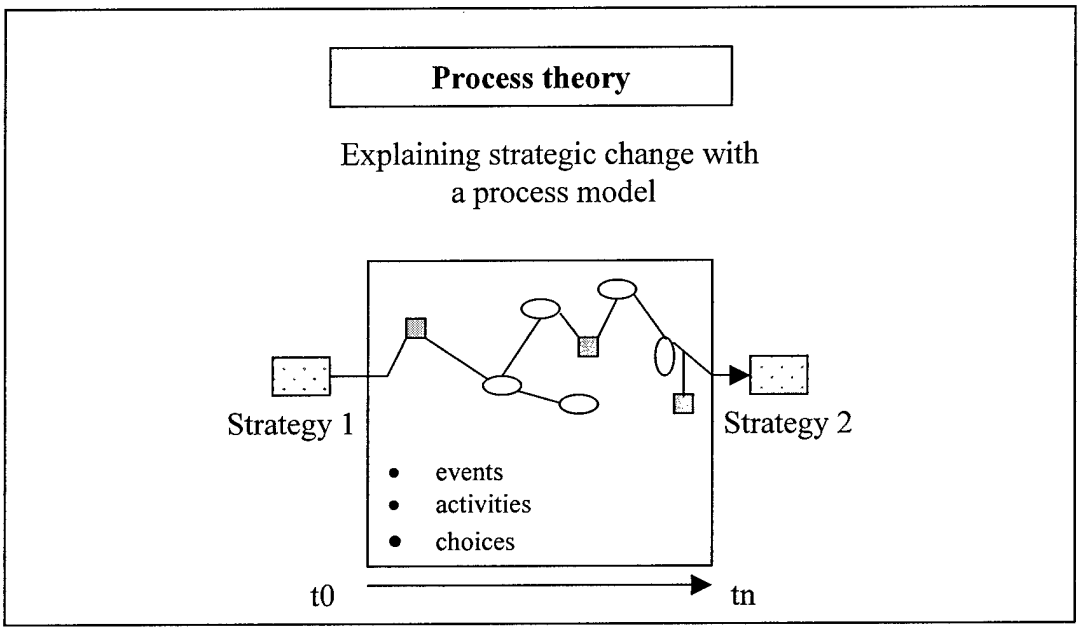

Figure 3. Process Theory/Visual Mapping (Taken from Langley, 1999: 693)

Data sources for this research included qualitative sources such as interviews, historical documentation such as minutes to meetings, and quantitative sources such as Reduction in Total Ownership Cost (R-TOC) briefings. Through a process referred to as triangulation, convergent data from multiple sources strengthens internal validity while divergent findings yield the opposite result. "That is, the triangulation made possible by multiple data collection methods provides stronger substantiation of constructs and hypotheses" (Eisenhardt, 1989: 538).

Questionnaire Development

The interview questions were developed to obtain the respondents' organizational positions and responsibilities, how long they have held their positions, and whether they worked in similar sustainment organizations prior to working in Detachment 11. The latter characteristic was used in an attempt to determine whether the formation of the Detachment changed the nature of daily work and thereby increased, decreased, or had no effect on integration. This differs from the remaining interview questions that were formulated to assess the current state of integration within the Detachment. Many of the questions were similar in an attempt to assess reliability. For instance if a respondent answered in the affirmative that resources are in fact shared across programs, one would also expect an affirmative response to the question of whether personnel communicate across program lines. Failure to answer consistently would result in asking the respondent to provide insight to clarify apparent ambiguities.

Because the respondents are best situated to provide meaningful insight into the daily functioning of the Detachment, open-ended questions were asked to capture this knowledge. Respondents received instructions asking for other sources of data that would tend to substantiate their positions:

> Since these interviews do constitute the bulk of the data collected, the more precise you can be in your answers, the more beneficial your interview will be. For instance, an answer such as DOD Instruction 5000.1 does not permit that action to be taken would be preferable to the generic answer regulations do not permit that action" (Appendix B).

Yin supports this practice. "Most commonly, case study interviews are of an *open-ended nature*, in which you can ask key respondents for the facts of a matter as well as for the

respondents' opinions about events...Such persons not only provide the case study investigator with insights into a matter but can also suggest sources of corroboratory evidence—and initiate the access to such sources" (Yin, 1994: 84).

Interview Procedures

Interviews were conducted on location at Detachment 11 for resource practicality and to reduce potential respondent anxiety. The interview questions were given to the respondents in advance so they could make notes thereby reducing the stress associated with recall. The interviewer wore normal office attire and started the interviews with brief, informal introductions to further place the respondents at ease. Upon completion of the introduction and subsequent to the reading of the instructions, the substantive questions were asked. The instructions contained statements asking the respondents to provide answers based on their experiences (as opposed to what they thought the interviewer would like to hear).

Research Plan

In generating an assessment of the state of integration within the Detachment, an iterative but systematic process was followed. The essential steps included: (1) defining the basic question, (2) selecting cases, (3) establishing data collection methods, (4) begin analysis while continuing to collect data, (5) formulating a hypothesis from the analysis, (6) continuously comparing the hypothesis with that of existing literature, and (7) concluding when additional data provides only marginal improvements in theory

(Eisenhardt, 1989: 533). The resulting analysis was continuously compared to the existing organizational theory literature to determine emergent concepts.

Data Collection

Three principles were followed during data collection: "(1) use multiple sources of data, (2) create a case study data base, [and] (3) maintain a chain of evidence" (Yin, 1994: 90-100). The use of multiple sources tends to increase internal and construct validity by providing multiple measures of the same construct. A further attempt to accomplish this was to have another researcher draw conclusions from the data. Although another interviewer was not present, the recording of the interviews allowed others to draw conclusions independent of the researcher.

The tape recordings and transcripts served as the case study database. "For case studies, notes are likely to be the most common component of a database...The notes may be handwritten, typed, or audio tapes" (Yin, 1994: 95). This concept is somewhat interrelated with the third principle. No information collected through the interviews was discarded. Although the data collected was used in analyzing the problem and drawing conclusions, the evidence presented in the case study write-up normally only represents a portion of that collected. Thus, the data itself was maintained independent of the case study write-up.

Strategies for Analyzing Research Data

The data collected in this study lend themselves to three strategies outlined by Ann Langley in her 1999 article published in the *Academy of Management Review* entitled "Strategies for Theorizing from Process Data." These include the narrative, visual mapping, and synthetic strategies.

The narrative strategy involves piecing together a story, or narrative, from the research data. This narrative seeks a rationale explanation of events consistent with relevant literature, or if different, attempts to determine why. "The aim is to achieve understanding of organizational phenomena—not through formal propositions but by 'providing experience' of a real setting in all its richness and complexity (Lincoln & Guba, 1985: 359)" (Langley, 1999: 695). This shows the importance of the relevant literature in benchmarking and providing vicarious experience. However, the use of the narrative strategy in a vacuum threatens to provide only idiosyncratic explanations of events. Consequently, the visual mapping and synthetic strategies complement the narrative strategy and thereby strengthen the internal validity of any potential findings.

The visual mapping strategy essentially has the objective of analyzing process data to "allow the simultaneous representation of a large number of dimensions so they can easily be used to show precedence, parallel processes, and the passage of time" (Langley, 1999: 700). This approach reduces relevant data into a graphical representation that might show such factors as temporal precedence, causation, and strength of correlation.

The final strategy involves analyzing the data in the aggregate. This analysis seeks to identify events demonstrating similarities in outcomes and relevant variables. This consistency is then utilized in synthesizing a theory consistent with the data. "When this strategy is used, the original process data are transformed from stories composed of 'events' to 'variables' that synthesize their critical components" (Langley, 1999: 704).

Advantages/Limitations of Research Design

Personal interviews allow the interviewer to observe non-verbal behavior. Respondent anxiety might suggest the respondent felt pressure to answer according to his or her speculation as to what the researcher expected. The respondent might also feel pressure to provide a favorable opinion of his or her organization. Personal interviews allow the interviewer to gauge these and other factors better than telephone interviews. The instructions, however, brought such potential biases to the respondents' attention so they could make a concerted effort to avoid them. The case study design also permits the researcher to focus directly on the research topic while providing inferences to causal relationships (Yin, 1994: 80). The use of the triangulation approach tends to strengthen construct and internal validity while adherence to the three data collection principles strengthens reliability.

Despite the best intentions of the researcher, it may still be difficult to discern the intent of the respondents' responses. In addition, the respondent might have had difficulty recalling facts and situations from memory during the interview despite best

efforts to alleviate this concern by providing the questions in advance. Finally, the focus on only Detachment 11 organizations limits external validity.

IV. Data Analysis and Findings

Overview

This chapter begins with an overview of the job descriptions and experience levels of the personnel interviewed. Then, the responses of those interviewed are grouped and presented according to the concepts discussed in the literature review. Although most individuals consented to having their interviews taped, the transcripts that were subsequently prepared are not included in their original form for a variety of reasons. First, the level of detail included in the responses would allow those within the organization to associate answers with respondents thereby violating the condition of anonymity. Second, the transcripts reflect the spoken word, which, at times, fails to flow in a cogent manner. Therefore, the portions of the transcripts reflected in this chapter have been edited to improve readability. Finally, as previously mentioned, the responses are presented according to common themes in an effort to identify both the consistencies and inconsistencies in individual perspectives. To the maximum extent practicable, the themes will parallel the ideas explored in the literature review. However, other issues important to establishing the organizational climate became apparent and are also presented.

Personnel and Experience

Those interviewed differed in their level of experience, functional specialty, and position in the organizational hierarchy. Everyone interviewed had at least two years experience working in the same or similar positions within the Detachment. In some cases, personnel had experience in such positions within Detachment 25, the predecessor of Detachment 11 and Detachment 5. Functional specialties included contracting specialists/officers, program managers, equipment specialists, technical order managers, financial analysts, and engineers. The following excerpts from the United States Office of Personnel Management *Handbook of Occupational Groups and Families* outlines the responsibilities of these positions.

GS-1102—Contracting Series.

> This series includes positions that manage, supervise, perform, or develop policies and procedures for professional work involving the procurement of supplies, services, construction, or research and development using formal advertising or negotiation procedures; the evaluation of contract price proposals; and the administration or termination and close out of contracts. The work requires knowledge of the legislation, regulations, and methods used in contracting; and knowledge of business and industry practices, sources of supply, cost factor, and requirements characteristics (Handbook of Occupational Groups and Families, 1999: 62).

GS-0340—Program Management Series.

> This series includes all classes of positions the duties of which are to manage or direct, or to assist in a line capacity in managing or directing, one or more programs, including appropriate supporting service organizations, when the paramount qualification requirement of the position is management and executive knowledge... (Handbook of Occupational Groups and Families, 1999: 27).

GS-1670—Equipment Specialist Series.

> This series includes positions the duties of which are to supervise or perform work involved in (1) collecting, analyzing, interpreting, and developing specialized information about equipment; (2) providing such information together with advisory service to those who design, test, produce, supply, operate, repair, or dispose of equipment; and/or (3) developing, installing, inspecting, or revising equipment maintenance programs and techniques based upon practical knowledge of the equipment, including its design, production, operational and maintenance requirements. Such duties require the application of an intensive, practical knowledge of the characteristics, properties, and uses of equipment of the type gained from technical training, education, and experience in such functions as repairing, overhauling, maintaining, constructing, or inspecting equipment (Handbook of Occupational Groups and Families, 1999: 75).

GS-1083—Technical Writing and Editing Series.

> This series includes positions that involve writing or editing technical materials, such as reports of research findings; scientific or technical articles, news releases, and periodicals; regulations in technical areas; technical manuals, specifications, brochures, and pamphlets; or speeches or scripts on scientific or technical subjects. Technical writers and technical editors draw on substantial knowledge of a particular subject-matter area, such as the natural or social sciences, engineering, law, or other fields. The work involves the development of information and analysis to select and present information on the specialized subject in a form and at a level suitable for the intended audience (Handbook of Occupational Groups and Families, 1999: 61).

GS-0505—Financial Management Series.

> This series includes all classes of positions the duties of which are to manage or direct a program for the management of financial resources of an organizational segment, field establishment, bureau, department, independent agency, or other organizational entity of the Federal Government when the duties and responsibilities include: (1) developing, coordinating, and maintaining an integrated system of financial staff services including at least accounting, budget, and management-financial reporting, and sometimes also one or more of such related staff services as auditing, credit analysis, management analysis, etc...(Handbook of Occupational Groups and Families, 1999: 36).

GS-0800—Engineering and Architect Group

> This group includes all classes of positions the duties of which are to advise on, administer, supervise, or perform professional, scientific, or technical work concerned with engineering or architectural projects, facilities, structures, systems, processes, equipment, devices, material or methods. Positions in this group require knowledge of the science or art, or both, by which materials, natural resources, and power are made useful (Handbook of Occupational Groups and Families, 1999: 49).

The number of individuals interviewed and the positions in which they served included: Commander (1), Deputy Commander (1), Chief Engineer (1), System Sustainment Manager (4), Deputy Sustainment Manager (2), Contracting Officer (1), Chief of Financial Management (1), Program Manager (2), Equipment Specialist (2), Technical Order Manager (1), Core Detachment Action Group (DAG) Member (1), and Customer (1). The number individuals interviewed according to programs included: AFSCN (3), DMSP (4), GPS (2), SBIRS (1), MILSTAR (1). The remaining 7 individuals were in positions outside the programs.

Dimensions of Differentiation

Goal Differentiation. The following responses to interview questions applied to the dimension of goal differentiation. Goal differentiation refers to the level of difference in objectives being pursued by organizational units. The more goal differentiated the units, the more divergent their objectives.

Response:

> I would say we have zero cross-flow in program sustainment specific requirements. We are stovepiped. We work for a particular program. We support the current ground systems in support of that program. We could care

less what the other programs are doing. We have a specific responsibility and that is to maintain the equipment we have fielded.

Response:

> The greatest interest is being effective at supporting your own program and not at the expense of supporting across programs. I do not think anyone would agree, especially any SPD, with sacrificing support to his program to be effective providing support across programs. In other words, he would view that as his program suffering because of it. So I think the greater interest, and the primary interest, is support to a particular program. Efforts to work across programs therefore are secondary to the greater interest, the individual program.

Response:

> We (the Detachment Action Group) try to look at things that are bigger than any one particular weapon system program. We are addressing sustainment issues that Air Force Space Command, 14th Air Force, and the wings are concerned with. And so in that vein, something we are working might not necessarily be all that important to the individual programs. They might think their program is running fine. For instance, GPS may have their issues and problems they are trying to tackle, but it may not have much of anything to do with what we are doing. We might be doing something that is really an issue spread across all the weapon system programs. But the individual in GPS, however, is only concerned with getting his contract awarded so that he can get his contractor on board finally and have sustained support to start meeting the requirements of the user.

These comments exemplify the views expressed by those interviewed with respect to the idea that the individual programs work independently. The individual programs, not surprisingly, focus on their programmatic goals. None of those interviewed suggested otherwise. The macrostructure created by the IWSM philosophy establishes lines of authority that make working across programs difficult. Fiscal law constraints only exacerbate the situation. However, everyone expressed a willingness to work across programs where it made sense. In an effort to stimulate a cross-flow of ideas, the Commander created the Detachment Action Group (DAG). This integration mechanism seeks to facilitate integration between the otherwise stovepiped programs. A more

complete discussion of how the DAG works is discussed later in the section covering integration mechanisms.

Temporal Differentiation. The following responses to interview questions applied to the dimension of temporal differentiation. Temporal differentiation refers to members' outlook towards a time horizon (short to long). The more temporally differentiated the units, the more their time horizons would differ.

Response:

> For instance, a recent staff summary sheet put together by the DAG (Detachment Action Group), seeks to establish a common process across all the programs for maintenance data collection. To institute that process, the staff summary is asking us to sign off on a letter to be sent to the SPO Director for funding. My problem is that I do not have enough money to meet my current needs. If the SPO Director signs off on this DAG initiative, guess where the money is going to come from? It's going to come from the funds I need to do the sustainment of my program. So, I'm cutting my own throat by signing off on this initiative. They are asking the program directors to put extra money in their budget, but it takes a few years to affect the POM. So in that interim, should the SPO Director sign off on it, the funds will have to come from my sustainment program. We are not currently fully funded. Yet, you are still going to take money away from me to do this effort? So this is the difficulty of standardizing across programs. I think it is a good idea. If there is anything I hate, it is different processes that accomplish the same task.

Response:

> These people in all these programs are too busy to be bothered with extra action items and extra projects that seek a more integrative approach. One such project right now is the collection of maintenance data. More specifically, the project focuses on maintenance data collection and analysis as well as how it is presented to give leadership a situational awareness picture of the health and status of the weapons system. If you go to the different programs, you will see it done differently, if it is done at all. These reports are submitted to AFMC and SAF/AQ to show them what we need money to fix. You will get a different picture from someone within this program as opposed to what the PEM in Air Force Space Command would tell you. The logistics guy in Air Force Space Command might tell you a different story as well. Anyway, that is why we are working a joint IPT with Air Force Space Command to get our arms around the data maintenance

collection process. Because if you were to ask one of the program managers to give up a body to accomplish this, he will not want to do that. He has other hot priorities he is trying to work. He may realize it is important, but it pales in comparison to the short-term needs of the program. Yet as a whole for all the programs, AFSPC, and AFMC, this project is important.

Once again, these comments were typical of those received. The individual programs find themselves in a resource-constrained environment that forces them to adopt a short-term perspective. Although the individual programs appear undifferentiated temporally, they are so differentiated from the Detachment Action Group. As the comments demonstrate, the programs find themselves dealing more with day-to-day crises. Although they acknowledge the importance and benefits associated with many of the DAG initiatives, given current resource constraints they are understandably unable to support many long-term initiatives to improve sustainment for fear of *cutting their own throat* in the short-term.

Interpersonal Differentiation. The following responses to interview questions applied to the dimension of interpersonal differentiation. Interpersonal differentiation refers to managers' orientation towards others within the organization (permissive to authoritarian). The higher the amount of interpersonal differentiation, the more different the managers' orientation towards others becomes.

Response:

> You have too many programs with their own thoughts, ideas, and attitudes. The SPO Director is telling me that this is the way things are going to be done and that is all there is to it. It does not matter what the other programs are doing.

Response:

> I think you have relationship issues. I think you have an apathetic attitude toward the processes of other programs. They all want to run their programs independently because they think their issues are unique. The belief is that they

all have different external and internal issues that other programs do not face. The fact that funds are provided by programs further complicates integration efforts.

Response:

The single manager is ultimately responsible for the cradle to grave management of a program. There is not anybody that is going to tell the single manager to use a particular process. Will he look at common processes? Sure. But if he can do it cheaper or he can do it as good with a current process, he may be reluctant to change.

Response:

All the different programs tend to be isolated within themselves in terms of support even at the same location. So I do not see any horizontal support going on between program offices.

The comments collected pertaining to interpersonal differentiation suggest that many of the system program directors and system sustainment mangers may differ in their personal styles and goals. This sometimes results in them wanting issues taken care of in their way instead of as a collective effort between programs. Some suggested that the maturity level of the program might influence this. The older, more established programs such as Air Force Satellite Control Network are viewed as having fewer constraints or demands than newer programs such as SBIRS. Because of less uncertainty and more stable funding, the mature programs are better situated to facilitate common processes. However because they often propose their own processes, the newer programs are not able to conform due to a more uncertain and constrained funding environment.

Structural Differentiation. The following responses to interview questions applied to the dimension of structural differentiation. Structural differentiation refers to which departments differ according to structure (low to high). As structural differentiation increases, structural differences increase.

Response:

> All the SSMs have really gone about things quite a bit differently. Some of the programs are organic while others use contractor logistics support. One of the programs, AFSCN, has a depot contractor while others like MILSTAR are still heavily tied to the Air Logistics Centers. My program is the only one that uses a central repair activity to support its fielded systems.

Response:

> The thing that is keeping them stovepiped right now is funding. The money is appropriated and tracked for a weapon system. When costs are tracked, they are tracked according to weapon systems. It would be a big convulsion of the system to change it. This is not to say it would not work. Like I said, you have classes of launch vehicles, payload busses, and payload packages. It might be possible to find a way to live within the existing structure but still take a commodities type approach to the weapon system.

Funding or fiscal law was the only structural constraint identified. This includes differences in the maintenance concepts of the various programs—contractor logistics support (CLS) and organic. Two of the system sustainment managers provided anecdotal evidence to illustrate their point. They insisted that what may appear to others as interpersonal differences between SSMs are actually structural barriers. They described a situation where they had co-located sites requiring similar maintenance on their ground systems. However because one relied on an organic capability and the other used contractor logistics support, they were unable to divert the revenue steam in such a manner as to allow the organic program to use CLS support with respect to the common maintenance item.

Integration Mechanisms and the Role of Integrators

The following responses to interview questions address the integration mechanisms within the Detachment and the perception of integrative efforts.

Response:

> There are no formal venues to aid in the interchange of ideas. We do go through the Detachment Action Group every once and a while. The DAG will ask us for an area we would like to see improvement in. The last issue they dealt with was metrics. They collect all the pertinent data to determine if metrics are being done differently across programs. They compile the data to determine who has the best method. But no forum exists for technical groups to exchange ideas.

Response:

> I have people who come to me informally asking me how we manage certain functions because they are experiencing problems in their programs. The problem is that any suggestion I offer must then be approved by their SSM.

Response:

> The DAG is structured so that we have representation from all five Detachment 11 programs as well as core members. The rotational members have all been rotated from a different program. So when they come to the DAG, they have insight into at least two of the programs. This has been a more effective way to get efforts implemented within the programs. If you are not invested in the different programs, then all you are is a staff organization to them. Thus, we create buy-in through the use of the rotational members from all five programs. In addition, the rotational members' time are divided between their respective program and DAG activities. Another way we make the DAG more effective is their placement in the organization. Our group works closely with the Detachment Commander so that we have his ear on a lot of issues. When he has something that he needs worked, he comes to us. At the same time, the rotational folks are situated with the sustainment managers in such a way that they should have a similar relationship. Some do. Some do not. It is personality dependent. But we try to make sure they all have responsible positions with the SSM. That way when you are working an issue, it becomes a top-down effort. So, we have found that since we live in a stovepiped environment where we have five weapon systems in Detachment 11, the DAG is the best way that we know so far to work amongst these programs. Otherwise, you do not have cross talk between the programs.

Response:

We have a group called the Space Systems Sustainment Working Group that meets twice a year for three weeks. The group consists of members from Detachment 11, Detachment 5, and Air Force Space Command. All the sustainers meet to work logistics and sustainment issues. Each meeting can generate as many as 20-25 action items.

Response:

The DAG is trying to look at common processes. We find ourselves having a problem adapting to common processes when the processes that we use on our program are dictated from our own SPO. So even if it's a common process, about the only thing we can do with the DAG is try to support them when they send a letter to the SPO Directors asking them to do something across programs.

Response:

My function within the SPO is matrixed. As the head of that function, I provide training for my specialty across the programs.

Response:

All the different programs tend to be isolated within themselves in terms of support even at the same location. So I do not see any horizontal support going on between program offices. I do know that the Detachment Commander is looking at every opportunity to take advantage of any synergism that would allow that to happen. But because he is not the SPD within these programs, it is something that would have to be coordinated through all of the system support managers to make something happen.

Response:

I think the SPDs look at the Detachment Commander in a support role. He aids he SPD in carrying out the responsibility for supporting a system through its life cycle.

Response:

The Detachment Commander that is here, from my look, is only providing housekeeping services. He provides no direction on how we do sustainment on our individual programs. He just provides infrastructure support such as computer systems, phones, lighting, and heating. He is more of a caretaker of the facilities.

Response:

> The Detachment Commander and his staff are a support group. The money they get is for infrastructure. They manage the payroll funds for the civilians. They manage the facility. They modify the facility. They run the network downstairs.

The comments identified three integration mechanisms: (1) the Detachment Action Group, (2) the Space Systems Sustainment Working Group, and (3) the Commander's weekly staff meetings. The Space Mission Integration Office (SMIO) was also identified by one individual but received nominal attention since they focus on how to satisfy new requirements within the space infrastructure as opposed to how to integrate the existing ground support systems.

The continuity of thought with respect to integration mechanisms, however, also extended to the perception to their role in the Detachment. Without exception, those interviewed recognized the difficulty of the mechanisms in overcoming the support role perception held by individuals within the programs. The view often expressed was that the Detachment Commander lacked legitimate authority for facilitating horizontal integration. Although program personnel grant deference to the role of the Detachment Commander due to his knowledge and position, he is largely seen as providing only administrative infrastructure support to the programs. This view also overshadows the Detachment Action Group and SMIO, creations of the Detachment Commander.

Geographical Issues

The following responses to interview questions address geographical issues. This includes the division between acquisition and sustainment as well as co-location with the customer.

Division Between Acquisition and Sustainment.

Response:

> From my perspective, there is a significant amount of truth to the perception that the remnants of the division between Air Force Systems Command and Air Force Logistics Command still exist. I think it is personality specific. I think you have some SPDs who have an understanding of sustainment, but I do not believe it is the norm. I think they have the mindset of just getting the system fielded and then looking toward Colorado Springs for support. I think that is the current state of affairs, and I do not think we should be satisfied with the current state of affairs. I have had a number of conversations about some ways of changing that. One thought that somebody came up with was having an SPD with an acquisition mindset and his deputy with a sustainment mindset. Or you could reverse it. You could have the SPD with a sustainment background with an acquisition deputy. Of course the thought is at the top levels having a combination of the two. I think this would go a long way in changing the mindset that exists now which is to concentrate on acquisition first and then on sustainment as an afterthought.

Response:

> The people I talk to suggest that segregation between acquisition and logistics is alive and well. The IWSM concept was a noble one. The seamless support for weapon systems made a lot of sense, and it continues to make a lot of sense for systems that are both in development and sustainment at the same time. However, you still have the us versus them mentality. I say this having served in both types of organizations. You definitely see some kind of division. It may be due to our physical separation from the SPO in Los Angeles. The geographical separation probably does not help matters.

Response:

> A big problem I see is that the SPOs are located in Los Angeles and sustainment is located in Colorado Springs. We do not have their ready ear since we are not geographically co-located with them. There is a Los Angeles versus Colorado Springs mentality. The practice of acquisition throwing a system over the fence

to sustainment that existed under Air Force Systems Command and Air Force Logistics Command still exists today under IWSM.

Response:

> If you have an SPD and his or her deputy both being acquisition minded and giving little appreciation to logistics and sustainment, then the rest of the organization will adopt that same mindset. But if you have a situation where you have the SPD being of one mindset, either acquisition or logistics and sustainment, or the deputy being such, then you do not have the right balance in order to focus on both sustainment and acquisition. Right now, I see too much focus on acquisition and not enough on sustainment. I think it is because you do not have the right mixture of leadership to emphasize both. I thought having a product center commander with sustainment and logistics experience would change things. I think he has probably set on a road to do that. But when people are not willing to change their mindset, it becomes a difficult task. I am hoping he will begin to challenge SPDs' thinking to ensure they have thought through sustainment issues. To an extent, I think I am beginning to see that.

The comments received suggest that the geographical separation between the product center and Detachment 11 is counter-productive to the IWSM concept. Although not reflected in the comments included, one Deputy SSM stated that he was satisfied with the relationship between the two offices. However, this appeared to be the exception rather than the rule. The general consensus was that the separation contributed to an out of sight—out of mind attitude.

Co-Location with Customer.

Response:

> It seems to me to make a lot of sense that the part of an organization responsible for the operational support of a system be co-located with the organization operating the system. Such an arrangement seems to provide for effective communication. It seems to provide for a greater appreciation of the sensitivities the operational command may have. I think that communication would be less effective without such an arrangement. There certainly could be exceptions. But it seems to me that co-location fosters the team concept.

Response:

> I think Air Force Space Command looks upon us favorably. With the last round of BRAC closures, there was an attempt to move us out of Colorado Springs to the product or air logistics center. However, that initiative failed due to the negative reaction from Air Force Space Command. They are very happy having us just down the road where they can find us.

Response:

> The co-location did not drive a better relationship at first. I think what has driven the better relationship has been the greater emphasis on sustainment due to the age of our space systems. This need creates a common enemy. The greater emphasis on sustainment has forced a closer relationship between the customer and the sustainment personnel. Co-location has facilitated the building of that relationship. The co-location with Detachment 11 allows us (the customer) to travel across the base and consult face to face with the sustainment personnel. For instance, we the customer have been bad about collecting data to provide back to the SPOs, and the SPOs have been bad about insisting on getting that information. The increased emphasis on sustainment is forcing this to change and co-location helps.

There was continuity of thought with respect to this issue. Everyone agreed that co-location with the customer enabled Detachment 11 and Space Command to work together more effectively. No dissenting opinions were expressed.

Process Mapping, Tacit Knowledge Capture, and Information Technology

The following response addresses the capture of tacit knowledge through the use of process mapping and information technology.

Response:

> When you look at implementing issues across the programs, one of the tools that has been useful is the idea of capturing processes. In a rigorous manner, we interview all of the players involved in the process and review all relevant material such as operating instructions. The first step is always to capture the existing process or processes so that you have a baseline from which to work. Then, we identify the weak areas of the process and try to improve them. The end

result is that instead of a package of written documents occupying a binder, you have some diagrams and flow charts that lay out what individuals should be doing. By placing it on the local area network, all the programs have insight into the processes and the ability to improve upon them. An example of a success story is the software version release process in the Missile Warning and Space Surveillance System Program. They started over a year ago on their software version release process. Almost immediately following the capture of their process, two of their senior engineers retired and left. Normally, all their knowledge would have gone out the door with them since most of it existed only in their head. Also, most of the people in the program had a different view of how the process worked. It was personality dependent. Now, they all have an agreed to process. So when the experts leave, they do not lose anything. They still have knowledge of the process. Another example is the efforts by the Space Environmental Sensing System and the Defense Meteorological Satellite Program to capture their configuration management process. They had some real success. Their ability to capture the process helped them iron out difficulties in the process with their SPO in Los Angeles. Had they not captured the process, it would have been a more difficult and painful process to hammer out differences in the two parties' positions. We even helped Air Force Space Command get their arms around their modification ranking process.

The issue of process mapping was not one addressed by most respondents. However, those who did discuss it considered it to be a beneficial initiative. The focus was not on standardization of processes but on the ability to capture organizational knowledge. Documentation of various processes allows the Detachment to capture tacit knowledge that otherwise would be lost due to personnel turnover. Another benefit of this has been the ability to improve upon existing processes. The Detachment uses their local area network to offer the programs a virtual library of processes. Rather than re-invent existing processes, the programs gain insight into what other programs are doing and use them as a starting point.

Analysis

The difficulties with integration experienced by Detachment 11 can be analyzed from both a micro and macrostructure perspective. Both approaches offer insight into the frustrations many Detachment 11 personnel experience in their attempts to horizontally integrate the five programs. The pragmatic literature review serves as the primary data source for analyzing the macrostructure. The literature explicitly defines the dominant structure and strategy from a macro-perspective. Interview responses were also included where relevant. However, most of the interview responses were used in the micro-analysis.

Macrostructure Analysis. The macrostructure analysis of the situation provides an overarching context for considering the problem. Figure 4 depicts the macrostructure framework.

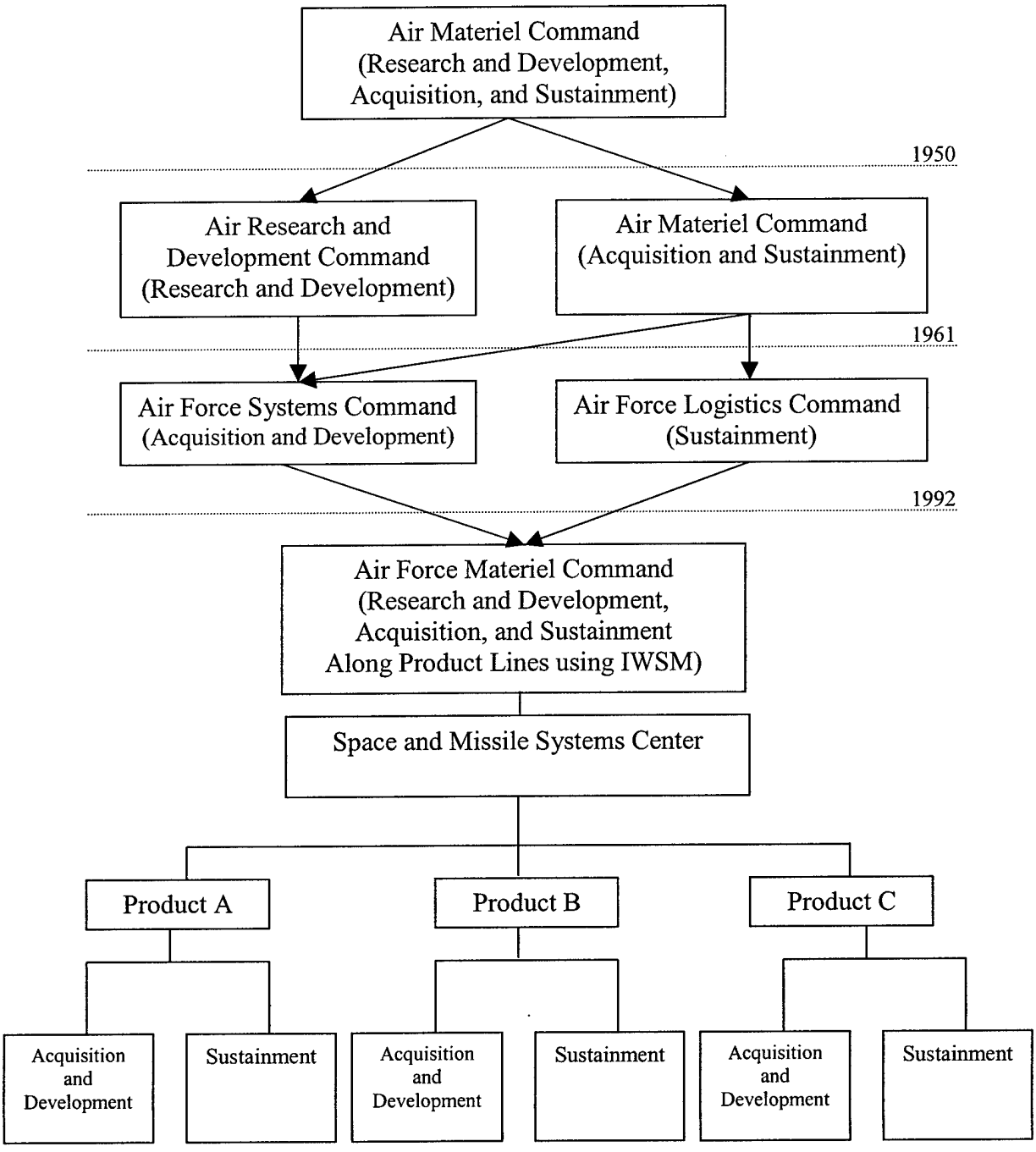

Figure 4. Vertical Integration Strategy—Transition From Function to Product

Figure 4 depicts the vertical integration strategy associated with the IWSM concept. As previously mentioned in Chapter 3, this strategy seeks to avoid, or at least reduce the likelihood, of accepting false acquisition savings only to encounter higher sustainment costs during fielding by consolidating authority for the weapon system life cycle, both acquisition and sustainment, in one individual, the SPD. This consolidation of authority resulted from the migration away from the horizontal integration concept toward a vertical integration strategy necessitating a shift in the macrostructure of the organizations responsible for the procurement and sustainment of weapon systems. The deactivation of the functionally oriented Air Force Logistics and Air Force Systems Commands and the activation of the product oriented Air Force Materiel Command represents the structural transformation designed to achieve this new system or product strategy. Figure 4 illustrates this change.

The data collected indicates that this shift may not be accomplishing its intended purpose. Most of those interviewed who addressed the issue suggested that the system approach still has not taken hold and that the remnants of AFSC and AFLC are *alive and well*. Two principal reasons were given to explain this *segregation between acquisition and logistics*. First, interviewees expressed their concern that, in general, the senior leadership lacks significant sustainment experience. The view is that more often than not, the SPDs possess predominantly acquisition backgrounds with insufficient experience or training in logistics and sustainment. Sustainment personnel say they find themselves attending acquisition professional development courses, yet acquisition personnel, in large part, do not attend logistics courses. The second reason cited for the *us versus them* mentality is the geographical separation between the SPOs and

Detachment 11. This factor was identified to be both an advantage and disadvantage. Some viewed the separation as a buffer that prevents acquisition concerns from overshadowing sustainment issues altogether. It also allows sustainment personnel to be closer to their customer thereby improving communication. The negative aspect is that the separation complicates communication with the SPO. Despite the overwhelming consistency of the views expressed here, it seems important to note that one individual (Deputy SSM) interviewed thought the system functioned as intended and found no shortcomings with the existing organizational arrangement.

The macrostructure establishes the larger environment in which the microstructure integration mechanisms must operate. The product oriented macrostructure environment is one characterized by differentiation. The dominant product strategy and structure, accompanied by the bureaucratic nature of the Air Force, tend to attract the organizations towards the polar management extremity of differentiation. This differentiation at the macro-level appears to stifle integration efforts at the micro-level.

Microstructure Analysis. The microstructure analysis, according to Boschken, provides the more meaningful level of analysis. Although the Detachment itself can be viewed as a macro-level integration mechanism, the microstructure analysis gives insight into how personnel actually accomplish their work on a daily basis.

The comments received suggest that the programs remain highly differentiated at the micro-level in three of the areas identified by Lawrence and Lorsch: goal orientation, interpersonal, and structural. Each of the programs tends to have a myopic view consisting of only their goals. The dominant macrostructure encourages this. The

programmatic alignment found in the macrostructure is mirrored in the microstructure perpetuating the situation. Program personnel's performance is measured in terms of their effectiveness at supporting the ground segment of their space system, not across space systems. Life cycle costs are tracked according to individual weapon systems. Historically, the systems evolved using different maintenance concepts. Fiscal law serves as another structural barrier. As a result, no incentive exists for individuals to incur an inconvenience or additional cost even if it resulted in a greater benefit or reduced cost to another program or programs. Furthermore, even though personnel indicated a willingness to undertake such initiatives, the structural constraints do not permit them to do so in many cases. Therefore, the product orientation in the microstructure tends to inhibit the cross-flow of ideas. The differentiation in goals, however, is not without merit. It fosters a high level of customer focus. The benefit of this focus does have a drawback though in cases where a single customer interacts with more than one product. As Galbraith identified, the product structure in these situations sometimes fails to present a single face to a customer who uses more than one product of an organization. The disparity of maintenance data collection procedures and reporting between the various programs illustrates this shortcoming.

Despite high levels of differentiation, the Detachment seems to be moving away from the polar extremity of differentiation by creating integration mechanisms. The most notable mechanism is the Detachment Action Group. A creation of the Detachment Commander, this mechanism arguably complies with most of the eight factors outlined by Galbraith for establishing a suitable power base: (1) structuring of the role, (2) staffing choice, (3) status of the role, (4) information systems, (5) planning process, (6) reward

systems, (7) budget authority, and (8) dual authority. Viewing the Detachment Commander as the "chief integrator" satisfies both the role-structuring factor and the status requirement. Since the Detachment Action Group reports directly to him, the mechanism garners organizational clout. The achievement of these two factors, however, resulted from the initiatives of the current Commander rather than through a formal designation from higher levels. This lack of formal authority contributes to the commonly expressed view that the Commander is responsible only for providing administrative support to the programs.

The process of staffing the Detachment Action Group resembles an interdepartmental exchange program. Figure 5 provides a pictorial depiction of how the DAG works.

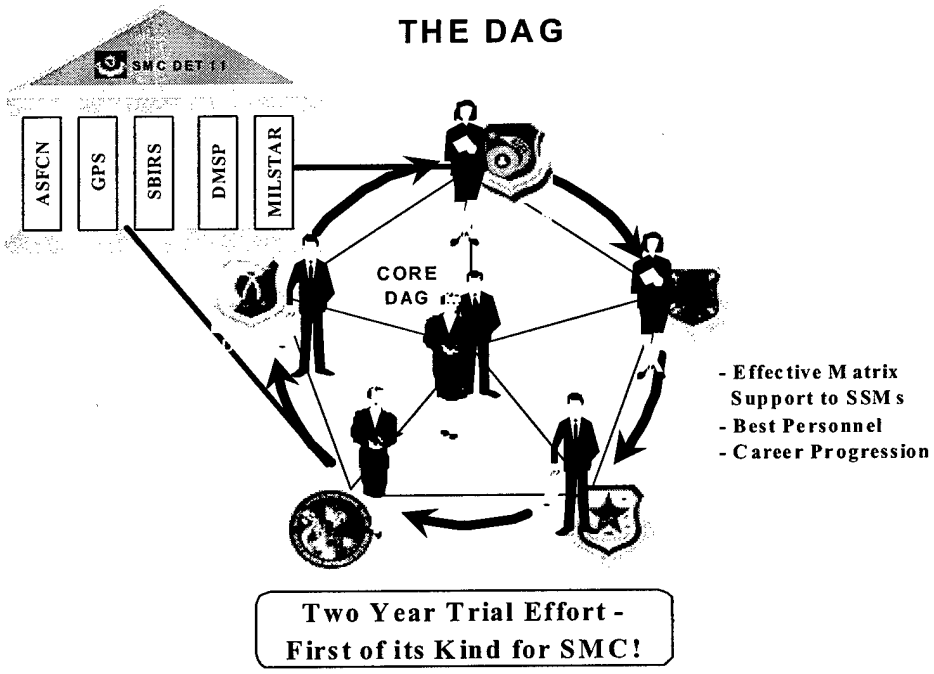

Figure 5. Detachment Action Group Rotational Program
(Adapted from October 2000 Briefing)

Those selected to work in the DAG on a rotational basis generally possess experience from at least two of the five programs. They divide their time between DAG activities and the current program they are assigned to. This division not only creates buy-in from the individual programs, but also allows the members to continue monitoring the pulse of their respective programs. The placement of the DAG rotational members in responsible positions with system sustainment managers further ensures integrators receive the appropriate support or *status*. Complementing this, DAG rotational members automatically receive a one-grade promotion while serving in their integrator roles. The DAG, however, is more than an interdepartmental exchange designed to familiarize personnel with other programs and de-differentiate their job skills. Although such programs are beneficial, pure interdepartmental programs are passive in nature. Instead, the DAG provides a forum for actively pursuing integration across the programs. Figure 6 shows the charter for the Detachment Action Group.

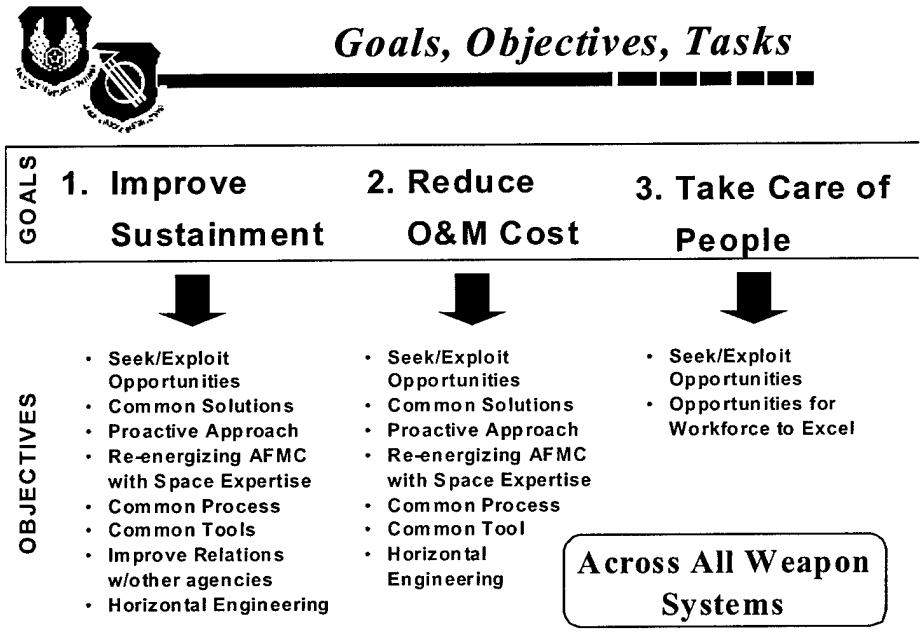

Figure 6. Goals, Objectives, and Tasks of the Detachment Action Group (Adapted from October 2000 Briefing)

As the figure indicates, most of the objectives contain the adjective *common* or *horizontal* further substantiating the role of the DAG as the principle integration mechanism.

The difficulties experienced by the Detachment Action Group can be attributed to a lack of two of Galbraith's factors: dual authority and budget. The absence of dual authority appears to be the least of the two shortcomings. The referent and expert authority of the current Commander and his staff, accompanied by strong collegial leadership within the Detachment, compensate for the perceived lack of legitimate authority. The more troubling of the two is that the principal integration mechanism lacks budget authority to provide the requisite investment dollars to accomplish its mission. Instead, the DAG tries to overcome this environmental constraint by obtaining funding from outside the Detachment through programs such as the Reduction in Total

Ownership Cost Program and the Computer Resources Support Improvement Program (CRSIP). Such sources, however, come with their own constraints. If an initiative falls outside the domain of the aforementioned programs, the DAG is not even able to *compete* for the investment dollars. This tends to confine DAG activities to cost reduction initiatives (the focus of most external funding sources) unless they are able to obtain funding from all the individual programs. Therefore, the DAG relies almost exclusively on the support of Detachment 11 programs to accomplish its first goal and accompanying objectives (reflected in Figure 6). Program personnel's preoccupation with day-to-day crises in many cases tends to create an insurmountable hurdle for the DAG.

Summary

In the early 1990's, Air Force Materiel Command was formed to manage Air Force weapon systems along product lines. The effects of such a strategy and organizational structure can be seen in the responses received. This strategy appears to promote goal, interpersonal, and structural differentiation between the programs of Detachment 11. To compensate for this polarization, integration mechanisms such as the Detachment Action Group, Space Systems Sustainment Working Group, and the Space Mission Integration Office were created to seek greater integration between programs. Currently, however, efforts to seek a more balanced approach between product and functional orientation appear to be stifled by the rigorous adherence to the dominant strategy and structure associated with the Integrated Weapon Systems Management philosophy.

Chapter V. Conclusions and Recommendations

Overview

This Chapter presents the answers to the research questions stated in Chapter 1 along with recommendations for improving the organizational climate and structure of Detachment 11. Then, the limitations of this research are presented along with potential topics for future research.

Research Question 1: Does the current organizational structure fit the Detachment's strategy of providing integrated system support management?

The current organizational structure, *absent* the macrostructure demands imposed upon the Detachment, does not represent the appropriate choice for a strategy of horizontal integration. The objectives of standardization, reduced redundancies, and increased communication represent the strengths of a functional organization, not a product organization. A pure product structure promotes differentiation and is ill suited for accomplishing the Detachment's strategy of providing integrated system support management. Although the Detachment created integration mechanisms in an attempt to move away from a pure product structure, the data indicates that the programs within Detachment 11 still remain stovepiped.

Research Question 2: If there is a mismatch, what causes the disparity between strategy and structure?

Detachment 11 is structured to achieve the macro-level strategy represented by the Integrated Weapon Systems Management philosophy. The IWSM strategy seeks to reduce costs and cycle time. The product structure represents the appropriate organization to accommodate these objectives. The strengths of this structure are that it is well suited for managing cost as a system, facilitating cycle time reduction, and providing greater focus or specialization (differentiation).

The disadvantages of the product structure, however, suggest that such an organization is not conducive to Detachment 11's micro-strategy of providing integrated system support management. A pure product structure creates redundancy due to poor communication between products. It also presents multiple faces to customers using more than one of Detachment 11's systems. The inconsistency in data management collection and reporting between the programs illustrates this shortcoming. These disadvantages, imposed upon the Detachment by its macro-environment lead to frustrations experienced by personnel. In short, the macro-strategy and micro-strategy are at different polar ends of the spectrum. The regulatory nature of the macro-strategy requires that such a conflict be resolved in its favor. Absent the Integrated Weapon System Management environment the Detachment operates in, the micro-strategy of the Detachment may be better suited for a functional structure. However, as Lawrence and Lorsch argue, the most successful organizations achieve high levels of both integration and differentiation.

Research Question 3: What formal or informal organizational mechanisms currently exist to facilitate integration between programs?

The Detachment uses several mechanisms to facilitate integration between programs. These mechanisms include the Detachment Action Group, the Space Mission Integration Office, the Space Systems Sustainment Working Group, and the Commander's weekly staff meetings. The intent of these mechanisms is to allow the Detachment to achieve a more balanced approach between integration and differentiation. Such an approach would allow the Detachment to satisfy the demands of the IWSM environment while at the same time rejecting the bipolar paradigm with which this issue is normally viewed. However, the data suggests, at least with respect to the Detachment Action Group, that such mechanisms currently lack the requisite authority and resources to effectively accomplish meaningful horizontal integration. The DAG relies almost exclusively on the programs for funding. This hampers its ability to facilitate integration since program personnel identify more with the macrostructure and strategy than the microstructure and strategy due to the regulatory nature of it. Even when they obtain outside funding, such initiatives tend to focus on cost reduction and not the larger goal of improved sustainment.

Research Question 4: What improvements can be made in the organization's integration mechanisms?

Recommendation 1. The Detachment has adapted to its environment in a manner consistent with the concepts of the relevant literature. The friction, however, appears to be the result of a failure to recognize and emphasize the importance of the Detachment's

integration mechanisms. Formal recognition from outside the Detachment may be needed to change perceptions regarding the legitimacy of such mechanisms. Perhaps the most significant step towards creating a more suitable power base would be the establishment of a budget for the Detachment Action Group to facilitate integration between programs. This could help solidify the role of the DAG within the programs.

Recommendation 2. Another potential improvement might be to transition more towards a matrix organization. "Many organizations have turned to a matrix design to address the limitations of mechanistic or bureaucratic structures. Recall that a matrix organization represents a balance between organizing resources by product or function" (Hellriegel, 1998: 603). To an extent, the Detachment has already done this in the area of financial management and contracting. The matrix organization recognizes the importance of the functional department in such matters as continuity, training, and resource allocation. The potential benefit is a better utilization of manpower by allowing the requirements to pull the necessary personnel into the programs. This also allows personnel to broaden their professional knowledge. The shortcoming, however, would be the loss of focus on an individual program that may not be well received by the SPDs or customer.

Limitations of Research

The results of this thesis have significant limitations. The selection of the respondents was the result of a sample of convenience and the number of respondents was limited to 18 people due to resource constraints. These limitations introduce the

possibility that the views expressed by the respondents may not be representative of the relevant population, in this case Detachment 11 personnel. It also made it difficult to analyze the data to assess inter- and intra-case reliability according to programs. As a result, the data was only considered in the aggregate. However, the consistency in answers in the aggregate suggests the same result would be achieved. The external validity and generalizability are also limited by the sampling technique. Another related limitation was the inability to include the views of the SPOs located in Los Angeles.

Future Research Topics

The following topics arose during the course of this thesis providing opportunities for future research.

Topic 1. Perform a quantitative analysis of relevant cost and schedule data of acquisition programs prior and subsequent to the implementation of IWSM to determine if the vertical integration strategy actually reduced incidents of negative cost and schedule variance.

Topic 2. Examine SPD career paths to determine their level of education and training in acquisition and sustainment. Does a balance exist?

Topic 3. Conduct a survey to determine whether the formation of AFMC represents a seamless union of AFSC and AFLC.

Appendix A: Acronyms

AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFMCP	Air Force Materiel Command Pamphlet
AFLC	Air Force Logistics Command
AFPD	Air Force Policy Directive
AFSC	Air Force Systems Command
AFSPC	Air Force Space Command
BRAC	Base Realignment and Closure
CLS	Contractor Logistics Support
CRSIP	Computer Resources Support Improvement Program
DAG	Detachment Action Group
DMR	Defense Management Review
DMSP	Defense Meteorological Support Program
ESC	Electronic Systems Command
GPS	Global Position System
IPPD	Integrated Product and Process Development
IPT	Integrated Product Team
IWSM	Integrated Weapon System Management
MDA	Milestone Decision Authority
O&M	Operations and Maintenance
PEM	Program Element Monitor
PEO	Program Executive Officers
R-TOC	Reduction in Total Ownership Cost
SAF/AQ	Office of the Assistant Secretary of the Air Force for Acquisition
SBIRS	Space Based Infrared System
SLCS	Satellite Launch Control System
SMC	Space and Missile Center
SMIO	Space Mission Integration Office
SPD	System Program Director
SPO	System Program Office
SSM	System Support (Sustainment) Manager
SSSWG	Space Systems Sustainment Working Group

Appendix B: Interview Guide

Instructions: Thank you for participating in this study. With your permission, I would like to tape the interview so that an accurate transcript can be made at a later date. If you should consent and later become uncomfortable with the interview being taped, please bring it to my attention and the taping will be stopped. Please understand that all answers given will not be attributed to any individual but may be associated with a collection of individuals, (i.e. System Sustainment Mangers, Item Managers, Finance Officers, etc.). However, the names of those interviewed will remain confidential, and your name will not be released without your permission. Since these interviews do constitute the bulk of the data collected, the more precise you can be in your answers, the more beneficial your interview will be. For instance, an answer such as "DOD Instruction 5000.1 does not permit that action to be taken" would be preferable than the generic answer "regulations do not permit that action." Do you have any questions before we start?

1. Do you consent to have the interview taped?

2. What is your name and grade?

3. What program do you work in?

4. What is your duty title?

5. Please briefly describe the duties associated with this position.

6. How long have you worked in your current job?

7. Who oversees your daily activities?

8. Who sets the sustainment goals for your program?

9. What are the goals, in descending order of priority, for your program?

10. Who sets the sustainment strategy for your program?

11. To what extent do you (or others within your program) communicate with others within the Detachment but outside your program concerning work-related activities?

12. What types of issues are addressed through these communications?

13. What factors, if any, tend to impede such communications?

14. What factors, if any, tend to facilitate such communications?

15. What resources do you or others within your program have in common with other programs?

16. To what extent do programs within the Detachment share such resources?

17. What factors, if any, tend to impede the sharing of such resources (i.e. technology, political, legal, cultural, regulatory, etc.)

18. What factors, if any, tend to facilitate such exchanges?

19. Who do you turn to for help when you have a sustainment problem you cannot resolve?

20. How often are problems resolved across platforms?

21. Is it more important to do your job effectively within your program or across other programs?

22. Are you encouraged to work with other programs in an effort to save money for common tasks or items?

23. Would you be willing to take an action that saved all programs a significant amount of resources, if it inconvenienced your program?

24. How frequently do you solve sustainment issues across platforms?

25. Were you involved in sustainment efforts on the same or similar systems prior to the formation of Detachment 11?

26. If the answer to 25 is yes, then how has the creation of Detachment 11 changed the way you do your job?

26. Please provide your assessment of who plays a more influential role in the sustainment efforts of your program, the System Program Director or the Detachment Commander, along with the method by which they exert such influence (i.e. sets policy, provides resources, writes performance appraisals, etc.).

Bibliography

Acquisition of Defense Systems. Ed. J.S. Przemieniecki. Washington D.C.: American Institute of Aeronautics and Astronautics, Incorporated, 1993.

Boschken, Herman L. "Strategy and Structure: Reconceiving the Relationship," Journal of Management, 16: 135-150 (1990).

Blue Ribbon Commission on Defense Management. Conduct and Accountability: A Report to the President. June 1986.

Blue Ribbon Commission on Defense Management. A Quest for Excellence: A Final Report to the President. June 1986.

Burns, Tom and G.M. Stalker. The Management of Innovation. London: Tivistock Publications, 1971.

Chakravarthy, Balaji S. "Adaptation: A Promising Metaphor for Strategic Management," Academy of Management Review, 7: 35-44 (1982).

Chandler, Alfred D. Jr. Strategy and Structure. Cambridge MA: MIT Press, 1962.

Department of the Air Force. Acquisition System. AFI 63-101. Washington: HQ USAF, 11 May 1994.

Department of the Air Force. Acquisition System. AFPD 63-1. Washington: HQ USAF, 31 August 1993.

Department of the Air Force. AFMC Pamphlet 800-60. Wright Patterson Air Force Base: Headquarters Air Force Materiel Command, 31 March 1993.

Department of the Air Force. Integrated Weapon System Management Program Planning and Assessment. AFI 63-107. Washington: HQ USAF, 5 August 1994.

Department of the Air Force. Manpower and Organization. AFI 38-101. Washington: HQ USAF, 1 July 1998.

Department of the Air Force. Manpower and Organization. AFPD 38-1. Washington: HQ USAF, 1 June 1996.

Department of Defense. Defense Acquisition. DOD Directive 5000.1. Washington: GPO, 15 March 1996.

Department of Defense. Introduction to Defense Acquisition Management. Fort Belvoir: Defense Systems Management College, June 1999.

Eisenhardt, Kathleen M. "Building Theories from Case Study Research." Academy of Management Review, 14: 532-550 (1989).

Fredrickson, James W. "The Strategic Decision Process and Organizational Structure," Academy of Management Review, 11: 280-297 (1986).

Galbraith, Jay R. Designing Organizations. San Francisco: Jossey-Bass Publishers, 1995.

Hellriegel, Don and John Slocum and Richard Woodman. Organizational Behavior (Eighth Edition). Cincinnati: South-Western College Publishing, 1998.

Jacobson, David Lee. Contemporary Organizational Integration in Schools and Firms. University of Chicago, Chicago IL, 1998 (AAG9829459).

Jauch, Lawrence R. and Richard N. Osborn. "Toward an Integrated Theory of Strategy," Academy of Management Review, 6: 491-498 (1981).

Jennings, Daniel F. and Samuel L. Seaman. "High and Low Levels of Organizational Adaptation: An Empirical Analysis of Strategy, Structure, and Performance," Strategic Management Journal, 15: 459-475 (1994).

Katz, Daniel and Robert L. Kahn. The Social Psychology of Organizations. New York: John Wiley & Sons, Incorporated, 1969.

Langley, Ann. "Strategies for Theorizing from Process Data." Academy of Management Review, 24: 691-710 (1999).

Lawrence, Paul R. and Jay W. Lorsch. Organization and Environment: Managing Differentiation and Integration. Boston: Harvard University, 1967.

Lorsch, Jay W. and Paul R. Lawrence. Studies in Organizational Design. Homewood: Richard D. Irwin, Incorporated, 1970.

McGiveney. "Detachment 11 Becomes Part of Team SMC." Astro News, 2 July 1998, 6-7.

Miller, Danny. "Configurations of Strategy and Structure: Towards a Synthesis," Strategic Management Journal, 7: 233-249 (1986).

Miller, Danny. "The Structural and Environmental Correlates of Business Strategy," Strategic Management Journal, 8: 55-76 (1987).

Mintzberg, Henry and Alexandra McHugh. "Strategy Formation in an Adhocracy," Administrative Science Quarterly, 30: 160-197 (1985).

Nelson, Richard R. "Why Do Firms Differ, and How Does it Matter," Strategic Management Journal, 12: 61-74 (1991).

Porter, Michael. Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York: Macmillan Publishing, 1980.

Ranson, Stewart, Bob Hinings, and Royston Greenwood. "The Structuring of Organizational Structures," Administrative Science Quarterly, 25: 1-17 (March 1980).

Robbins, Stephen P. Organizational Behavior: Concepts, Controversies, and Applications (Sixth Edition). Englewood Cliffs: Prentice Hall, 1993.

United States Office of Personnel Management. Handbook of Occupational Groups and Families. Washington: OPM, January 1999.

Yin, Robert K. Case Study Research: Design and Methods (Second Edition). Newbury Park: SAGE Publications, Incorporated, 1988.

Vita

Upon graduating from the United States Air Force Academy, Captain Tommy Gates received an assignment to the 45th Space Wing, Patrick Air Force Base (AFB), Florida. While assigned to Patrick AFB, he served as a construction contract administrator and services contracting officer. He subsequently worked at the Kennedy Space Center (KSC) on an initiative to consolidate common base support services between KSC and Cape Canaveral Air Station (CCAS). He entered AFIT, his second assignment, in August 1999.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 074-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
20-03-2001	Master's Thesis	Sep 1999 – Mar 2001

4. TITLE AND SUBTITLE

EVALUATION OF STRATEGY-STRUCTURE FIT OF SPACE AND MISSILE SYSTEMS CENTER DETACHMENT 11

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Gates, Tommy M., Captain, USAF

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)

Air Force Institute of Technology
Graduate School of Engineering and Management (AFIT/EN)
2950 P Street, Building 640
WPAFB OH 45433-7765

8. PERFORMING ORGANIZATION REPORT NUMBER

AFIT/GAQ/ENV/01M-06

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

SMC/Det 11
Attn: Major Quentin Dierks
1050 E. Stewart Ave
Peterson AFB, CO 80914 DSN: 834-2060

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Activated June 1,1998, Space and Missile Systems Center Detachment 11, located in Colorado Springs, integrates system support management for the Satellite Launch Control System (SLCS), MILSTAR, the Defense Meteorological Support Program (DMSP), the Space Based Infrared System (SBIRS), and the Global Positioning System (GPS). The Detachment performs operational software maintenance, satellite systems engineering, space testing and evaluation, and technology master planning. Contemporary management theory asserts that the appropriate match of strategy and structure determines an organization's level of performance. The Detachment is currently organized programmatically. The current programmatic organizational structure represents the physical manifestation of the Integrated Weapon System Management (IWSM) strategy and facilitates the vertical integration of all processes necessary to field, deploy, and maintain weapon/space systems. The rigid implementation of this strategy and the resulting structure impedes horizontal integration of similar processes and equipment across the various programs. However, the charter of the Detachment is to provide central integrated support for space systems capitalizing on opportunities for horizontal integration. This study finds that the macro-strategy of Air Force Materiel Command may create friction with the Detachment's micro-strategy of providing central integrated support for space systems.

15. SUBJECT TERMS

Integration, Differentiation, Strategy, Structure, Integrated Weapon System Management

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Michael L. Rehg, Maj, ENV
U	U	U	UU	81	19b. TELEPHONE NUMBER *(Include area code)* (937) 255-3636, ext 4711