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USSOCOM Special Operations Forces (SOF) Acquisition, Technology and Logistics (AT&L) struggles to keep pace with technology innovation cycle times, leaving operators at a strategic disadvantage. It seeks to understand how it can adapt and upgrade at the speed of the commercial market. To achieve the seamless development, acquisition, and fielding of new technologies and accelerate measure-countermeasure adaptation, USSOCOM must develop a unique organizational culture that possesses the attributes of responsiveness, innovation, and problem solving. This thesis presents an open system organizational model to illuminate essential organizational functions. Next, it analyzes five major structure elements to allow alignment of functions and skills. Then, it evaluates innovative organizations structures to inform an effective SOF AT&L structure designed to grow its unique and innovative culture. Finally, it describes cultural behaviors, values, norms, and beliefs in innovative companies to reveal the mindset necessary for SOF AT&L to innovate, acquire rapidly, and convert strategic disadvantage into strategic advantage.

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JOINT FORCES STAFF COLLEGE

JOINT ADVANCED WARFIGHTING SCHOOL

ORGANIZATION DESIGN FOR USSOCOM RAPID ACQUISITION

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes.

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Abstract

United States Strategic Command's (USSOCOM) Special Operations Forces (SOF) Acquisition, Technology, and Logistics (AT&L) organization, like many other DoD acquisition organizations, has seen an increase in acquisition cycle times and struggles to keep pace with technology innovation cycle times in the commercial sector. While industry reduces cycle times, defense acquisition lags behind with overregulated and bureaucratically structured organizations. SOF AT&L seeks to understand how it can adapt to take advantage of technology advances and upgrade its technologies at the speed of the commercial market. Despite SOF AT&L's innovative approaches, it still finds itself leaving SOF operators potentially at a strategic disadvantage.

To achieve the seamless development, acquisition, and fielding of new technologies, and meet the pace of measure-countermeasure adaptation, USSOCOM must develop a unique organizational culture that possesses the attributes of responsiveness, innovation, and problem solving necessary to convert strategic disadvantage into strategic advantage. This thesis presents an open system organizational model to illuminate essential functions the organization must perform. Next, it analyzes five major organizational structure elements to allow alignment of individual skills with functions. Then, it evaluates the structures of highly innovative organizations to inform an effective SOF AT&L top-level structure designed to grow a unique and innovative culture. Finally, it describes the cultural behaviors, values, norms, and beliefs of innovative companies to reveal the mindset necessary for SOF AT&L to innovate, acquire rapidly, and convert strategic disadvantage into strategic advantage for SOF operators.

Dedication

For my son, Hayden, who waited every Friday

night for Dad to get home from Norfolk.

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Preface

After over 20 years managing programs in U.S. Department of Defense (DoD), operating under what some call the most complicated and overregulated acquisition process in the world, I have developed unique perspectives on managing rapid and conventional acquisition programs. Acquisition organizations across the Department of Defense have a variety of structures, depending upon what they acquire and what phase of acquisition they are in: development, production, fielding, or sustainment. There are organizations designed with flat, or horizontal, structures and short decision chains for rapid innovation and acquisition, as well as organizations with vertical and bureaucratic structures designed for large development and production programs. Some organizations procure a single product or system, while others like United Stated Special Operations Command's (USSOCOM) Special Operations Forces Acquisition Technology and Logistics (SOF AT&L) procure a wide variety of products and services for all domains of warfare.

The senior leadership of the defense acquisition community has frequently introduced innovative ideas from industry in an attempt to refine, reform, transform, or re-invent acquisition processes and policies to correct real and/or perceived failures in programs. Arguably, none of these initiatives has been widely successful in improving the timeliness or cost of DoD's procurements. Growth in regulation has, undoubtedly, countered any positive effect these initiatives might have created. At present, the DoD operates under a new initiative called Better Buying Power (BBP) 3.0, defined as "the implementation of best practices to strengthen the Defense Department's buying power, improve industry productivity, and provide an affordable, value-added military capability

to the Warfighter."[1] BBP 3.0 is quite different from previous initiatives because it does not push a new business trend, but rather, it appeals to the community of acquirers to increase business acumen and apply best practices. The concepts behind the BBP 3.0 initiative support a key theme in this thesis, that regulation may seem stifling to timeliness or cost, but regulatory limitations can be offset by a highly effective organizational culture.

The seemingly insurmountable statutory and regulatory requirements of the acquisition system, which includes countless thousands of pages of regulations piled on top of the 1,897 page Federal Acquisition Regulation (FAR) containing, as one writer has claimed, the "densest prose on the planet," has never been reduced in size since its inception.[2] The DoD recently started a project to use a supercomputer to decode the regulation in hopes that it would help programs navigate regulations more efficiently. While DoD struggles to implement regulation, Congress continues to audit programs, finding even more problems, which has typically resulted in further oversight and regulation to ensure wise expenditure of tax money. Military Departments are unable to overcome the growth in regulation and Congress views most attempts to do so as efforts to shuck off oversight and hide bad news.

As grim as this situation sounds for the future of acquisition, there is at least one bright spot, which is the development of alternative procurement mechanisms and codification of those mechanisms in regulation. The challenge today's acquisition

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[1] Department of Defense, Office of the Undersecretary for Acquisition Technology and Logistics, "Better Buying Power," http://bbp.dau.mil (accessed October 13, 2016).

[2] Christian Davenport, "Cutting Edge IBM's Watson Supercomputer May Have Met its Match: The Federal Procurement Mess," *Los Angeles Times*, March 26, 2016, http://www.latimes.com/business/la-fi-tn-cutting-edge-watson-20160324-story.html (accessed December 9, 2016).

program managers face is to navigate the complex regulatory environment effectively to acquire capabilities more rapidly. Congress and the DoD could certainly simplifying regulations, but, because that seems unlikely in the near term, rather than asking a supercomputer, building a highly innovative organization is a more promising way to navigate regulation, meet regulatory intent, and decrease the cycle time of acquisition programs.

> The course of innovation…is highly uncertain. Moreover, it will always be sloppy, disorganized, and unpredictable, and that is the important point. It's important because we must learn to design organizations that explicitly take into account the unavoidable sloppiness of the process and use it to their advantage rather than fight it.[1]

Chapter 1: Introduction

USSOCOM's mission is to, synchronize the planning of special operations and provide SOF to support persistent, networked and distributed GCC [Geographic Combatant Command] operations in order to protect and advance our Nation's interests.[2] USSOCOM consists of five warfighting components, which include the Army, Air Force, and Marine Corps Special Operations Commands, the Navy Special Warfare Command, and the Joint Special Operations Command. USSOCOM has responsibilities, from Title 10 U.S. Code, to develop special operations strategy, doctrine and tactics; prepare and submit budgets; train assigned forces; validate requirements; establish requirement priorities; ensure interoperability of equipment and forces; formulate and submit intelligence support requirements; ensure SOF combat readiness; monitor SOF preparedness to carry out assigned missions and finally to develop and acquire special operations-peculiar equipment, materiel, supplies and services.[3]

Congress granted USSOCOM additional responsibilities to develop its own budgets, and manage acquisition programs to develop and buy new equipment, supplies, or services for the command. USSOCOM has delegated much of its acquisition

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[1] Thomas J. Peters, "Creating Innovative Climates, A Skunkworks Tale," in *The Human Side of Managing Technological Innovation*, 2nd ed, ed. Ralph Katz (New York: Oxford University Press, 2004), 405-413.

[2] USSOCOM, "Mission/Vision/Priorities of U.S. Special Operations Command," http://www.socom.mil/Pages/Mission.aspx (accessed December 9, 2016).

[3] USSOCOM, "About USSOCOM: Title 10 Authorities and Responsibilities," http://www.socom.mil/Pages/AboutUSSOCOM.aspx, (accessed December 9, 2016).

responsibilities to its SOF Acquisition Technology and Logistics (AT&L) organization, chartered with the tasks to develop and buy special operations-peculiar equipment, supplies and services. SOF AT&L's mission is to "Provide rapid and focused acquisition, technology, and logistics to special operations forces."[4] Ariel Robinson, in *Something Special about Doing Business with SOCOM*, stated that "SOF AT&L over time has fine-tuned its acquisition 'best practices' and these are shaped by the unique missions of SOF units . . . compared to how the regular Army buys equipment, special operations forces could not be more different."[5] To elaborate on this difference, USSOCOM depends upon the DOD military services to provide the platforms, such as helicopters, aircraft, armored vehicles, and watercraft, while SOF AT&L acquires unique systems to modify those platforms for SOF missions. The organization is fully responsible for equipping USSOCOM operators, which means they must manage research and development, production, logistics, maintenance, and disposal for a myriad of items.

In fiscal year 2015, SOF AT&L "managed more than 500 programs and projects, oversaw $7.8 billion in funds, and awarded over $3.4 billion in contracts with over 11,500 contract actions."[6] The Government Accountability Office found that "about 88 percent of the [USSOCOM] programs are relatively small, have short acquisition cycles, and use modified commercial off-the-shelf and non-developmental items or modify existing service equipment and assets. SOCOM's acquisition plans—as reflected in its

[4] USSOCOM SOF AT&L briefing, James Guerts, http://www.dtic.mil/ndia/2015SOLIC/Geurts.pdf (accessed December 9, 2016).

[5] Ariel Robinson, "Something Special About Doing Business with SOCOM," *National Defense* 99, no. 738 (May 2015): 47.

[6] Special Operations International, "USSOCOM 2016 Program Management Updates," May 22, 2016, http://www.specops-dhp.com/defense-news/ussocom-2016-program-management-updates (accessed December 9, 2016).

current 5-year plan—continue to focus on relatively small-scale, short-cycle programs with modest development efforts."[7] The breadth of SOF AT&L's responsibility and the types of things it procures are unrivaled by any other defense acquisition organization. Although senior leaders in SOF AT&L appear to embrace change and work diligently to evolve the culture of the organization for success, the challenges it faces are significant and unique. USSOCOM already possesses several attributes of a rapid acquisition organization, but it still struggles with bureaucratic regulations and the widening gap of technology cycle times. With limited ability to influence regulations, it must double its efforts to instill a rapid acquisition mindset.

SOF AT&L, like many other DoD acquisition organizations, has seen an increase in acquisition cycle times and struggles to keep pace with technology innovation cycle times in the commercial sector. While industry reduces cycle times, defense often lags behind with an overregulated, division and bureaucracy-base acquisition organizational structure at the top. SOF AT&L seeks to understand how it can adapt to take advantage of technology advances and upgrade its technologies at the speed of the commercial market. Its goal is to adapt current skills sets, processes, and regulations effectively while working within Congressional constraints.[8]

USSOCOM, more so than most other acquisition organizations across the DoD, is innovative in its approaches, but it still finds itself unable to keep pace with technology advances, leaving its operators potentially at a strategic disadvantage. These

[7] United States Government Accountability Office, Defense Acquisitions: An Analysis of the Special Operations Command's Management of Weapon System Programs, June 28, 2007, GAO-07-620, 3.

[8] Joint Special Operations University, "Special Operations Research Topics 2016," (MacDill Air Force Base: JSOU Press, 2015), 11, https://jsou.socom.mil/JSOU%20Publications/2016_SpecialOperations ResearchTopics_final.pdf (accessed December 9, 2016).

disadvantages emerge when weapons or intelligence collection capabilities are outdated, or when acquisition timelines are too slow to react to an adversary's new capabilities.

For example, a measure-to-countermeasure cycle for electronic warfare typically occurred within years, whereas a measure-to-countermeasure cycle for improvised explosive devices in Iraq occurred within months. In Iraq, adversaries used low-cost commercial technologies to counter expensive U.S. military systems, with U.S. forces unable to field effective countermeasures before the adversary changed its tactics again. This resulted in significant strategic disadvantage. With a firm understanding of these types of problems across multiple warfighting domains, USSOCOM seeks to adapt to meet the requirements necessary for its varieties of unique mission sets.

To achieve the seamless development, acquisition, and fielding of new technologies, and meet the pace of measure-to-countermeasure adaptation, USSOCOM must develop and maintain a unique organizational culture that possesses the attributes of responsiveness, innovation, and problem solving necessary to convert strategic disadvantage into strategic advantage. From this thesis statement, the following chapters focus on organizational structure and culture to work more efficiently within the existing regulatory environment. There are two significant assumptions underpinning the thesis: first, the heavy burden of regulation and oversight are unlikely to change; and, second, organizational structure and culture can create an innovative organization, which can adapt the organization to reduce acquisition cycle times and broaden commercial partnerships. These changes to organization and culture can compensate for an inflexible regulatory environment that slows down the acquisition process.

This thesis identifies significant common characteristics of innovative

organizations from an organizational structure and culture perspective. Organizational structures were compared for several commercial companies (Microsoft, Google, and Apple) and one innovative DoD organization, the Air Force Rapid Capabilities Office (AFRCO), to find common elements that resulted in recommendations for changes in SOF AT&L's structure and culture. Published academic studies and available DOD literature validated the organizational culture theories used to recommend a culture designed to be innovative, adaptive, and use alternate contracting mechanisms to become more effective. This thesis primarily focuses on organizational design; however, to be thorough in addressing USSOCOM's research question, a discussion of alternative contracting mechanisms is included in Appendix 1.

The next chapter introduces the generic model of an open social system and presents a defense acquisition open system model to identify five key functions of an organization to operate effectively in the open system. Applying this model to SOF AT&L, chapter 3 analyzes top-level organizational structures. Chapter 4 discusses cultural characteristics of innovative companies, focused on key behaviors, values, norms, and skills essential to developing the SOF AT&L innovative culture. Finally, chapter 5 provides recommendations for SOF AT&L structural and cultural changes. The resultant organization will promote mastery of regulation and be innovative, adaptive, and flexible to decrease the cycle time for acquisitions.

This thesis applies proven organizational theories and practices from commercial industry to the problem of designing a defense acquisition organization for rapid innovation. It is unreasonable to think that the commercial environment translates directly to a defense acquisition organization. Fundamental differences exist. First,

commercial business is motivated most by profits, where DoD is motivated most by national security, and second, commercial businesses produce things while the DoD only manages things. These differences must be considered in implementing changes to the AOF AT&L organizational design.

Chapter 2: USSOCOM Acquisition as an Open System

A fundamental task of applying organizational theory and organizational design is to determine which type of system, open or closed, is needed to achieve efficient production of a product or service. A system, for the purpose of this thesis, is defined as "a set of interacting elements that acquires inputs from the environment, transforms them, and discharges outputs to the external environment."[1] A closed system does not depend on its environment, but an open system "must interact with the environment to survive; it both consumes resources and exports resources to the environment."[2] Defense acquisition organizations exhibit the characteristics of an open system far more than a closed system. As an open system, they acquire resources from budget and personnel authorizations made by Congress. They acquire products and services from private industry more often than from internal laboratories and organic production lines. Finally, they acquire products and services on behalf of operational units, but are not assigned organizationally to those same units, in most cases.

These factors suggest significant inputs and outputs to the system where the role of the defense acquisition organization is to transform products and services into warfighting capabilities. Additionally, adversaries will always evolve strategy, operations, and tactics, and will constantly present new challenges; this is especially true for USSOCOM. Statutes, regulations, politics, and budgets, which regularly draw in government staff organizations and oversight authorities, are constantly changing as well. Thus, this chapter introduces a generic model of an open system and then provides a

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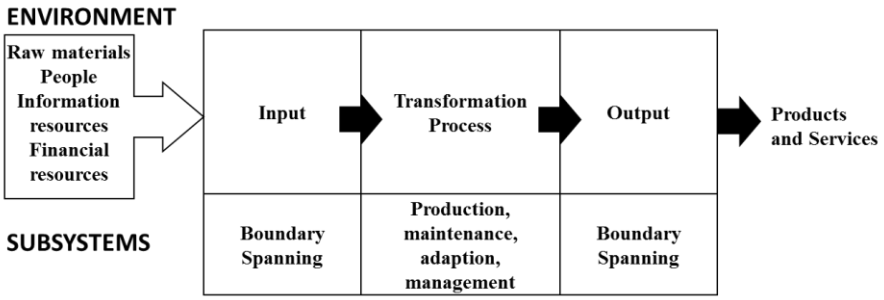
[1] Richard L. Daft, *Organization Theory and Design* (Mason, Ohio: Thomson/South-Western, 2004), 14.

[2] Ibid.

specific model describing a defense acquisition open system model, applicable to SOF AT&L. This model reveals a requirement for close interconnection between SOF AT&L and its oversight organizations, the defense industry, its supporting laboratories, and test organizations. The resultant close interconnection and organizational structure will help to achieve the goal of rapid adaptation for strategic success.

Richard Daft's generic open system model is shown in Figure 1. The model shows raw materials, people, information, and financial resources as primary inputs to a transformation process. The transformation process creates something of value, such as products or services, which can be exported as outputs to the environment, by employing processes such as production, maintenance, adaption, and management. Subsystems support each major element of the open system. The subsystems perform the functions required for organizational survival. Daft's model shows boundary subsystems under the inputs and outputs.[3] Boundary subsystems are responsible for exchanges with the external environment, in essence, transfers of materials, work, communications, products, or services to and from external organizations.

Figure 1. Generic Open System Model[4]



Each element of Daft's generic model can be applied to the broader

[3] Ibid.
[4] Ibid.

context of defense acquisition. Figure 2 depicts the specific application of the model to the defense acquisition open system. Oversight organizations strongly influence the environment of defense acquisition organizations. Congress provides budget authorizations, appropriations, and statutory law. Various DoD and Military Service headquarters provide governing regulations. Military Combatant Commands develop operational strategies. Politicians influence decisions concerning types and quantities of military equipment. Academic institutions and research organizations provide defense industrial knowledge. The inputs to the open system consist of the funding and assigned personnel consistent with Congressional authorizations, requirements and threat assessments flowing from military strategies, and research and industry capabilities flowing from industrial knowledge.

The defense acquisition transformation processes include the core functions of managing research and development, production, integration between systems and into the interoperable battlespace, test and evaluation, system fielding, and logistics and sustainment. The transformation functions may vary slightly depending upon the specific purpose of the organization. For instance, some organizations may only be chartered to perform research and development. Finally, the outputs of the defense acquisition organization include the fully tested and fieldable capabilities, logistics and sustainment data and services, and weapon use data.

Major subsystems under inputs, transformation, and outputs are also depicted in Figure 2. As discussed previously, boundary subsystems and hence boundary spanning refers to external exchanges. Boundary spanning in the input stage of the model include exchanges with oversight organizations regarding budget content and structure,

applicable acquisition regulations, requirements definition and approval processes, acquisition and contracting approval processes, and exchanges with industry, academia, and research institutions for acquisition knowledge and skills.

Subsystems under the transformation process include exchanges with organizations that are material contributors to the process for transforming the inputs into useable military products and services. These include: management practices, processes, governance, and oversight; alternative buying approaches; transitioning laboratory technologies; purchasing from traditional and non-traditional defense countries, working with internal and external test organizations, and working with operators.

Boundary spanning functions in the output phase of the model include working with operators and industry on requirements for logistics and sustainment, operations and maintenance, mission execution, reviewing lessons learned, and providing feedback to oversight organizations regarding system performance.

A unique aspect of defense acquisition is the influence of adversary actions in warfare, which influence the defense acquisition environment. Therefore, a feedback loop is included in the defense acquisition model. The feedback is normally accomplished through post-operational after action reports, which influence new threat assessments, political decisions, military strategies, authorized budgets and personnel, statutes, and regulations.

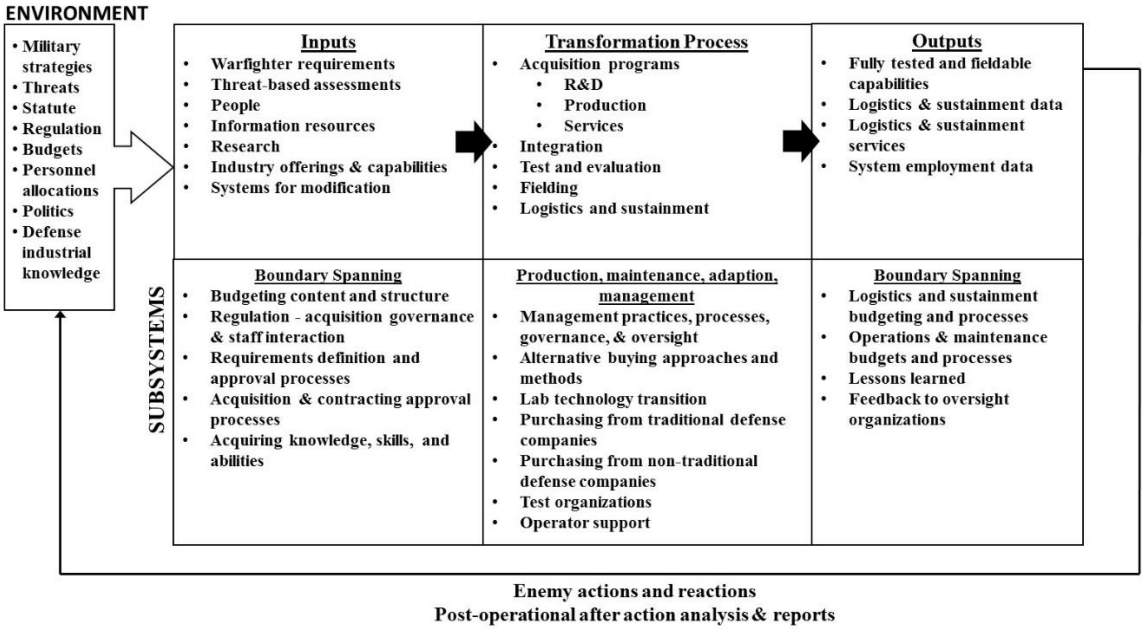


Figure 2. Defense Acquisition Open System Model

The model presented in Figure 2 depicts several unique elements to defense acquisition, which distinguish it from a commercial industry model. First, oversight organizations and adversaries primarily influence the environment of defense acquisition whereas market conditions and competition influence the environment of commercial industry. Second, the defense acquisition organization does not typically develop or produce anything – rather it manages projects. Because it acquires the predominance of its products and services from external industry sources, it rarely acquires raw materials as commercial industry would. It may acquire complete systems, or it may acquire subsystems and hire industry to integrate them. For example, SOF AT&L commonly integrates new SOF-unique capabilities onto existing platforms provided by the various Military Services. Third, defense acquisition organizations have access to a wide variety of research information from government, university, and public, and private laboratories.

This provides significant opportunities to utilize laboratory data and capabilities. Fourth, the defense acquisition enterprise maintains numerous test organizations and facilities with specialized skills and equipment to test military systems. The unique elements of the defense acquisition model reveal SOF AT&L's organizational dependencies, in its open system, and the requirement for close interconnection with oversight organizations, the defense industry, supporting laboratories, and test organizations in order to achieve the goal of rapid adaptation for strategic success.

A review of innovative companies, such as Google, Inc., Sony, Inc., Microsoft, Inc., and 3M shows that all of these companies restructured with a greater understanding of the open system environment in order to innovate and survive. Daft observed several factors which contributed to open system thinking by stating that, "the rapid changes over the past few decades, including globalization and increased competition, the explosion of the Internet and e-business, and the growing diversity of the population and work-force, have forced many managers to reorient toward an open-systems mindset." Similarly, SOF AT&L should consider how it is organized and structure itself with experienced personnel assigned to managing the external exchanges with the goal of closing the technology gap between defense acquisition and commercial industry.

There is evidence that SOF AT&L is employing open system thinking to accelerate development cycle times in experimental initiatives. For example, SOF AT&L hosts events bringing representatives together from various companies, universities, and laboratories to collaborate on problem solutions, producing studies, preliminary designs, and limited prototypes. Another similar initiative, called Hacking4Defense, employs university students to research problems and propose solutions, designs, or prototypes.

These two initiatives bring together industry, universities, laboratories, and operators across the open system by creating opportunity for "collisions." Collision are interactions between people enabled by regular interchange opportunities and/or collaborative working environments. They often seek to bridge organizational affiliations. To encourage open communication and protect intellectual property rights of the participants, SOF AT&L uses Cooperative Research and Development Agreements and Non-Disclosure Agreements. The concept of creating collision opportunities between people is not new. Google, for example, created open and collaborative spaces to encourage employees to collide with co-workers from various departments, professionally and socially. These collisions create innovation through communicating and sharing ideas.[5] SOF AT&L's initiatives tend to be limited to smaller projects with limited scope and complexity, and are not typically used for the complete development, production, and fielding of complex multi-million dollar systems. It does, however, benefit significantly by collaborative initiatives and facilitated collisions.

Despite the limited number and scope of collaborative initiatives at present, they model the kind of open system interconnection that is required more broadly to achieve the goal rapid adaptation for strategic success. These open system concepts are essential to adjusting the organizational structure for innovation success.

[5] Annika Steiber and Sverker Alänge, "A Corporate System for Continuous Innovation: The Case of Google, Inc.," *European Journal of Innovation Management* 16, no. 2 (2013): 251.

Chapter 3: Organizational Structure

In Chapter 2, the generic open system and defense acquisition open system models were introduced. This chapter discusses the structure of the organization to achieve innovation. First, it discusses the structure and five basic elements of the organization using the open system model. Second, it analyzes organizational structures of innovative companies to identify common characteristics that may be applied to SOF AT&L to achieve innovation.

Five Major Elements of the Organizational Structure

The first approach to innovation requires the leader to design the organization to perform the subsystem functions as described in the open system model. Henry Mintzberg offers that every organization has five common elements, which help to provide a top-level structure that aligns personnel with functions.[1] These common elements include the technical core, technical support, top management, middle management, and administrative support. The parts vary in size and importance depending upon the environment and purpose of the organization.

The technical core contains engineers and project managers who perform the transformation process. In commercial companies, these personnel are the designers and producers of the primary product lines. In defense acquisition, they are the engineers and managers who manage the industry contractors or laboratories who perform the research

[1] Henry Mintzberg, *The Structuring of Organizations* (Englewood Cliffs, NJ: Prentice Hall, 1979): 215–297; and Henry Mintzberg, "Organizational Design: Fashion or Fit?" *Harvard Business Review*, 59 (January – February 1981): 103-105.

and development, production, or services. The technical core may also have personnel who perform a range of system integration, test and evaluation, fielding, and logistics and sustainment functions.

The technical support element adapts the organization to the environment by managing the boundary spanning subsystems under inputs, transformation processes, and outputs. A technical support element is essential for innovation in the organization. Furthermore, it manages the feedback functions and external exchanges to achieve the interconnection of organizations. The technical support element consists of researchers who scan the environment and boundary subsystems for problems and opportunities. Daft suggests that this element also has an essential function to "create innovations in the technical core."[2] This implies that personnel in the technical core must have a broad knowledge base and ability to analyze and innovate internal processes and methods for communicating with external organizations. The diverse activities and processes within defense acquisition requires the technical support element to have a breadth of expertise in engineering, management, contracting, and financial management.

An example of a technical support element was the Xerox Corporation's Palo Alto Research Center (PARC). PARC was a division chartered with the role of innovating new products for XEROX to incorporate into its product lines.[3] However, compared to Mintzberg's characterization of the role of the technical support element in innovating boundary subsystems and transformation processes, PARC only performed technical aspects of a technical support role. In addition to technical innovation, the technical support element must be concerned with innovating business processes,

[2] Daft, *Organization Theory and Design*, 15.
[3] Ibid., 5.

regulations, and relationships.

In 2016, USSOCOM started to employ technical and business process innovation aspects of the technical support element across the organization. For example, in 2015, SOF AT&L started a new initiative called SOFWERX, which is a collaborative workspace located in Tampa, Florida designed to promote co-invention, rapid prototyping, technology awareness, workforce development, education, and industry engagement.[4] A primary objective of the SOFWERX according to the SOF AT&L lead, Mr. James Guerts, was to "figure out how to work together to increase SOCOM's competitive advantage in acquisition velocity."[5] The SOFWERX concept was further expanded to a project called DIRTYWERX, which provided a workshop for innovative people to come together to build hardware and software together for prototypes and demonstrations. Additionally, in 2016, SOF AT&L stood up a small organization called Crazy 8's, whose function is to develop and evolve business processes to make SOF AT&L more effective. Staffing for Crazy 8's comes from each of the major SOF AT&L divisions, assigned temporarily, while it reports its findings and initiatives directly to the SOF AT&L Director. These are excellent examples of how AT&L is employing aspects of Daft's and Mintzberg's concepts for technical support elements to engage the open system network with more companies contributing to SOF acquisition innovation.

Middle management is responsible for implementation and coordination at the department level and mediating between top management and the technical core. In

[4] James Guerts, "Evolving the Network to Counter Emerging Threats," briefing presented to the Special Operations Industry Conference, May 2016, (Approved for Public Release,) charts 24-27; and Howard Altman, "SOCOM Looks to Enhance with Industry, Academia," *Times Publishing, Incorporated*, May 18, 2016, http://www.tbo.com/list/military-news/altman/socom-looks-to-enhance-interactions-with-industry-academia-20150518/, (accessed January 2, 2017).

[5] Altman, "SOCOM Looks to Enhance with Industry, Academia."

defense acquisition organizations, middle management includes project managers and the managers of supporting functional elements such as engineering, finance, and contracting. Middle managers also support boundary spanning external exchanges at commensurate working levels.

Top management provides direction, strategy, vision, goals, and policies for the entire organization or major divisions. They manage boundary spanning external exchanges at the senior management levels. In defense acquisition organizations, top management interacts with Congressional and DoD headquarters oversight personnel, operational warfighting commands, laboratory directors, and industry leaders. Most importantly, top management drives the organizational culture discussed further in chapter 4.

The final element is administrative support. This element includes administrative assistants, as well as those who perform the operational support functions to keep SOF AT&L running smoothly. In defense acquisition organizations, this staff takes on a many military unique functions. Such functions include unit deployment managers, military personnel managers, and military training managers. These unique military functions often create a larger administrative staff than a traditional commercial company might have.

Daft notes that in real organizations, rather than in theoretical concepts of organizations, the five common elements are interrelated, and often serve more than one subsystem function.[6] In other words, personnel from the technical core may also work in technical support areas, or managers who direct a project may also have a role in

[6]Daft, *Organization Theory and Design*, 16.

technical support boundary spanning functions.

Top Level Organizational Structure Comparisons

The open system model and Mintzberg's five essential elements both resulted in a better understanding of functions to be performed. This section analyzes the organizational structures of several companies and one Air Force organization to allow effective structuring of the innovative organization to manage its inputs, transformation process, outputs, and boundary spanning subsystems to innovate more effectively and rapidly.[7] For this analysis, the Chief Executive Officer (CEO) and the Board of Directors together represent the first level of the organization. Those who work directly for the CEO are at the second level; they are typically Vice Presidents or Directors. Those who work for the Vice Presidents or Directors represent the third level.

The first example, Microsoft, has a structure that exhibits a hybrid product and functionally structured organization. The product portion of the organization combines products together at second level of the organization, under three major groups, Applications and Services, Windows and Device Group, and Cloud Enterprise. These products are grouped together because they must be tightly integrated to work well for the customer as a seamless set of capabilities. However, some products, such as Xbox, are at the third level either because they do not require the same level of attention to integration or because they are not as significant to overall company revenues and thus demand less senior oversight. The functional portion includes a Technology and

[7] Appendix 2 shows the top-level structures analyzed, including Microsoft, Google, Apple, Air Force Rapid Capabilities Office, and SOF AT&L. The analysis focuses on the strategic levels of the organizations, going down to the third level of the organizational chart, where the CEO and Board of Directors are the first level.

Research group, which represents the technical support element discussed previously; it reports directly to the CEO and has responsibility for boundary spanning functions to evolve products and services. Uniquely, the Chief Financial Officer holds both Chief Economist and Cloud Enterprise Marketing positions. These positions, at the third level, provide boundary spanning functions to link the company to the global economic and information storage markets. There is also a Strategy and Operations group, at the second level, suggesting a strong focus on a continuous effort to evolve the company strategy. Human Resources has a top management role reporting directly to the CEO. Human Resources is separated into human resources and talent acquisition as separate functions at the third level of the organization, indicating a higher middle management role and a higher level of company interest in recruiting and maintaining top talent.

The second example, Google, is also product and functionally organized. Most products are managed at the third level of the organizational structure, but select products such as the self-driving car project and YouTube are potentially more essential to future business enterprises, and so are managed at the second level for greater visibility. Google uses technical support elements: Creative Labs and Product Management provide cross-company technical and management boundary spanning functions to evolve company processes and management methods. Like Microsoft, Human Resources and Staffing are separate functions, but at Google, they both report directly to the CEO rather than through a Human Resources Director, thereby prioritizing staffing functions at the highest level within the company. Most notably, there is also a Chief Culture Officer under Human Resources, showing strong commitment to organizational enculturation and

employees satisfaction.[8]

The third example, Apple, also has a hybrid product and functional structure but core products such as iPhone, iMac, and iPad appear to be the resulting products of three functional divisions including Design, Software Engineering, and Hardware Engineering, rather than structured into separate major product divisions at the second level in the structure. Emerging technologies such as Special Projects Car Project and Artificial Intelligence (AI) Research report directly to the CEO. There are four divisions at the second level, Technology, Hardware Technology, AI Research, and User Interfaces, which make up the technical support elements performing technology boundary spanning functions across the company. Unlike Microsoft and Google, staffing is not separate from Human Resources, representing a more traditional view of staffing as a Human Resources function.

The Air Force Rapid Capabilities (AFRCO) office, an innovative Air Force organization, also has a hybrid product and functional structure. It has a Board of Directors (BOD) much like a commercial company, which consists of four members. However, one of the BOD major functions is to fill the roles of large numbers of traditional DoD oversight staffs, who tend to slow the decision making process. The AFRCO Director has a small staff, which does not have a role in approving information for the Director's review. There are four product-oriented divisions at the second level of the organization: Red Team, Blue Team, White Team, and Talon Group, which report directly to the AFRCO Director. Each of the product divisions contain multiple product teams. Additionally, the divisions have very small staffs who only perform technical

[8] Steiber and Alänge, "A Corporate System for Continuous Innovation," 247.

support functions rather than oversight functions. Managers of individual products work at the third level of the organization. Because the small staffs across the organization have no significant oversight role, managers have easy access to the Division Directors, AFRCO Director, and Board of Directors for rapid decisions. There are several technical support elements performing boundary-spanning functions. The Director and Technical Director use a small team of highly skilled advisors for boundary spanning across the AFRCO portfolio of programs. A Program Integrator manages external interchanges with industry and oversight offices. Additionally, a small team within the Talon Group, called Integrated Systems, performs technical support boundary spanning functions across programs within the Talon Group portfolio. Functional support such as Contracting, Finance, Legal, and Human Resources all have Directors who report to the AFRCO Director, but provide their personnel to the programs on a matrix basis. Overall, the AFRCO most resembles Google's structure and has the advantage of a very short decision chain as compared to more traditional acquisition organizations.

There are several common elements among all of these innovative organizations. They all use hybrid product and functional structures. Furthermore, they all attempt to maintain a short decision chain between major products and the CEO by placing the top-level product managers at the second or third level of the structure; these short decision chains are also referred to as "flat" or "horizontal" organizations. They all use technical support elements that report directly to the CEO and provide support to each product group or division in the organization with the objective of rapidly evolving and integrating technologies. Finally, they all have Human Resources reporting directly to the CEO to ensure the highest level of attention is given to recruiting and retention of top

talent.

The SOF AT&L organizational chart shown in Appendix 2, Figure 5, was derived from published briefing materials and discussions with SOF AT&L members. The chart shows that the organization is a hybrid product and functional structure. Program Executive Officers, who function like corporate division or group directors, manage portfolios of programs grouped together based on common functions or warfighting domains. Functional divisions provide matrixed support to the PEOs as needed. A Science and Technology division supports technical support boundary spanning functions while the Crazy 8's support management boundary spanning to improve management practice. Both report directly to the SOF AT&L Director.

Innovative companies have increasingly moved toward horizontal and hybrid organizational structures to increase development cycle times. Furthermore, defense acquisition has most commonly used variations of horizontal and hybrid structures for its more successful rapid development projects. Chapter 5 will provide recommended changes to the SOF AT&L top-level organization structure to enable it to take advantage of organizational structure elements used by highly innovative companies to reduce development cycle times.

Chapter 4: Innovation Culture

After understanding the open system model and common structural characteristics of innovative companies, organizational culture is the third essential component for developing an innovative organization. Better than most acquisition organizations, USSOCOM has recognized the value of instilling a unique culture but it can refine and formalize its efforts to achieve greater success. A unique culture and a formal process for initial and recurring enculturation programs are essential for SOF AT&L to achieve success focused on a critical set of organizational culture elements including behaviors, values, norms, and individual skills.

Organizational Culture Element 1: Behaviors

Behaviors are diverse and fall into categories of individual and group, or organizational, behaviors. This section deals with three behaviors, which influence organizational success: 1) innovation oriented culture; 2) mindset for rapid acquisition, and; 3) mindset for learning.

Innovation Oriented Culture

An innovative culture masters regulation, acquires technology faster, and introduces advanced technology integration. Integral to the development of the innovative culture are shared beliefs, the role of leadership, hiring practices, and the role and process of human resources.[1] It is important that new hires fit the organization culturally. They must integrate into the organization's networks quickly and fully subscribe to the organization's vision, mission, and initiatives. Shared beliefs bind the

[1] Ibid., 247-248.

members of an organization around a common purpose. USSOCOM's shared beliefs originate from the organization's vision, mission, and themes articulated by top leaders. Leaders continuously articulate how projects contribute to the vision and mission to boost morale and unify the workforce in purpose. Additionally, top leaders encourage division leaders to develop division-specific beliefs that are rooted in the company's beliefs. This creates a sense of uniqueness and competitive spirit within the divisions but also a sense of unity with the company. Leaders act as cultural ambassadors and connectors, who share information between parts of the organization and facilitate communications and innovation processes.[2] Leaders establish hiring and human resource policies and programs to shift the makeup of the organization to become more innovation oriented. Hiring must be selective using resumes and interviews to identify members who have an aptitude and experience managing rapid development and production projects, and have experience working in small teams under short deadlines.

Mindset for Rapid Acquisition

Several organizational attributes and beliefs are essential for innovative rapid acquisition organization. The organization must have a horizontal organizational structure, it must selectively hire, it must prioritize technical and schedule over cost, and it must field mature technologies in evolutionary phases.

Rapid acquisition organizations generally have a horizontal structure with a short decision chain. The Commander, USSOCOM is the decision authority for most requirements. SOF AT&L and Program Executive Officers (PEOs) approve a majority

[2] Ibid., 249.

of the programs.[3]

In rapid innovation, it is important for Program Executive Officers to ensure that technical and schedule performance is prioritized over cost performance. Cost growth nearly always results from poor technical and schedule performance. If a project is technically harder than initially believed, it will take longer to develop, costing more money. If a project requires longer to complete additional labor will drive cost growth. If project managers start with a realistic technical, cost, and schedule baseline, and remain focused on technical and schedule issues, cost will remain on target. As remedial as this may sound, programs often fail to recognize risks early and fail to employ technical expertise to resolve problems quickly to avert schedule slips and cost growth.

Complex technical problems often stem from over-complexity created by advanced technologies not mature enough for integration into near-term systems. Good analysis of technical maturity allows a program to field incremental technology evolutions in phases. This technique allows rapid fielding and earlier proof-of-concept with fewer program delays, cost overruns, and re-planning efforts caused by technical immaturity. A steady stream of successful capability fielding also creates interest and advocacy within the DoD and Congressional oversight organizations.

Mindset for Learning

Edward Hess authored a prescriptive book detailing how to build a high performing learning organization stating that, "you need to select and then cultivate people who like or even love to learn. Constant improvement is table stakes in today's

[3] USSOCOM is required to comply with acquisition statutes, but with most of its programs categorized below the level of Acquisition Category I, it is permitted to tailor regulations in DoD5000.02.

business environment."[4] Hess highlights a need to hire the right people with a mindset for learning. He draws upon the work of Carol Dweck whose research shows that "people with an intrinsically motivated, mastery approach to learning, as evidenced by a growth mindset, are better learners and are not as afraid of negative feedback, failure, difficult tasks, uncertainty, and new situations."[5] The master mentality of learning is the preferred learning mentality as the corollary of performer mentality. Furthermore, the right people have self-determination, a sense of autonomy, effectiveness, and relatedness. Hess, drawing from Bandura states that, "people with a strong sense of self-efficacy are likely to be more resilient and adaptable."[6] Hess asserts that the right people are hired from outside or developed within. Developing people within the organization is a function of the enculturation process and human resources personnel who should seek to identify individuals with the right thinking, and then intentionally develop their skills and apply them to the problems of the organization.

There is ample information in the organizational design literature about learning organizations, but neither the concept nor the term has seen much emphasis in defense acquisition organizations. On the purpose of the learning organization, Daft states, "The learning organization promotes communication and collaboration so that everyone is engaged in identifying and solving problems, enabling the organization to continuously

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[4] Edward D. Hess, *Learn or Die: Using Science to Build a Leading-Edge Learning Organization* (Columbia University Press, 2014), 39.

[5] Carol S. Dweck, *Mindset: The New Psychology of Success* (New York: Ballantine Books, 2006); and Dweck, "Motivational Processes Affecting Learning," *American Psychologist* 41, no. 10 (1986): 1040–1048.

[6] Albert Bandura, "Personal and Collective Efficacy in Human Adaptation and Change," *Advances in Psychological Science* 1 (1998): 51–71; and Bandura, "Perceived Self-Efficacy in Cognitive Development and Functioning," *Educational Psychologist* 28, no. 2 (1993): 117–148, See also Hess, *Learn or Die*, 34-37.

experiment, improve, and increase its capability".[7] He further elaborates by explaining that the shift to the learning organization moves from vertical structure, rigid culture, routine tasks, and formal systems, to a system with horizontal structure and self-directed teams, empowerment rules, adaptive culture, open information, problem solving, and collaborative strategy.

Organizational Culture Element 2: Values

Several values stand out prominently that defense acquisition organizations may find helpful to improve organizational performance for rapid acquisition and fielding of military capabilities. Karen Zien and Sheldon Buckler, identified seven principles for maintaining innovative climates, which they found to be consistent in twelve innovative companies in the U.S., Japan, and Europe.[8] The following discussion expands upon these seven principles and adds an eighth principle unique to defense acquisition.

1) Sustain faith and treasure identity as an innovative organization. Examples include skunkworks-like organizations that treasure and reinforce an innovative mentality. Skunkworks teams are generally small and staffed with top talent and world-class susbject matter experts. Members are encouraged to avoid internal bureaucracy and bust through external bureaucracy. Leaders encourage technical excellence and rapid problem solving to ensure schedules stay on track.

2) Be truly experimental in all functions, especially in the front end. Innovative organizations use a "fail early" policy. This idea suggests that if a project tests product

[7] Daft, *Organization Theory and Design*, 28.

[8] Karen Anne Zien and Sheldon A. Buckler, "Dreams to Market, Crafting a Culture of Innovation," in *The Human Side of Managing Technological Innovation*, 2nd ed, ed. Ralph Katz, (New York: Oxford University Press, 2004), 478.

performance early and often, decision makers can assess results and terminate unsuccessful programs before reaching a point of unacceptable sunk cost. Highly innovative companies test systems, or portions of systems, extensively in the front end of a development project to identify technical challenges and constantly assess the required investment and business case for continuing. However, unlike commercial industry, defense acquisition often cannot afford to fail in fielding effective systems to operators for national defense. This in turn drives a need for broader experimentation in the front end to resolve technical problems early and control cost growth during fiscally constrained times.

3) Structure "really real" relationships between marketing and technical people. Innovative organizations build close relationships between marketing and engineering personnel to ensure credibility of marketing through accurate representation of product capabilities and responsive and knowledgeable service to customers.

4) Generate customer intimacy. Companies use a variety of methods to generate customer intimacy such as liaison officers, customer service through online or telephone lines, and on-site representatives. Military success for national security demands a very close relationship between acquisition and operational personnel yet defense acquisition managers tend to create formal processes for operator input only at prescribed points in the system development, production, and fielding phases of a program. A lack of informal communication involving the operator, as the customer, runs contrary to rapid innovation, proper force structuring, and preparation of operators to employ new capabilities. A liaison program is an effective way to tap into operational skill sets and achieve regular and informal operator input without removing the operators from the

field.

5) Engage the whole organization. Managers often grow talent within their divisions, and then retain those highly skilled people. People with specialized skills must be viewed as broader organizational resources. Highly innovative companies form and dissolve small teams frequently. These teams are most effective at innovating when they are composed of people with the right combination of specialized skills. Rapid innovation requires the breakdown of fiefdoms (elimination of resource hording and empire building) in the organization. Senior leaders must recognize the needed skills for a specific project and be willing to move people between projects quickly.

6) Never forget the individual. Industry employs many methods to incentivize and retain its best employees including financial incentives, promotions, job rotations, non-monetary benefits, and awards. The Department of Defense's military and civilian personnel systems are not ideal for building ambition and high skill due many factors, some of which include central personnel management and fixed rank and pay structures. The most common incentives available to leaders in defense acquisition are numerical stratification in performance appraisals, to enhance future promotion potential, and awards at individual or team levels. Empowerment and opportunity to solve national security problems can build passion for the mission and partially make up for the limited incentives available.

7) Tell and embody powerful and purposeful stories. Employees are motivated by the stories and history of an organization if it has a distinctive history and record of performance in delivering products or services.

8) Build strong partnerships with industry. Experience has shown that an

acquisition program is most successful when the government views the contractual relationship as a partnership, rather than simply as a fee for service. Skunkworks projects illustrate key principles for partnerships where the contractor and government mutually believe that technical problems are a shared responsibility to resolve, and that schedule, being paramount to national security, demands elimination of bureaucracy and traditional formal communication stovepipes. Leaders focus on facilitating design and operator teams to solve problems quickly while driving greater concurrency between design, production, and test activities. These shared beliefs help establish a shared culture in an integrated team. Second, for defense acquisition managers to communicate and integrate better, they must improve business acumen. For example, many defense acquisitions managers do not study a company's financial disclosures, business segment objectives, and internal research and development investments, resulting in a failure to structure acquisition strategies and business deals that benefit both parties.

Organizational Culture Element 3: Norms

There are two norms in defense acquisition which require significant consideration to promote innovation. First is the need to accelerate the cycle time of new product development or keep pace with a rapidly evolving market. The commercial market recognizes that risk tolerance is associated with the degree of innovativeness. On the contrary, defense acquisition's risk tolerance is anchored in a different reality than the commercial market. Second is a need to apply the old adage that you have to know the rules before you can break them to achieve innovation success.

Risk Tolerance

Understanding how industry is increasing speed in new product development and how it views risk will help SOF AT&L to take advantage of the speed of commercial markets. This thesis has already discussed common organizational structures in innovative companies who decrease cycle times. A new study, presents the concept of the Fast-Track New Product Development (FT-NPD), which is defined as, "an abrupt and significant reduction in new product development time relative to a firm's normal product development cycle."[9] The study offers the innovative idea that "new product development is fundamentally a social process. The open social system includes the interplay of firm culture, firm capabilities, and firm structure that can greatly affect actors' behaviors."[10] The study concludes that risk tolerance is among the key variables that is strongly correlated to FT-NPD success, following the axioms that innovative organizational cultures embrace risk to enhance market position and that more risk tolerance tends to translate into more radical innovations.[11] Together, they suggest that to survive, companies must accept risk, and that companies will eventually lose market advantage if they become too risk-averse.

Unlike commercial business, defense acquisition organizations typically accept high risks only when faced with urgent national security issues. Additionally, oversight audits send a critical message of program failures, suggesting that all tax payer

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[9] Charles H. Noble, Matthew B. Shaner, Anton Fenik, and Kang Bok Lee, "On the Fast Track: Strategies and Implications of Accelerated New Product Development," (working paper). Used with permission of the authors, passim.

[10] Ibid.

[11] G.J. Tellis, J.C. Prabhu, R.K. Chandy, "Radical Innovation Across Nations: The Preeminence of Corporate Culture," *Journal of Marketing* 73, no. 1 (2009): 3-23; and BJ Jaworski, AK Kohli, A. Sahay, "Market Orientation: Antecedents and Consequences," *Journal of Marketing* 57, no. 3 (1993), 53-70.

investments must result in successful outcomes, leading to an unrealistic expectation that all investments must result in successful products.

Mastery Culture

Acquisition statute and regulation has only grown in volume and complexity. It is unlikely that it will ever be reduced due to an increasingly more complex defense business environment. To overcome the complexity of the acquisition environment and limitations to risk tolerance imposed by the defense acquisition structure, there is great long-term value in adapting the culture of the organization to master the regulatory environment. A culture of mastery seeks to comply with the intent of statutes and regulations while credibly tailoring a program's compliance. When the organization masters the rules, it can apply them more creatively.

Organizational Culture Element 4: Skills

Edward Roberts and Alan Fusfeld identified five critical personal skills, which key people within the organization must have to promote an innovative culture.[12] The five critical skills are as follows: idea generating, entrepreneuring or championing, project leading, gatekeeping, and sponsoring or coaching.

Idea generating personnel have expertise, enjoy conceptualization, abstraction, and innovation, and are individual contributors. These personnel should reside at nearly all levels of the organization but are especially important in the technical core and technical support elements. Within the technical core, they innovate product or service

[12] Edward B. Roberts and Alan R. Fusfeld, "Information Critical Roles in Leading Innovation," in *The Human Side of Managing Technological Innovation*, 2nd ed, ed. Ralph Katz, (New York: Oxford University Press, 2004), 252.

design, utility, and function. Within the technical support element, they innovate design and business processes and boundary spanning. Idea generating personnel also have an important role at the middle and top management levels. At the middle level, they motivate and manage complex projects. At the top, they generate new strategies to leverage ideas into marketable products or services.

Entrepreneuring or championing personnel have strong application interests, wide ranging interests, are energetic, determined, and willing to put themselves on the line. These skills are most essential in top level management; however, champions are important in the technical core, technical support, and middle management elements as well. Successful entrepreneurial top managers develop and convey a vision while they have a realistic understanding of the art-of-the-possible. They contextualize risk and risk tolerance and either accurately select a successful course of action or have the skill to recover from a poor course of action. Champions throughout the organization promote organizational morale and spirit to achieve success.

Project leading personnel are decision making, manage information well, are sensitive to needs, use organizational structure to get things done, and integrate disciplines of marketing, finance, engineering, and production. Project leading is most essential in the middle management and technical core elements where personnel must be experts in managing complex and multi-disciplinary problems. They deliver products and services from the visions of entrepreneurs and idea generators.

Gatekeeping personnel have high technical competence, are personable, and help others. Gatekeeping skills are most important in the technical core and middle

management elements. These personnel bring synthesis to the team's work and they help to ensure that product or service integration goals are achieved.

Finally, sponsoring or coaching personnel develop new ideas, listen well, are objective, tend to be more senior. Top managers must possess these skills to identify and cultivate top talent, boost organizational morale, and inculcate the vision and mission of the organization.

Top leaders in the organization must recognize these skills in people and seek to put them in influential positions. Top leaders must also possess vision for crafting, evaluating, and driving an innovative culture. They must facilitate interaction, manage expectations of their superiors, and sell and protect the organization. Top leaders who do these things tend to build more successful and innovative organizations.

Chapter 5: Conclusion and Recommendations

This thesis introduced SOF AT&L's barrier to innovation success: it has seen an increase in acquisition cycle times and at the same time, struggles to keep pace with technology innovation cycle times in the commercial sector. As a result, USSOCOM faces a potential strategic disadvantages caused by being unable to keep pace with the accelerated cycle times; these disadvantages emerge when weapons or intelligence collection capabilities are outdated, or when acquisition timelines are too slow to react to an adversary's new capabilities.

To achieve the seamless development, acquisition, and fielding of new technologies, and meet the pace of measure to countermeasure adaptation, USSOCOM must develop a unique organizational culture that possesses the attributes of responsiveness, innovation, and problem solving necessary to convert strategic disadvantage into strategic advantage. A unique SOF acquisition culture and a formal enculturation process are essential for SOF AT&L to achieve success, focused on a specific set of organizational culture elements: behaviors, values, norms, and individual skills. These changes to organization and culture will compensate for the inflexible regulatory environment that slows down the acquisition process.

Organizational Structure Recommendations

SOF AT&L should make several modifications to its top-level organizational structure (see Appendix 2, Figure 6), consistent with other highly innovative organizations, to increase innovation and drive cultural change.

1) Add Enterprise Communications at the second level of the organizational structure. The role of this position is to manage information exchanges in the open system and adjust communications exchanges to achieve closer integration with laboratories, supporting DoD Services and Agencies, test organizations, and traditional and non-traditional defense companies.

2) Add Strategy and Operations at the second level of the organizational structure. The role of this position is to develop SOF AT&L strategies and plans, perform boundary spanning functions to evolve management processes, and focus on management techniques and tools. Program management is the heart of SOF AT&L.

3) Elevate Human Resources to the second level of the structure and create a Chief Culture Officer who develops and administers a formal enculturation program.

4) Elevate the staffing function by using a Talent Acquisition Director at the second level of the organization. The role of this Director is to modify and closely monitor hiring processes, which recruit and hire people who culturally align with the organization's goals.

5) Clarify the role of Science and Technology as the primary technical boundary spanning organization focused on product transformation processes across SOF AT&L and greater collaboration through Creative Labs like SOFWERX and DIRTYWERX as well as Government labs and Industry Labs.

6) Create a Special Projects Director at the second level of the structure for the shortest decision chain on high-priority and time-critical projects.

Organizational Culture Recommendations

Based on the examination of innovative culture in the previous chapter, SOF AT&L should consider the following organizational culture changes:

1) Create a Chief Culture Officer under Human Resources, no lower than the third level in the organizational structure to formalize processes of indoctrination and enculturation of employees in innovation, rapid acquisition, and learning mindsets.[1] Additionally, top leaders should encourage PEOs and Program Managers to adopt unique but consistent shared values for their own projects. Furthermore, all top leaders must continue communicating the vision, mission, and concepts of Acquisition − SOCOM Style, internally and externally to enculturate and retain talent and to attract top talent from the Military Services, DoD, and private industry. Additionally, expand the Ghost Deployment program to indoctrinate and recruit talented officers and civilians from the Services.[2]

2) Prioritize technical performance and project schedules over cost. Maintain aggressive focus on risk identification and management across all elements of the open system and resolve technical problems as rapidly as possible. Use top subject matter experts and world-renowned experts. Do not rely solely upon Federally Funded Research and Development Corporations' (FFRDC) and Systems Engineering Technical Support

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[1] Steiber and Alänge, "A Corporate System for Continuous Innovation," 248-249.

[2] USSOCOM's Ghost Program deploys a handful of high-energy AF junior officers to SOCOM each year to learn and apply SOCOM's tactics, techniques, and procedures. The "Ghosts" are then empowered with the responsibility to implement their ideas when further deployed to multiple Areas of Responsibility. Captain Jason Rathje, "RATPAC: How a Network of Junior Acquirers is Changing the Air Force," Acquisition News and Gazette, December 12, 2014, http://www.transform.af.mil/About/Display/tabid/1596/Article/612249/ratpac-how-a-network-of-junior-acquirers-is-changing-the-air-force.aspx (accessed 14 February 2017).

(SETA) contractors' existing staffs. Insist that they extended their talent pool by bringing in select world-renowned experts as consultants on an as needed basis. This results in faster problem resolution and avoids an idle contractor workforce with rapidly accumulating labor cost growth.

3) Develop a Learning Organization Mindset. Pushing the limits of commercial acquisitions and alternative contracting mechanisms requires absolute mastery of the regulation, innovative people to apply it in an innovative way, and innovative people to encourage evolution of the regulation at the staff levels. Develop and maintain core competencies in diverse acquisition approaches and increase the use of venture capital type acquisitions such as Small Business Innovative Research (SBIR), Advanced Concept Technology Development (ACTD), and Other Transaction Authority (OTA) as mechanisms to draw in non-traditional companies. Refine the hiring process to value commitment, depth, and diversity in competencies, expectations, and emotions.[3] Develop human resources programs to grow and sustain talent and follow up on employee satisfaction. Enculturate using a socialization process including orientation days, assisted internal network building, and an annual survey to assess cultural perceptions.

4) Be truly experimental in all functions, especially in the front end. Increase early modeling and simulation, bench or brass board demonstrations, and prototype demonstrations in industry research and development contracts and in supporting government laboratories. This implements the fail early policy. The use of government laboratories in this capacity reduces the costs of terminating industry contracts.

5) Structure strong relationships between Enterprise Communications (marketing)

[3] Steiber and Alänge, "A Corporate System for Continuous Innovation," 247.

and technical people. SOF AT&L should bolster two teams with skilled communications and marketing experts backed by skilled engineers. The first is an internal team who connects warfighter needs with capabilities; this team strengthens communications between acquisition managers and operators to rigorously develop requirements, maintain requirements stability, and test product performance. The second is the team that deals with external staff and Congressional overseers. This team establishes and maintains a strong narrative, clearly and continually justifying acquisition projects, even those projects that do not easily bear results or might need to be terminated. Over the long term, the external team preserves the credibility of SOF AT&L through a continuous and open dialogue with oversight authorities.

6) Generate customer intimacy. USSOCOM should provide its best and brightest operators with future career potential in the SOF community to influence its SOF AT&L acquisition projects. SOF AT&L already generates a degree of operator intimacy by including operators in acquisition program planning, system development technical reviews, and test and evaluation. But, SOF AT&L may achieve greater results by expanding the successful USSOCOM liaison (LNO) program with highly competent operators as embedded or temporary liaisons to acquisition programs. Liaisons may be assigned by their operational units and are given time to interact with acquisition programs at key points in the design and testing processes, and informally, from the early requirements definition phase all the way through the fielding phase.

7) Continue to tell and embody powerful and purposeful stories and sustain faith and treasure identity as an innovative organization. SOCOM acquisition is unique and has a powerful story to tell about equipping the world's most elite warriors. This is

foundational to the story that resonates with people who want to work in USSOCOM − to equip forces for effective warfighting, for personnel safety, to deal with the toughest fights anywhere in the world, to keep terrorists away from our soil – all are powerful purposes to build teams who possess urgency and work with a unity of effort.

8) Enhance business acumen across SOF AT&L. In pre-acquisition phases of a program, managers should study the public disclosures of interested companies regarding their profit, revenue, cash flow, business segment expectations, and internal research and development investment to determine long-term strategies. These are essential to structure and communicate terms of a new contract and partnership with industry.

Managers should obtain formal education in negotiation techniques and venture capital commercial market approaches. If acquisition managers increase business acumen and learn to communicate and integrate buying strategies with a greater knowledge of company objectives, projects are more likely to yield success over a longer term.

9) Reinforce a culture that embraces and effectively manages risk. Decrease cycle time by taking more risk and shift the oversight authorities' expectations of program success. Study the efficiency of commercial R&D investment and rates of product success to establish realistic expectations of allowable investment loss.

10) Create a culture of statute and regulation mastery. Encourage employees to study statutes and regulations and explore innovative and alternative approaches that meet the statutory and regulatory intent. Encourage application of alternative methods rather than conventional contracts.

11) Identify shortfalls in organizational innovation skills by identifying personnel

who exhibit critical skills for each of the five functions: Idea Generating, Entrepreneuring, Project Leading, Gatekeeping, and Sponsoring/Coaching. Realign personnel or hire to fill gaps. Ensure people with these skills are put in influential positions within SOF AT&L.

Gaining Strategic Advantage

Implementing the recommended structural changes will improve the innovativeness of the organization in several ways. A flatter, more accountable, and more empowered top management structure will focus people on developing an innovative and rapid organization. The Director needs critical thinkers, representing each functional discipline, who operate at his level of thinking and who will support his initiatives to drive the innovative culture. The recommended structure puts top managers in the role of creative thinking and helping to promulgate the vision, mission, and organizational concepts for innovation. This will also remove some workload from the SOF AT&L Director and allow him to focus on collaboration and decision-making roles. The inclusion of Strategy and Operations and Enterprise Communications in the second level of the organizational structure will improve awareness and management of the open system elements, especially boundary spanning functions. Most of the structural recommendations can be addressed within 6 months. In some cases, elevating some positions in the organizational structure may require increases in pay grade. In these cases, temporary or acting directors may be considered.

Implementing the recommended culture recommendations will also improve the innovativeness of the organization. A Chief Culture Officer is an essential addition to the

organization to assist top management with implementing the culture recommendations. The culture recommendations in this thesis, developed from research of best practices in innovative companies, ensure that the organization has the proper mindset, critical thinking, and critical skills for innovation and constant improvement. SOF AT&L will be well served if it recalls Edward Hess' advice that "constant improvement is table stakes in today's business environment." The recommendations in this thesis enable SOF AT&L to build an organization that can adapt and overcome stifling regulation while reducing the gap in technology cycle time.

Appendix 1: Mechanisms for Innovation in Defense Acquisition

USSOCOM's research question that generated this thesis asked how it can evolve its processes and procedures for innovative and rapid acquisition. This appendix helps to address this question as it discusses business relationships and contracting mechanisms more suited to reducing acquisition timelines. This Appendix discusses a Center for Strategic and International Studies (CSIS) concept of commercial and military integration, a source for additional cycle-time-reduction initiatives, leveraging FT-NPD, the role of the government laboratory, and three alternative contracting mechanisms.

Integration

SOF AT&L is not alone in its frustration with integrating commercial technologies. Over-regulation is a central issue identified in a 1991 CSIS Steering Committee on Security and Technology study report. The report identified two major problems: "erosion of the defense industrial base is undermining U.S. national security, a problem compounded by growing budget constraints," and "enormous federal investment in high technology for national defense is not, and under the current structure cannot be, adequately leveraged for overall national technology goals."[1] The report states that these problems have a common origin: "the fragmentation of high technology enterprise in the United States into discrete commercial and military sectors," and "the wall between the commercial and military sectors has been built over time by regulatory and legislative rules that send a clear message to industry to segregate in order to protect commercial

[1] Debra van Opstal, *Integrating Commercial and Military Technologies for National Strength, An Agenda for Change*, Report of the CSIS Steering Committee on Security and Technology, (Washington D.C.: Center for Strategic and International Studies, March 1991), v.

viability."[2] Companies, still today, tend to separate military and commercial products into separate company divisions with little crossover of knowledge or resources. The report accurately asserts that, "defense technologies are unique largely because of the way the government procures them." Indeed, most companies find bureaucratic government requirements too unique to mix products and personnel, and they segregate their defense and commercial business to avoid seriously jeopardizing commercial efficiency and profitability. The U.S. defense industrial base has devolved into a small and highly specialized defense-unique sector that is incapable of producing affordable quantities. Furthermore, because its organizational structures often mimic the DoD's bureaucratic structures, it lags the commercial technology industry in its ability to access and rapidly field cutting-edge technologies and quickly expand production capacity.

The CSIS report recommends a solution, called integration, where the Department of Defense relies far more on commercial products, processes, and buying practices. Companies achieve the CSIS vision of integration when they develop and produce a military product using nearly the same processes and procedures ordinarily used for their commercial products. The approach implies that many companies could employ the same technologies, administrative procedures, research, and production facilities for both commercial and military customers. The report also suggests four areas of regulation or legislation driving a wedge between commercial and military business: accounting requirements, military specifications and standards, technical data rights, and unique contract requirements.

[2] Ibid., xii.

All of these areas of regulation still exist 25 years after the CSIS published its report, but there are new regulations that allow programs to tailor the old regulations. SOF AT&L can expand its purchases of commercial items using Part 12 of the Federal Acquisition Regulation and consult with Military Services' and OSDs' contracting authorities if portions of the regulation are overly restrictive. SOF AT&L can make internal decisions, in many cases, to replace military standards with commercial standards if those standards are sufficiently similar.

SOF AT&L may also seek waivers from accounting requirements in its new small business and fixed price contracts. Contracting officers may assess price reasonableness based on market-based or value-based price assessments. Operators and acquisition managers determine if unique contract requirements are necessary as they come to agreement on the requirements. Therefore, USSOCOM can make requirements tradeoffs to ensure commercial procurement options are available. Finally, SOF AT&L can increase the merging of commercial and military product lines by engaging companies with high-potential dual-use technologies and by removing military-unique requirements as much as possible.

Additional Cycle Time Reduction Initiatives

In their journal article titled, *Shortening the Product Development Cycle*, Preston Smith and Donald Reinertsen note that "there are untapped resources of cycle time reduction for R&D managers to exploit. These include opportunities to accelerate the 'fuzzy front end,' in which half of the typical development cycle vanishes before the

team even starts work."[3] This concept suggests that industry does more of its early development in informal environments with loosely structured organizations and little formal oversight. The authors suggests 10 additional opportunities to reduce cycle times in R&D. The commercial market is indeed innovating faster and faster and they have revolutionized open-system, horizontal and functionally-based organizational structures to achieve it. Smith and Reinertsen give a strong indication that there is no shortage of new ideas emerging to reduce cycle times even more so.

Fast-Track New Product Development

Noble, Shaner, Fenik, and Lee introduced a new typology of FT-NPD strategies.[4] The typologies include Accelerators, Separators, Accommodators, and Responders. Accelerators seek to anticipate customer needs. Separators seek to distance themselves from competitors by leading in their current markets. Accommodators seek to provide products customers already indicate they want. Responders simply react to competitors who try to compromise their competitive position. The study found that, firms that are both proactive and customer or competitor oriented are associated with high performance.[5] The Accelerators strategy achieved the most success, followed by Separators, Accommodators, and Responders respectively. The Accelerators also exhibited the highest level of organizational improvisation.[6]

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[3] Preston G. Smith and Donald G. Reinertsen, "Shortening the Product Development Cycle," in *The Human Side of Managing Technological Innovation,* 2nd ed, ed. Ralph Katz (New York: Oxford University Press, 2004), 573-582.

[4] Noble, Shaner, Fenik, Lee, "On the Fast Track," passim.

[5] Ibid., 13.

[6] Ibid., 14.

From the study findings, we can surmise that when defense acquisition managers seek to acquire or integrate FT-NPD commercial products into military equipment, a company's development strategy matters. If we can determine the commercial customer base and development strategy typology, we can assess potential for product success in the commercial market and potential success in a military application. It is important to understand who the commercial customer is, what factors drove development strategy, and what the long-term commercial market might look like. Failure to do this may result in acquiring a commercial product with no commercial market to support its long-term sustainment costs. Additionally, SOF AT&L may influence the development topology by considering what kind of customer it would be for the commercial product and what conditions would be created that are beneficial to the company. Key questions include: Is there a high-threat need? Will there be a high level of SOF customer involvement? Will the company be out-in-front as an Accelerator? Is there high lifetime value for the company? More of these questions answered affirmatively will make it more likely that a FT-NPD strategy will be successful in developing and fielding a new commercial product-based capability for SOF.

Government Laboratories

When working with Government laboratories, SOF AT&L should ask if lab personnel are following commercial markets for specific products and whether the laboratory can acquire, integrate, and test prototypes using those technologies. This suggests that laboratories should organically continue development further than just basic research. From 2006 to 2010, for example, AFRCO utilized a government laboratory to

develop a new product. The laboratory designed the product, built and tested prototypes, and organically produced a small initial lot of the product for system testing. The laboratory contracted for select parts and assembly operations. The result was a product produced in half the time and 25% of the cost that industry proposed.

Alternative Procurement Mechanisms

SOF AT&L already employs a variety of alternative procurement mechanisms and should continue to increase their use. There are a few recent successes. For instance, between 2013 and 2015, SOF AT&L increased its use of Cooperative Research and Development Agreements (CRADA) from approximately 10 to approximately 110 yielding a significant improvement in industry and laboratory partnerships.[7] Additionally, in 2015, SOF AT&L opened SOFWERX, a collaborative workspace in Tampa, Florida, which promotes co-invention, rapid prototyping, technology awareness, workforce development, education, and industry engagement.[8] A primary objective of the SOFWERX according to the SOF AT&L lead, Mr. James Guerts, is to "figure out how to work together to increase SOCOM's competitive advantage in acquisition velocity."[9] The SOFWERX concept was further expanded to a project called DIRTYWERX, which provides a workshop for innovative people to come together to build hardware and software together for prototypes and demonstrations. These are excellent boundary spanning initiatives to expand the open system network of possible

[7] Guerts, "Evolving the Network to Counter Emerging Threats," Chart 22.

[8] Howard Altman, "SOCOM Looks to Enhance Interactions with Industry, Academia," Times Publishing, Inc., May 18, 2015, http://www.tbo.com/list/military-news/altman/socom-looks-to-enhance-interactions-with-industry-academia-20150518/ (accessed December 30, 2016).

[9] Ibid.

companies who can contribute to the SOF mission and accelerate development cycle times.

In 2014, SOF AT&L spent $1.7 million through Small Business Innovative Research (SBIR), the U.S. government's oldest venture capital initiative started in 1982.[10] However, this was only 0.5% of the $369 million research and development budget for 2014. There appears to be additional opportunity in this area.

There was no data available regarding the SOF AT&L's use of Other Transaction Authority (OTA).[11] "Other transactions" refers to 10 U.S.C. 2371 authority to enter into transactions other than contracts, grants, or cooperative agreements. OTA is typically used for research and/or prototype projects and is not subject to Federal Acquisition Regulation. Use of OTA requires at least one nontraditional defense contractor participating or at least one third of total costs paid by non-government participants or under special approval of the senior program executive for the agency. A primary objective of OTA is to promote commercial-military partnerships. NASA used OTA for commercial off the shelf cargo missions, and in 2016, the Air Force used it under its Evolved Expendable Launch Vehicle Program for four separate commercial-military rocket engine prototypes. OTA provides efficient opportunities to engage in commercial partnerships while avoiding many of the requirements in the Federal Acquisition Regulation that typically discourage commercial companies from doing business with the government.

[10] Guerts, "Evolving the Network to Counter Emerging Threats," Chart 23.

[11] Under Secretary of Defense for Acquisition, Technology and Logistics, "'Other Transactions' (OT) Guide for Prototype Projects," December 21, 2000.

Finally, USSOCOM should consider additional organic government development and production resources. In 2006 and again in 2010, AFRCO used the Economy Act to acquire production services from the Department of Energy's Kansas City Plant. The facility provided highly-qualified engineers and state-of-the art electronic and mechanism manufacturing facilities to successfully transition laboratory designs into production processes. Both projects resulted in a limited production run of military systems at a fraction of the cost and schedule proposed by traditional defense companies.

SOF AT&L is expanding its use of alternative procurement mechanisms but each of these requires careful study and management expertise to execute. The culture model introduced in this thesis will result in the highly skilled and innovative organization with the mastery needed to employ these mechanisms more broadly.

Appendix 2: Organizational Structures

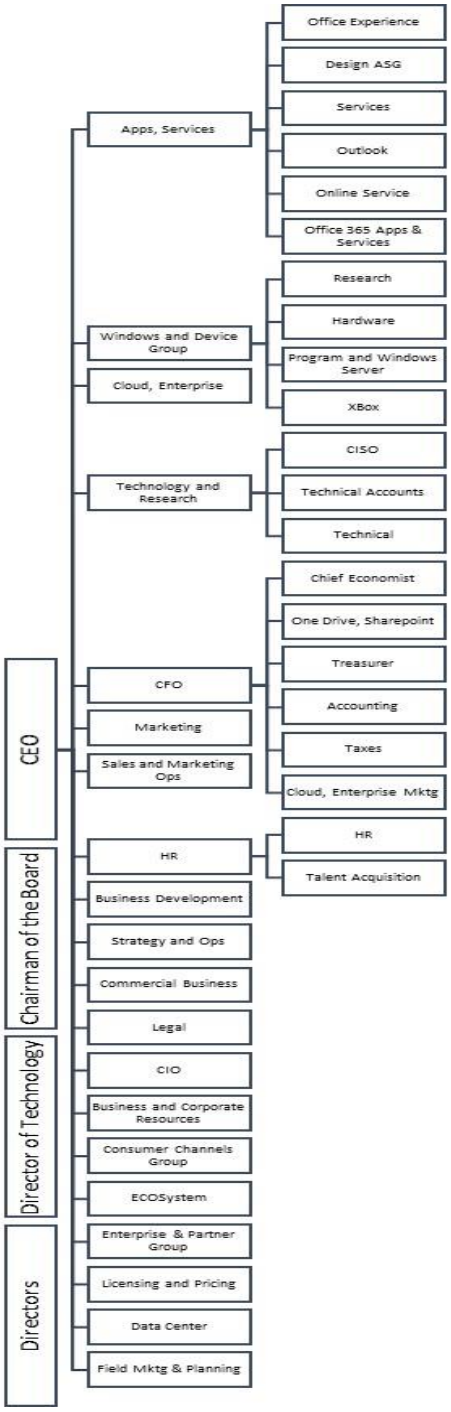

FIGURE 1: Microsoft, Inc.[1]

[1] The Official Board, http://www.theofficialboard.com/ (accessed January 2, 2017).

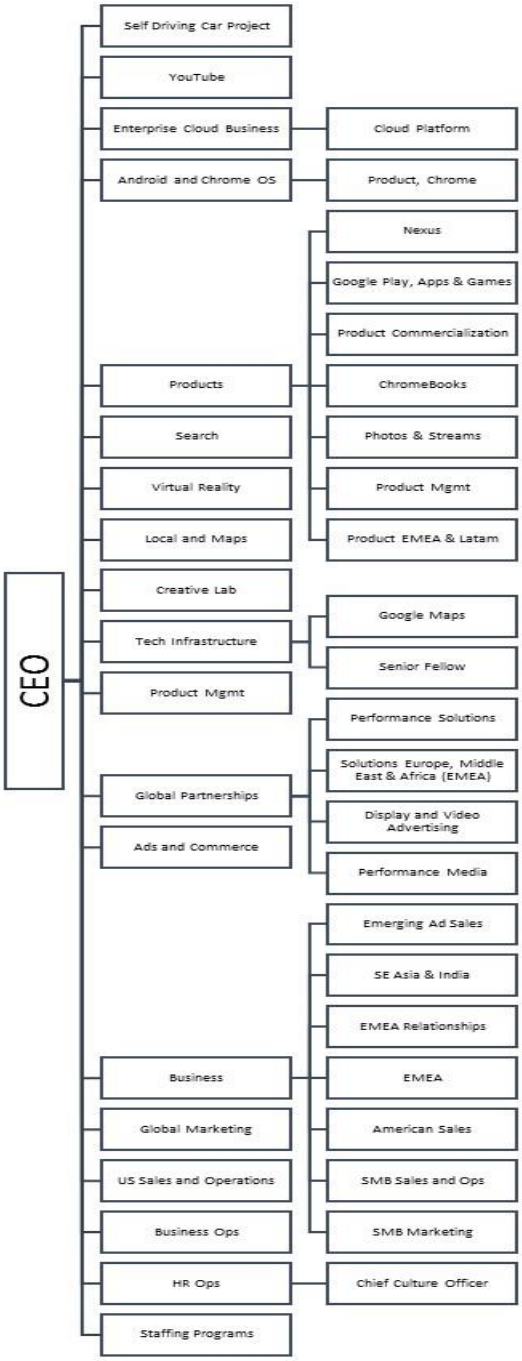

FIGURE 2: Google, Inc.[2]

[2] Ibid.

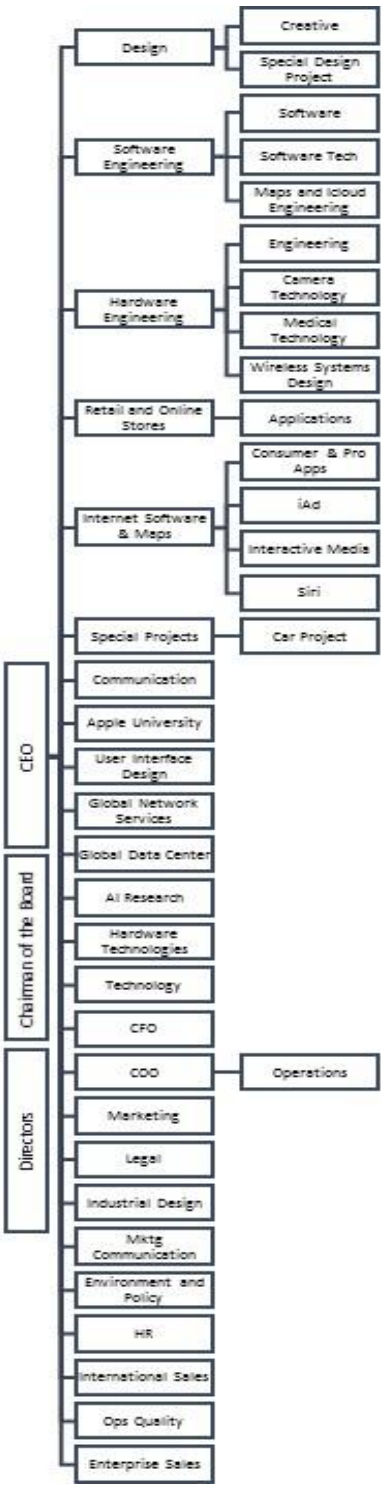

FIGURE 3: Apple, Inc.[3]

[3] Ibid.

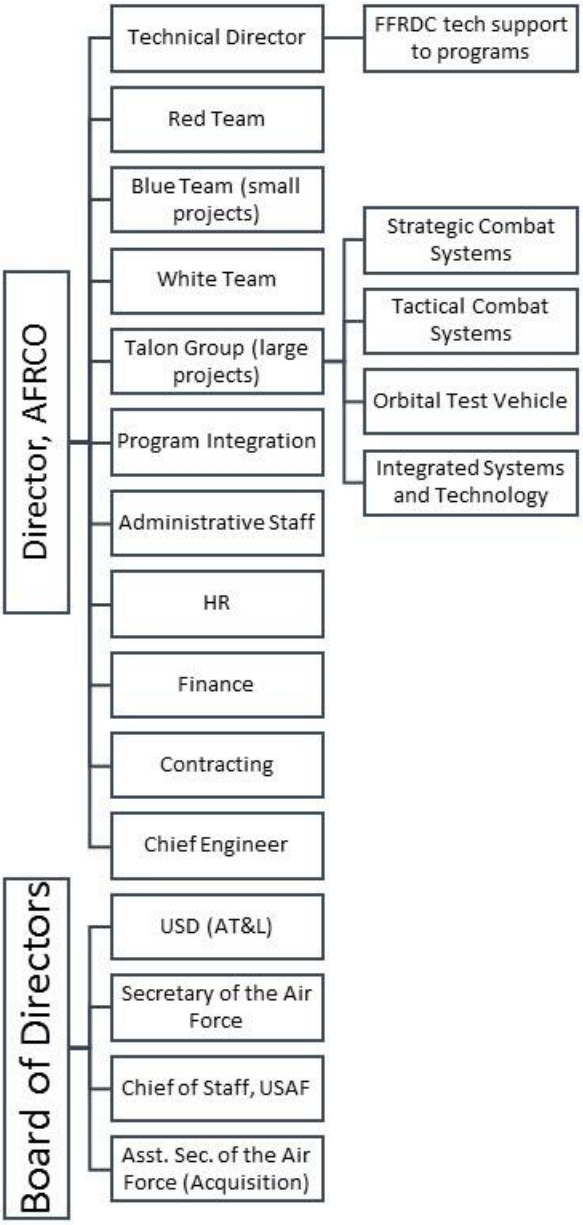

FIGURE 4: Air Force Rapid Capabilities Office (AFRCO)[4]

[4] 2010 structure based upon author's experience in the organization from 2006 – 2010.

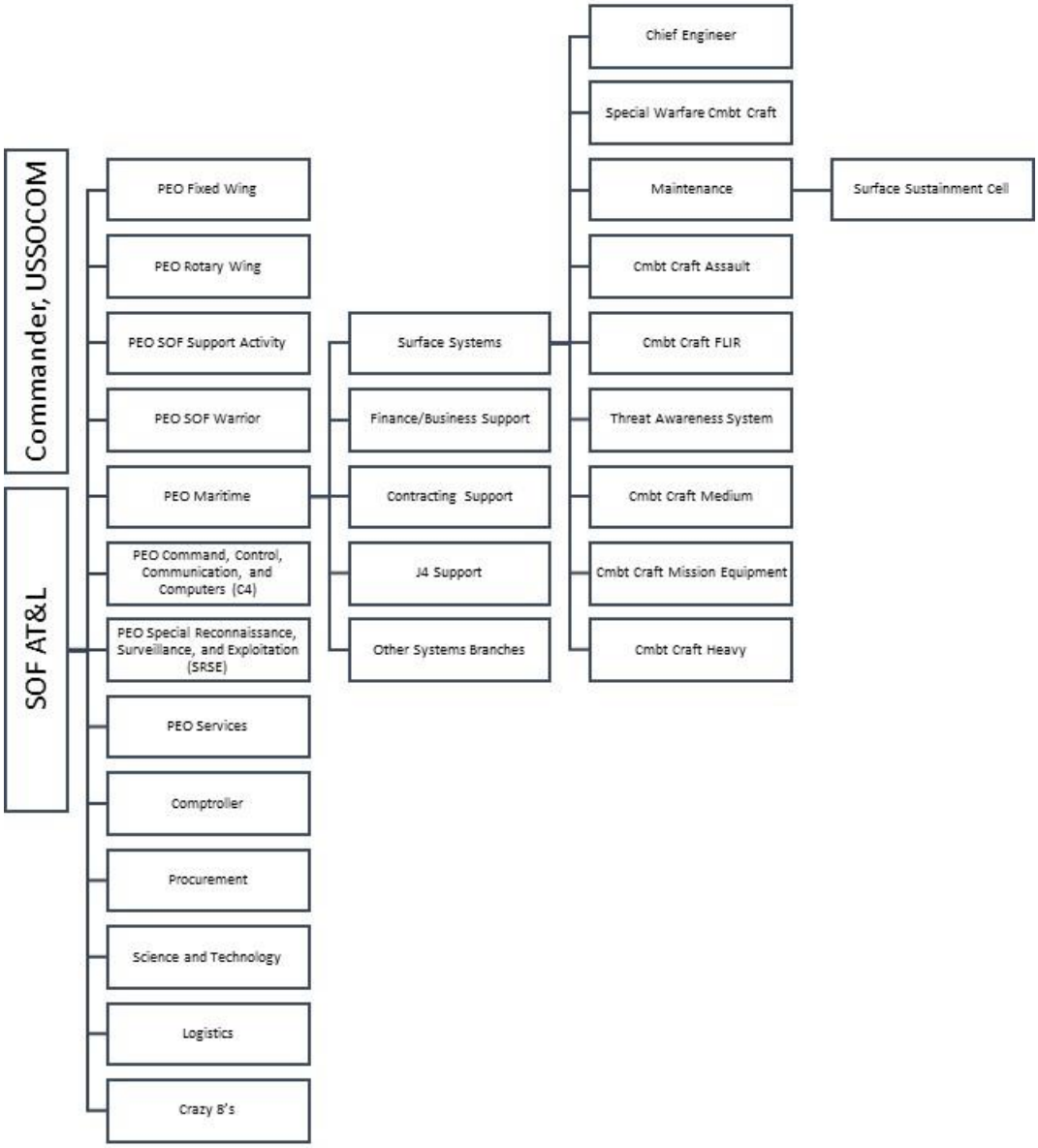

FIGURE 5: SOF AT&L[5]

[5] Derived from: "Evolving the Network to Counter Emerging Threats," chart 8 SOF AT&L Organization; and Surface Systems Program Management Office Organization Chart provided by CDR O'Lavin, as of Novermber 9, 2016, FOUO information redacted.

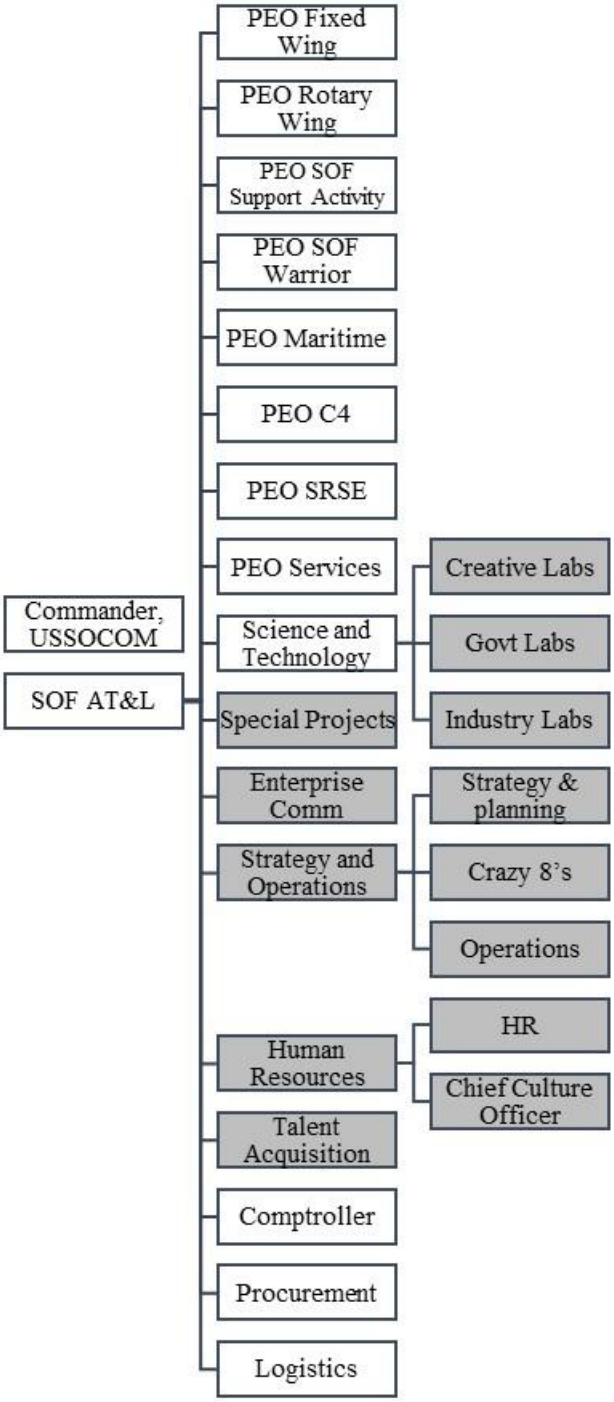

FIGURE 6: Recommended Top-Level SOF AT&L Organizational Structure[6]

[6] Ibid., with modifications by the author.

Appendix 3: Additional Notes from Company Studies

Innovation Oriented Culture

Google, Microsoft, Apple, and 3M have all achieved advantages through instilling an innovative oriented cultural mindset in employees. In order to understand what makes Google, Inc. an innovative company with continuous innovation, Annika Steiber and Sverker Alänge interviewed 28 employees and asked them to rank seven organizational elements for influence on Google's innovativeness. All participants ranked innovation-oriented the highest. The study found that "Google's organization for continuous innovation can be viewed as a dynamic and open corporate system for innovation, involving the entire organization, and supported by an innovation-oriented top management and board."[7] Shared beliefs at Google include do no evil, large impact, and we can change the world.[8] The founders started with a vision to change the world and a mission to organize the world's information and make it universally accessible and useful. Steiber and Alänge defined leadership as, "leadership style, values, and behavior . . . setting vision, goals, assigning tasks, providing resources, securing knowledge transfer, and rewarding and monitoring."[9]

Air Force Rapid Capabilities Office's shared beliefs included: bust the bureaucracy, regulation is guidance - multiple ways to meet intent, involve only materially contributors, your contribution is not about personal glory…it is about the

[7] Steiber and Alänge, "A Corporate System for Continuous Innovation," 244, 247.
[8] Ibid., 247.
[9] Ibid., 248-249.

highest levels of national security.[10] At the Air Force Rapid Capabilities Office, leaders understood the value of shared beliefs and acted to facilitate communications, and spoke the vision and mission.

Mindset for Rapid Acquisition

There are four key enabling attributes documented in the AFRCO's organizational charter, which enhance the organization's rapid mindset. They include a short chain of command, a tailored approval process in lieu of DoD5000.02 regulation, firm program requirements, and highly selective staffing. In addition to the documented attributes, there are several other important beliefs that project managers apply; they include technical and schedule precedence over cost, use of world-renowned experts, and incremental technology evolution.[11]

Mindset for Learning

Regarding Google, Steiber and Alänge found that the company has no formal systems for organizational learning, but learning and sharing knowledge are inherent in the basic methods of operation within the company. In essence, organizational learning is what the company does in order to create innovative products and survive. They note that, "interviewees emphasized the importance of building an internal network, being open and sharing as much as possible, because learning was believed to take place in

[10] AFRCO's views were not documented. These were common themes and messages promulgated by the senior leaders of the organization from the author's recollection and verified by other officers who worked in the organization between 2006 – 2010.

peer-to-peer networks."[12] There is a close correlation of Steiber and Alänge's research to Hess' model for the learning organization as they discovered that "the hiring process filtered out the wrong people from the right ones by asking questions in four pre-defined areas: cognitive ability, role-related knowledge, leadership, and 'Googliness,' . . . a test of the cultural fit between the individual and the company." The hiring process values commitment, depth, and diversity in competences, expectations, and emotions.[13] Furthermore, Google's Human Resources personnel develop programs to grow and sustain talent and follow up on employee satisfaction. For example, after being hired, Google uses a socialization process to enculturate its employees. It includes special orientation days, assisted internal network building, and an annual survey called 'Googlegeist' with perceptions of innovativeness within departments.[14] The right people and a learning mindset are essential to the innovativeness of the organization and Google has made significant investment in formal enculturation to build and maintain it.

[12] Steiber and Alänge, "A Corporate System for Continuous Innovation," 250–251.
[13] Ibid., 247.
[14] Ibid., 248.

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