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THESIS

INNOVATIVE PRACTICES FOR SPECIAL WARFARE

by

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December 2015

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13. ABSTRACT (maximum 200 words)

Special Warfare forces are tasked with conducting operations in uncertain environments defined by rapidly changing environmental elements (instability) and the interaction of many diverse external factors (complexity). In order to succeed, organizations operating in uncertain environments should decentralize decision-making to the appropriate level and emphasize an "organic" approach that focuses on the importance of people, adaptation, and innovation. The current USASOC bureaucracy, mirroring the conventional Army, is built to maximize internal efficiency and specialize in previously predicted scenarios. Due to persistently high operational tempo, personnel downsizing, and fiscal constraints, redesigning USASOC is not feasible at this time. However, the improvement of processes and incremental enhancement to align better with the operational environment within the existing design is possible. This study explores best practices from innovative and adaptive organizations that ARSOF can draw upon to increase its capability to conduct special warfare. Through the examination of these best practices, the study identified four key factors that lead to innovation: collaboration, organizational structure, incentives, and acceptance. This study recommends that Special Warfare forces apply these factors by increasing career flexibility, internal and external linkages through broadening opportunities and liaisons, and the collective intelligence of the organization through the use of cross-functional teams and increased communication measures. Adopting these enhancements may promote innovation and adaptation and increase Special Warfare forces' contributions to national defense.

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INNOVATIVE PRACTICES FOR SPECIAL WARFARE

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Special Warfare forces are tasked with conducting operations in uncertain environments defined by rapidly changing environmental elements (instability) and the interaction of many diverse external factors (complexity). In order to succeed, organizations operating in uncertain environments should decentralize decision making to the appropriate level and emphasize an "organic" approach that focuses on the importance of people, adaptation, and innovation. The current USASOC bureaucracy, mirroring the conventional Army, is built to maximize internal efficiency and specialize in previously predicted scenarios. Due to persistently high operational tempo, personnel downsizing, and fiscal constraints, redesigning USASOC is not feasible at this time. However, the improvement of processes and incremental enhancement to align better with the operational environment within the existing design is possible. This study explores best practices from innovative and adaptive organizations that ARSOF can draw upon to increase its capability to conduct special warfare. Through the examination of these best practices, the study identified four key factors that lead to innovation: collaboration, organizational structure, incentives, and acceptance. This study recommends that Special Warfare forces apply these factors by increasing career flexibility, internal and external linkages through broadening opportunities and liaisons, and the collective intelligence of the organization through the use of cross-functional teams and increased communication measures. Adopting these enhancements may promote innovation and adaptation and increase Special Warfare forces' contributions to national defense.

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LIST OF ACRONYMS AND ABBREVIATIONS

APM	Associate Product Manager
ARSOF	Army Special Operations Forces
CEO	Chief Executive Officer
CONUS	Continental United States
CSL	Command Select List
DOD	Department of Defense
EC	Entrepreneurial Capacity
FLOC	Future Land Operating Concept
HRC	Human Resources Command
IDF	Israeli Defense Force
ILE	Intermediate Level Education
IT	Information Technology
JIIM	Joint Interagency Intergovernmental and Multinational
JSOC	Joint Special Operations Command
LNO	Liaison Officer
MIT	Massachusetts Institute of Technology
NCO	Non-Commission Officer
NGO	Non-Governmental Organization
SWC	Special Warfare Command
TOE	Table of Organization and Equipment
TSOC	Theater Special Operations Command
U.S.	United States

USAJFKSWCS	United States Army John F. Kennedy Special Warfare Center and School
USASOC	United States Army Special Operations Command
USSOCOM	United States Special Operations Command
VTC	Video Teleconference

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I.   FRAMING THE PROBLEM

A.   INTRODUCTION

Uncertainty is central to the respective identities of both special warfare and surgical strike forces. ARSOF 2022, the Special Warfare vision document, states that surgical strike forces undertake all efforts to reduce uncertainty in order to gain the necessary advantage. Conversely, special warfare forces are "designed to wade into uncertainty…and prevail."[1] Special warfare forces mitigate uncertainty through the fielding of self-contained forces "designed to accomplish its mission through and with indigenous surrogates and partners,"[2] while surgical strike forces reduce uncertainty through detailed analysis and pinpoint accuracy.[3] This acknowledgement of uncertainty in the operating environment establishes a benchmark against which both forces can design organizations and establish measures of effectiveness.

To determine whether ARSOF are properly structured to conduct special warfare, one must establish the organizational design principles that best fit environments encountered when conducting special warfare. These principles can then be compared to the characteristics of the current ARSOF organizational design and the incompatibilities between the two.

B.   DESIGN PRINCIPLES FOR SPECIAL WARFARE

Special warfare forces are tasked with unconventional warfare, foreign internal defense, stability operations, counterinsurgency, and other activities in environments that range from permissive to non-permissive. These operations entail persistent and embedded partnerships with a network of defense and governmental organizations, both foreign and domestic. These multidimensional networks are constantly evolving as they interact with each other. Rapidly changing environmental elements (instability) and the interaction of many diverse external factors (complexity) are the characteristics of an

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1 Charles T. Cleveland, *ARSOF 2022* (Washington, DC: Department of the Army, 2013), 16.

2 Ibid., 11.

3 Ibid.,10–11.

uncertain environment.[4] Uncertainty is a defining characteristic of environments where special warfare forces operate.

In his 2015 work, *Team of Teams*, General (Ret) Stanley McChrystal describes the difference between systems that are complicated and those that are complex. Complicated systems, analogous to an internal combustion engine, are those with many parts that are joined in relatively simple ways. Complexity is the description of "a diverse array of connected elements that interact frequently." This dramatic increase in interactions between components creates environments that prevent effective prediction.[5] Building on this idea, in 2004 David Kilcullen described the increasing complexity of the future, (now current) operating environment as multilateral and ambiguous, with increasingly complex physical, human and informational terrain that "interact in a mutually reinforcing fashion."[6]

Instability compounds the issues created by complexity. Increased likeliness of change indicates that even if the complex environment was completely understandable, it will likely shift rapidly, making prior systems and knowledge inapplicable. In the technology industry, the rapid rate of advancement is one of the contributing factors to a shift in the "Static-Dynamic dimension" of an environment.[7] Following the theory of Moore's Law, this instability will continue to increase exponentially as new technologies continually disrupt markets.[8] The abrupt entrance of a new technology can shift an entire industry and therefore requires a system that is able to withstand constant change.[9] Similarly, as the world becomes increasingly connected, and the U.S. continues to

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4 Henry Mintzberg, "Organizational Design: Fashion or Fit?," *Harvard Business Review* (Jan–Feb 1981): 4.

5 Stanley A. McChrystal, Tantum Collins, David Silverman, and Chris Fussell, *Team of Teams: New Rules of Engagement for a Complex World* (New York: Portfolio/Penguin, 2015), 56–57.

6 Dave Kilcullen, *Complex Warfighting* (Sydney: Australian Army, 2004), 19.

7 Robert Duncan, "Characteristics of Organizational Environments and Perceived Environment Uncertainty," *Administrative Science Quarterly Vol. 17 Issue 3*, (September 1972): 316. http://www.mcs.org.br/mbc/uploads/biblioteca/1158006928.32A.pdf

8 "50 years of Moore's Law," accessed June, 14 2015, http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html.

9 Anna Lee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Cambridge, MA: Harvard University Press, 1994), 80.

confront an evolving network of nation-states and non-state actors, the operating environment for special warfare forces will likely become increasingly unstable.

Dr. Henry Mintzberg's *Harvard Business Review* analysis of contingency theory and organizational structures defines uncertainty as a function of increasing complexity and increasing instability. Mintzberg states that organizations that operate in complex and unstable (uncertain) environments decentralize decision-making to the appropriate level and emphasize an "organic" approach that focuses on the importance of people, adaptation, and innovation.[10] Uncertain environments necessitate organizations that measure effectiveness through the ability to adapt. This measure requires the ability to recognize the external environment and adjust the organization to meet situational requirements.[11] Adaptation and innovation in response to uncertain environments requires increased connectivity and information sharing. This demand necessitates increased vertical and horizontal linkages within the organization and to its stakeholders.[12]

C. ARSOF ORGANIZATIONAL DESIGN AND INCOMPATIBILITIES WITH SPECIAL WARFARE

Over the past several years, USASOC has enacted several important organizational reforms in response to demands from the operational environment. These reforms include the establishment of the 1st Special Warfare Command, the Special Forces Group unconventional warfare capability redesign, Project Diane, and initiatives to institutionalize persistent engagement duty positions. ARSOF's high levels of training, education, and an organizational focus on the importance of humans over hardware characterize differentiation between the conventional Army and ARSOF. While this focus on human capability is necessary and valuable, it falls short of providing an institutional capability to innovate and adapt commensurate with the complexity of the operational environment.

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10 Mintzberg, "Organizational Design," 8.

11 Edward N. Luttwak, "Notes on Low-Intensity Warfare," *Parameters* (December 1983): 336.

12 Richard M. Burton and Borge Obel, *Strategic Organizational Diagnosis and Design: The Dynamics of Fit*, 3rd ed. (Boston: Kluwer, 2004), 7.

The current ARSOF organizational design can be described as a combination of a professional and machine bureaucracy marked by standardization of work and skills. Machine bureaucracies are built to succeed in environments with greater levels of certainty while executing less-complex tasks; they maximize internal efficiency but lack the flexibility and specialization to adapt to uncertainty.[13] They inherently focus on improving internal processes and efficiency, and tend to be "tall," or have greater numbers of organizational echelons.[14]

USASOC maintains this tall, hierarchical structure, with five or more levels of organization between the operational core and the commander. Current USASOC organizational structures above the operational core mirror those of the conventional Army, with standard divisional structures, coded staff positions and spans of control designed to prevent task saturation. This vertical organizational structure reduces information sharing and limits the use of cross-functional teams, while emphasizing standard operating procedures and rigid control systems to regulate the interaction of departments and subordinate units.

As a non-deployable force provider headquarters, the purview of USASOC is necessarily limited to the preparation and sustainment of special operations forces. As subordinate units are deployed for operations, their aligned Theater Special Operations Commands (TSOC) employ them. This force provider/combatant command relationship is common across the military, and is not unique to USASOC. What makes USASOC unique is the regional alignment of its forces and its ability to provide these regionally aligned special operations forces to each of the TSOCs from the lowest levels (Detachment, Platoon) to an operational two star headquarters (1st Special Warfare Command).

The implications of this design are that USASOC is tasked with preparing its forces to conduct operations, including special warfare. However, it does so from an organizational design that is optimized for administration, training, education, manning,

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13 Mintzberg, "Organizational Design," 8.

14 Ibid.

sustainment, and deployment, largely mirroring the larger Army bureaucracy. To this end, the areas of emphasis are adherence to standard operating procedures, protocols, maintenance of equipment, and personnel management. While these functions are necessary and valuable in order to maintain standards and ensure compliance, special warfare forces are then deployed to operate in support of the TSOC in operational areas defined by complexity and uncertainty. Within this construct, the time should be spent preparing for operating in uncertainty and complexity is dominated by interaction within standardized bureaucratic constraints. These efforts are misaligned.

ARSOF 2022 describes the vision for the optimization of the interdependence between ARSOF, Conventional Forces, and Joint, Interagency, Intergovernmental and Multinational (JIIM) partners. It describes the endstate that "USASOC optimizes the force multiplying potential of partnership with the Army and interagency to provide the nation with seamless combat power."[15] The uncertain and complex environment that necessitates Special Warfare requires constant communication and horizontal integration between nodes in the network.

General (Ret) Stanley McChrystal, in his exploration of organizational development *Team of Teams,* draws from Sandy Pentland's work, *Social Physics,* in distilling the two largest determinants of idea flow within an organization. Pentland finds that "engagement," or problem-solving within a team or unit, and "exploration," or frequent contact with other teams or entities enables idea flow and builds the collective intelligence of an organization.[16] In order to maximize the collective intelligence of an organization, it must be connected within itself and with a diverse set of outside entities.

Despite the unity of command in the newly created 1st Special Warfare Command, there is limited integration of Special Forces, Civil Affairs and Psychological Operations Forces prior to deployment into the theater of operation. The Special Warfare components offer mutually supporting capability and maintain parallel regional alignment. However, the three functions above remain separate as distinct and

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15 Cleveland, *ARSOF 2022*, 17.

16 McChrystal, *Team of Teams*, 196; Sandy Pentland, *Social Physics: How Good Ideas Spread- the Lessons from a New Science* (New York: Penguin Press, 2014), 61, 19–20.

nonintegrated units with few horizontal coordination mechanisms. In accordance with the design of bureaucratic organizations, it is the role of the parent headquarters to accomplish most of the coordination between the units.[17] Furthermore, limited infrastructure exists to integrate interagency partners and ARSOF into cohesive Special Warfare teams and networks prior to arrival in theater. These integration seams and capability gaps require ARSOF to form cohesive teams without the benefit of habitual engagement with other special warfare units and institutionalized interaction with the interagency. The absence of well-developed organizational connections between special warfare units prevents the formation of necessary mutually adjusting networks that habitually communicate prior to employment.

Similar to the absence of internal linkages, special warfare forces currently have limited channels of communication with interagency entities that have a stake in special warfare operations and campaigns. Without persistent organizational ties with multiple levels within the interagency, habitual and widespread collaboration is limited, and special warfare forces are prevented from maximizing their collective intelligence.

However tempting, it is not feasible or realistic to redesign the USASOC organization. The current environment of persistently high operational tempo, personnel downsizing, and fiscal constraints denies the time, space, and will of the organization to attempt such a daunting and potentially risky overhaul. More feasible, however, is the improvement of processes and incremental enhancement to align with the operational environment within the existing design.

Edward Luttwak, in his work "Notes on Low Intensity Conflict" describes two approaches to organizing and preparing for war, attrition based and relational maneuver. The attritional warfare approach strives to optimize the most efficient and overwhelming technological and organizational advantage. In doing so, attrition warfare strives "to develop an optimal set of organizational formats, methods, and tactics which are then to be applied whenever possible with the least modification, because any modification must

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17 Mintzberg, "Organizational Design," 6.

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be suboptimal."[18] This focus on internal processes and optimization limits adaptation to the external environment. Conversely, forces "with a high relational maneuver content cannot usually maximize process efficiencies and cannot logically develop optimal organizational formats, methods, and tactics. Instead, each must be relational, i.e., reconfigured ad hoc for theater, the enemy and the situations."[19] As a result of its inflexibility, the attrition warfare approach declines in effectiveness in the realm of low intensity conflict, while relational maneuver forces become increasingly valuable.[20]

The Army has a long and successful tradition of creating, training, and grooming experts at controlling moving pieces. The U.S. Army as a whole is incentivized to continue to develop leaders that show the highest competence in maneuvering forces in the battlespace, supporting the attrition approach to warfare. In order to measure this ability, measures of effectiveness are often replaced by measures of task proficiency. This subtle shift replaces adaptability in the face of uncertainty and mission success with performance of standard procedures.[21] This preference aligns core competency of the Army as a whole.

It is the relational maneuver capability, however, that ARSOF provides to the Army. As such, its measure of effectiveness should be its ability to adapt to its environment and innovate solutions in the face of uncertainty. Incentive systems play a key role in shaping this capability. ARSOF Officers and Non-commissioned Officers (NCOs) are incentivized very similarly to their counterparts in the rest of the Army. The U.S. Army Human Resource Command (HRC) is the centralized headquarters that directs the administration of Soldiers of all ranks and branches. HRC's promotion and incentive systems are common across all branches of the Army. In particular, the Command Select List (CSL) boards that select individuals to command units at the Battalion level and above are manned by personnel from across the branches of the Army. Currently

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18 Luttwak, "Notes on Low-Intensity Warfare,"13.

19 Ibid., 13.

20 Ibid., 14.

21 Stanley McChrystal (lecture, Naval Postgraduate School, Monterey, CA, July 13, 2015).

USASOC provides guidance to the representatives on CSL boards as to what constitutes success in key developmental positions.

Despite this influence, ARSOF maintains a similar incentive and career progression that largely mirrors requirements for the attrition-oriented branches of the Army. Adherence to this system results in ARSOF leaders that are incentivized to shape their careers in concert with the values and progression of attrition warfare leaders. This fundamental difference in desired leader attributes and actions prevents USASOC from incentivizing the necessary innovation and adaptation to align its force with the demands of special warfare in complex environments.

D.   RESEARCH QUESTION

The emergence of these incompatibilities between USASOC's organizational design and the conduct of special warfare led to the question: what best practices from innovative and adaptive organizations can ARSOF use to increase its capability to conduct special warfare?

E.   METHODS

In order to best understand the broad subject of innovation as it bears upon this study, the research team focused the literature review in the areas of organizational design theory, idea development in organizations, military innovation, and corporate approaches to innovation. From the literature, four factors emerged that increased the innovative capacity and adaptability of organizations: collaboration, organizational structure, incentives, and acceptance.[22]

The group then selected and examined cases of private sector and military innovation, examining if and where the factors of innovation were present. In order to

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22 In order for an idea to become an innovation it must gain acceptance from within the originating organization and in a market of end users. For this study the term acceptance defines the process of building buy-in within an organization for the idea or product, and recognizing a demand for a product or idea and delivering to its end users. This term was derived from the works of Victor A Thomas "Bureaucracy and Innovation" *Administrative Science Quarterly Vol. 10 No.1*, (June 1965): 2. and Loren R. Graham, *Lonely Ideas: Can Russia Compete?* (Cambridge, Massachusetts: MIT Press, 2013), x.

bridge the gap between private sector firms and Department of Defense entities, cases were selected with several key attributes in common with special warfare forces. Cases include organizations that are established and mature, operate across multiple cultures, markets, or demographics, and produce multiple outputs matched against multiple problem sets.

Based on this exploration, the information was compiled to present an analysis of each organization's use of organizational design, methods of collaboration, incentives, and acceptance to increase their capacity to innovate and adapt to best advance their position in the market or service provided. These principles and observations were then applied to special warfare forces in the form of recommendations to increase the organizational capability to innovate and adapt.

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II. LITERATURE REVIEW

A. INTRODUCTION

In order to navigate the full spectrum of literature on innovation, the research group utilized a system to progress towards refined analysis on innovation practices. The first goal was to understand organizations and learn how they develop ideas. This established a base of knowledge from which to understand the fundamentals of innovation. The second goal was to understand how military organizations innovate. This provided an understanding of how organizational theory and creativity apply to the context of special warfare. The third goal was to learn innovation from the perspective of businesses. These lessons could then be compared to those obtained from studying military innovation in order to establish themes for further exploration. Once these categories were thoroughly understood, the group could effectively analyze selected cases to compare specific innovative practices to those identified in the literature review.

This literature review is thus organized into the following sections: organizational design theory, idea development in organizations, military innovation, and corporate approaches to innovation.

B. ORGANIZATIONAL DESIGN THEORY

In his article for the *Harvard Business Review*, "Organizational Design: Fashion or Fit," Henry Mintzberg derives and builds a model for analyzing organizational design. He posits that most organizations fall into natural configurations based on their requirements and environment. Mintzberg organizes his analysis of best-fit organizational structures in relation to the dimensions of task complexity and instability, which are defined as the interaction of many diverse external factors and changing environmental elements, respectively.[23]

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23 Mintzberg, "Organizational Design," 4.

A machine bureaucracy is the natural configuration of an organization in a stable environment with simple tasks.[24] Machine bureaucracies are built to coordinate by standardizing work and maximize efficiency through internal regulations and controls. Professional bureaucracies are designed to coordinate through standardized skills and professional competency; they are characterized by high specialization, education, and training. It fits best in a stable environment with complex task requirements.

Mintzberg indicates that organizations that conduct complex tasks in unstable environments must decentralize decision-making to the appropriate level and emphasize an organic approach that focuses on the importance of people, adaptation, and innovation. In these uncertain environments, groups and organizations interact using mutual adjustment rather than established behavior controls and standard operating procedures. He labels this form the adhocracy.

Burton and Obel's 2004 Strategic Organizational Diagnosis and Design defines the organizational design problem as creating "an organizational design that matches the demand for information." That is, "the greater the uncertainty of the task, the greater the amount of information that has to be processed between decision-makers." In response to this dilemma, "organizations can either increase their ability to process information or decrease the amount of information needed to process."[25] Burton and Obel use structural contingency theory as the framework to solve this matching or fit problem. The organizational diagnosis and design fit process consists of optimizing the organizational design and culture creation to the variables of leadership, organizational climate, skill sets, environment, technology and strategy. The outcomes are measured against optimization of the fit criteria of effectiveness, efficiency and viability.[26]

Using Burton and Obel's method of optimization, the organizational diagnosis and design fit process consists of maximizing both the organizational design and culture creation to the variables of leadership, organizational climate, skill sets, environment,

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24 Ibid., 4.

25 Burton and Obel, *Strategic Organizational Diagnosis and Design*, 7.

26 Ibid., 20.

technology and strategy. The outcomes are measured against optimization under the criteria of effectiveness, efficiency and viability.[27]

Burton and Obel's concepts are further supported by Driver, Brousseau, and Hunsaker's adaptation of the Yerkes-Dodson model. This model represents the relationship between information processing and environmental load. Given the large amount of information to be processed in a complex environment, a centralized hierarchal organization will fail when the leadership is overloaded with information and their performance declines.[28] Information load capacity will vary with individual experience, and increased environmental load will improve performance until overload is reached. By reducing the impediments to work and preventing employees from becoming overloaded with ancillary tasks, organizations create a culture and environment conducive to innovation.

In his basic organizational text, Richard Daft defines culture as "the set of values, beliefs, understandings, and ways of thinking that is shared by members of an organization and taught to new members as correct."[29] He discusses how culture is an everyday component of any organization. Members or employees participate in the organizations culture generally without notice, until the basic cultural norms or values of the organization are challenged or changed. He posits that an organization's culture exists on two levels: observable symbols and underlying values.[30] Daft uses the image of an iceberg to demonstrate the relationship between the observable signs of an organizations culture and the underlying values and norms that support that culture.[31] The unspoken and often unseen underlying assumptions and beliefs greatly impact the culture of an

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27 Ibid., 20.

28 Philip Hunsaker, Kenneth Brousseau, Mike Driver, *The Dynamic Decision Maker* (New York: Harper & Row, 1990), 40.

29 Richard L. Daft, *Essentials of Organizational Theory & Design*, (Mason, Ohio: South-Western College Publishing, 2003), 112 also supported by Vijay Sathe's definition of culture as "the set of important assumptions (often unstated) that members of a community share in common." He asserts that culture is often hard to define because the shared assumptions of the people that make up an organization can be more difficult to interpret than their communications. Vijay Sathe, *Culture and Related Corporate Realities*, (Homewood, Illinois: Richard D. Irwin INC., 1985), 10–11.

30 Daft, *Essentials of Organizational Theory & Design*, 112.

31 Ibid., 113.

organization. A complex working environment, such as the technology industry, by definition has many diverse variables and a large information load that influence an organization.[32]

In his 1968 book, *The Temporary Society*, Warren Bennis explained the need to depart from traditional structures in order to operate in an increasingly changing world.[33] Alvin Toffler built off the ideas of Bennis and proposed the concept of the adhocracy.[34] Under this construct, an organization has the structure to develop new ideas and implement them more effectively than traditional models. Both these organizational theorists laid the foundation for concepts that would eventually be adopted by some of the most innovative institutions in modern business.

C.   IDEA DEVELOPMENT IN ORGANIZATIONS

Steven Kerr's article "On the Folly of Rewarding A While Hoping for B," explains the importance of properly structured incentives. Kerr states that "organisms seek information concerning what activities are rewarded, and then seek to do (or at least pretend to do) those things, often to the virtual exclusion of activities not rewarded."[35] Kerr emphasizes the importance of using incentives to align the goals of individuals with the desired goals of the organization. If the goal of an organization is to win a war, the individuals within that organization should share that as a personal goal. As Kerr describes in a comparison between World War II and Vietnam, the army is less effective at winning a war when the majority of its soldiers are primarily focused on surviving their tour rather than personally concerned with the overall outcome of their collective efforts.[36] Incentives form naturally based on personal perspectives and must be understood by leadership in order to properly align organization member behavior.

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32 Daft, *Essentials of Organizational Design and Theory*, 52.

33 Warren Bennis, *The Temporary Society* (New York: Harper Row, 1968).

34 Alvin Toffler, *Future Shock* (New York: Bantam Books, 1970), 125.

35 Steven Kerr, "On the Folly of Rewarding A While Hoping for B," *Academy of Management Executive Vol I. No. 1*(1995): 7.

36 Kerr, "On the Folly of Rewarding A While Hoping for B," 8.

In support of Kerr's ideas, expectancy theory explains a person's goal-driven motivations. Fred Lunenburg summarizes expectancy theory as having "three key elements: expectancy, instrumentality, and valence. A person is motivated to the degree that he or she believes that (a) effort will lead to acceptable performance (expectancy), (b) performance will be rewarded (instrumentality), and (c) the value of the rewards is highly positive (valence)."[37]

In his book *Group Genius*, Keith Sawyer argues that collaboration is the most critical aspect of innovation. Innovation is not the work of a lone genius but the result of collaborative efforts that achieve sparks of applicable ideas.[38] Information flow and building upon externally developed ideas are inextricable elements of innovation. This collaboration, however, requires guidance and focus in order to produce effective results.[39]

Sawyer gives an example of classic innovation in the creation of the mountain bike: the design for mountain bikes formed through groups of bicycle riders that came across each other riding along steep California trails. In the 1970s, no company produced bicycles specifically for this purpose. As these groups got together, they each noticed little changes that they implemented into their road bikes that helped to maneuver on steep grades. Over time and through increasingly large social gatherings, these groups combined their ideas; handlebar changes, brake modifications, etc. and an innovative design emerged. This design for a bicycle ideal for mountain riding quickly entered the mainstream and the bicycle industry leaders realized they would have to produce this new style in order to compete in the market.[40]

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37 Fred C. Lunenburg, "Expectancy Theory of Motivation: Motivating by Altering Expectations," *International Journal of Management, Business, and Administration. Vol 15 No. 1* (2011): 1–6.

38 Keith Sawyer, *Group Genius* (New York: Basic Books, 2007), Kindle edition, loc 212.

39 Ibid., loc 213.

40 Ibid., loc 39.

Keith Sawyer's studies revealed that insights emerge in individuals as a result of previous collaboration.[41] The Wright brothers reached their historical innovation by building off of previous ideas and then continuing successive development through their own interaction.[42] Even the most creative accomplishments in humanity can be attributed to groups of talented individuals sharing ideas. Claude Monet, and Auguste Renoir were not solely responsible for their brilliant work. They were part of a closely knit group of impressionists who shared ideas and communicated regularly.[43]

The innovative capacity of high rates of collaboration is comparable to the chemical process known as auto-catalysis. Vinod Khosla, co-founder of Sun Microsystems, explains in "The Innovator's Ecosystem" that the interaction of various types of chemicals in the appropriate environment is similar to the science behind innovative systems. When certain chemicals are combined, they catalyze and create a reactant which further catalyzes the compound.[44] Khosla applies this concept, as it relates to complexity theory, to human interaction. "When an idea is successful (even if incremental), it combines with other successful ideas, creating new ideas at an ever faster pace. . ."[45] Sun Microsystems and the high paying clients of Khosla's consulting firm are not the only organizations to recognize the innovative value of collaboration. It is a common theme among the most innovative companies in America.

Ron Adner's review of collaborative innovation, The Wide Lens: What Successful Innovators See That Others Miss establishes a baseline of analysis for organizations desiring to improve innovation and collaboration. Adner establishes that within the private sector, rapidly evolving competition from increasingly responsive

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41 Sawyer, *Group Genius*, loc 121.

42 Ibid., loc 158

43 Ibid., loc 230

44 Jeffrey Steinfeld, Joseph Francisco, and William Hayes, *Chemical Kinetics and Dynamics*, second edition, (Upper Saddle Wood, NJ: Prentice Hall), 151.

45 Vinod Khosla, "The Innovator's Ecosystem," (http://www.khoslaventures.com/wp-content/uploads/The-Innovator%E2%80%99s-Ecosystem.pdf).

competitors force businesses to collaborate within the delivery chain in order to be successful. This collaboration increases potential output and profitability while simultaneously increasing risks, if not properly managed.[46] Therefore, partnership in innovation can lead to failure, as an organization's success becomes vulnerable to the strengths and weaknesses of organizations outside the control of the innovating firm.[47] Wise innovators carefully analyze the links in their chain of collaboration to ensure their product adds value to each collaborator, thereby incentivizing a profitable process for all. An effective strategy for collaboration must account for the interdependence of stakeholders in the innovation process.[48]

Networks are key to building the type of collaboration that capitalizes on ideas from varied organizations. According to Patti Anklam in *Net Work*, a network is a collection of nodes and ties with a common purpose. The nodes can be individuals, groups, or organizations. The strength of a network is usually formed through a dense connection of ties as opposed to capitalizing on strong, isolated, internal nodes. Organizations that close themselves off to external ties are denying the inherent advantages of interconnectivity. On the other hand, a node with the ability to strengthen the network through an increased density of ties is known to have strong social capital. This social capital is key to building the collaboration necessary to compete in a complex environment.[49]

D.   MILITARY INNOVATION

Edward Luttwak describes in "Notes on Low-Intensity Warfare" that in using a direct approach, a conventional, less adaptive force seeks to overwhelm with superior resources and firepower through efficient centralized execution.[50] However, in order to

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46 Ron Adner, *The Wide Lens: A New Strategy for Innovation* (New York: Portfolio/Penguin, 2012), 10.

47 Ibid., 25.

48 Ibid., 157.

49 Patti Ankam, *Net Work* (Amsterdam: Elsevier, 2007), Kindle Edition, loc 420, 798.

50 Luttwak, "Notes on Low-Intensity Warfare," 336.

meet the demands of Special Warfare, ARSOF must be designed to accomplish the tasks of relational maneuver (indirect approach) as well. Luttwak describes the indirect approach as operations by an unorthodox, highly adaptive force that seeks to recognize the aspects of the external environment and adjust its own organization and methods to meet situational requirements.[51] This adjustment of the organization and methods requires innovation and creativity to keep pace with the operational demands.

Barry Posen, in his work *The Sources of Military Doctrine* analyzes military doctrine and its effects on the state security of Britain, France, and Germany during the interwar period. Posen uses organizational theory and balance of power theory as instruments to assess a state's grand strategy. Posen posits that military organizations will seldom innovate on their own. Consistent with organizational theory, he asserts that organizations dislike uncertainty and therefore instinctively avoid the major changes to operations and processes that entail uncertainty. Furthermore, military organizations are hierarchical, and those at the top of the hierarchy tend to restrict idea flow and maintain previously mastered practices, rather than accepting new ones. He then summarizes that because of these organizational constraints, military innovation tends to occur after a large defeat or is due to civilian intervention.[52] Militaries have cultural and bureaucratic resistance to change and often adjust to changes in warfare after suffering major losses.[53] If an organization does not have the internal structure to facilitate the implementation of useful ideas, an external element with significant influence can force the change.

In "New Ways of War: Understanding Military Innovation," Stephen Rosen defines militaries as "complex political communities" and therefore "innovation requires

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51 Luttwak, "Notes on Low-Intensity Warfare," 336.

52 Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars* (Ithaca: Cornell University Press, 1984).

53 Supported by evidence of Russian innovation after Operation Barbarossa. David M. Glantz, "The Red mask: The nature and legacy of Soviet military deception in the Second World War," *Intelligence and National Security 2:3* (1987): 177. Also supported by changes from the Goldwater-Nichols Act. Whittaker, Alan G., Brown, Shannon A., Smith, Frederick C., & McKune, Elizabeth, "The National Security Policy Process: The National Security Council and Interagency System," *Annual Research Report* (August 15, 2011).

an ideological struggle" that will produce a "new theory of victory."[54] According to Rosen, legitimacy in military organizations comes from victory in military operations. To seek legitimacy, militaries will attempt to determine what future operational environments will exist and how the organization will achieve success operating in those environments; this becomes a new theory of victory. The theory must then be translated into critical tasks and missions that are accepted by the service. The tasks must be defined and measures of effectiveness must be created as well. Officers and subordinate units will then be judged by their ability to perform these new tasks. If the organization fails to reformulate new tasks and measures of effectiveness, the innovation may become irrelevant and will not change the organizations behavior. Rosen continues by asserting that political power in in military organizations is gained by influencing who reaches senior command positions. A career path for those innovative officers who subscribe to the "new theory of victory" must be made in order to prevent them from being pigeon holed into a specialty position that offers no future for senior command. Rosen believes that innovation in military organizations tends to occur from the top down, although the innovative ideas can come from the bottom up. This exemplifies that the institution must be complicit for change to occur in a military organization.[55]

Rosen attributes faster innovation in wartime than in peacetime to the fact that "bad commanders can be relieved and bureaucratic routines bypassed more easily."[56] Without the dynamics of wartime, he argues, military innovation is a 20-year process dependent on appropriate assessment of future requirements. If the future environment can be predicted accurately, the institutional changes will affect incoming junior officers, and over time they will be making the critical decisions through a new perspective.[57] The advantages provided by wartime innovation are the only means to affecting innovation in a timeframe suitable for the contemporary operating environment.

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54 Stephen Rosen, "New Ways of War: Understanding Military Innovation," *International Security, Vol. 13, No. 1* (Summer, 1988): 141.

55 Rosen, "New Ways of War: Understanding Military Innovation," 140–143.

56 Ibid., 167.

57 Ibid., 167.

Dima Adamsky of Stanford University examines the history of military innovation during the revolution of military affairs in his book *The Culture of Military Innovation*. Adamsky states that there were three unique responses to the revolution in military affairs from the three nations. The Soviets were the first to conceive of the "new theory of victory," and their conceptualization of the revolution in military affairs preceded their technological procurement and combat experience.[58] Conversely, in the American and Israeli cases, technological gains far preceded the realization that the nature of warfare had changed.[59]

While the Soviets contemplated the impact of the technological leaps, they lacked the industrial capability to stay astride the west in the development of technology. This combined with the Russian culture's comparative emphasis on declarative knowledge, and the relative importance of understanding over acting and implementing, ensured that the Soviets never fully executed their superior thoughts and ideas.[60] In contrast, the American fixation on quick results, opposition to long wars, and fixation on new technologies led to a reliance on technology as a cure-all for national security challenges.[61] The Israelis developed a regionally peerless defense industry and became similarly fixated on the power of technology, at the price of an understanding of the vision of future warfare. Furthermore, great importance was placed on "promoting practitioners over theoreticians," and the IDF developed an anti-academic and anti-intellectual tradition.[62] Thus, "the IDF operated without long term conceptual and doctrinal vision," and this tactical capability and focus produced an inability to perceive game-changing shifts in the nature of war and military thought.[63]

Hy Rothstein provides a useful summary of military innovation in waging unconventional warfare in his 2006 work *Afghanistan and the Troubled Future of*

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58 Dima Adamsky, *The Culture of Military Innovation: The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, U.S., and Israel* (Palo Alto: Stanford University Press, 2010), 131.

59 Ibid., 131.

60 Adamsky, *The Culture of Military Innovation*, 57.

61 Ibid., 91.

62 Ibid., 127.

63 Ibid., 127–128.

Unconventional Warfare. Rothstein draws from a lengthy list of works studying bureaucracy, contingency theory, and the role of the military in innovation. With respect to organizational theory, Rothstein concludes that contingency theory is an effective model for designing organizations to conduct operations in uncertain environments with high task complexity. Rothstein further summarizes the implications from literature discussing innovation as applied to the conduct of unconventional warfare with nine propositions.[64]

1. Innovation in military organizations is difficult and often requires outside intervention.[65]
2. Military organizations cope with uncertainty by developing standardized procedures and by distributing authority to enforce these procedures.[66]
3. Those who hold power and authority in an organization have a vested interest in the doctrine associated with their status.[67]
4. Innovation can be internally generated by the desire of professional officers to secure the state as well as by the promise of more resources.[68]
5. Scientific entrepreneurship helps develop technologies that can instigate innovation.[69]
6. Innovation is the result of individuals and their ideas.[70]
7. Organizational culture can either facilitate or deter innovation.[71]

64 Hy S. Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare* (Annapolis, MD: Naval Institute Press, 2006), 46–87.

65 David Tucker, "Processes of Innovation" (Monterey, CA: unpublished paper, 2002): 60, 74–75, 239; Barry R. Posen, *The Sources of Military Doctrine, France, Britain, and Germany between the World Wars* (Ithaca: Cornell University Press, 1984) in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

66 Tucker, "Processes of Innovation," 44, 46; Posen, *The Sources of Military Doctrine* in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

67 Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 60.

68 Emily O. Goldman, "Mission Possible: Organizational Learning in Peacetime," in *The Politics of Strategic Adjustment, Ideas, Institutions, and Interest,* eds. Peter Trubowitz, Emily O. Goldman, and Edward Rhodes (New York: Colombia University Press, 1999), 255. in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

69 Tucker, "Processes of Innovation," 44; Matthew Evangelista, *Innovation and the Arms Race* (Ithaca, NY: Cornell University Press, 1988), 59–65; Kimberly Marten Zisk, *Engaging the Enemy: Organization Theory and Soviet Military Innovation, 1955–1991* (Princeton, NJ: Princeton University Press, 1993), 6, 26, 184 in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

70 Tucker, "Processes of Innovation," 44 in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

71 Theo Farrell, "World Culture and the Irish Army, 1922–1942," in *The Sources of Military Change: Culture, Politics, Technology,* eds. Theo Farrell and Terry Terriff (London: Lynne Rienner Publishers, 2002), 70–82 in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

8.   Organizational culture is shaped by incentive structures that operate in the organization.[72]

9.   The interests of an organization determine what it thinks about a given innovation.[73]

These premises provide a roadmap for understanding the causes and impediments of military innovation. Application of organizational design theory or private sector innovation to the ARSOF can be viewed through the framework of these propositions.

Dave Kilcullen developed the Australian Army's Future Land Operational Concept (FLOC) in Complex Warfighting. In this doctrinal work he explains that "Land Forces for complex warfighting must be optimized for versatility, agility and orchestration." Building on previous military strategists and his own research on contemporary battlefields, he illustrates the key elements necessary to succeed in the 21st century. He universally applies versatility, agility, and orchestration as essential elements of future land forces operating in an increasingly complex environment.[74]

In The Generals, Thomas Ricks asserts that the U.S. military has experienced a steady decline in the efficacy of general officers. He attributes this to a poor incentive and promotion system that rewards risk aversion and promotes mediocrity.[75] He further argues that few American generals have been competent in recent military conflicts yet there are no consequences for their failures as opposed to World War II when leaders at all echelons were fired for poor performance.[76] According to Ricks, "adaptability and risk taking largely had been bred out of American Generals."[77]

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72 Deborah D. Avant, *Political Institutions and Military Change: Lessons from Peripheral Wars*, (Ithaca, NY: Cornell University Press, 1994), 6, 7, 15, 17 in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

73 Zisk, *Engaging the Enemy,* 6, 26, 184 in Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare*, 46–87.

74 Kilcullen, *Complex Warfighting*, 19.

75 Thomas E. Ricks, *The Generals: American Military Command From World War II to Today* (New York: Penguin Press, 2012), 375.

76 Ibid., 1.

77 Ibid., 393.

E.   CORPORATE APPROACHES TO INNOVATION

Jeff Dyer, Hal Gregersen, and Clayton M. Christensen conducted a six-year study to identify the skills common among top innovative leaders and published the work as The Innovator's DNA for the Harvard Business Review Press. Dyer, Gregersen, and Christensen identified five increasable skills that separate creative and innovative leaders from their peers: associating, questioning, observing, experimenting, and networking.[78] They also noted that executives are seldom the direct source of innovation, rather, they create and facilitate environments where innovation flourishes.

The Innovator's DNA describes associating as the ability to "connect seemingly wildly different ideas, objects, services, technologies, and disciplines to dish up new and unusual innovations."[79] Furthermore, Innovators question. They seek to ask hard questions to challenge the status quo, and they embrace opposite paradigms and intellectual constraints.[80]

The majority of innovators are observers. They produce new ideas by observing and understanding the desired intent of those doing a job and by recognizing how solutions from different contexts can be applied to new problems.[81]

Experimenting is the fourth skill. "Like scientists, innovative entrepreneurs actively try out new ideas by creating prototypes and launching pilots."[82] This attitude is characterized by Edison's famous quote, "I haven't failed. I've simply found 10,000 ways that do not work."[83] The final skill is networking. Innovative leaders network to encounter new perspectives from diverse thinkers and actors in disparate fields.[84]

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78 Jeff Dyer, Hal B. Gregersen, and Clayton M. Christensen, *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*, (Boston: Harvard Business Press, 2011), 17–133.

79 Ibid., 45.

80 Ibid., 66–69.

81 Ibid., 89.

82 Ibid., 133.

83 Ibid., 133.

84 Ibid., 113.

To extrapolate the individual skills of innovators into organizational design, The Innovator's DNA presents three central ideas. First, innovative firms select personnel based on the five discovery skills and hold the most qualified in key leadership positions. Innovative organizations then create internal processes "that mirror the individual discovery behaviors."[85] These behaviors are supported by four philosophies that support innovation as a core capability, and motivate people to align themselves accordingly: "innovation is everyone's job, disruptive innovation is part of the, deploy lots of small properly organized innovation project teams, and take smart risks in the pursuit of innovation."[86]

In their article for the *Journal of Leadership and Organizational Studies*, "Strategic Leadership and Entrepreneurial Capability for Game Change," Abdelgawad, Zahra, Svejenovea, and Sapienza assert that senior leadership in an existing organization is critical in creating the capability to realize game changing outcomes, which are the result of Entrepreneurial Capability (EC).[87] EC is "a means of sensing, selecting, shaping, and synchronizing internal and external conditions for the exploration and exploitation of opportunities." Furthermore, "EC involves both the exploration and exploitation of opportunities to synchronize and shape emergent conditions internal and external to the firm."[88]

Leaders create EC by incentivizing and aligning people in organizations to gather and present new information, including challenging the status quo and those practices that are "taken for granted." This process is referred to as sensing. Second, leaders select from a broad range of ideas, including those that may be contradictory and subject them to rigorous analysis. Third, leaders shape their organization to match the ideas and actions selected through reconfiguration of existing capability, transposing knowledge from outside sources, alignment of proponency for particular ideas or courses of action.

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85 Ibid., 169.

86 Ibid., 169.

87 Sondos G. Abdelgawad, Shaker A. Zahra, Silviya Svejenova, and Harry J. Sapienza, "Strategic Leadership and Entrepreneurial Capability for Game Change," *Journal of Leadership & Organizational Studies XX(X)* (2013): 394–407.

88 Ibid., 3.

Finally, leaders ensure that the organization is synchronized through alignment of internal processes and capabilities to external resources to enable effective creation of outputs.[89] Developed EC has several positive effects on an organization's capability and influence. EC increases an organization's ability to realize opportunities exist and create avenues to exploit those opportunities. Externally, exploited opportunities transform an organization's ecosystem.[90] Internally, EC increases the organization's ability to create novelty (innovate), and more rapidly initiate game changing strategies.[91]

"Change is pervasive; the key strategic challenge facing managers of contemporary businesses is managing this change."[92] In *Competing on the Edge: Strategy as Structured Chaos*, Brown and Eisenhardt discuss strategies for businesses that need to consistently anticipate the change in the environment and markets in order to stay ahead of their competitors. The authors divide the cases they examine and the lessons they draw into three major areas: strategy, organization, and leadership. Through these areas, Brown and Eisenhardt seek to learn how the managers of organizations in the computer industry cope with the fast-paced volatile marketplace where the slogan is "have lunch or be lunch."[93] The rules that Brown and Eisenhardt offer for "competing on the edge" seem applicable to any organization that must render management solutions when facing constant change. The themes presented by Brown and Eisenhardt offer helpful advice for organizations that seek to bolster innovation and expand creative culture.

F.   IDENTIFIED INNOVATION THEMES

The research group identified four themes emerging from the previously described works and supporting literature: collaboration, structure, incentives, and acceptance. Of these, no single theme identifies a lynchpin for innovation. Instead, they

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89 Ibid., 4.

90 Ibid., 8.

91 Ibid., 7.

92 Shona L. Brown and Kathleen M. Eisenhardt, *Competing on the Edge: Strategy as Structured Chaos* (Boston: Harvard Business School Press, 1998), 243.

93 Brown and Eisenhardt, *Competing on the Edge: Strategy as Structured Chaos*, 243. Another common term being used is "Innovate or die," Matthew Wall, "Innovate or die: The stark message for big business," BBC.com, 5 September 2014, http://www.bbc.com/news/business-28865268 .

each include factors that build on an organization's ability to innovate and adapt. For example, the machine bureaucracy is not a favorable structure for idea development, yet innovative ideas can emerge from within such an organization. It is more likely, however, that ideas emerge from an adhocracy.[94]

1.   Collaboration

Organizations with high rates of collaboration increase idea flow by involving a diverse array of specialists to bring unique insight into a problem. This is aided by an organization's structure, its culture, and connections to an external network.[95]

2.   Structure

Modern organizational theorists recognize the creation and implementation of new ideas are more likely in certain structures than in others. Increasing horizontal instead of vertical linkages facilitates the flat and highly connected structure common in most of today's innovative organizations.[96]

3.   Incentives

Innovation is stimulated by aligning incentives to traits and activities that align with and support innovation and adaptation. Innovation may be discussed, and mandated by organizational leadership, yet if there is no process for rewarding that innovation, it is unlikely to catch on among members.[97]

4.   Acceptance

Innovative ideas must be accepted at all levels in an organization in order to be completely implemented. For this study the term "acceptance" is the process of building

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94 Mintzberg, "Organizational Design," 6.

95 Identified through the previously cited works by Sawyer, Mintzberg, Bennis, Toffler, Khosla, Adner, and Anklam.

96 Identified through the previously cited works of Mintzberg, Burton and Obel, Bennis, Toffler, Sawyer, Luttwak, Posen, Kilcullen, Christensen, Abdelgawad, and Brown and Eisenhardt.

97 Identified through the previously cited works of Kerr, Rothstein, Abdelgawad, Ricks.

buy-in within an organization for an idea or product, and recognizing a demand for a product or idea and delivering to its end users.[98] This is especially difficult in the conservative and risk averse culture of militaries.[99]

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[98] This term was derived from the works of Victor A Thomas "Bureaucracy and Innovation" *Administrative Science Quarterly Vol. 10 No.1* (June 1965): 2, and Loren R. Graham, *Lonely Ideas: Can Russia Compete?* (Cambridge, Massachusetts: MIT Press, 2013), x.

[99] Identified through the previously cited works of Posen, Rosen, Adamsky, Daft, Adner, Rothstein, Ricks, and Abdelgawad.

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III. CASE ANALYSES

A. INTRODUCTION

This chapter presents examples of organizations that exhibit innovative and adaptive practices. These organizations are not only innovative but also extremely successful within their respective fields. These organizations possess several key attributes in common with special warfare forces. The cases include organizations that are established and mature, operate across multiple cultures, markets, or demographics, and produce diverse outputs matched against unstable or complex problem sets.

First, the group chose to examine Google as an example of an adaptable organic organization that tends to exist in the uncertain environment of the technology industry. The second case, JSOC, represents a military organization that has modified its organizational design to match the networked design of its adversaries. The third case study examines why a particular geographical area, Silicon Valley, contains such a high concentration of innovative organizations. The last case examines several organizations from outside the military and technology industries to evaluate innovative practices from the manufacturing, design, food, and beverage industries. In sum, this chapter seeks to illuminate best practices from these organizations from a variety of industries.

B. GOOGLE

Google is one of the most successful tech companies of the information age, and it is well known through contemporary media for its creative culture. The company intentionally creates a workspace very different from conventional corporate America. Today Google has over 40,000 employees working at more than 70 offices in 40 countries across the world.[100] However, the roots of Google's philosophy were seeded when the fledgling company was formed on the Stanford campus by its founders Larry

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100 "About Google," accessed October 14, 2015, https://www.google.com/intl/en/about/company/facts/locations/.

Page and Sergey Brin.[101] Page and Brin proceeded to build the multi-billion dollar company from a startup based out of a garage in Menlo Park, California.[102]

In the Plex, Steven Levy conveys the "dorm room" mentality throughout the massive Mountain View, California Google office complex as a replication of the environment in which the company began.[103] Google intentionally creates a work environment that facilitates interaction and creativity while avoiding conventional office designs intended to increase efficiency.

Google maintains a structure of fluid collaboration despite growing to a company of over 53,000 employees.[104] Always seeking to capitalize on the concept of dorm room and garage style offices of its origin, the strategic vision of the company ensures that employees of different specialties are constantly interacting and combining their genius in order to develop new and innovative products.[105] Through the lens of organizational design theory, Google's structure can be described as an adhocracy with temporary, cross-functional teams.[106] Google maintains a loose administrative structure with many functional areas. These different functions do not have distinctly defined lines because the company operates mostly in project teams with various support staff assisting the overall structure. Through cross-functional teams, members from various functions are constantly interacting. Engineering, design, and technical solutions personnel are coordinating with government relations and social impact specialists. Within this structure there are temporary teams assigned for special projects. There are horizontal linkages and collaborations happening within teams across a wide variety of functional areas and across the different teams in the company due to the unique environment that

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101 Ibid.

102 $65.83 billion in 2014, from Google annual income statement, marketwatch.com, accessed October 14, 2015, http://www.marketwatch.com/investing/stock/goog/financials.

103 Steve Levy, *In the Plex* (New York: Simon and Schuster, 2011), 129.

104"Financial Reporting and Headcount," accessed October 14, 2015, https://investor.google.com/financial/tables.html.

105 Annika Steiber, *The Google Model: Managing Continuous Innovation in a Rapidly Changing World* (Goeteborg, Sweden: Springer International Publishing, 2014), Kindle edition, loc 418.

106 Mintzberg, "Organizational Design," 11.

Google establishes. These mutual adjustments, as described by Mintzberg, are one of the defining features of the Adhocracy.[107]

Anika Steiber provides insight into Google's organizational structure in her book on the company's ability to innovate. "Companies that operate in rapidly changing environments need to continuously and proactively change their organization."[108] Google's fluid nature and structural flexibility allow teams to form and interact as needed. There is no need for a complex mapping of linkages when describing the company because the very strength of the organization is the lack of defined links. If a product team recognizes the need to collaborate closely with a social impact specialist (vertical, horizontal or diagonal link), they can integrate that specialist into the project team.

This conceptual structure may give the impression that Google operates through chaotic disorganization. However, this assumption ignores the effectiveness of the company's technical expertise. A high level of professionalism is evident through engineering and maintenance accomplishments that exceed other companies in the field. The exceptionality of Google in this area is not that it ignores the need for organization; it is that teams self-adjust and rapidly change the organization as necessary.

As an organization, Google continues to be a model for success in the fast paced tech world. Its structure, however, is only one small part of what makes it efficient in the unstable, complex environment. The structural concepts are effective within this model because of its organizational culture.

Maintaining the culture and atmosphere of Google is extremely important to its founders Larry Page and Sergey Brin. The bright colors, recreation facilities, lounges, and cafes all have distinct purposes and are critical to the way Google does business.

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107 Mintzberg, "Organizational Design," 11.

108 Steiber, *The Google Model*, loc 639.

At Google, the office culture and atmosphere are a physical manifestation of the organizational design elements of an adhocracy.[109] The "Plex" was designed to have a "campus like" feel. The compact workspaces force Google employees to collaborate. The cafes and recreational areas are designed to reduce the impediments to work and force creative interactions by keeping the employees at work and bringing them together in community areas. This design brings personnel from different project teams together to interact where they would not have normally had interaction in a different work environment. Google's AdSense product, a multi-billion dollar business, was created by a group of engineers from different design teams that were hanging out playing pool in one of Google's many lounge areas.[110]

In the high technology world, companies self-innovate to increase internal collaboration. Industry leaders recognized that they had no way to maintain their companies without constant innovation.[111] Innovative companies like Google put serious thought into how to increase interaction among employees beyond structural adaptations. One proven technique is the on-site free cafeterias that keep employees on campus and constantly communicating, even eavesdropping on other group's ideas. The cafeteria and lounge areas are known for being the locations in which many great ideas were formed. Google spends 80 million dollars per year on food for its employees.[112]

When Google relocated to their current campus, they applied specific design elements to increase human density. The previous owners of the structure, Silicon Graphics Inc., had only 950 employees. Google placed over 2,500 workers in the same space, overcrowding work areas to increase interaction. These areas were also kept open and unobstructed by the partitions ubiquitous throughout corporate America. This open

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109 "Adhocracy" is a term coined by Alvin Toffler in his *Future Shock* (New York: Bantam Books, 1970), 125. (he in turn, built on the ideas from Warren Bennis, *The Temporary Society* (New York: Harper Row, 1968).

110 Eric Schmidt, *Google: How Google Works* (New York: Grand Central Publishing, 2014), 34–37.

111 Steiber, *The Google Model,* Kindle edition, loc 639.

112 Levy, *In The Plex*, 134.

space allows conversations to be accidentally overheard thus creating passive collaboration.[113]

Another aspect of Google's internal integration is the weekly Friday afternoon meeting nicknamed "TGIF," initially started as an informal gathering to spread news and introduce new employees. TGIF is now video teleconferenced to all Google locations which demo new programs, initiatives, and most importantly, allow a "no holds barred Q and A" session with the founders, Larry Page and Sergey Brin. Ideas generated throughout Google are shared with fellow employees from Asia to Silicon Valley and project teams receive input as a result.[114] Employees are expected to ask tough questions if they do not understand the direction a project is moving or disagree with new policy.[115] This type of behavior that questions authority and seeks truth is a cornerstone of Google's internal process and is rooted in the personalities of the founders. It not only serves to inculcate a culture of open communication, but also encourages interaction between various echelons of management and employees.

The underlying values and beliefs of Google can be traced back to the personality and experiences of founders. Larry and Sergey were both "Montessori" kids. At Montessori school Larry and Sergey learned to do things because they made sense, not because an authority figure told them to do it. This experience made them natural problem-solvers, independent thinkers, and programmed to challenge authority.[116] Another aspect of the underlying values can be attributed to the way Google started in the garage of a colleague's house in a residential neighborhood. At their original location in Menlo Park they became accustomed to the amenities and conveniences of working from a residence. Having a shower and kitchen in the immediate vicinity helped the Google's founders realize the benefits of removing as many of the impediments to work as possible. Google removes impediments to work in other ways as well. In order to minimize the disruption of expense processing, Google set up a corporate "G-Card" that

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113 Ibid., 132

114 Ibid., 6.

115 Ibid., 130.

116 Ibid., 121.

streamlined the system and automated the work.[117] "Essentially, Google has eliminated a potential hundreds of thousands of downtime hours that employees would otherwise spend on housekeeping errands [sic]."[118]

Another characteristic of Google culture stems from the core beliefs of the founders. The mission of Google, "to organize the world's information and make it universally accessible and useful,"[119] reflects the normative values of Larry and Sergey. Google's mission and culture are deliberate and thoroughly considered by the founders themselves and contrasts sharply with the practices of some large companies where the mission statements and company vision-documents are filled with corporate jargon and cliché, created by human resources personnel, signed by the CEO and distributed.[120] Larry and Sergey want their mission and beliefs to guide their employees' focus and factor in decision making. The founders of Google understand the importance of having clearly articulated mission and goals, and allowing their employees the room to accomplish that mission. Google's policies and strategy are focused on anticipating and managing the change in the external environment and they must be highly adaptive to a consistently changing technology environment. Conversely, the bureaucratic culture focuses on internal processes and efficiency. External alignment rewards innovation and creates change.

Organizations are influenced by a variety of external stakeholders.[121] Google's external stakeholders are its users. Google's approach to the external environment is displayed by their "Ten Truths."[122] Their external focus exemplifies what Daft calls a "strong adaptive culture."[123] The management of their strong adaptive culture is the main way they attract new talent. This can be seen through Google's hiring practices. Google

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117 Ibid., 137.

118 Ibid., 137.

119 "About Google," accessed March 20, 2015, https://www.google.com/intl/en/about/.

120 Schmidt, *Google*, 47–67.

121 Ibid., 122.

122 "About Google," accessed March 20, 2015, https://www.google.com/intl/en/about/.

123 Daft, *Essentials of Organizational Theory & Design*, 117.

places a strong emphasis on the measurable scores of academia when vetting employees. They run their interview process much like a Ph. D. defense,[124] and value talent over experience. This focus on creating an intellectually charged atmosphere, "where the kind of people we wanted to work here would work here for free,"[125] has helped Google remain outwardly focused and an industry leader, with a distinct a culture. Consistent with Google's progressive cultural adjustments are the ways in which they incentivize their employees.

Talent management and incentives are as important to Google as the structure and culture. The selection and development of high potential junior executives is a central element to continuous success in the industry. Google uses the Associate Product Manager Program (APM) to inculcate a culture of innovation and understanding among those that have a bright future within the company. Levy points out one particular APM trip in which the future leaders of the company traveled to more than a dozen cities across the world. They were exposed to Asian tech markets and remote third world villages. The trip did not force ideas upon the group, but facilitated their self-improvement through exposure. The author describes this inculcation process as making APMs "more Googley."[126]

The 70/20/10 policy instituted by Google has clear ties to the underlying values of the company. Under this rule, the engineers would spend 70% of their time on assigned projects, 20% on projects of their choosing within their area of expertise, and 10% on "wild card" projects that could be anything that interested them.[127] This system helps Google maintain a creative edge, stay true to its beliefs, and provide intrinsic motivation for its top talent.

Google places extraordinary value on establishing an organizational culture that supports the competitive advantages of innovation and adaptability. The incentive structure driving this culture is aligned with the expectancy theory model. First, Google

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124 Levy, *In The Plex*, 135.

125 Ibid., 138.

126 Levy, *In the Plex*, 4.

127 Ibid., 162.

recognizes the centrality of hiring people with valence[128] in line with the culture, phrased simply as "getting hiring right."[129] For Google, this means intentionally and persistently hiring people who are highly intelligent and potentially smarter than the manager or the person conducting the interview.[130] This includes hiring heavily from the academic community, a population that tends to be smart and well vetted through tenure and peer review, thereby reducing the risk of inadvertently hiring someone less intelligent or a poor performer.[131]

The predominant trait sought by Google is a growth mindset, described in How Google Works, of being a learner. The valence of a typical learner nests neatly within Google's culture. Learners tend to be self-motivated to improve and drive themselves; they need room for self-improvement, and value the process of competition and the resulting comradery. Additionally, learners tend to more easily admit mistakes, and view failure as a natural part of the self-improvement process. The combination of vetted intelligence and self-motivation provides the ideal hire for Google, in the form of "Smart Creatives."[132] This self-propelled drive toward excellence in its employees gives Google the freedom to establish a culture that focuses on removing barriers to communication. It provides great freedom to innovate, and stays away from unnecessarily restrictive rules and work standardization.

To provide initial incentives for "smart creatives" to join their ranks, Google uses the herd effect to their benefit.[133] By placing great emphasis on the importance of getting hiring right, Google ensures that the "smart creatives" hire more smart creatives. The perpetuation of a high bar to entry becomes a recruiting tool in itself.

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128 Expectancy theory defines valence as the perceived value of the rewards expected from the work undertaken. This value and expectation is based on the needs, goals and values of the individual. Fred C. Lunenburg, "Expectancy Theory of Motivation: Motivating by Altering Expectations," *International Journal of Management, Business, and Administration. Vol 15 No. 1* (2011): 1–6.

129 Schmidt, *Google*, 96.

130 Ibid., 98.

131 Ibid., 98.

132 Schmidt, *Google,* 102–105.

133 Ibid., 99.

Intrinsic rewards are a powerful tool to motivate people toward effort and performance, but are not complete by themselves (few people actually work for free). Monetary rewards to ensure instrumentality are utilized by Google to shape and reinforce the culture through further incentivizing high performance. Google chooses to use disproportionate rewards in their pay structure to motivate and retain key employees. The idea that "exceptional people get exceptional pay" bucks the long-standing trends in corporate culture that rewards go to those close to the top (CEO salaries) and close to the transactions (investment bankers, salespeople). Instead, big rewards are given to the people closest to great products and innovations.[134] Google strives to avoid egalitarian pay, where people making vastly different contributions are paid about the same.

The ongoing desire to perform is maintained by ensuring that these smart and creative employees are kept interested. One way this is accomplished is by preventing people from becoming too comfortable or settled in one particular role. High performing employees are moved between key developmental jobs periodically as they progress through the company, ensuring they are developed into well-rounded professionals and ensuring a state of constant learning.[135] As a force of market demand for their employees, top performers and smart creatives are frequently drawn toward other opportunities. In response, Google has chosen to make retention of top employees a financial priority, and they have chosen to "move mountains to retain valued leaders, stars and innovators."[136]

Google's incentive structure acts as a self-feeding system, mirroring the Expectancy model. The company is built on the backs of "smart creatives" and learners, driven explorers with a high tolerance of failure with tendencies toward comradery and high performance. These top performers are incentivized by rewards for adding value to the company, and retained through initiatives to keep the work interesting. This combination results in exceptional individual effort, which combined with the inherent ability of the personnel, and backed by the resources of a multi-billion dollar company, to

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134 Ibid., 126–128.

135 Schmidt, *Google,* 127.

136 Ibid., 129–131.

performance above and beyond other industry leaders. This performance feeds back into the valence and instrumentality that define the baseline for Google's performance.

Google considers the environment and its connection to a culture of innovation to be essential.[137] While the dorm room mentality may be difficult to transplant into military culture, there are aspects that can be transferred to any organization that requires a shift to more innovative practices.

1. Conclusions

- Specific aspects of infrastructure design, physical environment and culture, and reduction of the impediments to work force collaboration and knowledge sharing promote innovation

- Organic, ad-hoc, cross-functional project teams facilitate the required flexibility and adaptability to succeed in an unstable and complex environment.

- Clearly understood priorities and organizational philosophy, and a culture of open communication between echelons of the organization, stimulate initiative and permit ideas to grow.

- A strong emphasis on hiring talented personnel and rewarding those with great and innovative ideas provide motivation and incentive to attract top performers.

C. JOINT SPECIAL OPERATIONS COMMAND

The Joint Special Operations Command (JSOC) is an operational subordinate command of the U.S. Special Operations Command (USSOCOM), and was established in 1980. Formed in response to the institutional failures of Operation EAGLE CLAW in Iran, JSOC members have been active in each of our nation's conflicts since its inception. According to SOCOM, JSOC is "charged to study special operations requirements and

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137 Levy, *In the Plex*, 136.

techniques, ensure interoperability and equipment standardization, plan and conduct special operations exercises and training, and develop joint special operations tactics."[138]

General (Ret.) Stanley McChrystal commanded JSOC from 2003 to 2006. Upon taking command, General McChrystal realized that his command was facing an enemy that was arrayed as a loose network, loosely structured and highly adaptive, but capable of great operational breadth and agility.[139] During his time at JSOC, he enacted fundamental organizational design and cultural changes in response to the complex environment that the command faced in its surgical strike operations in Iraq and Afghanistan. In his work Team of Teams and supporting lectures, McChrystal lays out ideas on increasing organizational effectiveness, drawn from his personnel experience and additional research. The central idea of the book is the interaction of organizations with complexity. McChrystal uses Edward Lorenz's definition of complexity, described as "…a diverse array of connected elements that interact frequently."[140] As the density of these interactions increases, even small numbers of elements in a network can quickly prevent prediction.[141] This definition resembles that of Mintzberg, as it relates frequent interactions and constant change.

General (Ret.) McChrystal discusses three key themes concerning organizational effectiveness in the face of complexity. First, he explains that the inflexible and bureaucratic measures of efficiency that JSOC employed were insufficient in the face of the complexity of the operational environment in Iraq during Operation IRAQI FREEDOM. Second, he explains the importance of institutionalizing shared consciousness, and the effects of connecting his organization to itself and an exterior network of partners. Lastly, he argues that decentralization of decision-making in JSOC enabled greater organizational flexibility.

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138 "Joint Special Operations Command," Joint Special Operations Command. October 13, 2015, http://www.socom.mil/pages/jointspecialoperationscommand.aspx.

139 Stanley A. McChrystal, Tantum Collins, David Silverman, and Chris Fussell, *Team of Teams: New Rules of Engagement for a Complex World* (New York: Portfolio/Penguin, 2015), 49.

140 Ibid., 56.

141 McChrystal, *Team of Teams*, 57.

McChrystal notes that the focus of management has long been improvements to organizational efficiency.[142] The result of this quest for efficiency was hierarchical divisional and bureaucratic organizational structures, which were well utilized by businesses and militaries alike.[143] Upon initiation of operations in Iraq, the rigid hierarchy that defines military bureaucracy was a reality in JSOC, despite its stature as an elite special operations entity. When faced with a newly complex and volatile operational environment, JSOC increased its internal efficiency in conducting core tasks. However, this response was ineffective due to the organization's lack of flexibility and adaptability. The classic military bureaucratic structure stifled both the necessary speed of execution and adaptability to react in pace with changes in the environment. JSOC had assumed that the organization "had adequate time for information to flow through those [existing organizational] pathways."[144]

Rather than continuing to simply react, JSOC realized that it needed to increase its ability to execute a larger variety of tasks at a speed that matched the environment.[145] JSOC had to let go of its previous emphasis on doing things "the right way" and start doing "the right things,"[146] as measures of efficiency and task competency are valuable but do not predict successful outcomes.[147]

The first step toward adapting to the complexity of the operational environment in Iraq was to establish a shared consciousness. McChrystal argues that this shared consciousness creates idea flow that builds the collective intelligence of an organization. This idea flow is based upon two determinants. The first is "engagement," or active participation within a small group or team, followed by "exploration," or frequent contact

142 Ibid., 80.

143 Ibid., 47.

144 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

145 McChrystal, *Team of Teams*, 81–83.

146 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

147 Ibid.

with other entities within, and exterior to the organization.[148] To attain this idea flow, the organization needed to connect with its partners and within itself.

To increase idea flow, General McChrystal instituted a video teleconference (VTC) that included all entities within the command. This VTC forced information flow to leaders, units and staffs alike, creating a venue to establish a common operational picture, share best practices, and ensure people within the organization knew what others were doing. This VTC created a level of personal buy-in and further opened linkages within the organization to allow for collaboration and continuous innovation.[149]

JSOC's efforts to match the environment included building a network wherein people from disparate ends of the organization were linked to each other, toward the goal of having someone in every office know someone in all the others.[150] This linkage is critical, as McChrystal notes, because these links create the emotional bonds that drive people,[151] and allows large and diverse organizations to reap the benefits of loyalty and connectivity that small teams enjoy.[152] To create the linkages, JSOC strove to dissolve the barriers and "silos" that existed between each element of the command.[153] JSOC initiated an "embedded exposure" exchange program between operational personnel from different subordinate units.[154] The program became empowering as operators and other personnel spent time with other units within JSOC to build personal relationships and develop mutual understanding.[155] This program created relationships between people in disparate units. These personal bonds served to reduce institutional barriers to communication and created linkages supporting exploration and idea flow.

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148 McChrystal, *Team of Teams*, 196.

149 Ibid., 164.

150 Ibid., 129.

151 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

152 Ibid.

153 McChrystal, *Team of Teams*, 20.

154 McChrystal, *Team of Teams*, 177.

155 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

To amplify the effects of internal collaboration, JSOC increased its external links. The organization increased these linkages through the addition of a large number of liaison officers (LNOs). They put some of their best officers and NCOs in embassies, interagency organizations, and adjacent military headquarters. While other units typically sent less capable leaders to fill liaison slots, JSOC provided highly talented individuals, proving to the outside organization that collaboration was a top priority.[156]

Another effort to flatten the organization was, "the creation of the NSA-created linkup called the Real Time Regional Gateway, which allowed operatives who seized scraps of intelligence from raids to send their crucial data to different nodes across the network."[157] "One analyst might not appreciate the significance of a given piece of intel. But once JSOC effectively became an experiment in intel crowdsourcing, it soon got a bigger, deeper picture of the enemy it was fighting and essentially emulating."[158] JSOC's ability to implement structural changes to adapt with the changing environment demonstrated the organic flexibility required of an innovative organization operating in a complex environment.

A large factor to JSOCs transformation was the effort to decentralize authorities, information, and responsibility. General McChrystal stands on firm footing in his assessment that decentralization of decision-making provides greater institutional flexibility. He states that he and other leaders in his command empowered the "doers to think."[159] McChrystal realized that, "the seemingly instantaneous communications available up and down the hierarchy had slowed rather than accelerated decision making."[160] Because information was readily available to commanders at the higher echelons, the commanders retained authority over certain combat actions. Even when faced with these types of command decisions, because of the sheer volume of

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156 McChrystal, *Team of Teams*, 177.

157 Spencer Ackerman, "How Special Ops Copied al-Qaida to Kill It," October 12, 2015, http://www.wired.com/2011/09/mcchrystal-network/all/1.

158 Ibid.

159 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

160 McChrystal, *Team of* Teams, 202.

information, McChrystal found himself comparatively less informed and generally relying on the advice of the officers that had brought the decision to him.[161] He realized that the time required, minutes in some cases, to seek command approval was not resulting in better, more informed decisions but potentially preventing the task force from executing a successful operation.[162] In response, McChrystal communicated his thoughts to his subordinates and then delegated the command authority for certain actions to them.

General McChrystal advocates that senior leaders facing complexity should strive to be gardeners, rather than chess masters. "Chess masters," he explains, are the classic heroic leaders that the military has long strived to produce, "the courageous and all-knowing puppet master."[163] In today's world of mass information and instant communication, the human mind is easily overwhelmed and a centralized leadership can quickly become a hindrance.[164] In contrast, McChrystal presents the idea of the gardener. The gardener uses decentralization to free the mind to think in broad terms about the strategic direction of the organization, while tirelessly creating and maintaining the organizational "ecosystem" where idea flow and decentralization are constantly reinforced. The two decisive elements of the gardener's leadership are clearly communicating priorities, with clearly articulated actions in concert with the priorities.[165] This leadership through personal transparency in alignment with organizational priorities is, as McChrystal states, "the new ideal."[166]

This focus on the creation of an ecosystem that aligns with organizational goals has several effects on an organization. First, it provides subordinate leaders and staffs greater buy-in to the decision-making process, which improves productivity and often the quality of the decision. This ability to make decisions and be evaluated on their quality and outcome provides a positive correlation between efforts and tangible rewards for

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161 Ibid., 202.

162 Ibid., 209.

163 Ibid., 221.

164 Ibid., 222.

165 Ibid., 226.

166 McChrystal, *Team of* Teams, 232.

favorable performance. In this case, the tangible rewards are the favorable evaluations that enable members to compete for the best jobs in the future, and the intrinsic reward of working somewhere within the military that truly rewards initiative and collaboration.

The second effect of decentralization is that it frees senior leaders to spend less time making decisions that can ultimately be handled effectively below them. This time and energy now becomes available to think in broad terms about organizational issues and strategic direction.[167] This is positive for subordinate leaders and staffs in two ways. First, if the senior leaders spend their time creating and maintaining an ecosystem that is decentralized and collaborative, the work environment is more rewarding for subordinates. Second, the senior leaders' time spent tending the strategic needs of the organization is time not spent micromanaging the decisions of subordinate leaders. Similar to Google, the fast-paced and decentralized environment attracts individuals who desire autonomy in their work.

At all levels of JSOC, hiring requires an assessment and selection.[168] This is a departure from the remainder of commands within the military. Other special operations commands require assessment and selection for operators and key supporters, but none require all staff and support personnel to be vetted prior to assignment. For operators, this includes the military's most physically demanding selection process. For staff officers and support personnel, this process is less strenuous, but present nonetheless. In the military environment, the mere presence of a viable selection process for staff and support attracts people interested in working with higher caliber individuals. In concert with Google, a high bar to entry becomes a recruiting tool.

JSOC effectively recognized the disparity between their organizational design and the operational environment that was preventing the task force from realizing results in Iraq. With decentralized decision making, increased linkages, and shared consciousness, JSOC transformed itself into an organization capable of innovation and able to adapt to the challenges of complexity.

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167 Ibid., 213–214.

168 Stanley McChrystal, "View from the Top" (lecture, Stanford Graduate School of Business, Palo Alto, CA, February 3, 2014).

1. Conclusions

- Increased idea flow throughout the organization can be achieved by creating external linkages to resources, ideas, and end users, and by establishing internal linkages across subordinate entities.
- Leaders should clearly articulate mission and priorities and tirelessly maintain an ecosystem that gives subordinates the autonomy and resources to succeed
- Autonomy and a high bar to entry allow initiative and attracts talent

D. SILICON VALLEY

Silicon Valley is a geographic area known for innovation in high technology industries. The region includes highly profitable companies such as Hewlett Packard in Palo Alto, Google in Mountain View, and Uber in San Francisco. Equally important are the countless "garage start-ups" in which small groups of technology-savvy entrepreneurs attempt to develop innovative concepts into billion dollar corporations. Top universities, including Stanford University and the University of California- Berkeley, also play a major role in the region. All these entities interact in a way that has resulted in some of the most groundbreaking technological developments of the information age. The purpose of analyzing Silicon Valley is not to understand why individual organizations within the valley are successful but to understand why the region has such a high concentration of businesses that can rapidly innovate.

Silicon Valley emerged organically as the world leader in high technology development when it surpassed the Route 128 region of Massachusetts. A major difference between Silicon Valley and the previous United States technology development center is the fact that companies in the valley recognized that the technology world is not a zero sum game. In the Route 128 region, large corporations utilized traditional, industrial age, isolated research and development and an offensive strategy to corner markets. "In Silicon Valley, 'collaboration' is defined as something

you do with another colleague or company that achieves greatness."[169] Silicon Valley companies recognize that technology develops so quickly and opens up so many new markets that there is little need to try to push out all the competition. This recognition improves collaboration and overall productivity within an industry. Companies spend less time fighting competitors and more time being complementary to overall system development. Silicon Valley companies will often go to similar companies to borrow components and provide each other with business. The prevailing thought centers on forward progress of their own organizations, rather than with pushing out competition.[170] In Silicon Valley "the flow of ideas, startup creation, and partnering activities produced value for the companies and individuals involved, and also for the regions as a whole."[171]

Many organizations in Silicon Valley recognize the importance of increasing the rate of technology improvement in a particular field. For example, Elon Musk decided to share critical patents used to produce the groundbreaking Tesla electric cars, similar to Adner's information collaboration concept in The Wide Lens. He explained to Harvard Business Review that "other companies making electric cars, and the world would all benefit from a common, rapidly-evolving technology platform." The more Tesla's competitors develop their own electric cars, the more ubiquitous charging stations will become and the more people will be willing to buy one of the most advanced electric cars in the world.[172] Many of the organizations in the region now have a vested interest in progress being made in battery technology. This progress is made through information sharing and increased interaction between organizations.

Interdependent industries facilitate innovations in reaching the market and developing ideas. The region is resilient because of the ties among organizations, not reliance on the strength of any particular node. If one area of the industry fails, or

169 Alan Cohen, from: Thomas Friedman, "Collaborate vs. Collaborate," *The New York Times*, January 12, 2013, http://www.nytimes.com/2013/01/13/opinion/sunday/friedman-collaborate-vs-collaborate.html?_r=0.

170 Anna Lee Saxenian, "Global Innovation Summit 2014" (lecture, Global Innovation Summit 2014, San Jose, CA, September 16, 2014).

171 Patti Anklam, *Net Work* (Burlington, MA: Butterworth, Heinemann, 2007) kindle edition, loc 889.

172 James Bessen, "History Backs up Tesla's Patent Sharing," *Harvard Business Review* (June 13 2014).

becomes obsolete, ties are adjusted in order to compensate. In contrast, one large node that attempts to accomplish all tasks by itself does not easily adjust to change. For example, the tech companies of the Massachusetts Route 128 region of Massachusetts fell behind the level of progress that Silicon Valley was able to maintain because they relied on large, self-sufficient models.[173]

As the preeminent region for technology innovation, San Jose, California area attracts brilliant minds and participates in a system with an unprecedented "velocity of information."[174] It is common for employees in the tech industry to move from job to job every few years, bringing their ideas and connections along with them and capitalizing on extensive personal networks. From the competitive CEOs to the youngest software engineers, this community is continuously communicating and building off of each other's ideas.[175] Advanced communication technology and a connected community support this flow of information despite intense competition among certain corporations. Companies have learned that embracing openness and acceptance of fluid environments are beneficial when designing an organization geared towards innovation.[176]

A network with a functional need to transfer complex knowledge must have strong ties between nodes that are constantly kept aware of each other's knowledge. In order to satisfy the need for external information there must be diverse external ties.[177] Silicon Valley meets these requirements through the underlying social network. Whereas traditional, hierarchical organizations are defined by strong pensions and stable careers, Silicon Valley employees rarely stay with a single company for long. The need to move based on changing markets and opportunities for innovation are a primary motivator for employees.[178]

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173 Saxenian, *Regional Advantage*, 3.

174 Ibid., xi.

175 This section was submitted to Special Warfare Magazine

176 Saxenian, *Regional Advantage*, 29.

177 Anklam, *Net Work*, Loc 1451, 1000.

178 Harry Anderson, "In Silicon Valley, the Jobs Are Changing as Fast as Technology," *L.A. Times*, Spetember 11, 1990, http://articles.latimes.com/1990–09–11/business/fi-272_1_silicon-valley.

Silicon Valley is an open network with diverse nodes that reach beyond the San Francisco Bay area. Thirty-six percent of the region's population is foreign-born.[179] With this influx of immigrants comes foreign ideas that contribute to the wide range of innovative capabilities. The social networks that exist throughout Silicon Valley are subsequently extended to other technology centers such as Tel Aviv, Beijing, and Bangalore.[180] International technology specialists spend years in Silicon Valley and then return to their own countries armed with valuable social capital.[181] They then create nodes and ties that can be integrated as clusters into the network. The more people from Beijing travel to Silicon Valley for temporary work, the greater the density between the regional clusters. Their travel throughout the world only improves the social capital of all those that stay in contact with Silicon Valley.

Inexperience can be an advantage; innovative approaches are often developed by those new to a field. Garage startups generate many disruptive innovations because "they are not tied to any specific customer base, product design biases, or even business model frameworks."[182] Therefore, by interacting and communicating problem sets to those not directly related to the field, the likelihood of innovation increases.[183] In any field that involves great uncertainty, people will attempt to simplify a situation by relying on what they know from past experience.[184] Extensive experience and success propagates biases that lock professionals into previously learned expectations.[185]

Dominant organizations within the region become highly popular and increase their capacity to expand their network. "Popular hubs tend to grow more connections (think of eBay and Amazon). Thus, hubs that serve as the sticky ground points of a

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179 Rachel Massaro, *Silicon Valley Index* (San Jose, CA: Joint Venture Silicon Valley, 2015), 6.

180 Anna Lee Saxenian, *The New Argonauts* (Cambridge, MA: Harvard University Press, 2006), 88.

181 Maximilian Bode "World Innovation Clusters" *MIT Technology Review* (July 2013), http://www.technologyreview.com/news/517626/infographic-the-worlds-technology-hubs/; Saxenian, T*he New Argonauts*, 276.

182 Khosla, "Innovator's Ecosystem," 9.

183 Khosla, "Innovator's Ecosystem," 9.

184 Richards J. Heuer, "Cognitive Factors in Deception and Counterdeception," in *Strategic Military Deception*, ed. Donald C. Daniel and Katherine L. Herbig (New York: Pergamon Press, 1981), 35.

185 Heuer, "Cognitive Factors in Deception and Counterdeception," 35.

network continue to attract more hubs."[186] A company like Amazon therefore increases their ability to work with other innovators and share ideas. Despite becoming large and unwieldy to manage in a flat structure, external factors enable innovation while internal factors limit it.

The Skolkovo innovation center, was initiated by former Russian president Demetri Medvedev in 2010.[187] It was designed to be a Russian version of Silicon Valley. However, it is has yet to achieve any significant innovative output. Exploring the characteristics of this unsuccessful innovation center illuminates the successful characteristics of Silicon Valley.

Former Russian President Demetri Medvedev established the Skolkovo Innovation Center with a large supporting budget. President Putin and the Duma have provided further support. "The project will receive a total of 135.6 billion rubles ($4.1 billion) from the state budget by 2020."[188] Despite paying millions of dollars to bring in Silicon Valley veterans and foreign organizations, including a close partnership with MIT, Skolkovo is not making progress towards emulating the Silicon Valley network environment.[189]

Russia's innovation center continues to stumble despite massive financial investment. This results from deeply bureaucratic regulation and paranoia concerning the theft of developing technologies. In 2012, Vladimir Putin's new treason laws further threatened the ability to collaborate with the wider technology community. The law states that "citizens recruited by international organizations acting against the country's interests will also be considered traitors."[190] These types of laws, intentionally written

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186 Anklam, *Net Work*, Loc 1429

187 "Skolkovo Foundation," September 12, 2015, http://sk.ru/foundation/about/.

188 Margarita Papchenkova, "Government extends Skolkovo funding through 2020," Russia-direct.org, August 6, 2013, http://www.russia-direct.org/russian-media/government-extends-skolkovo-funding-through-2020 translated from: "«Сколково» осталось при бюджете," <Skolkovo remains in the budget> Vedmosti.ru, August 1, 2013 http://www.vedomosti.ru/newspaper/articles/2013/08/01/skolkovo-ostalos-pri-byudzhete

189 Svetlana Reiter and Ivan Golunov, "Расследование РБК: что случилось со «Сколково»" <RBC Investigation: What Happened with Skolkovo> РБК <RBC> March 23, 2015. http://daily.rbc.ru/special/business/23/03/2015/5509710a9a7947327e5f3a18

190 Loren R. Graham, *Lonely Ideas: Can Russia Compete?* (Cambridge Massachusetts, 2013), 109.

with ambiguity, allow Putin to legally attack those who are suspected of working against Russian progress.[191] This inhibits collaboration and networking with foreign technology leaders. At the micro level, intellectual property laws are so inadequate and theft is so common that collaborating on projects is more likely to profit a third party than provide collective benefit.[192] The cost of networking and collaboration is significantly higher in Russia. Whereas Silicon Valley is a melting pot that attracts minds and money from all over the world, Skolkovo is isolated by a hostile government and international sanctions.[193]

In Russia, there is significantly less incentive to innovate than in western nations. "Throughout history, Russia has never adequately rewarded or protected its most innovative citizens."[194] Despite major inventions since Tsarist times, few were taken to the conclusion of becoming innovation.[195] The lack of applicable patent laws has reduced innovation since Yablochkov's invention of an electric street lamp. His invention was unwanted in Russia, so he went to Paris and turned it into the "city of lights."[196] There was no profit for him in Russia and no incentive for anyone to financially back his work. In Soviet times, the idea of taking an invention and using it for profit was offensive to scientists. Entrepreneurship was viewed by Soviet society as the bourgeoisie attempting to take advantage of workers.[197] Significant advances in laser technology never amounted to anything applicable in Russia but entrepreneurs in the western world used this technology to revolutionize several fields of science.[198]

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191 Graham, *Lonely Ideas*, 133.

192 Ibid., 124–126

193 Leon Nayfakh, "Russian science is amazing. So why hasn't it taken over the world?" *The Boston Globe*, January 4, 2015, https://www.bostonglobe.com/ideas/2015/01/04/russian-science-amazing-why-hasn-taken-over-world/u61VuLiq3lJiyIMY0OLZ7N/story.html.

194 Graham, *Lonely Ideas*, 119.

195 Nayfakh, "Russian science is amazing."

196 Graham, *Lonely Ideas*, 33.

197 Ibid., 103–108.

198 Ibid., 87.

Today, Russia still struggles with innovation and cannot provide the appropriate incentives to innovators. The patent system fails to offer the legal protection necessary to facilitate monetary rewards for innovation. During Soviet times, all inventions were the property for the state. Russia never even had patent laws until 1992 and since that time they have been inadequate by western standards. Other corporations, and even the government, can steal an idea for their own profit, leaving the innovator without any reward.[199] Investment in anything other than energy and resource extraction is rare in Russia. Venture capitalism is not the great search for innovation that it is in the United States and it is extremely rare for an oligarch to put money into a third party's research and development.[200]

According to MIT's Russian business professor, Loren Graham, "Technology doesn't take off by itself. It has to have all kinds of supporting ingredients." The social, legal, political and economic factors necessary for technology to be utilized in business do not exist for Skolkovo.[201]

There is no pool of venture capitalist investors seeking to take risks with new technology in order to develop a start-up company. Russian wealth is based on oligarchical energy billionaires that have little desire to invest in these technologies. Additionally, the legal system is insufficient for protecting intellectual property. Russian businesses can easily steal technology from competitors. This makes IT investment much riskier than in the United States. Russia's political actions continue to push foreign investors away. Whereas Silicon Valley is a melting pot that attracts minds and money from all over the world, Skolkovo is isolated by a hostile government and international sanctions. The Skolkovo network is limited by its environment. These limitations create tight boundaries which exclude the necessary nodes to make an effective network.[202]

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199 Graham, *Lonely Ideas,* 123–126.

200 Ibid., 123–126.

201 Nayfakh, "Russian science is amazing."

202 Graham, *Lonely Ideas,* 155–159.

1. Conclusions

- Organizations use mutually beneficial collaboration to create value rather than focus on zero sum gains
- Open networks and diverse external ties drive fresh ideas
- Innovation and collaboration must be incentivized and enabled through environmental conditions

E. INNOVATION OUTSIDE OF THE MILITARY AND INFORMATION TECHNOLOGY INDUSTRIES

Organizations seeking to become more innovative and adaptive are not isolated to the military and technology industries. The following companies of the manufacturing, design, food, and beverage industries have utilized organizational design principles, structural and procedural, to increase innovation, and ensure relevant products are reaching their end users. W.L Gore and Associates, IDEO, Stone Brewing Company, and Chipotle Mexican Grill's respective operational practices toward innovation differ; however, all are industry leaders competing in complex markets where relationships with their customers are critical to success.

W.L Gore and Associates, Inc is an innovative, privately-held technology and manufacturing firm. "Gore focuses its efforts in four main areas: electronics, fabrics, industrial and medical products."[203] Its notable products include Gore-Tex fabric, fiber optic cables and assemblies, and medical technology. Recent revenues are approximately $3 billion.[204]

Founder Bill Gore started his career as an electrical engineer at DuPont, and started his namesake enterprise from the basement of the family home in 1958.[205] Needless to say, Bill Gore's startup was a success, as Gore is a top manufacturing and

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203 "About Gore," Gore, October 13, 2015, http://www.gore.com/en_xx/aboutus/index.html.

204 "W. L. Gore & Associates: Bringing Dreams to Reality," Our History, October 13, 2015, http://www.gore.com/en_xx/aboutus/timeline/index.html.

205 Ibid.

technology innovator, and is consistently ranked among the top firms to work for, both domestically and abroad.[206]

Bill Gore had a knack for organizational design, and asked questions while striving to create an organization "…with no hierarchy- where everyone was free to talk with everyone else? Could you let people choose what they wanted to work on, rather than assigning them tasks?. . . where people would put as much energy into finding the next big thing as they did into milking the last big thing?"[207] Gore's answer to these questions was at first glance a divisional structure, based around its core products of fabrics, electronics, medical products and industrial products.[208] However, underneath the surface was a functioning and deliberately shaped flat lattice organization of cross-functional teams and informal networks. This lattice structure is characterized by a lack of hierarchy of communication, and the absence of traditional organizational charts. Communication and collaboration are critical, but occur through the company's network of personal relationships.[209] Similar to Google and IDEO, physical locations were kept intentionally small to promote community and personal buy-in.[210] Gore was driven by his experience working on small teams at DuPont, characterized by initiative, courage, and operational autonomy.[211] The lattice concept of cross functional teams, combined with rigorously informal and flat communication ensures that Gore retains the advantages of the small team while continuing to grow. The tempting efficiency and predictability of a rigid organizational structure is cast aside in favor of a people-based organic structure that is adaptable, and encourages innovation.

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206 W.L. Gore and Associates, Inc., "Working in our Unique Culture," W.L. Gore and Associates Website, http://www.gore.com/en_xx/careers/whoweare/ourculture/gore-company-culture.html, (accessed March 10, 2012); Jay Rao, "W.L. Gore- Culture of Innovation," *Case Study, Harvard Business Publishing* (2012).

207 Gary Hamel and Bill Breen, *The Future of Management* (Boston: Harvard Business School Press, 2007), 86.

208 Jay Rao, "W.L. Gore- Culture of Innovation," *Case Study, Harvard Business Publishing* (2012): 5.

209 W.L. Gore and Associates, Inc., "Working in our Unique Culture," W.L. Gore and Associates Website, http://www.gore.com/en_xx/careers/whoweare/ourculture/gore-company-culture.html, (accessed March 10, 2012); Jay Rao, Babson College "W. L. Gore culture of Innovation," Harvard Business Publishing.

210 Hamel, *Future*, 93.

211 Hamel, *Future*, 85.

Associates at Gore are incentivized by an environment shaped by four simple principles, driven by the premise that associates "will exceed expectations when given the freedom to do so."[212] The first is freedom, "where action is prized…and mistakes are viewed as part of the creative process."[213] Each associate is expected to act on their own initiative, and failure serves to inform the organization of best practices and fresh direction. Fairness to each other, suppliers, and customers is expected; this fairness creates an environment that is stable and pleasant during risk-taking endeavors. Next is commitment, where associates are not assigned tasks, but instead make their own commitments. These commitments are not forced or delegated, but are binding when undertaken. This autonomy ensures that people gravitate toward projects that are interesting and rewarding, and providing near-maximum buy in. Finally, the waterline principle is described central to risk mitigation. The water line principle is described as "everyone at Gore consults with other associates before taking actions that might be below the waterline- causing serious damage to the company." [214]

This "extreme freedom" is sustained only through strenuous hiring procedures focused on finding individuals who are initiative-based communicators that freely collaborate and need little outside motivation. Peers evaluate results and leadership is earned over time. At Gore, compensation is based on contribution to project teams and rank ordered by a combination of leaders and peers, with rewards emphasizing stock options and profit sharing. These principles succeed in making Gore fiercely decentralized, constantly collaborative, and incentivized to work hard on projects that are interesting and good for the organization.

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212 W.L. Gore and Associates, Inc., "Working in our Unique Culture," W.L. Gore and Associates Website, http://www.gore.com/en_xx/careers/whoweare/ourculture/gore-company-culture.html, (accessed March 10, 2012); Jay Rao, Babson College "W. L. Gore_ culture of Innovation," Harvard Business Publishing.

213 W.L. Gore and Associates, Inc., "Working in our Unique Culture," W.L. Gore and Associates Website, http://www.gore.com/en_xx/careers/whoweare/ourculture/gore-company-culture.html, (accessed March 10, 2012); Jay Rao, Babson College "W. L. Gore_ culture of Innovation," Harvard Business Publishing.

214Jay Rao, "W.L. Gore- Culture of Innovation." *Case Study, Harvard Business Publishing*, 2012: W.L. Gore & Associates, Inc., "What We Believe," W.L. Gore & Associates Website, http:///www.gore.com/en_xx/careers/whoweare/whatewebelieve/gore-culture.html, accessed March 10, 2012.

This balance of people-first organizational design and risk mitigation reflect in CEO Terri Kelly's words, "I spend a significant amount of time focusing on the environment at Gore. I'm a firm believer that if you get the environment right, the business stuff is easy."[215] Furthermore, "The belief at Gore was that it was tough to plan for innovation, but it was possible to organize for it."[216]

Gore is a unique case of laser-like focus on creating and maintaining an organization dedicated to the principle that the right people, given the proper amount of freedom and expectations are capable of continually innovating.

Since its inception in 1991, IDEO has been providing innovative solutions and turnkey products for a wide range of businesses. David Kelley originally started the design consulting firm in 1978 after his disappointing experiences working as an engineer at several large corporations.[217] The firm began to grow after several successful projects which were largely a product of creativity, flexibility, and the firms' proximity to the emerging tech industry of Silicon Valley.[218] The industry leading design firm, is wildly successful in uncertain environments largely because of their project team structure.

IDEO's organizational structure exemplifies what Mintzberg describes as the required fit for the highly complex, unstable environments of the technology industry. IDEO "fuses experts drawn from different specialties into smoothly functioning creative teams,"[219] to solve design problems for its clients. IDEO uses a networked approach to problem solving. IDEO's founder David Kelley emphasizes that when he is stuck with a difficult problem that he seeks help from the smart people around him.[220] At IDEO, the problem-solvers are linked with the heads of corporations who need solutions, unlike the more traditional hierarchical organizations that Kelley had worked for where the

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215 Jay Rao, "W.L. Gore- Culture of Innovation," *Case Study, Harvard Business Publishing* (2012): 3; Terri Kelly, "Nurturing a Vibrant Culture to Drive Innovation," (lecture, MIT Sloan School of Management, Cambridge, MA, December 9, 2008).

216 Hamel, *Future*, 95.

217 Tom Kelley with Jonathan Littman, *The Art of innovation*, (London: Profile Books, 2004), 16.

218 Ibid., 19

219 Mintzberg, "Fashion or Fit," 10.

220 Kelley, *The Art of innovation*, 19.

engineers or problem solvers were kept behind the scenes apart from the big machine.[221] The problem solvers must also be the researchers, they need to immerse themselves into the situation where the problem exists to conduct hands-on organic research.[222] Once their teams brainstorm potential solutions, they test and modify their prototypes extensively in a "safe" environment where failure is accepted and expected.

IDEO utilizes similar environmental characteristics as Google's, campus-like feel where open spaces and flow patterns are designed to increase employee interaction.[223] Similar to McChrytstal's assertions about "gardeners"[224] IDEO believes that innovation flourishes in a carefully constructed environment where the proper components will foster the growth of new ideas.[225] In addition to their efforts to "alter space to support innovation,"[226] IDEO's strength is their ability to assemble the "right" teams to solve problems. They understand the strength of a team, compared to an individual when seeking innovative solutions. General Manager Thomas Kelley demonstrated this assertion when describing the work of Thomas Edison, "Even the most legendary individual inventor is often a team in disguise."[227] Kelley discusses how in several years Edison generated over four hundred patents included those for, "the telegraph, telephone, phonograph, and light bulb; with the assistance of a fourteen man team."[228]

IDEO believes innovative teams must be ruthlessly mission-oriented and faced with a deadline, non-hierarchical, diverse and well-rounded, work in the proper environment where negative consequences of failure and limitations are removed.[229] IDEO, achieves success through small teams of diverse individuals. An effective IDEO

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221 Ibid., 21.

222 Ibid., 25–34.

223 Kelley, *Art of Innovation*, 133–136.

224 McChrystal, *Team of Teams*, 225.

225 Kelley, *The Art of innovation*, 121.

226 Ibid., 140.

227 Kelley, *The Art of Innovation*, 69.

228 Ibid., 70.

229 Ibid., 71.

"hot team" is "well rounded and respectful of its diversity."[230] The company recognizes that many of its most innovative groups contain peculiar members who do not seem to fit into the larger group. Eccentric thinkers and introverted book worms are often the key to bringing fresh perspectives and igniting the innovation process with an unexpected approach.[231] There must be significant differences in perception in order to avoid biases and promote original discussion.

IDEO has been successfully designing products for clients from diverse industries for almost 25 years because of their flat, organic, and adaptable team concept. Attention to the needs of their customers, accepting failure as learning, and collaboration has helped them stay the design industry leader.

Understanding the market or needs of an end user can be the motivational forces required to cause a disruptive innovation. In game theory, when an actor is faced with a situation in which a favorable outcome is unlikely in a given situation, they may seek to "change the game."[232] Two companies in the food and beverage industry have caused major disruptions by avoiding industry standard vertical mechanistic processes and becoming more horizontal with their innovative approaches: Stone Brewing Company and Chipotle Mexican Grill.

The U.S. beer industry is composed of three tiers: the brewer, the distributor, and the retailer. Breweries, whether small or large, are reliant on the independent distribution system to get their products on retailers' shelves. Independent distributors allow small breweries better access to markets because of the prohibitive costs of building a standalone distribution network.[233] However, because of the costs to the distributors for lesser performing products, and the increased competition for distributor space, the

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230 Kelley, *The Art of Innovation*, 71.

231 Kelley, *The Art of Innovation*, 97–100.

232 Adam M. Brandenburger and Barry Nalebuff, "The Right Game: Use Game Theory to Shape Strategy," *Harvard Business Review* (July-August 1995).

233 Neil Houghton, Jr. and Marin Gjaja, "For Small and Large Brewers, the U.S. Market Is Open," *Boston Consulting Group Perspectives* (June 19, 2014), https://www.bcgperspectives.com/content/articles/consumer_products_for_small_large_brewers_us_market_open/.

distributors tend to dictate what products will go to retail.[234] This limits some products that smaller craft breweries produce from reaching a retailer, even if the product has a popular following. If a beer does not compete in volume sales with distributors' other brands, it may not make it to shelves. These smaller brewers must then accept the status quo, focus on advertising to build their brand, or introduce differentiated products, whether they desire to or not, to entice the distributors to pick up their product.[235] The existing system forcibly constrains smaller craft brewers who must conform or fail.

Stone Brewing Company, on its way to becoming the fastest growing brewery in the U.S.,[236] challenged the industry standard by creating its own distribution network, bypassing the existing distribution bureaucracy to meet the demand of its customers and maximize profits.[237] Stone recognized the limitations of the independent distribution system and created an alternative approach to supply its customers. The founders, Greg Koch and Steve Wagner, realized that to continue producing their products the way they wanted to would require circumventing the established distribution system.[238] Koch and Wagner understood the great costs of developing a standalone distribution system, and they chose to collaborate with several other small up and coming brewers to create their distribution system. The innovation of a brewery owned distributor was disruptive to the market. Stone now determines and regulates its own inventory with each retailer account instead of an independent distributor. This improvement removed previous obstacles and allowed Stone to more carefully react to its customer's sentiments, which in turn increased sales. Most importantly, Stone understood the needs of the market. Creating their own distribution system was the innovation that allowed Stone to capitalize on the demand signals of the market.

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234 Ibid.

235 Neil Houghton, Jr., "For Small and Large Brewers, the U.S. Market Is Open," https://www.bcgperspectives.com/content/articles/consumer_products_for_small_large_brewers_us_market_open/.

236 Greg Koch and Steve Wagner with Randy Clemens, *The Craft of Stone Brewing Co*. (New York: Random House, 2011).

237 Greg Koch, "Our Story," October 20, 2015, http://www.stonedistributing.com/story.

238 Ibid.

Another example of innovation through understanding market demand can be seen in the fast casual concept of the restaurant industry. Fast casual restaurants, a hybrid of the quick service and casual restaurant concepts, provide customizable, freshly prepared, and higher quality food from a counter service platform.[239] The fast casual restaurant concept can be traced back to the early 1990s when restaurants like Fuddruckers and Au Bon Pain offered consumers, "a commitment to an elevated experience in food,"[240] compared to the low-quality processed foods of their quick service competitors. More recent versions of this concept, like Chipotle Mexican Grill, have evolved to match the markets demand of "heightened interest in health, sourcing, ethics, and value."[241] Chipotle is described as "the best restaurant brand created in 10 or 15 years,"[242] and as the leader of the fast-casual restaurant style, is currently revolutionizing the fast food industry. The overall restaurant market has remained flat; however, the fast casual industry continues to grow, stealing customers from traditional quick service fast food restaurants.[243] Innovations in restaurant design, food preparation and distribution, are being mimicked by many as the fast-casual movement is expected to continue to capture larger portions of the fast food market share.[244] Chipotle's acute awareness of market demand and its ability to deliver a matching product have made them an incredibly successful organization.

Similar to Stone and Chipotle, Tesla is improving its ability to create applicable innovations by creating a closer relationship with customers. Tesla automobiles are only

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239 Trefis Team, "How The Fast Casual Segment Is Gaining Market Share In The Restaurant Industry," Forbes, June 23, 2014, http://www.forbes.com/sites/greatspeculations/2014/06/23/how-the-fast-casual-segment-is-gaining-market-share-in-the-restaurant-industry/.

240 Roberto A. Ferdman, "The Chipotle effect: Why America is obsessed with fast casual food," *The Washington Post*, October 21, 2015, http://www.washingtonpost.com/news/wonkblog/wp/2015/02/02/the-chipotle-effect-why-america-is-obsessed-with-fast-casual-food/.

241 Ibid.

242 Roben Farzad, "Chipotle: The One That Got Away From McDonalds," *Bloomberg News*, October 21, 2015, http://www.bloomberg.com/bw/articles/2013–10–03/chipotle-the-one-that-got-away-from-mcdonalds.

243 Ferdman, "The Chipotle effect."

244 Yuki Noguchi, "Shake Shack Sizzles With IPO As McDonald's Fizzles," October 21, 2015, http://www.npr.org/blogs/thesalt/2015/01/30/382658859/shake-shack-sizzles-with-ipo-as-mcdonald-s-fizzles.

sold directly to customers, not through a third party dealership. The customer provides feedback directly to the company, providing clearer communication of needs directly to the organization that has the most interest in incremental innovations and improvements.[245] This reduces confusion and eliminates unnecessary bureaucratic links in the feedback process.

Chipotle, Stone, IDEO, and Gore are all prominent leaders in their respective industries. These companies effectively utilize organizational practices such as decentralization, incentives, adaptable project teams, and understanding market demand to produce innovative products and teams that create incremental change and disruptions to their markets. These innovative practices have contributed to the success of these businesses in ever-changing complex environments.

1. Conclusions

- An autonomous flat lattice network of cross-functional teams creates an environment conducive to innovation and collaboration. "It's tough to plan for innovation, but possible to organize for it."
- Innovative teams must be ruthlessly mission oriented, faced with a deadline, non-hierarchical, diverse, in a physical environment tailored for flexibility and brainstorming.
- Teams must be empowered to seek outside expertise, connected to exterior networks, and failure must be viewed as part of the process.
- Innovation is driven from the identification of a demand for a product or idea and the requirement to deliver it to the end user.

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245 Nick Chambers, "Tesla is Turning the Car Sales Model on Its Head," autotrader.com, November 2011, http://www.autotrader.com/car-info/proxied_article-132587.

IV.   COMPOUNDING FACTORS OF INNOVATION AND ADAPTATION

A.   COLLABORATION

The organizations examined in the previous case studies used collaboration to increase collective intelligence and create value. They accomplished this through physical infrastructure design, establishing internal connections, and creating diverse external linkages to resources, ideas and end users.

- Google, Gore, and IDEO used infrastructure design to force interaction and connectivity among members of the organization, and reduced impediments to work and communication.

- JSOC used exchange programs and an all-members teleconference to connect the organization to itself; Google used a similar teleconference.

- JSOC established a network of LNOs to connect itself to other entities and stakeholders to increase buy-in from other governmental organizations.

- Silicon Valley similarly uses collaboration to create value, rather than forcing out competition.

B.   STRUCTURE

Organizational structure plays a central role in the success of innovative and adaptive organizations. Gore CEO, Terri Kelly, summed it well with her comments that organizations can organize themselves for innovation.[246] The cases revealed common structural components that increased the capability to innovate and adapt. Autonomous, ad-hoc, cross-functional teams were mission oriented, faced deadlines, were diverse, and operated in a physical environment tailored for flexibility. Leaders clearly articulated priorities and maintained a culture of open communication among echelons of the organization.

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246 Hamel, *Future*, 95.

- Google, Gore, and IDEO organize cross-functional teams around specific projects.

- At Google, JSOC, IDEO, and Gore, leaders emphasized a common understanding of the mission and established priorities that shaped the culture of the organization.

C. INCENTIVES

Incentive structures should align individual and group behavior with processes and actions that support innovation. Personnel must be well suited to working in uncertain environments defined by autonomy and constant communication with diverse groups of people. To meet this demand, organizations hire talented personnel and reward those who contribute to innovation, not just the leaders of innovative groups. In order to ensure that team members continue to pursue fresh ideas, failure must be viewed as part of the learning process for the organization. Additionally, environmental conditions surrounding the organizations must be conducive to collaboration and innovation.

- Google uses a long and difficult hiring process to ensure they get the right type of employees. JSOC uses selection processes at all levels of the organization.

- Google, Gore, and IDEO use pay structures that avoid egalitarian pay, choosing instead to reward value-producing achievement.

- Environmental factors in Silicon Valley incentivize innovation and collaboration.

D. ACCEPTANCE

Ideas must be accepted by the appropriate level of an organization in order to be implemented as innovation. Acceptance is the process of building buy-in for an idea within the organization and delivering the product to meet the demand of the end user.

- Stone and Chipotle studied the external environment and recognized a market demand. Process and product innovations allowed them to penetrate their markets in new ways.

- JSOC instituted a system of LNOs to sense and satisfy demand signals with buy-in across the interagency.

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V. RECOMMENDATIONS

A. APPLYING THE LESSONS LEARNED TO SPECIAL WARFARE UNITS

The compounding factors of innovation identified in the previous chapter may be applied to special warfare units in several ways. Based on the research, prior experience, and knowledge of special warfare, this project group identified several applications of these factors. The examined cases indicate while a single factor can improve innovative capacity, combinations of factors provide exponential improvement. However, the implementation of each recommendation will incur a cost. As indicated by Luttwak, military forces cannot be organized to maximize both efficiency and adaptability.[247] The recommendations for improving innovation must coincide with the acceptance of reduced efficiency.

1. Career Flexibility

Mintzberg asserts that organizations operating in uncertain environments must utilize an organic approach emphasizing flexibility and adaptability to succeed.[248] Organizations like Google, IDEO, and Gore are able to innovate and quickly adapt in part because of their ability to organically construct project teams for emerging challenges. Their project teams are diverse, constantly evolving, and networked. This environment sets conditions for adaptability, information flow, and access to expertise. These organizations benefit from the networks created by the flexible career paths of their employees. Similar flexibility within special warfare career management system is required in order to build a networked force with political, educational, and social capital.

Currently, career progression milestones required for promotion of special warfare personnel mirror those of the conventional Army. Typical career timelines of those currently selected for battalion commands and higher also mirror conventional timelines and require specific duty assignments. This rigidity leaves little room for the

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247 Luttwak, "Notes on Low-Intensity Warfare," 336.

248 Henry Mintzberg, "Organizational Design: Fashion or Fit?," *Harvard Business Review* (Jan-Feb 1981): 4.

diversification and collaboration across non-DOD organizations that is needed to promote innovation within the special warfare force.[249] The Army's pre-requisites for promotion are designed to select leaders with the attributes that have proven to be successful for conducting attrition warfare.[250]

However, special warfare forces are required to succeed in the uncertain environments of relational maneuver warfare.[251] In order to allow special warfare forces the flexibility required to succeed in uncertain environments, USASOC should modify the career management model of special warfare forces. This will enable USASOC to build special warfare forces that are most capable of innovation and adaption instead of the current "up or out" model that creates leaders who exhibit characteristics that are successful in a machine bureaucracy. [252] When operating in an uncertain environment, the ability to adapt to changes and instability becomes a significant measure of effectiveness of the organization.[253]

Special warfare forces should ensure leaders are selected for their ability to adapt in uncertain environments. Those leaders will exhibit the traits and characteristics of the innovative leaders and organizations consistent in the examined cases. Selection criteria for promotion or command should focus on those members who have demonstrated dedication to mission accomplishment, success in uncertainty, who possess a diverse network and experiences, feel empowered to challenge standard practices and embrace unorthodox paradigms, and seek outside expertise when necessary. Selected leaders would have demonstrated that they can clearly articulate missions and priorities and tirelessly maintain an ecosystem that gives subordinates the autonomy and resources to succeed.

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249 This statement is based on the collective experience of the authors and their observations of the current career progression practices within USASOC and the Army.

250 Charles Cleveland, former Commander of USASOC (lecture at Naval Postgraduate School, Monterey, CA, May 7, 2015).

251 Cleveland, *ARSOF 2022*, 16.

252 Charles Cleveland, former Commander of USASOC (lecture at Naval Postgraduate School, Monterey, CA, May 7, 2015).

253 Luttwak, "Notes on Low-Intensity Warfare," 336.

Participation in the current HRC promotion and command selection boards should be maintained. However, as the proponent for accessions within USASOC, USAJFKSWCS must exert greater influence within the current processes to incentivize innovation and adaptation in complex and unstable environments. The Goldwater-Nichols Act revolutionized military promotion in favor of joint capability, and requires joint duty assignment for promotion.[254] Similarly, USASOC should assert influence to HRC promotion boards to ensure that interagency, special warfare liaison positions, and broadening opportunities are viewed as career enhancing and are weighted for promotion.

In addition to these changes, USASOC should no longer implement "up or out" career advancement. Special warfare career progression should be flexible enough to allow for timeline adjustments such as year group jumps, forward and backward, based on performance, experience, and mission requirements. Broadening opportunities such as higher education or partnerships with industry that are deemed enhancing to special warfare must not jeopardize a career trajectory; instead they must be highly valued because they would further link special warfare forces with a diverse network.

It must be noted that these changes do not exactly replicate the selection processes of the most innovative organizations discussed earlier, which generally utilize more subjective processes to promote and select project team leaders and managers.[255] Although a USASOC influenced incentive system would maintain some rigidity, over time a system that incentivizes innovation and adaptation would ensure that personnel displaying these key attributes matriculate to senior command positions. These leaders would manage selection criteria to reflect the needs of an agile innovative force. A USAJFKSWCS influenced career management system would have the ability shape the force to best meet the needs of conducting special warfare in uncertain environments.

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254 Goldwater-Nichols Department of Defense Reorganization Act of 1986 , H.R. Rep. No. 3622 Title IV, Section 404 (1986).

255 Kelley, *The Art of innovation*, 83–84.

2.   Broadening Opportunities

Achieving innovation requires diversity of thought. Common experiences and near-identical career paths throughout ARSOF limit diversity. The recent focus on a "Global SOF Network"[256] and new initiatives such as the Volkmann project[257] will contribute to innovative collaboration. This research supports both efforts, however, a network internal to the military world only does not offer the same benefits as one that also reaches into the civilian world. SOF operators across the globe can have remarkable similarities in culture and in thought processes.

Expanding collaboration into other environments, such as the business world and non-governmental organizations, will increase the range from which ideas are incorporated. Furthermore, the experience of working in a different organization or studying in a different field changes the perspective of the participant. He or she will then return to the special warfare community with diversity of thought and the social capital to seek fresh ideas from previous contacts. Google utilizes their associate product manager program to foster innovation among rising stars of their organization by providing them with unique experiences around the world.[258]

In order to build a collaborative, external network and have access to fresh ideas, members of the special warfare community must find ways to connect with outside agencies. Usually, opportunities to interact with other organizations are limited to deployments or an occasional embassy meeting. Military professionals are rarely exposed to environments that do not directly relate to their current position. They usually work on military bases and live in predominantly military areas, separated from the social circles of disparate industries. If given time to work among other groups and participate in educational programs that foster different ideas, they can establish linkages outside of military circles. The Army's broadening opportunities program offers various means to

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256 Cleveland, *ARSOF 2022*.

257 A U.S. Special Operations initiative for officer exchange programs with allied nations. Eric Wendt, "The Green Beret Volkmann Project," *Special Warfare Volume 28 Issue 3* (September 2015).

258 Levy, *In the Plex*, 4.

interact and develop strong social capital in the outside world. This program is unfortunately limited in scope and availability.

There are approximately 298 broadening opportunity slots available to the Army.[259] Considering both active duty and reserve soldiers, these slots are only available to 0.105% of the Army. Accordingly, USASOC should develop and implement its own professional broadening opportunities. Congressional fellowship and training with industry programs are excellent pathways to develop social capital and expose leaders to diverse ideas. The Downing Scholarship awards approximately four officers a year with an opportunity to earn security studies degrees at top universities. Such a program would also potentially expose participants to future state department leaders as well former government senior appointees. USASOC must fine tune the program and assign participants to reliable, supportive members of the selected institution. A well-known, tenured professor with a background in security studies can guide participants and fulfill the intent of the program.

Following the trend of Silicon Valley innovation leaders, the special warfare command must recognize that its size is a limiting factor in its ability to innovate. Companies like Google and Apple understand this and therefore pay close attention to garage start-ups that develop innovative ideas.[260] The large, accomplished innovators integrate smaller companies into their umbrella organization, thereby capturing their potential for mutual benefit. The smaller, inexperience companies are desperate to demonstrate breakthrough innovations as it is the key to their survival.

Similarly, there are hundreds of NGOs throughout the world, struggling to exercise innovative ideas to make a difference in developing countries and failed states. The special warfare community must build linkages to the world of NGOs and private military contractors who have the potential to enhance mission accomplishment. Special

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259 "U.S. Army Human Resources Command Broadening Opportunities," September 9, 2015, https://www.hrc.army.mil/OPMD/Broadening%20Opportunity%20Programs_Building%20a%20cohort%20of%20leaders%20that%20allow%20the%20Army%20to%20succeed%20at%20all%20levels%20in%20all%20environments.

260 Victor Luckerson, "How Google Perfected the Silicon Valley Acquisition," *TIME*, April 15, 2015, http://time.com/3815612/silicon-valley-acquisition/.

warfare units may reach out to these organizations, offering resources, support, and contracts.

Selection criteria for broadening opportunities participants must be carefully considered and tailored to develop special skills. A candidate chosen to work with innovative businesses should have some knowledge of the assigned sector in order to add value to the organization. He or she must be of proven moral character in order to avoid negative and corruptive influences that can be found in the corporate world. A candidate chosen to work with the state department should have the intellect to gain the respect of experienced foreign service officers.

In addition to providing these opportunities, the special warfare community must embrace the program. Special warfare units will need to support broadening opportunity initiatives by recommending top performers for specialized programs that will enhance an interagency network. An officer or NCO selected for such an assignment should be recognized as having high potential and not as one who missed the opportunity to spend more time with his or her unit. Current Army broadening opportunity programs often derail officers from competition for command. Officers, in particular, miss out on the performance evaluations to be competitive for the next promotion board. Special warfare leaders can eliminate this obstacle through command emphasis and the directing of branch proponents that define broadening opportunities as highly desirable experiences for promotion. Instead of attending basic intermediate level education (ILE), a field grade officer with high potential should be able to participate in a broadening opportunity as an alternative.

3. Liaisons

Another opportunity to increase social capital and networking is the use of liaisons. Strong ties should be developed with agencies with the potential to contribute to special warfare solutions. A valuable and experienced member of the special warfare community, can also benefit that agency and further strengthen ties and increase information flow. By increasing the flow of information and fostering a desire to be part of innovative solutions, the special warfare network expands its collaborative capabilities.

Learning from JSOC's example, competent personnel must be placed in these positions. The liaison should be a top performer.[261] His or her potential for promotion must also be maintained following liaison duties. A common practice in the special warfare community is to keep top performers in operational duty positions required for command track progression while the inexperienced and unproven personnel serve as liaisons. While this is efficient from a manning perspective, it does not contribute to adaptability and the development of social capital which supports innovation.

The more crucial the partnered organization, the higher quality the liaison officer should be. In this way, the reputation of the special warfare community improves in the eyes of those who have the ability to add to the collaborative network. These liaisons are not only conduits of information, but must also offer special warfare solutions to assigned partners. They must add value and be a desirable addition. Persistent, respected presence in interagency decision-making processes will build equity and enhance reputation. Popular hubs build linkages quickly as demonstrated by the rising stars of Silicon Valley.[262] When the interagency community finds value in working with special warfare units, the collaborative network will expand quickly.

Liaisons can serve to build and participate in the cross-functional team system used so effectively by innovative organizations. State Department planners could benefit greatly from having a member of the special warfare community working on their team. JTF-B provided a full time LNO to the US Country Team in Honduras to facilitate IA collaboration.[263] Their presence alone provided a conduit for quickly responding to task force requests for information. They also had the ability to report State Department dilemmas to their own command which, in turn, offered solutions. There may be significant resistance to such close cooperation due to culture and divergent goals. A special warfare professional, trained in dealing with unique cultures and complex situations, should respect the needs of the partner and continue to build rapport.

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261 LTG Tony Thomas, current JSOC Commander (lecture, Naval Postgraduate School, Monterey, CA, October 20, 2015).

262 Anklam, *Net Work*, Loc 1429.

263 COL Guy Lemire, prior commander of JTF-B (lecture, Naval Postgraduate School, Monterey, CA, December 1, 2015).

Consequently, the liaison will develop diversity of thought from the experience and bring those lessons learned back to the parent unit.

The temporary unavailability of successful leaders as a result of participation in networking and liaison opportunities is problematic for commands. Competent officers and NCOs will have to be pulled from crucial positions in order to interact outside of the community. This is a significant cost to the organization. Increases in collaboration and coordination by utilizing critical personnel for networking and liaison positions reduces internal efficiency. It already takes significant efforts to complete all the administrative and operations tasks for current requirements. Most staffs cannot afford to give up key members to outside organizations. More importantly, most active units cannot give up personnel because they are needed for deployment. Any commander who is seeking to expand innovative capacity and make their organization more adaptable must accept this cost.

An effort towards organizational innovation should coincide with the recognition and preparation of reduced efficiency. Shifting priorities and reporting requirements may reduce the workload and manpower requirements of the staff. This, in turn, will free up personnel for liaison positions. Liaison positions can also become authorized billets and added to a unit's table of organization and equipment (TOE). This will eliminate the inefficiency associated with reduced staffing to fill liaison positions.

There is no concrete measure of effectiveness for the benefits of collaboration. A leader may not know that a member of his staff created a solution by reaching out to a contact in an outside agency. The solutions facilitated by other agencies derived from collaborating with military liaisons will not always attribute credit to the right people. However, the collective benefit will be enhanced if key players are not overly concerned with sharing credit.[264] Just as popular hubs in Silicon Valley contribute greatly to the overall innovative capacity of the industry, the special warfare community can be a central node of information flow and a leader in national security solutions.

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264 Stanley McChrystal (lecture, Naval Postgraduate School, Monterey, CA, July 14, 2015).

4. Cross-Functional Teams

As seen in the cases of Google, Gore, and IDEO, organizing in cross-functional teams is a useful tool that enables organizations to adapt to uncertain environments. Teams composed of people with different backgrounds and skillsets create diversity of thought and linkages within the organization necessary for innovation.[265] In these adaptive organizations, cross-functional teams are a way of life in response to the environment, not something that is done simply in an emergency or crisis.

Former USASOC Commander LTG Charles Cleveland stated that one of the driving ideas behind the ARSOF 2022 vision is to operationalize special warfare forces prior to deployment. This is done by focusing efforts to "aggregate and disaggregate command and control" against problem sets in the geographic combatant commands.[266] As a force provider, USASOC has the leading role in developing special warfare forces capable of acting as C2 nodes and cross-functional teams. By nature of disparate unit locations and the current organizational design, these forces often meet for the first time in theater, forcing the formation of the cross-functional team under operational conditions. Uncertainty in the operational environment will always create friction in the forecasting of force requirements. Therefore, great emphasis should be placed on the creation and operation of special warfare cross-functional teams in the force generation process, forcing habitual relationships between special warfare forces within 1st SWC. The idea is not to perfectly predict which individuals or teams will deploy together, but to train and continuously improve the practice of forming and exercising special warfare cross-functional teams.

An organization connected to itself through horizontal coordination measures increases its collective intelligence.[267] To this end, one tool used by Google and JSOC is a regularly occurring meeting forum where all members of the organization can brief and discuss operations, critical issues, and organizational initiatives. Disparate unit locations,

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265 Mintzberg, "Organizational Design," 11.

266 Charles Cleveland, former Commander of USASOC (lecture at Naval Postgraduate School, Monterey, CA, May 7, 2015).

267 McChrystal, *Team of Teams*, 196; Pentland, *Social Physics*, 61, 19–20.

areas of operation, and the sheer number of special warfare forces in USASOC prevent a single forum meeting or video teleconference (VTC) from being a realistic option. A more useful option may be the implementation of a regularly occurring situation and operations update between special warfare forces and their aligned TSOC. This forum would regularly include special warfare forces at the tactical and operational levels to support idea flow between special warfare forces and keep CONUS forces in tune with operational developments in theater. Furthermore, the shared consciousness between special warfare forces can reinforce the aggregation of cross-functional teams.

Special warfare forces should remain cognizant of the costs associated with implementing programs and processes to increase innovation and adaptability. However, these recommendations, informed by the compounding factors of innovation identified in this study, could render special warfare forces better postured to operate in uncertainty. Organizational enhancements that bolster innovation and adaptability will improve special warfare forces' contributions to national defense.

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