Exploring Strategic Thinking:
Insights to Assess, Develop, and Retain
Army Strategic Thinkers

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This research product provides a thorough examination of the question: "How can the Army assess, develop, and retain strategic thinkers?" Expert input from within and outside the military provide a variety of perspectives that highlight areas of convergence and divergence, as well as, exemplar techniques, processes and insights that inform and change the conceptualization and practice of strategic thinking in the military. This compendium does not provide *the answer* to all of the Army's strategic thinking challenges, but it does provide many possible avenues to explore with the goal of enhancing the Army's strategic thinking capabilities.

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CONTENTS

Exploring Strategic Thinking: An Introduction

Heather M.K. Wolters, Ph.D., *Senior Research Psychologist, U.S. Army Research Institute for the Behavioral and Social Sciences*

> After six months as chief of staff, I can see clearly that the coming decade will be a vital period of transition for the U.S. Army. The service will have to adjust to three major changes: declining budgets, due to the country's worsened fiscal situation; a shift in emphasis to the Asia-Pacific region; and a broadening of focus from counterinsurgency, counterterrorism, and training of partners to shaping the strategic environment, preventing the outbreak of dangerous regional conflicts, and improving the Army's readiness to respond in force to a range of complex contingencies worldwide. (Odierno, 2012)

The above quotation by General Odierno, Chief of Staff of the Army, highlights the imperative for strategic thinking in today's military. The operational environment includes asymmetric threats, cyber attacks, and non-state actors that require military leaders to think about the environment and problem space from a systems perspective, taking multiple elements into account. Military leaders from all services will need to rely heavily on strategic thinking to shape the future of military operations. In order to adequately prepare for future environments, military leaders need to consider many factors (e.g., possible operational environments, manning requirements, training, and resources). Military leaders need to set the conditions for military readiness without knowing the exact requirements ahead of time. Setting the conditions requires strategic thinking about complex and dynamic factors. Strategic thinking capability has always been and will always be important for military leaders at the highest level. However, understanding is important at multiple echelons as it "equips decision-makers at all levels with the insight and foresight required to make effective decisions, to manage the associated risks, and to consider second and subsequent order effects" (Dempsey, 2012). Investing in strategic thinkers will create leaders who can better understand complex systems, anticipate change, create greater coherence across operations, and generate faster adaptation to unforeseen events.

To begin understanding strategic thinking in the military, one must first have a basic sense of what strategic thinking is and what it is not. Examination of literature on strategic thinking does not lead to one common definition of strategic thinking. However, there are some identified common attributes of strategic thinking. Strategic thinking is built on a systems perspective, intent driven, hypothesis driven, intelligently opportunistic (capitalizing on new possibilities as the situation changes), and involves the ability to think in time (linking past, present, and future elements) (Liedtka, 1998).

The confusion about the definition of strategic thinking is exacerbated by the confounded concepts of strategic thinking, strategic planning, strategy, and the strategic thinker. In addition to the lack of common definition of strategic thinking, Heracleous (1998) notes that there is no common definition of strategic planning or common understanding of the relationship between strategic thinking and strategic planning. Liedtka (1998) outlines several differences between strategic thinking and strategic planning that include reliance on systems thinking, the role of measurement and control, and a focus on the outcome (strategy) versus the process. For the

purpose of this compendium, we have focused extensively on concepts related to strategic thinking (cognitive processes) and the strategic thinker (characteristics of a person). This work does not extensively address the concepts of strategy (outcome) or strategic planning (programmatic, analytical process).

Strategic thinking in the military comes with unique challenges and opportunities. It is different than strategic thinking in the private sector. One major challenge within the military is that the military cannot go outside the organization to hire a general. The military cannot hire someone with strategic thinking capability and place him or her in a rank and position that relies on that ability. The military must promote and develop their own strategic thinkers: they must grow their own. The opportunity in this is that the military has the chance to shape, develop, and mentor leaders to best prepare them for assignments requiring strategic thinking. However, this situation places a considerable burden on the institution to identify, select, develop, and retain strategic thinkers.

Another challenge for strategic thinking in the military is that strategic thinking activities often require communication and coordination with disparate elements within and outside the military. Military leaders must be capable of strategic discourse when communicating with civilian counterparts; however, this can be seen as inconsistent with traditional military culture of taking direction from civilian leaders and executing without question. That means that in addition to cognitive skills related to thinking strategically, good strategic thinkers will need to be able to communicate with a variety of audiences that may have different cultures and worldviews. The nature of current military activities provides ample opportunity to develop these strategic thinking skills. In the current operational environment a vast majority of leaders have interacted with people from other cultures (e.g., coalition partners, host-nationals, and other government and non-government agencies). According to General Odierno, "We have a generation of young leaders who have grown up thinking through not only joint, but also interagency solutions—and they have developed relationships that will pay dividends in the future" (Gurney & Smotherman, 2009, p. 123). Even communicating with members in other U.S. military services can provide a broadening experience where leaders can expand their worldview and develop skills for communicating with a variety of audiences. If the military approached the current environment recognizing and capitalizing on the developmental opportunity, then it will enhance the strategic thinking capability of many in the force.

There is a dichotomy in the military between tactical and strategic success. Young officers are trained and developed to be tactically successful. However, the skills and experience needed for strategic success are not always built into tactical development and experiences. The Army institution relies heavily on the Officer Efficiency Report (OER) system that evaluates officer performance. The OER is an assessment where officers are evaluated by their superiors against their peers on their performance in their current role. The OER system– as an important mechanism for shaping the strategic thinking capability of military leaders as raters– could identify officers with demonstrated strategic thinking abilities and recommend them for promotions and assignments that would develop those abilities. However, the OER currently does not emphasize strategic thinking as critical. If strategic thinking is mentioned as a valuable component of an officer's OER, it is only because the officer's rater and senior rater have highlighted strategic thinking as critical. Laich and Young (2011) asserted that the Army's

current system of rewards and punishments and the personnel system in general promotes conformity and is blind to merit. This is not a system conducive to identifying and developing strategic thinkers.

However, it is critical that the Army invest resources into doing just that: identifying and developing strategic thinkers. As General Odierno aptly noted:

> Today's complex world creates an environment that requires much more of our leaders. It is not enough to be technically and tactically proficient. We must be able to assess, understand, adapt, and yet still be decisive. We have to think through complex multidimensional problems, taking into account the diplomatic, economic, military, political, and cultural implications of every action. (Gurney & Smotherman, 2009, p. 124)

There is some concern that the Army does not currently have enough strategic thinkers. One example of this concern is that the Army is under represented in key strategic jobs. Wong noted that "36 percent of all military officers serve in the Army, yet Army officers fill only a little over 15 percent of the key joint military positions" (2011, web based). Given the imperative to foster strategic thinking, the U.S. Army Research Institute (ARI) recently completed a multi-disciplinary inquiry on strategic thinking. The overarching question asked by ARI was: how can the U.S. Army assess, develop, and retain strategic thinkers? Thirteen military and non-military experts responded to this question by providing concept papers in their area of expertise. In addition to addressing ARI's overarching question, there are three other major goals of this compendium.

One goal is to provide a wide variety of perspectives on the topic. This goal is accomplished by including authors with a wide variety of educational backgrounds (e.g., psychology, business, political science, education, human resources, design, Russian and Eastern European Studies, and engineering). Further the contributors bring a variety of experiences to their writing from academic experience, experience working in private industry, consulting for the government, and active duty service in the military. A second goal is to identify areas of convergence and divergence among the experts on the topic of strategic thinking. A thorough read of the papers will provide the reader with detailed instances of convergence and divergence. The final chapter in this compendium also provides a comprehensive synopsis highlighting many areas of convergence and divergence. It is important to remember that the authors are expressing their opinions based on their background and expertise. There are points in the compendium where even multiple authors disagree on the topics addressed. The divergent viewpoints are as beneficial as the areas of convergence for generating thought and discussion on these topics. A third goal is to identify exemplar techniques, processes, and insights that could inform and change the conceptualization and practice of strategic thinking in the military. Every paper in this compendium accomplishes this goal.

Organization of this Compendium

Thirteen papers are organized into four sections: 1) strategic thinking - big picture, 2) impact of culture, 3) insights from outside the military, and 4) ways of thinking. Each of the four sections

addresses elements related to the overarching question guiding this compendium: how can the U.S. Army assess, develop, and retain strategic thinkers?

Section 1: Strategic Thinking - Big Picture

In the first section, three papers provide a broad overview of strategic thinking based on perspectives from experience in the military and academic study of strategic thinking. Van Riper's paper identifies two key components of strategic thinking related to the military:

> (1) ability to assist in selecting the ways and means needed to support the achievement of national policy goals (ends); select the military strategy, that is the ways and means required to accomplish the goals (ends) of national security strategy; and plan for and execute campaigns and operations that advance that strategy, and (2) uncover or discern the logic that holds together seemingly intractable and ill-defined problems and develop a counter-logic that resolves them. (Ch. 1, p. 16)[1]

He then describes three approaches to decision making and discusses how strategic thinking relates to one approach to decision making—design. Additionally, the paper discusses several attributes required for strategic thinkers and discusses six subjects that are critical for a strategic thinker's professional education: systems theory, strategic theory, "how to think," history, geostrategy and geopolitics, and cultural anthropology.

Goldman's paper provides a definition of strategic thinking based on her synthesis of strategic thinking literature as well as her own research. Goldman contends that strategic thinkers have a unique thinking style that involves "conceptual, systems-oriented, directional, and opportunistic thinking, applied and further developed via dynamic, interactive, and iterative scanning, questioning, conceptualizing and testing, in order to discover novel, imaginative organizational strategies" (Ch. 2, p. 36). She goes on to describe a learning model based on the knowledge, experiences, and habits she identified as important for strategic thinking. The learning model includes work experiences, knowledge creation, strategic thinking activities (i.e., scanning, questioning, conceptualizing, and testing), individual factors (e.g., family upbringing, education, and individual learning style), and organizational influences (workgroup and organizational level). Further, Goldman discusses current attempts to assess strategic thinking and considerations for development of assessments of strategic thinking.

Bethel's paper provides an assessment of the current status of strategic thinking in the military. He contends that the military does not systematically identify, train, and retain officers with high strategic thinking capability. That strategic thinkers exist in the military is often the result of a "happy accident" (Ch. 3, p. 55). Throughout his paper he provides insights and recommendations to recruit, develop and train strategic thinkers in the military. Bethel's recommendations to develop a cadre of strategic thinkers include identifying successful strategic thinkers now and through history and determining their common skills, experiences and training; then establishing an initial vetting process for strategic thinkers including a test, evaluation, and practical

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[1] Citations without year listed refer to chapters within this compendium.

component; and finally, aggressively approaching individuals with potential and providing them opportunities to demonstrate that potential.

Section 2: Impact of Culture

In this section, four papers provide perspectives on cultural impediments to strategic thinking in the military and insights on creating a culture conducive to strategic thinking. Wong and Gerras describe strategic thinking by outlining three innate abilities (conceptual skills, openness, and courage) and three learned competencies (frames of reference development, future orientation, and enterprise understanding) that indicate strong ability to think strategically. Examining the prevalence of these six indicators in the Army, Wong and Gerras argue that the current Army systems and culture do not support strategic thinking. They make a strong case for selection (at multiple points in one's career) on the innate abilities and development of the learned competencies. They also describe a model for development of competency in strategic thinking.

Paparone's paper asserts that the concepts of strategy and strategic thinking are products of one way of thinking about the world: a functionalist paradigm. He describes and demonstrates this paradigm by examining military documents (e.g., doctrine, the Officer Professional Military Education Policy, and The U.S. Army Learning Concept for 2015) making the claim that U.S. military culture is firmly entrenched in the functionalist paradigm. Additionally, Paparone introduces three other paradigms (radical humanism, radical structuralism, and interpretivism) and demonstrates how each of those paradigms might interpret various military documents. He argues that there is value in broadening the frames (paradigms) in which a person views the world.

Casey's paper focuses on how organizational practices can either inhibit strategic thinking or create an environment for strategic thinking to flourish. Casey summarizes research on organizational culture, including Schein (1992) and Hatch (2004). Her summary includes a discussion of the role of organizational identity and the role of leaders with regards to organizational culture. Casey then applies past research and describes six leadership practices that impact or change organizational culture with regard to strategic thinking. She goes on to discuss the role of leaders, stories, organizational structures, socialization practices, anniversaries, and the structure of tasks and technologies in building strategic thinking cultures. Further, Casey discusses how these elements can be applied to the military. Finally, she discusses how the Army can recruit and retain strategic thinkers from the perspective of organizational culture.

Cross's paper draws on his experiences both working with the military and his career with private industry. He describes a comparison between traditional and enlightened strategy processes while highlighting the benefits (e.g., dynamic, flexible, creative, innovative) of an enlightened process. He goes on to compare the strategy processes between PepsiCo (a company with an enlightened strategy process) and the U.S. Army (an organization that uses a more traditional strategy process). Cross concludes with an outline of several tools and processes to encourage strategic thinking competency development that are applicable and transferable to the U.S. Army.

Section 3: Insights from Outside the Military

The third section includes papers that discuss techniques and concepts that are somewhat outside mainstream techniques for strategic thinking in the military. However, each provides valuable contributions that, if adopted, will enhance the Army's strategic thinking capabilities. Duggan describes the process of creative strategy as a formal mechanism to apply strategic intuition. This perspective draws on recent research examining the process of learning and memory in the brain. When you do not have the knowledge to understand a situation through your own experiences, Duggan argues creative strategy can be used to break down a situation into component parts and search for elements elsewhere to combine the elements creatively to solve a problem.

Sanders demonstrates the importance of creativity as a component for strategic thinking. She discusses research and techniques for individual and collective creativity noting that there is a scarce amount of research on collective creativity. However, based on her work and research, she outlined several tools and techniques that the Army can use to develop collective creativity that can be applied for strategic thinking (e.g., future workshops, scenario planning, and open space technology).

Owen describes strategic thinking from a design perspective. The U.S. Army is starting to incorporate principles of design into professional military education (e.g., at the School of Advanced Military Studies) and doctrine (U.S. Department of the Army, 2010). However, design is not widely practiced. Owen's paper describes fundamental elements of design thinking (e.g., conditioned inventiveness, human-centered focus, environment-centered focus, ability to visualize, tempered optimism, bias for adaptability, systemic vision, and affinity for teamwork). Further, Owen's paper outlines a method for teaching strategic design thinking including the goals as well as specific aspects of a course that could be modified for use in the Army. Finally, he discusses cultural change, resistance, and how to foster a culture that supports design thinking.

Section 4: Ways of Thinking

The fourth section includes three papers that provide discussion on a variety of ways of thinking: linear or nonlinear, qualitative or quantitative, and past, present, or future. Vance's paper describes a linear thinking style, and then outlines seven types of nonlinear thinking styles: intuitive thinking, insightful thinking, creative thinking, imaginative thinking, emotional thinking, values-centered thinking, and flexible thinking. Vance argues that there is value in both linear and nonlinear thinking and that a balance between the two approaches is advantageous for strategic thinking. He also describes two assessments he created to assess linear/nonlinear thinking style balance. Finally he describes ways a person can achieve a balance of linear and nonlinear thinking styles.

Schmidt argues that the culture of the military is predominately quantitative, however, a qualitative mindset is likely more congruent with strategic thinking. He describes the differences between quantitative and qualitative approaches, research questions, and thought processes. Schmidt argues that quantitative methods are appropriate for tactical engagements and can inform strategic thinking, but a completely different thought process (i.e., qualitative) is

necessary for success when asking questions with strategic implications. Schmidt also discusses how time delays can affect the perceived impact of qualitative modes of thinking. There are a multitude of relevant variables in a situation with strategic implications, yet those variables are frequently difficult to measure and the effects of action taken may not manifest for a considerable amount of time. Schmidt argues that the Army needs to embrace qualitative modes for strategic thinking and determine appropriate ways to measure the effectiveness of qualitative work.

Clark discusses how time influences thinking models. He discusses past, present and future time orientations and the implications they have for strategic thinking and, in a more basic sense, how a person views the world. Clark outlines three profiles for strategic thinking: future (conceptual knowledge), present (procedural knowledge), and past (factual knowledge). Clark concludes with a discussion of three common threads for strategic thinking: 1) organizing related events into a reality of present, future and past; 2) learning or how organizations develop knowledge and structure problem solving; and 3) the role of narratives that describe relationships in a contextual setting.

Conclusion

In a time when the U.S. military is facing large scale change in the type of conflict fought, budgetary reductions, and changes to the political environments of other countries, military leaders are required to think strategically to address the current environment and adequately prepare for likely future environments. Some military leaders and scholars question whether the military is adequately prepared to meet the challenge with the current strategic thinkers in the military (Bethel, et. al., 2010; Wong, 2011).

This compendium provides a thorough examination of the question: "How can the Army assess, develop, and retain strategic thinkers?" Expert input from within and outside the military provide a variety of perspectives that highlight areas of convergence and divergence, as well as, exemplar techniques, processes and insights that inform and change the conceptualization and practice of strategic thinking in the military. This compendium does not provide *the answer* to all of the Army's strategic thinking challenges, but it does provide many possible avenues to explore with the goal of enhancing the Army's strategic thinking capabilities.

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Section 1
Strategic Thinking – Big Picture

Chapter One

The Identification and Education of U.S. Army Strategic Thinkers

Paul K. Van Riper*, LtGen, U.S. Marine Corps (Retired), *Marine Corps University*

This paper has three purposes. The first is to define with some specificity what we mean by "strategic thinking," especially in a military context. Without agreement as to how the community of practice understands the term there is little likelihood this project will succeed in informing the U.S. Army about the best ways to identify, educate, and assign the officers it needs to resolve strategic issues. The second is to relate strategic thinking to the three approaches to decision-making. In essence the objective of strategic thinking is to help senior leaders make important decisions. This requires some knowledge of the three possible approaches to decision making and an awareness of which to use in particular circumstances. The third purpose is to single out the key elements necessary in any program the U.S. Army creates to educate strategic thinkers. This last purpose speaks to the most consequential part of the paper in that it gets to the heart of what makes a strategic thinker.

Strategic Thinking and Strategy: What Do We Mean?

Over the past few years the term "strategic thinking" has become very popular within the defense community and elsewhere.[1] However, a review of contemporary professional military journals and various other publications related to national security reveals that the authors define the term differently, and in some cases those definitions are not very clear. Thus, any study on strategic thinking within the U.S. Army must first establish a more exacting meaning.

Thinking

Of the two words that make up the term strategic thinking, "thinking" may be the easier to define. In its Old English origins, "*think* probably carries the notion of 'causing images, reflections, etc. to appear to oneself, in one's brain'" (Ayto, 1990, p. 528). (I will have more to say about "mental images" later in this paper.) Among the several dictionary definitions for thinking, the following seems best suited for our needs: "to employ one's mind rationally and objectively in evaluating or dealing with a given situation" (Webster's, 2003, p. 1971). In other words, we are dealing with cognition and judgment, but of a particular kind delineated as "strategic."

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[1] A search of amazon.com on January 2, 2012, using the key word "strategic thinking" produced 14,905 results and a survey of the first 100 entries found 74 of the books listed had those words in the title. There is clearly an appetite for understanding strategic thinking. The term is also common in the business and academic communities as evidenced by the large number of companies that offer training in so-called strategic thinking skills. For examples, see: http://www.strategyskills.com/; http://www.cmoe.com/ahead-of-the-curve.htm?_oskwdid=3225979&gclid=CLaF0bmUq60CFUsaQgodRlNtnA; http://www.ecornell.com/individual-course-list/leadership-and-strategic-management-courses/strategic-thinking/crs/LSM502; http://www.impactfactory.com/p/strategic_thinking_skills_training_development/issues_148-10108-7713.html, and http://www.thethinkingcoach.com/articles/strategic-thinking-article.htm/128.

I will next turn to defining strategic, but at this point we need to separate strategic thinking from senior executive skills. Though the two have an association, the latter is broader in scope. A senior executive will almost certainly have to employ strategic thinking skills, but he or she must also possess many other attributes to lead effectively. Among these is the ability to communicate, motivate, direct actions, mentor, and resolve differences. By contrast, a strategic thinker may be a member of a staff and have focused responsibilities that do not require the full range of executive competencies. In determining executive and strategic thinking skills we must be cautious of a systems analysis approach that leads to detailed competency mapping, which over emphasizes "hard skills" while ignoring the element of art (Reed, Bullis, Collins, & Paparone, 2004).

There is "Strategy" and There is Strategy

Strategic, of course, is the adjectival form of the noun strategy, which signifies that it pertains to or relates to strategy. We must begin, therefore, by examining the meaning of the noun. The task is not easy, as two eminent historians warn us: "The concept of 'strategy' has proven notoriously difficult to define" (Murray & Grimsley, 1994, p. 1). Another distinguished historian, Hew Strachan (2005) contends that: "The word 'strategy' has acquired a universality which has robbed it of meaning, and left it with only banalities" (p. 34). This charge of laxity in the use of language certainly fits many American military officers whose professional lexicon is careless at best and often simply confused. Because characterizations of strategy abound throughout the U.S. defense community any discussion of the subject becomes difficult unless we first clarify terminology. Finding a satisfactory description is made even more difficult if we do not first limit some of the possibilities, which I shall do by setting aside meanings not related to the military or to high-level decision-making.

"Strategy" Discarded

Despite its initial association with things military, strategy has assumed other more generic meanings that people use broadly and commonly. To mention just a few, there are strategies for nearly every board-game and most sports, strategies for winning the lottery and finding a spouse, and strategies for buying a car and placing a bet in a horse race. There are even strategies for physical exercise and living one's life! And the list goes on, seemingly without end. To illustrate the ubiquity of the word, the day I wrote this paragraph I heard a woman on television say she had a "strategy" for Christmas shopping and I read a comic strip where a child spoke of having a "strategy" for preventing an opponent from scoring goals against her soccer team. Clearly, such uses of the word do not require strategic thinking of the sort envisioned by the U.S. Army Research Institute project on "Strategic Thinking for Command." Thus, I have eliminated from further consideration the everyday use of strategy as a mere synonym for a simple plan or idea.

Strategy Described

In its historic and more narrow usage strategy pertains to "the science or art of combining and employing the means of war in planning and directing large military movements and operations" while in more general—and not necessarily military—usage it concerns "a plan, method, or series of maneuvers or stratagems for obtaining a specific goal or result" (Webster's, 2003, p.

1880). So, at this point in our inquiry we might conclude that for our intention: *Strategic thinking means employing a leader's wisdom—gained through experience and education—to plan for and achieve particular outcomes, some of a purely military nature and the others of a more general character*.

Military Strategy Described

The word strategy "comes ultimately from Greek *strategos* 'commander-in-chief, general,' a compound noun formed from *stratus* 'army' and *agein* 'lead' (a relative of English *act*, *agent*, etc.)" (Ayto, 1990, p. 505). Our understanding of strategy has evolved far from "a person who leads an army." Ironically, one authority writes: "While the term is credited to the Greeks, no Greek ever used the word. The Greek equivalent for the modern word 'strategy' would have been 'strategike episteme' (general's knowledge) or 'strategon sophia' (general's wisdom)" (Horwath, 2006). "General's knowledge and wisdom" come closer to our need, for certainly these attributes benefit strategic thinking.

Many books on military strategy note the origin of the word strategy, but almost none trace its changes in meaning over the ages; they simply put forward a contemporary meaning. Happily, a recent book by Beatrice Heuser (2010) does describe with some detail this transformation in the meaning of strategy. Heuser does this onomasiologically, that is, she provides a definition and then seeks its linguistic expression in the past. I have found her approach useful in my effort to unravel the several current definitions of strategic and strategy. Heuser's definition of strategy is, "how people thought about the link between political aims and use of force, or its threat . . . ." (p. 3). She notes that while the Greek word strategy applied to "the art or skills of the general" by the sixth century the Byzantines differentiated between strategy and tactics; the former for how to conduct a war, and the latter for how to maneuver units (p. 4). A work by Leo VI, Byzantine emperor from 886 to 912, brought knowledge of this framework with its larger meaning of strategy to the West, though not to Western languages (Heuser, 2010, p. 4). As an example, the French Count and General Jacque Antoine Hippolyte Guibert wrote of "grand tactics" and "tactics," which today would be strategy and tactics (Heuser, 2010, p. 5). In 1771 Paul-Gedeon Joly Maizeroy, a French officer and theoretician, used "for the first time in the West, the two terms 'strategy' and 'tactics' . . . in a hierarchical sense," after which this Byzantine understanding quickly spread (Heuser, 2010, p. 5).

Though a number of writers made the concrete connection between strategy and policy in the late 1700s and early 1800s, it is Carl von Clausewitz's words translated from his opus *On War* that eventually proved seminal; "it is clear that war should never be thought of as *something autonomous* but always as an *instrument of policy*. . . ." (von Clausewitz, 1976, p. 88, italics in the original).[2]

But Clausewitz's definition of war "as an act of force to compel our enemies to do our will" proved more alluring and for many military leaders this phrase defined strategy; thus, strategy became imposing ones will on the enemy in lieu of achieving the political aim (Heuser, 2010, p. 6-8). This view caused military leaders as well as theoreticians to focus on the mechanics of

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[2] Heuser (2010) discusses how widespread the idea of the bond between political aims and war objectives was during this period (pp. 10-15).

military operations under the guise of strategy. One of the first to move beyond this narrow definition was Henry Spenser Wilkinson, a British historian, who in 1894 wrote: "A policy is national action directed to an end or purpose. The object set up must be one that the nation values and appreciates . . . . And the means must be suitable to the end" (Heuser, 2010, p. 7). Others built on this idea introducing the term "grand strategy" to incorporate the concept of coordinating all the elements of national power that a state could bring to bear in a war. Grand strategy was clearly separate from strategy, as the latter centered on how to employ military force. There was and remains, though, an unfortunate tendency to conflate policy and grand strategy.

In his latest book, Colin S. Gray (2010), a well-regarded strategic theorist, puts forward a ten-level schema that goes a long way in sorting out the modern strategic lexicon. For the intentions of this paper, though, only six of these terms are of concern. They are:

- *Policy*: The political objectives that provide the purposes of particular historical strategies. [Politics, not surprisingly, produces policy; see the definition of grand strategy below.]

- *Strategy* (content neutral): The direction and use made of means by chosen ways in order to achieve desired ends. [This establishes an "ends-ways-means" model that I will refer to later in this paper.]

- *Grand strategy*: The direction and use made of any or all among the total assets of a security community in support of its policy goals as decided by politics. The theory and practice of grand strategy is the theory and practice of statecraft itself. . . . [This term is equivalent to the United States Government's term "national security strategy."]

- *Military strategy*: The direction and use made of force and the threat of force for the purposes of policy as decided by politics. . . . Definitions that identify strategy and strategies only as plans should be rejected because they fail to grip the essence of strategy, which is *its instrumental nature*. Strategy has to be expressed in strategies as plans, but most significantly *it is about the intended consequences* of the operational and tactical behavior advanced by those plans. [Italics added.]

- *Operations*: Combinations of purposefully linked military engagements, generally though not necessarily on a large scale. Operations are strategy as action; they appear as plans (strategies), as combat, and as consequences (effect).

- *Tactics*: Actual military behavior, most especially, though not only, directly in combat (fighting) (p. 18).

With a deeper understanding of how the meaning of strategy has grown over the years, we need to modify the first part of our earlier definition—the military part—to read: *Strategic thinking employs a leader's wisdom—gained through experience and education—to assist in selecting the ways and means needed to support the achievement of national policy goals (ends); select the*

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military strategy, that is, the ways and means required to accomplish the goals (ends) of national security strategy; and plan for and execute campaigns and operations that advance that strategy.

This description expands upon and incorporates the view of strategic thinking B.H. Liddell Hart (1967) expressed in his classic work on strategy; "the art of distributing and applying military means to fulfil (sic) the ends of policy" (p. 335). It also parallels the U.S. Department of Defense (DoD) *Dictionary of Military Terms*' (2012) definition of strategy: "A prudent idea or set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve theater, national, and/or multinational objectives." The description is basically incorporated in Harry R. Yarger's (2008) definition of strategic thinking in his popular text on strategy: "Strategic thinking in the purest sense is the capacity to apply strategic theory in the real world and formulate strategy that successfully advances specific state interests without undue risk of creating negative consequences for the state's other interests" (p.11).

In the last section of this paper I will discuss what knowledge and skills are required of officers who must think through situations related to national security and military strategy. In other words, what does it take to be a strategic thinker in the national security and defense arenas?

Non-Military Strategy Described

By "non-military" I do not mean that this kind of strategy, and hence strategic thinking, is not of interest or use to the military; rather, that it does not refer directly to activities designed to support the development and execution of national security strategy or military strategy. Non-military strategy does, however, mimic these latter strategies to the degree it enables officers to judge what needs to be done to resolve complex issues and to describe how to go about doing so. Such strategic thinking entered business and industry in the 1960s as "strategic planning." Nearing the end of the 1960s strategic planning became, in the words of one noted authority Henry Mintzberg (1994), "a virtual obsession among American corporations (and in the American government, in the form of the Planning-Programming-Budgeting system, or PPBS)" (p. 6). As Mintzberg points out, in spite of its popularity, no one was able to determine what the difference was between strategy formulation, that is, the development of a strategy, and planning. Some advocates insisted that "strategy making [was] simply a process of planning;" but, as Mintzberg noted, this plainly makes the term strategic planning an oxymoron (1994, p. 5). By the time he wrote his book in 1994, it was becoming increasingly obvious that strategic planning was failing in nearly every setting. Mintzberg's conclusion as to why, which he named "the grand fallacy," is that strategic planning fails to recognize that strategy requires synthesis while planning requires analysis (p. 321). Creating a strategy obliges one to think holistically— to employ a gestalt. Planning requires reducing a situation to its constituent parts for examination, sorting, modifying, and then reassembling those parts in accordance with an overall strategy. Overly busy executives allowed high-level planning to absorb strategic thinking and too often this resulted in muddled plans. Strategic thinking—a distinct activity—is to guide, not do, strategic planning. Corporations—or at least the consultants they rely upon—appear to have heeded Mintzberg's advice as they now take great pains to separate strategic thinking from strategic planning and strategic management. (View the web sites listed in footnote 1 for evidence.)

To illustrate the shortcomings of strategic planning in the defense community one needs only turn to a National Defense University book titled *Creating Strategic Vision: Long-Range Planning for National Security* (Smith, Allen, Stewart, & Whitehouse, 1987). Smith et al. argued that:

> The most productive time frame for serious consideration by long range-planners is the 10- to 25-year period. Any time short of 10 years is so near term that it is hard to conceive of significant changes or approaches that might move an institution in new directions. (p. 3)

The book continues offering a variety of techniques for conducting "long-range planning." One of these is the use of a:

> . . . hedging strategy to cope with unforeseen contingencies—events outside the range of possibilities covered by the alternative environments. Such events include surprises whose occurrence, although extremely important, would be highly improbable; specific examples relevant to this would include a full-scale revolt in Eastern Europe or a complete switch in the Soviet economic systems [sic] to a market orientation. (p. 97)

Of course the "highly improbable" did occur: the collapse of the Warsaw Pact in February 1991 and, beginning in December 1991, the movement of Russia to "a more market-based and globally-integrated economy" (Central Intelligence Agency, 2012). So if one adds 10-years to the 1987 publication date, it is clear that the book fails to live up to its claim that "[a]ny time short of 10 years is so near term that it is hard to conceive of significant changes or approaches that might move an institution in new directions," for the United States definitely moved in new directions after 1991. In addition to the inability of some proponents of strategic planning to adequately fix time horizons, few have been able to demonstrate with any consistency the worth of the tools they offer.

Despite their prevalent use, by definition we cannot consider problem-solving or decision-making approaches that depend upon rule-based or analytical methodologies as "strategic thinking"—even though advocates do so. This includes those bureaucratic procedures that the Army and the Department of Defense use to create new organizational structures and to develop and acquire new weapons and equipment. Among these are the Army Force Development processes and the Department of Defense's Joint Capabilities Integration and Development System (JCIDS).

Yet, there are a number of reasons for officers to possess strategic thinking skills beyond those required to develop and execute national security strategy and military strategy. One example is to generate the visions or strategies that guide the force development processes. Other examples revolve around personnel matters that require new or changed policies.

Strategic Thinking Defined

As we did at the end of the earlier discussion of military strategy, we must modify again our initial definition of what strategic thinking means to include that which is beyond developing and

executing national security strategy and military strategy. I suggest adding a second bullet to make complete my earlier definition: *Strategic thinking employs a leader's wisdom—gained through experience and education—to:*

- *Assist in selecting the ways and means needed to support the achievement of national policy goals (ends); select the military strategy, that is, the ways and means required to accomplish the goals (ends) of national security strategy; and plan for and execute campaigns and operations that advance that strategy.*

- *Uncover or discern the logic that holds together seemingly intractable and ill-defined problems and develop a counter-logic that resolves them.*

Strategic Thinking and Three Approaches to Decision Making

Decision Making: System 1 and System 2

For many years military officers relied on a rule-based approach for making decisions. The Army first codified this approach in its July 1950 FM 101-5, Staff Officers Field Manual: Staff Organization and Procedures (Paparone, 2001, p. 46).[3] The heart of the approach was a five-step analytical procedure, which doctrine writers greatly expanded in later editions of the manual. To illustrate, the 1984 edition depicted a nine-step procedure and the 1997 edition a 38-step procedure (Paparone, pp. 46-47). These later models of military decision-making were based on techniques that replicated those of formal system analysis. In fact, the steps for comparison of courses of action bare a strong resemblance to multi-attribute utility analysis, a method where corporate and government analysts use models and analytical tools to evaluate alternatives.[4]

Military decision making grew more complex—and in the view of many observers more cumbersome—every year. Meanwhile research by cognitive psychologists provided evidence that commanders and staff officers frequently circumvented these increasingly complicated methods of decision making and made decisions intuitively or through the use of heuristics. Much of the groundbreaking work leading to this new understanding of decision making was done by Herbert A. Simon beginning in the late 1940s followed by that of Daniel Kahneman and Amos Tversky in the 1960s and 1970s.[5]

Though some officers may have been aware of the findings of Simon or Kahneman and Tversky, it was another cognitive psychologist, Gary A. Klein, who brought theirs and his own unique understanding of decision making to the larger Army. He accomplished this largely through the publications that detailed his fieldwork as well as his project reports for the U. S. Army Research

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[3] The decision making procedural steps published in the 1950 manual were the culmination of an effort that began with the 1932 edition of the *Staff Officers' Field Manual*.

[4] For examples of such tools, see: Quade, E. S. (1975). *Analysis for Public Decisions* (ch. 3). New York: American Elsevier.

[5] For an overview of Simon's research, see: Simon, H. (1996). *The Sciences of the Artificial* (3rd Ed.). Cambridge, Massachusetts: The M.I.T. Press. For Kahneman and Tversky, see: Kahneman, D. (2011). *Thinking, fast and slow.* New York: Farrar, Straus and Giroux.

Institute. Klein gained the attention of many officers in the Army and other services with his article "Strategies of Decision Making" in the May 1989 issue of *Military Review*, in which he opened with these provocative words: "It is time to admit that the theories and ideals of decision making we have held over the past 25 years are inadequate and misleading" (p. 56).

Klein (1989) labeled his new approach as "recognition primed decision making" and argued that in real situations an "officer used experience to recognize the key aspects of a situation, enabling rapid reaction. Once a decision maker identifies the typical action, there is usually a step of imagining what will happen if the action is carried out in *this* situation" (pp. 58-59). In short, Klein suggested that experienced leaders faced with a problem typically see a familiar pattern that provides a framework for thinking about the situation and a potential solution. Such pattern recognition can be visual, audible, or of a sequence of events. Basically, the decision maker is creating a mental model or mental image of how he or she believes things will play out in a particular circumstance.

Herbert Simon wrote that: "Intuition is nothing more and nothing less than recognition" (as quoted in Kahneman, 2011, p. 11). Political scientist Howard Margolis (1987) carried this thought further in a book that aimed "to apply recent insights from cognitive psychology to . . . students of politics." Margolis opened with these words: "This study gives an account of thinking and judgment in which—to lay cards immediately on the table—everything is reduced to pattern-recognition" (pp. ix, 1).

By the early 1990s the Army acknowledged two distinct approaches to decision making, intuitive and analytical. Kahneman (2011) identified these as system 1 and system 2, a classification commonly used today, and states that:

- *"System 1* operates automatically and quickly, with little or no effort and no sense of voluntary control.

- *System 2* allocates attention to the effortful mental activities that demand it, including complex computations. The operations of system 2 are often associated with the subjective experience of agency, choice, and concentration" (pp. 20-21).[6]

Klein's emphasis on intuition and pattern recognition and Kahneman's focus on heuristics and biases can appear to conflict. In 2009 they wrote a journal article, "Conditions for Intuitive Expertise: A Failure to Disagree," which aimed to "map the boundary conditions that separate true intuitive skill from overconfident and biased impressions" (p. 515). Importantly, they detailed the circumstances under which we can trust professionals to exhibit expert intuition (pp. 534-525).

The Army, the other services, and joint forces adopted these two systems of decision making and included them in doctrinal publications such as Field Manual 5-0 (U.S. Department of Army, 2005), which includes this statement:

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[6] Kahneman acknowledges that psychologists Keith Stanovich and Richard West originally proposed these labels.

1-19. *Decision making* is selecting a course of action as the one most favorable to accomplish the mission (FM 6-0). Planning is a form of decision making. However, not all decisions require the same level of planning. Commanders make hundreds of decisions during operations in an environment of great uncertainty, unpredictability, and constant change. Some decisions are deliberate, using the MDMP and a complete staff to create a fully developed and written order. The commander makes other decisions very quickly. This results in a fragmentary order (FRAGO). When developing plans, *commanders normally choose between analytic or intuitive* means of decision making. [Italics added.]

Nonetheless, there remains a tendency to default to the analytical approach. Some officers seem to believe that learning the analytical military decision making process is a precursor to learning the intuitive approach when in fact they are fundamentally different. Much of this confusion comes from an inconsistency among doctrinal publications. To illustrate, U.S. Army Field Manual 6-0 (U.S. Department of Army, 2011), *Mission Command and Control of Army Forces* states:

2-54. Commanders *establish and use systematic processes and procedures to organize the activities within the headquarters and throughout the force. For example, the military decision making process provides the commander, staffs, and subordinate commanders an orderly method for planning.* Procedures govern actions within the mission command system to make it more effective and efficient. Adhering to processes and procedures minimizes confusion, misunderstanding, and hesitation as commanders make frequent, rapid decisions to meet operational requirements. [Italics added.]

Both system 1 and system 2 offer valid approaches for making a decision; the secret is in knowing which is appropriate for the situation or problem at hand. An experienced officer facing circumstances whose outlines are similar to ones he has experienced in the past is likely to see a pattern that is familiar. In short, he sees "an old story" that perhaps needs some slight updating. This is not surprising for in essence decision making involves "story telling." Leaders are trying to tell themselves—and sometimes their staffs and subordinates—a story that makes sense. That story guides actions and is the basis for intuitive decision making. On occasion, though, an officer faces a new or novel situation or problem whose outlines are unfamiliar. This is when he or she resorts to analytical decision making, working to gather and analyze enough information to uncover a pattern that gives sufficient reason for making a decision.

Decision Making: "System 3"

In the early 2000s neither system 1 nor system 2 seemed adequate for making decisions in the campaigns the U.S. was fighting in Iraq and Afghanistan. Commanders were challenged as they worked to convert the relative abstraction of strategy to the mechanics of tactic. Normally this is the role of operational art or more precisely, operational design. However, information on operational design in U.S. joint doctrine was very thin with little more than definitions such as the "elements of operational design," examples being *centers of gravity* and *lines of operation*.[7]

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[7] See especially past editions of Joint Publications 3-0 *Joint Operations* and 5-0 *Joint Operation Planning*.

Though the U.S. military has been slow to adopt it, a more formidable approach to design exists. I have taken the liberty of designating this approach "system 3." Retired Israeli Defense Force Brigadier General Shimon Naveh first introduced the outlines of this much improved method to the Army Training and Doctrine Command in 2004.[8] Known as systemic operational design (SOD), it rests on an understanding of system theory. Due to language and cultural differences, many officers found General Naveh's pure method unworkable. However, several individuals have simplified his method and integrated it with the concept of ill-structured or unstructured problems an idea offered by sociologists Horst W.J. Rittel and Melvin M. Webber in an important journal article in 1973.[9] These are situations where there is no obvious way to tackle them. They are not subject to intuition or analytical procedures because a pattern is not obvious and because a rule-set does not exist for solving them. Each is unique. Planners must uncover or distinguish a structure from what is indistinct and obscure.

The essence of this more modern approach to operational design requires a group of people knowledgeable about some aspect of an area, enemy, issue and so forth to engage in a discourse as they attempt to give form to what appears unstructured. The participants must be conversant with the basics of nonlinear systems. This allows them to generate a system view as they discern and outline a structure. The product they create not only reflects the nonlinearity of the system, it also serves as a shared mental model of how they perceive and think about the situation. In the act of creating that structure a potential solution commonly becomes self-evident. In place of the verb "structure" some have used words like frame, set, formulate, or define the problem. Of course, because the design team considers the problem as a nonlinear system there are a multitude of ways to structure it, which means there are no right and wrong answers, just better and poorer ones. Moreover, there are no permanent answers, just a way to act on the existing system to move it to a different and more desirable state.[10]

Donald Schon's (1983) landmark book, *The Reflective Practitioner: How Professionals Think in Action*, described the fundamental nature of this new approach to design, although only a few proponents of that approach appear knowledgeable of Schon's work. His central idea is that

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[8] I served as a senior mentor to a multi-year project the U.S. Army Training and Doctrine Command undertook to explore and evaluate this new approach to operational design.

[9] The very best of several good pamphlets on operational design is John S. Schmitt's, *A Systemic Concept for Operational Design* published by the Marine Corps Combat Development Command, Concepts and Plans Division, Marine Corps Warfighting Lab in August 2006 (http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf). The former U.S. Joint Forces Command published *Design in Military Operations: A Primer for Joint Warfighters* in September 2010 as Pamphlet 10, part of its Joint Warfighting Center Joint Doctrine Series. A commercial company, Booz Allen Hamilton has created an extensive program to educate military staffs on the new approach to operational design. The company has considerable written material on the subject that is useful, although it is all proprietary. Chapter 3 of Army Field Manual 5-0 (U.S. Department of Army, 2005) discusses operational design in detail, but it is flawed by a conflation with system 2 procedures. This same deficiency exists in a *Planner's Handbook for Operational Design* published by the Joint Staff (2011; http://www.dtic.mil/doctrine/doctrine/jwfc/opdesign_hbk.pdf).

[10] I have drawn much of the material in this and the preceding paragraph from an article I wrote for a forthcoming edition of the online journal *Infinity*.

professionals reflect on what they are doing while doing it as well as afterwards. Schon called this reflection-in-action and reflection-on-action, which is learning while carrying out an action and at a later time.[11] At its core the modern approach to design embodies learning in-action, though with a group instead of an individual. Schon's work evidences that his idea of thinking about a task while engaged in it to creatively adapt, parallels the ideas of Naveh and Rittel and Webber. Of special interest is his chapter, "Design as a Reflective Conversation," a source that Naveh often references in presentations. Schon noted that "the concept of design has broadened" over the years and that "at a deeper level" there is "a generic design process" where the designer converses with him or herself or another person about the situation, the construction of a model, and the phenomenon in question (p. 77). They reflect-in-action. Schon (1987), in a later book, dispelled any doubt about the relevance of his thoughts to the U.S. military's latest approach to design: "[A]s we have come to see with increasing clarity over the last twenty years, the problems of real-world practice do not present themselves to practioners as well-formed structures. Instead, they tend not to present themselves as problems at all but as messy, indeterminate situations" (p. 4).

Strategic thinkers need to be able to employ all three approaches to decision making, although the character and form of the situations and conditions they will likely face lend themselves mostly to a design approach (system 3). As to the intuitive approach (system 1), strategic thinkers need to seek as much relevant experience as possible to increase the odds they will recognize patterns, which to others might seem obscure when faced with a troubling situation.[12] This ability is very useful when engaged in a design discourse where the participants are attempting to discern the "system logic" of the circumstances that concern them. Strategic thinkers have an advantage when using the analytical approach (system 2) if their intellectual development exposes them to useful quantitative methods. Even within the holistic or systemic approach to design there are times when such methods are useful, particularly when examining specific linear elements of the larger system under study. Professional military education must include instruction on all three approaches and provide ample opportunity for students to practice with each.

Identifying and Educating Strategic Thinkers

Identifying Strategic Thinkers

The literature search for this paper found very little on how to identify and educate strategic thinkers. The search, however, uncovered considerable material on how to identify and educate strategists and much of this material spoke to deficiencies.[13] Is there a difference between a

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[11] John Dewy (1933) was the first to describe this form of learning in *How We Think. A Restatement of the Relation of Reflective Thinking to the Educative Process* (Rev. Ed.). Boston: D.C. Heath.

[12] Although we should always prefer actual experience, vicarious experience attained though reading, exercises, and wargames is also valuable.

[13] One of the most important documents is the U.S House of Representatives, Committee on Armed Services Subcommittee on Oversight and Investigations April 2010 report, *Another Crossroads? Professional Military Education Two Decades After the Goldwater-Nichols Act and the Skelton Panel* (http://www.mcu.usmc.mil/SACS1/PME/HASC%20PME%20Report%202010.pdf). A major finding of this report

strategist and a strategic thinker? I believe there is not, because the definition of strategist is "an expert in strategy," and Gray's previously mentioned schema declares strategy to be: "The direction and use made of means by chosen ways in order to achieve desired ends." Elsewhere Gray (2010) stated that:

> . . . a strategist is understood to be a professional military person charged either, or both, with: (1) guiding and shaping, subordinate military operations by major units in campaigns for the purpose of securing military advantage (success or victory); and (2) guiding and shaping the course of military events for the purpose of achieving the polity's political goals (pp. 14-15).

And this, as I have written earlier, is essentially what strategic thinkers must be capable of doing.

Gray (2009) also states that: "Above all else, the strategist has need of an educated capacity for strategic judgment" (p. 37). Judgment, not surprisingly, is a facility that arises from wisdom, which itself is a product of experience and education. Before turning to what experience and education is needed to produce a strategist or strategic thinker, we need to consider what characteristics best enable one to take full advantage of such experience and education. Gray (2009) maintains that: "The superior strategist is ever uniquely a product of nature/biology, personality/psychology, and experience/opportunity" (p. *v*). The 1989 U.S. House of Representatives Skelton Panel Report on military education asserted that strategists need to be analytical, pragmatic, innovative, and broadly educated (p. 28). Where does the Army find such individuals and how does it educate and assign them after commissioning?

There is some evidence that those strategic thinkers who received a liberal education[14] with emphasis on the humanities[15] and who have spent considerable time living or working in other cultures are at an advantage when provided the right education and given appropriate assignments (Salmoni, Hart, McPherson, & Winn, 2010, pp. 72-88). Primarily, though, a person must possess the intellect to both grasp and make use of what he or she is taught or learns through experience. This suggests there is merit in ascertaining if there are tests that would measure the personality and intellect of those enrolled in pre-commissioning programs as well as at other key points in the early parts of officers' careers. It also implies there would be value in identifying both experience (in terms of assignments) and educational opportunities that nascent

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was: "Joint and service efforts to identify and cultivate strategists are disassociated from one another. Although officer-in-residence PME is a factor in these efforts, it is not the primary means for developing future strategic decision-makers. All of the services should cultivate strategists to assume positions of senior command authority" (p. xiv). Another important document is: Yarger, H. R. (2009, April). *How Do Students Learn Strategy? Thoughts on the U.S. Army War College Pedagogy of Strategy*." Paper presented at the Annual Teaching Strategy Conference at the U.S. Army War College, Carlisle, PA.

[14] The Association of American Colleges and Universities defines a liberal education as "a philosophy of education that empowers individuals with broad knowledge and transferable skills, and a stronger sense of values, ethics, and civic engagement... characterized by challenging encounters with important issues, and more a way of studying than a specific course or field of study" (http://www.aacu.org/resources/liberaleducation/index.cfm).

[15] Defined as "academic disciplines that study the human condition, using methods that are primarily analytical, critical, or speculative, as distinguished from the mainly empirical approaches of the natural sciences" (http://en.wikipedia.org/wiki/Humanities).

strategic thinkers could take advantage of throughout their careers. The U.S. House of Representatives, Committee on Armed Services Subcommittee on Oversight and Investigations report of April 2010 recommended that:

> The services should sponsor a number of junior/company grade officers for Ph.D.s in strategic studies including history, political science, international relations, and economics at top-tier civilian institutions, beyond that needed for faculty positions at academic institutions, in order to build a cadre of strategic thinkers for the operating forces and higher-level staffs. (p. 48)

Taught by the eminent scholars John Lewis Gaddis, Paul Kennedy, and Charles Hill as part of Yale University's International Securities Studies, "The Brady-Johnson Program in Grand Strategy" appears to be an ideal course for aspiring strategic thinkers. The program's web site states that it seeks to teach "future leaders to think about and implement grand strategies in imaginative and effective ways" (Yale University, 2012).

Educating Strategic Thinkers

In the following paragraphs I describe several of the fundamental elements that should constitute the core of a strategic thinker's professional education.

System theory. First and foremost strategic thinkers need to "know how the world works." They need to have a system view of the world and all that is in it. Systems are a form of mental model. In fact a system only comes into existence when the mind places an adjective in front of the noun, thereby creating a mental model, for example, an *economic system.* An even more definitive mental model would be the *Euro-zone economic system.* Too many officers view all systems as linear where events are caused by the interaction of variables and we can represent the process graphically as a straight line. They see the results as the product of causes and effects. By separating linear systems into smaller parts or subsystems we can learn a great deal about the larger system and how it functions. Thus, we can use analytical techniques to study and make decisions about the expected actions of linear systems. For this reason, the analytical approach (system 2) is most appropriate for these kinds of systems.

The vast majority of systems, however, are nonlinear. Their constituent parts have great freedom of action, thus they often produce cascading effects that create unexpected outcomes. Ecologies are an example of a nonlinear system. So are economic and political systems, as are wars and battles.[16] These interactively complex systems do not lend themselves to analytical methods of study and decision making; one must consider them holistically. In addition, nonlinear systems usually lose meaning when deconstructed. Ordinarily only a design approach (system 3) allows one to fathom how nonlinear systems function.

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[16] The central role nonlinearity plays in international relations and war is spelled out in detail in John Gaddis' "International Relations Theory and the End of Cold War" (pp. 5-58) and Alan Beyerchen's "Clausewitz, Nonlinearity, and the Unpredictability of War" (pp. 59-90) in *International Security* (Winter 1992/1993).

Strategic theory. Although military officers sometimes view theoretical study with disdain, an understanding of strategic theory is mandatory for a strategic thinker. As Clausewitz (1976) told us:

> Theory exists so that one need not start afresh each time sorting out the material and plowing through it, but will find it ready to hand and in good order. It is meant to educate the mind of the future commander, or, more accurately, to guide him in his self-education, not to accompany him to the battlefield... (p. 141)

In his latest book on strategy, Gray (2010) asked: "What is theory?" He then noted: "Strategists and their critics are wont to deploy the term recklessly . . . ." (p. 22). To avoid being reckless, I turn to an expert, R.D. Reynolds, (1971), who recognizes three forms of theory. The first form understands theory to mean laws supported by empirical observations. The second form sees theory as interrelated definitions and propositions derived from axioms. In this paper I employ the third form, which looks at theory as a description of casual processes. This latter form gives us the "sense of understanding" that we need to apply any theory: such understanding is certainly a requirement for strategic thinkers (pp. 10-11).

Gray (2010) also writes: "Everything necessary for a general theory already exists in the literature, but the trouble is that its constituents are widely scattered and the whole is less than the sum of the parts" (p. 24). In his latest book he attempts to collect these "constituents" in nine dictums. Though these dictums might prove useful to a student of strategy, I believe firmly that any officer who aspires to be worthy of the title strategic thinker must turn to the classic strategists—Clausewitz, Sun Tzu, and Thucydides—and read for him or herself what they have to say. A true strategic thinker needs also to be conversant with the works of Niccolo Machiavelli, Basil Liddell Hart, J.C. Wylie, Michael Howard, John Boyd, and Colin Gray. Synthesizing what these classical and important strategists have to tell us will go a long way in helping a strategic thinker grasp the "causal processes" that provide a "sense of understanding."

How to think. Before discussing the subject of how to think, we need to temper one contemporary idea on the subject—critical thinking—and dismiss another—creative thinking. This is important since several existing courses for strategic thinkers include critical thinking and creative thinking as part of their curricula.[17]

Considerable contemporary U.S. military literature focuses on the need to develop critical thinking skills. Unknown to the majority of its proponents is the fact that critical thinking is a field dominated by analytical procedures. Systems analysis is at the core of many of these procedures. There are a number of organizations promoting critical thinking that endorse this analytical focus. Among them is The Critical Thinking Community, which sponsors a Center for Critical Thinking under the auspices of the Foundation for Critical Thinking and a National Council for Excellence in Critical Thinking (The Critical Thinking Community, 2011). There are

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[17] These two subjects are part of the ten lessons taught in the first few weeks of the Army War College course; see Walters, D. (2011, October). *Understanding strategic thinking and developing strategic thinkers*. Retrieved January 7, 2012, from http://www.ndu.edu/press/understanding-strategic-thinking.html.

also numerous web sites devoted to the subject that advocate analysis.[18] I believe strategic thinkers need to be able to *think critically*; however, they should shy away from the prescriptive methods advocated by those who champion a form of critical thinking built upon system analysis. Thinking critically calls for knowledge of the obstacles that hinder clear and logical thinking, as well as, specific skills such as the ability to ask essential questions and frame arguments. There are several good books on thinking critically. One of the best—despite its title—is M. Neil Browne and Stuart M. Keely's (2010) *Asking the Right Questions: A Guide To Critical Thinking*. Although changing "critical thinking" to "thinking critically" may seem like pretentious wordsmithing, it serves to keep students from confusing the central idea of asking and answering pertinent questions with the more limited analytical techniques.

The emphasis on creative thinking in the U.S. military is misdirected. One can find abundant books with titles like, *Out of the Box: 101 Ideas for Thinking Creatively* (Eastaway, 2007) that claim they can make a person more innovative and imaginative. Web sites asserting the same thing abound.[19] Yet, there is little evidence to support these claims. As a respected cognitive scientist (Harnad, 2012) wrote:

> There are a number of theories about the underlying mechanisms of creativity, theories attributing it to everything from method to madness—none of them very satisfactory. As to inducing creativity—by using heuristic strategies or through "creativity training"—this has had very limited success. (web-based)

After trying to measure the potential for creativity, Gardner (1993) declared, "tests of creativity have failed to satisfy the expectations they were designed to meet" (p. 20). Those striving to become strategic thinkers would do well to heed the words of Louis Pasteur: "Chance favors the prepared mind." Though officers who study and seek broad experience are not guaranteeing they will become strategic thinkers, if they do not undertake such study and seek such experience they are guaranteeing they *will not* become strategic thinkers.

Because I argue that critical thinking and creativity thinking are of little value to strategic thinking, I need to identify another useful thinking skill. One previously referenced study (Salmoni et al., 2010) observed that: "Officers considered the how-to think method essential for cultivating other important cognitive qualities, particularly the ability to think analogically from one case to another" (p. 73). This suggests metacognition (i.e., thinking about thinking). Livingston (1997), an educational psychologist, defined the term thusly:

> Metacognition refers to higher order thinking which involves active control over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. (web-based)

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[18] For examples, see http://www.criticalthinking.net/, http://www.sjsu.edu/depts/itl/graphics/main.html, and http://www.criticalreading.com/critical_thinking.htm.

[19] For examples, see http://creativethinking.net/WP01_Home.htm, http://www.creativethink.com/, http://www.brainstorming.co.uk/tutorials/creativethinking.html.

Klein (1988) identified four important components of metacognition: memory limitations, having the big picture, self-critiques, and strategy selection (p. 158). A synopsis of these components is that experts are aware of their memory limitations and act to avoid exceeding that capacity; they gain situational awareness quickly and adapt it as needed through conscious effort; they notice when they are getting off track in their thinking and determine why, then make corrections; and they monitor and control how they learn to ensure they meet their goals. These are certainly desirable attributes for strategic thinkers.

Rosen (2005) explored "the role human biological factors may play in shaping human strategic behavior" (p. 179). He reviewed studies of human cognition by neurobiologists, behavioral biologists, and psychologists to see how biological factors affect decision makers, and he argued that understanding these data might aid our knowledge of how, why, and in what circumstances leaders make particular decisions. Knowledge of these factors and their impact on cognition takes metacognition to a different and higher level, and that knowledge would certainly be of interest to strategic thinkers.

History. History teaches no lessons, but it does provide context for thinking about current-day issues. As importantly, it provides vicarious experience for strategic thinkers for whom actual experience is often difficult to obtain. The esteemed military historian Sir Michael Howard (1962) spoke to this a half-century ago in a seminal article: "If there are no wars in the present in which the professional soldier can learn his trade, he is almost compelled to study the wars of the past" (p. 4). John Gaddis (2002) shares the same idea, but perhaps a bit more eloquently: "For if you think of the past as a landscape, then history is the way we represent it, and it is that act of representation that lifts us above the familiar to let us experience vicariously what we can't experience directly; a wider view" (p. 5). Even the most experienced strategic thinker can have but minuscule experience measured against the sweep of history, therefore, he or she is wise to heed the long-standing counsel of B.H. Liddell Hart (1944): "There is no excuse for any literate person if he is less than three thousand years old in mind" (p. 143).

May (1973) wrote in an important book that "history is important to people in government. Men and women making decisions under conditions of high uncertainty necessarily envision the future partly in terms of what they believe to have happened in the past" (p. 190). Strategic thinkers will frequently find themselves "making decisions under conditions of high uncertainty" (p. 190). Eliot Cohen (2005) asserted:

> No less important than the study of history by the would-be strategist or student of strategy is the acquisition of *the historical mind*—that is, a way of thinking shaped by one's reading of history and by using history as a mode of inquiry and framework for thinking about problems. (p. 575)

To underscore this point, Cohen (2005) wrote:

> The strategic mind encounters the historical mind when it engages in the use of analogies. Analogies are, of course, unavoidable. The strategic mind turns to them for illumination of current predicaments. But the historical mind views them with grave suspicion because it looks for context: it looks for uniqueness much more than commonality. (p. 579)

Cohen (2005) continued: "The historical mind has little use for . . . blanket appeals to historical certainties. It looks for continuity but even more so discontinuity; it believes in evolution and change; it is many ways the *enemy* of myths of stability, not its proponent" (p. 582).

History has long been "the school of the Soldier;" it must also be the school of the strategic thinker.

Geostrategy and geopolitics. "[F]or realists . . . the central question in foreign affairs [is]: Who can do what to whom? And of all the unsavory truths in which realism is rooted, the bluntest most uncomfortable, and most deterministic of all is geography" (Kaplan, 2009, p. 98). Strategic thinkers certainly need to be realists; thus, they must have a firm grasp of geography, especially as it relates to strategy. Officers today are often at a disadvantage when it comes to an appreciation of geography because American schools have largely marginalized the subject. Professional military schools have also reduced or eliminated what was once a key part of their curricula. The classic works of Halford J. Mackinder (1919) and Nicholas J. Spykman (1944) are almost unknown in today's officer corps. Yet it was Spykman's "Rimland" theory that served as the frame for George Kennan's containment policy, which was central to U.S. national security strategy for some 40 years (Mladineo, 1942/1981, p. *xix*). Strategic thinkers would add to their knowledge-base as well as their skill-set if they revisited the geostrategic thoughts of Mackinder and Spykman along with those of Alfred Thayer Mahan, George F. Kennan, Henry Kissinger, and Zbigniew Brzezinski.[20]

Cultural anthropology. Cultural Anthropology, a subfield of anthropology, is the study of; "how variation in the beliefs and behaviors of members of different human groups is shaped by culture, sets of learned behaviors and ideas that human beings acquire as members of society" (Lavenda, 2010, p. 4). Strategic thinkers must never forget that relation among nations and the use of force or the threat of its use always involve humans of varying cultures and ethnicities. The United States has too often held an ethnocentric view when it comes to interactions with other nations. Our hubris has been the subject of self-criticism in books like Burdick and Lederer's 1958 novel *The Ugly American*, which described the antics of an ambassador in a fictitious Southeast Asian country, as well as from publics around the world where the slogan "Yankee Go Home" was seen so often in the 1960s and 1970s. Anti-Americanism still dominates many societies, especially in the Middle East and parts of South America. Much of this animosity was, and is, not wholly undeserved as there are countless examples of American officials, military members, and citizens behaving badly when overseas. If nothing else, our experiences in Vietnam, Iraq, and Afghanistan have taught us that an over-bearing attitude and a slighting of local cultures are counterproductive. We cannot build enduring relations with others if we do not understand and respect their customs and traditions. As a Marine Corps handbook succinctly put it: "The quality of our relationships with people, in and out of uniform, is of paramount importance in determining mission success" (Salmoni & Holmes-Eber, 2008, p. 2).

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[20] Example writings include: Mahan, A. T. (1894) *The Influence of Sea Power Upon History: 1660-1783*. New York: Dover Publications, Inc.; Kennan, G. F., (1996). *At a Century's Ending: Reflections 1982–1995*. New York: W. W. Norton & Company; Kissinger, H. (1994). *Diplomacy*. New York: Simon and Schuster, Inc.; and Brzezinski, Z. (2012). *Strategic Vision: America and the Crisis of Global Power*. New York: Basic Books.

Understanding and appreciating these relationships is important to strategic thinkers as they assist in the development of national and military strategies and design campaigns.

I believe the six fundamentals I have outlined above are at the heart of a strategic thinker's professional education. Other subjects might rival these in importance, including economics, political theory, international relations and Law of War, but none exceeds them.

Conclusion

People and organizations define strategic thinking in various ways. The meaning for the noun strategy itself has evolved over time. I do not believe it is possible for the Army to determine how it might identify and then educate strategic thinkers unless it first clarifies what it intends for the term *strategic thinking* to express. In this paper I attempt to do so and conclude that:

Strategic thinking employs a leader's wisdom—gained through experience and education—to:

- Assist in selecting the ways and means needed to support the achievement of national policy goals (ends); to select the military strategy, that is, the ways and means required to accomplish the goals (ends) of national security strategy; and to plan for and execute campaigns and operations that advance that strategy; and

- Uncover and discern the logic that holds together a seemingly intractable and ill-defined problem and develop a counter-logic that resolves it.

The U.S. Army must answer questions about who is able to acquire the needed wisdom of a strategic thinker and how the right individuals might actually attain that wisdom. Here I offer thoughts on both issues. Foremost, to be a strategic thinker a person must possess a strong intellect. With an intellect informed by a solid liberal education and time spent in a foreign culture, the likelihood a person is a good candidate for becoming a strategic thinker increases significantly. The Army would profit if it had the means to identify and evaluate officer candidates and junior officers for their capacity for strategic thinking.

Officers the Army identifies as having potential to become strategic thinkers need a broad education, which should include instruction on system theory, strategic theory, "how to think," history, geostrategy, and cultural anthropology. The Army should give strong consideration to sending officers to doctoral programs that offer these and other related areas of study.

To ensure the best strategic thinkers reach its general officer ranks the Army needs to develop those officers who possess the required intellect and civilian education with assignments to advanced schooling and key staff and command billets throughout their careers.

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Chapter Two

Strategic Thinking: Requirements, Development, and Assessment

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This paper aims to assist The U.S. Army Research Institute for the Behavioral and Social Sciences in improving strategic thinking among the forces by addressing the following topics:

1. What are the characteristics and/or skill sets of strategic thinkers?

2. How do individuals develop strategic thinking skills? Specifically:
   a. What work experiences help people develop strategic thinking skills?
   b. What aspects of organizational culture matter?

3. How can one evaluate whether someone is thinking strategically?

To explore these questions, we first need to clarify what is meant by strategic thinking, as the definition has implications for the characteristics and/or skill sets required. Given the author's experience in business, that literature is the main source for this paper; in addition, the term "strategic thinking" originated in the business literature.

The Concept of Strategic Thinking

Strategic thinking has been recognized as an individual activity influenced by the context within which it takes place (Liedtka, 1998). It has also been identified as the distinctive ingredient required by leaders to address the challenges of complex and uncertain environments (Weber, 1984). Studies across industries point to the absence of strategic thinking as a major detractor from firm performance (Bonn, 2001; Essery, 2002; Mason, 1986; Zabriskie & Huellmantel, 1991). Despite acknowledging the importance of strategic thinking, there is little agreement in the literature as to what strategic thinking is. Three major conceptualizations exist.

The Antecedent to Strategy Development

The intent of strategic thinking is "to discover novel, imaginative strategies which can rewrite the rules of the competitive game; and to envision potential futures significantly different from the present" (Heracleous, 1998, p. 485). Given this purpose of strategic thinking, understanding what strategy is and how it is formed is instructional to understanding strategic thinking.

The concept of strategy traces its origins to ancient Greece, where *strategos* indicated a general set of maneuvers to overcome an enemy (Eden & Ackermann, 1998). After the industrial revolution, the concept of military strategy became apparent to the corporate world. In that context, strategy indicated ways in which organizations could shape their environments by concentrating on attainment of long-term goals and objectives (Chandler, 1962). For the next two decades, the strategy literature focused on organizational expansion and diversification and the

associated structures to manage this growth (Andrews, 1980). Numerous analytical frameworks (e.g., Strengths, Weaknesses, Opportunities, and Threats (SWOT), Five Forces, share/growth) were developed to assist leaders at various organizational levels (e.g., corporate, business, product) with directional decision-making. Thus, it was recognized that "strategy" could be identified for the entire organization ("grand strategy") or its sub-components (strategy can be discussed at various organizational levels). Simultaneous exploration was underway to identify leaders' behaviors in developing strategy.

Two major views of how strategy is formed and the related role of strategic thinking surfaced (Hatch, 1997). The first, associated with Porter (1998), among others, is considered the "rational" view in which strategy is planned. It is first formulated using strategic thinking and based on analysis of the organization's internal and external environments. Once formulated, strategy is then implemented; these two functions—formulation and implementation—are distinct processes.

In the second view, labeled "emergent" and associated with Mintzberg (1994a), strategy surfaces from actions taken over time, rather than decisions made via a rational planning process (Hatch, 1997). Strategy formation and implementation are synonymous, described as a "messy process of informal learning" (Mintzberg, 1994b, p. 108). Empirical studies have supported this more incremental view of how strategy is formed, describing activities that are fragmented, evolutionary, intuitive, and take place in many parts of the organization at the same time (Mintzberg, 1978; Quinn, 1981). Here strategic thinking can occur at any time; it is not dependent on a formal planning process. However, the emergent view does not preclude the existence of a formal planning process. Thus, while the two views are often presented as polar opposites, they are not necessarily inconsistent.

These views have implications for the development of strategic thinking. The planning view focuses attention on understanding and applying analytical tools, while the emergent view focuses on experience implementing strategy. Recent portrayals of strategic thinking divorce it from either view of strategy formation, instead considering it purely a critical process that articulates and frames strategic issues, uses analysis and experience to develop insight, reconceptualizes positioning, evaluates alternatives, and selects strategy (Tovstiga, 2010).

Mental Processing

A second major conceptualization of strategic thinking builds off of the idea that it is a distinct form of individual mental processing. Hanford (1995) distinguished strategic from operational thinking as, among other features, being longer-term, more abstract, and issues-oriented. Since the 1980s, strategy theorists and practitioners have collectively identified 10 different types of thinking associated with strategic thinking. These are abstract, convergent, creative, critical, divergent, inductive, lateral, logical, rational, and systems thinking (Bates & Dillard, 1993; Bonn, 2001, 2005; Graetz, 2002; Heracleous, 1998; Liedtka, 1998; Mintzberg, 1995; Ohmae, 1982; Sloan, 2006; Stumpf, 1989; Zabriskie & Huellmantel, 1991). Most of the foregoing authors do not provide a consistent definition of the type of thinking they identify. Of the types mentioned, only two were identified by a significant proportion of the authors: creative thinking (Bonn, 2001; Graetz, 2002; Heracleous, 1998; Liedtka, 1998; Mintzberg, 1995; Ohmae, 1982;

Sloan, 2006) and critical thinking (Bonn, 2001; Liedtka, 1998; Sloan, 2006; Stumpf, 1989; Zabriskie & Huellmantel, 1991).

Two additional mental processes are associated with strategic thinking in the literature: intuition and mental elasticity. Intuition is identified by several authors (Bates & Dillard, 1993; Dickson, Farris, & Verbeke, 2001; Graetz, 2002; Mason, 1986; Mintzberg, 1995; Ohmae, 1982; Tovstiga, 2010). Kutschera and Ryan (2009) noted that the literature on intuition indicates two consistent elements: It is an unconscious process and it comes from the "gut" rather than deliberate thinking. They also indicated that the use of intuition in strategic decision-making remains debatable in the literature; it is unclear if its use is advantageous or not. A second process, mental elasticity, is less frequently mentioned (Bates & Dillard, 1993; Ohmae, 1982). While not specifically defined, mental elasticity is described as being flexible in one's thinking; able to consider and weigh a range of alternatives in a given situation and thus respond flexibly to change.

Creative thinking, critical thinking, and intuition are commonly associated with strategic thinking. However, there is little empirical work to support the association of any of the above-mentioned mental processes with strategic thinking. One researcher confirmed intuition but did not find associations with either creative or critical thinking (Pellegrino, 1996). In addition, all of the mental processes discussed above are useful in a wide variety of endeavors; it is not clear if they are all required or combine in a unique fashion to affect strategic thinking, or how the context they are utilized in may affect their application.

The current literature emphasizes the uncertainty, ambiguity, and contradiction in today's strategy-making situations. To function in this environment, some theorists suggest that leaders use distinct cognitive capacities that are not traditionally defined, including fluid problem framing, holding contradictory ideas, and forestalling judgment to explore more interpretations (McKenzie, Woolf, van Winkelen, & Morgan, 2009). Others have added sensemaking (Weick, 1995) to the mental processes associated with strategic thinking, indicating that it allows individuals to balance volumes of information and analysis with their intuition (Tovstiga, 2010).

Perspectives and Activities

The third major conceptualization of strategic thinking focuses on points of view taken and actions engaged in when thinking strategically. Descriptions provided by theorists include integration of cognitive and behavioral components. The first of these concerns the multiple vantage points taken in considering a strategic issue. Mintzberg (1995) identified seven ways of examining an issue to fully understand it: considering what is ahead, behind, above, below, beside, beyond and through it. Bonn (2005) echoed this, indicating that strategic thinking uses a diversity of representation systems to filter what is paid attention to and frame the unknown.

Liedtka (1998) identified five elements specific to strategic thinking: seeing vertical linkages from multiple perspectives (taking a systems perspective); marshalling energy in a future direction ("intent"); continuously developing an agenda ("intelligent opportunism"); recognizing patterns ("thinking in time"); and generating and testing hypotheses. All of the elements are essential and used in combination.

Table 1
Activities of Strategic Thinking

Activity	Purpose/requirements	Exemplar techniques (used iteratively and in combination)
Scanning	Identify patterns in the environment • scan TIPSE* areas • use novel sources; other industries • combine discoveries • apply to future	Modeling, forecasting, scenario development Expert/ Delphi panels, interviews Stakeholder analysis SWOT, CSFs (critical success factors)
Questioning	Gain perspectives on issues • frame issue broadly (role, positioning) • explore vs. solve • question beyond preset view • consider all constituents	DeBono's thinking hats (creative, negative, emotional, constructive, neutral, inclusive) Action learning (ask questions only) Opportunity matrix (action, inaction; timing) Business strategies: share growth, new products or markets, horizontal or vertical integration, diversification
Conceptualizing	Identify possibilities • maximize use of analytical tools • develop strategic vs. tactical concepts • identify a broad range of options • reject options only after exploration	Planning tools: Porter's Five Forces, BCG matrix, resource-based view, blue ocean identification, etc. Expert/ Delphi panels, interviews Brainstorming, futures workshops Map future positioning vs. current and historical (twice as far back as future)
Testing	Anticipate performance impact on: • organization • affiliates • community • competitors	Pilot, pose trial balloon Stakeholder impact assessment, role play Mentally rehearse results Map scenarios of degrees of implementation success and contingencies

*TIPSE= technology, industry, political/legal, social, economic

Casey and Goldman (2010) recognized four major activities in the literature that describe what happens when one thinks strategically: scanning, questioning, conceptualizing, and testing (Liedtka, 1998; Mintzberg, 1995; Mintzberg, Ahlstrand, & Lampel, 1998). Scanning (the

environment) enables the identification of historical and emerging patterns. Questioning (asking questions of data, others, and oneself) elucidates different perspectives on issues. Conceptualizing potential strategies identifies possibilities for future direction. Testing allows for informed speculation of the impact of the strategy on organizational performance. Table 1 provides further detail and related techniques that are effective in achieving the requirements of each activity. The four activities can be applied in a linear fashion to develop planned strategy, but are reported by expert strategic thinkers to occur on a continuous, nonlinear basis (Goldman, 2005, 2008a), as depicted in Figure 1. As individuals engage in this process, their strategic thinking further develops.
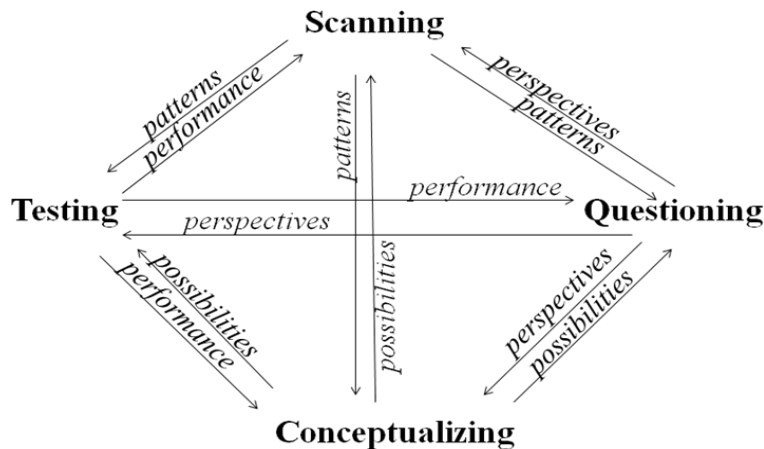
Figure 1. Strategic Thinking in Action.Source: Casey, A., & Goldman, E. (2010). Enhancing the ability to think strategically: A learning model. *Management Learning*, *41*, 167-185.

Other theoreticians and practitioners have speculated about specific practices that inform the four categories of activities of strategic thinking. These include experimentation and openness to experience (Graetz, 2002; Tovstiga, 2010), reflective practice (Sloan, 2006; Tovstiga, 2010), attentive listening and dialogue (Mason, 1986; Sloan, 2006), tolerance of ambiguity and risk (Bates & Dillard, 1993; Stumpf, 1989), and using techniques such as imagery (Sanders, 1998) and foresight development processes to identify a range of future views (van der Laan, 2008).

Synthesized Conceptualization

The three conceptualizations of strategic thinking are not mutually exclusive, since they reflect purpose, cognition, and behavior. Strategic thinkers can be recognized by the practice of their distinctive thinking, which is:

> conceptual, systems-oriented, directional, and opportunistic thinking, applied and further developed via dynamic, interactive, and iterative scanning, questioning, conceptualizing, and testing, in order to discover novel, imaginative organizational strategies.

More specifically, (a) "conceptual" reflects ideas, models, and hypotheses; (b) "systems-oriented" indicates taking into account interactions across the organization, as well as its relationship with the external environment; (c) "directional" provides the sense of an aimed-for

future state that is different from the present; and (d) "opportunistic" requires taking advantage of past achievements and present competitive and environmental conditions.

Recognizing strategic thinkers by their thinking allows the timing to be both deliberate and spontaneous and indicates the importance of context. It tolerates individual differences in the array of identified yet unproven mental processes and characteristics that may support strategic thinking (e.g., critical thinking, creative thinking, intuition). Finally, focusing on the practice of the thinking portends enhancement of the activities occurring when one is thinking strategically (scanning to identify patterns, questioning to elucidate perspectives, conceptualizing to identify future possibilities, and testing to anticipate performance), with these activities occurring nonlinearly and iteratively. The interactions of these activities are depicted in Figure 1.

This definition of strategic thinking is consistent with but broader than definitions used by the armed forces. Waters (2011) reported that two members of the U.S. Army War College defined strategic thinking as "the ability to make a creative and holistic synthesis of key factors affecting an organization and its environment in order to obtain sustainable competitive advantage and long-term success" (p. 115) and then defined it himself as "a purposeful, deliberate activity that seeks to generate innovative strategies and approaches to posture organizations for success in the complex and ambiguous strategic environment" (p. 118). Both definitions relate most closely to the rational planning view of strategy formulation; they ignore the spontaneous and emergent aspects of strategy formation and focus independently on mental processing and activity completion. Because the empirical work points to more emergent formation with thinking and doing as inseparable, we have specified a less restrictive definition in this paper.

Requirements for Thinking Strategically

A reasonable question is whether strategic thinking capacity can be developed or is in fact inherently predetermined. Cognitive science incorporates two opposing views. The first view argues for limits to cognitive capacity and advocates matching individuals with a level of responsibility consistent with these limitations (Jaques & Clement, 1991). The second view, codified through decades of research, considers the acquisition of abilities as a journey from novice to expert performance (Ericsson, 1996). Both views agree that education and experience are important requirements for maximum performance, providing a common point of departure for considering the requirements of strategic thinkers.

Knowledge

Several types of knowledge are identified as essential to developing any ability. These are (a) content knowledge, consisting of theories and principles in a given domain; (b) process or procedural knowledge—that is, how to acquire, work with, and communicate information; (c) practical knowledge, or skills and know-how; and (d) personal knowledge (Eraut, 1994). It is also recognized that much knowledge is tacit, not explicitly stated or taught (Polanyi, 1967).

Empirical work indicates that individuals considered experts in organizations have significantly more tacit knowledge than those deemed novices (Sternberg, 1998). This allows for the development of "rules of thumb." Such rules are used in strategic thinking to identify and

narrow alternative directions (West & Wolek, 1999). The rules concern industry-specific expectations, such as rates of growth, return on capital investments, market share, and research and development costs.

The types of knowledge identified above are defined in isolation of one another; for example, content knowledge is separated from the skills that utilize it. In the reality of strategic thinking, these types of knowledge are used in tandem (Goldman, 2005). A framework that allows for this differentiation is Anderson and Krathwohl's (2001) update of Bloom's (1956) taxonomy of educational objectives. Taxonomies are used by educators to articulate objectives related to course content and to provide a basis for testing student learning (Fink, 2003). The Anderson and Krathwohl update separates types of knowledge (factual, procedural, conceptual, and metacognitive) from levels of cognitive processing (what the knowledge is used to do): remember, understand, apply, analyze, evaluate, and create. This serves to further specify teaching objectives and improves the selection of teaching strategies.

The types of knowledge required to think strategically are consistent with those listed by Anderson and Krathwohl (2001) and, accordingly, can be used to specify a taxonomy specific to teaching strategic thinking (discussed in detail in Goldman, 2008b). Four types of knowledge are involved:

- *Factual knowledge about the industry*. This includes descriptive information about programs, operations, financing, differences in organizational structures, and developmental timelines for new business.

- *Procedural knowledge related to strategic thinking*. This includes understanding the necessary components and behaviors to think strategically—how to most effectively scan, question, conceptualize, and test.

- *Conceptual knowledge regarding the organization and its environment*. This relates to overarching thoughts about the positioning of the organization and the direction of the industry. Two subtypes are (a) knowledge that broadens perspectives, such as perceptions of various constituencies and societal views of the industry, and (b) knowledge that enhances focus, such as approaches being applied elsewhere, alternative scenarios of the future used in the industry, and opportunity costs.

- *Self-knowledge*. This includes individuals' knowledge of themselves as strategic thinkers—what aspects of scanning, questioning, conceptualizing, and testing they understand and do well, as well as where they need to augment their abilities.

Experts also identified how this knowledge is gained, specifying numerous learning methods (Goldman, 2005). Most popular are those where knowledge is purposefully or extemporaneously discovered (e.g., reading, observing, listening) and those where meaning is constructed from oral, written, or graphic information via discussion and via asking and being asked questions.

This reinforces the importance of "scanning" and "questioning" in Figure 1 and speaks to the interpersonal aspects of strategic thinking.

Experience

A cadre of occurrences comprises the notion of experience, including planned and unplanned events taking place in both formal and informal situations (Tennant & Pogson, 1995). Experience plays a major role in what, when, how, and why adults learn (Knowles, Holton, & Swanson, 1998). For those in leadership positions, the chief location in which these events occur is the workplace (Dechant, 1990; Farkas & Wetlaufer, 1996; Kolb, Lubin, & Spoth, 1986; McCall, Lombardo, & Morrison, 1988).

Several elements are required for work experiences to result in learning (Senge, 1994). First is the individual's ability to absorb new knowledge. This knowledge needs to be related to existing knowledge, but not so much that it will not get noticed (Cohen & Levinthal, 1990). It also needs to contain an element of diversity, something about it that is different, spurring attention. In addition, the experience has to be valued by the learner—self-identified as important—and significantly affect the person's skills, perspectives, or sense of self (Merriam & Clark, 1993).

Research on experiences required to think strategically is sparse. A few studies conducted between 1975 and the early 1990s offered no or inconsistent definitions and/or measurements of strategic thinking. In 1988, McCall, Lombardo, and Morrison completed the largest cross-industry study on executive learning experiences. The study identified events helpful to developing leadership, allowing respondents to articulate what specific abilities they helped develop. Experiences identified as developmental to leadership included job rotations, special assignments, leading start-ups or turnarounds, working with outside experts, and time spent in corporate staff positions. Of these, doing staff corporate planning work was the only experience where strategic thinking skills (undefined) were mentioned.

Within the last decade, the only study identified that explored experiences required of strategic thinkers was completed with healthcare CEOs (Goldman, 2005). Ten categories of experiences, nine of them work-related, were identified as material to the development of experts' ability to think strategically. While this study focused on experts in one industry, when the results were initially published, comments were received from executives in manufacturing, defense, and the clergy indicting the relevance of the identified categories of experiences (Goldman, 2007). In addition, the categories of experiences were confirmed in a subsequent study (Goldman, Cahill, & Filho, 2009). The 10 categories of experiences are as follows:

- *Family upbringing/education:* A diverse set of experiences occurring before college matriculation, such as being in a family that owned a business, significant travel, and education via the Socratic method.

- *General work experience:* Wide-ranging employment activities in the same industry.

- *Becoming a CEO:* Being named chief executive officer and reporting to a board for the first time.

- *Being mentored:* Having a supportive coach, usually a preceptor or first boss.

- *Being challenged by a key colleague*: Having a peer, boss, or subordinate who regularly challenges—whether kindly or aggressively.

- *Monitoring results/benchmarking:* Keeping track of the organization's operational and market performance.

- *Doing strategic planning:* Being involved in organizational strategic planning.

- *Spearheading a major growth initiative:* Leading a growth project or initiative.

- *Dealing with a threat to organizational survival:* Leading the organization's response to a material threat caused by an external agent.

- *Vicarious experiences:* Thoughts and actions of other individuals and organizations.

Table 2
Categories of Experiences Contributing to the Ability to Think Strategically

Personal	Organizational
Family upbringing/education • Encourages exploration • Embraces complexity • Can reflect father's push for solutions	*Monitoring results/benchmarking* • Uses numerous and diverse measures • Compares performance to others • Occurs at least monthly
General work experience • Involves a variety of environments • Involves repetition of situations • Involves projects significant to the organization • Offers freedom to make decisions, mistakes	*Doing strategic planning* • Occurs multiple times per year • Involves a topical focus • Requires preparation
Becoming a CEO • Offers a widened span of control • Focuses time and attention • Involves access to new groups	*Spearheading a major growth initiative* • Is complex: capital and labor-intensive • Requires ≥1 year to complete • Offers freedom to make decisions, mistakes
Interpersonal (one-to-one)	External
Being mentored • Occurs early in career • Involves meeting at least several times per week • Leads to immediate feedback on thinking	*Dealing with a threat to organizational survival* • Involves material financial impact • Could jeopardize control/ownership • Involves leading the organization's response
Being challenged by a key colleague • Is done privately, formally and/or informally • Questions thoughts • Provides new ideas	*Vicarious experiences* • Involves colleagues at similar levels • Includes monthly-quarterly contact • Could include other industries

Source: Goldman, E. F. (2005). *Becoming an expert strategic thinker: The learning journey of healthcare CEOs.* Available from ProQuest Dissertations and Theses database. (UMI No. 3181551)

With a few exceptions, each category of experience contributes to all four types of requisite knowledge, as shown in Figure 2. This indicates a degree of fluidity in meeting the knowledge requirements of strategic thinkers. It also allows educators to use the aforementioned taxonomy to integrate work experiences with the types of knowledge being taught (Goldman, 2008b). More important than having experiences in these categories were the characteristics (arrayed in Table 2) that made the experience salient to strategic thinking (Goldman, 2008a). Common elements include significance and intensity, an action orientation, and interactivity. During these experiences, significant initiative is required by the individual as well as close colleagues. In addition, an organizational environment is needed that supports proactivity, encourages new thinking, and supports individuals taking on significant responsibility with associated freedom to act. This is consistent with literature on workplace learning, which identifies two levels that are historically considered important to supporting the individual (Antonacopoulou, 2006): the immediate work group (Brown & Duguid, 1991; Lave & Wenger, 1991) and the organization overall (Hedberg, 1981; Simon, 1991).

Categories of Experiences	Factual knowledge	Procedural knowledge	Conceptual knowledge: broadening perspectives	Conceptual knowledge: focusing direction	Self-knowledge
Family upbringing/education		Black			Black
General work experience		Gray	Black	Black	Black
Becoming a CEO			Gray	Gray	Black
Being mentored		Gray	Black		Gray
Being challenged by a key colleague		Gray		Gray	Gray
Monitoring results/benchmarking		Black	Gray	Gray	
Doing strategic planning	Gray	Black	Gray	Black	Black
Spearheading a major growth initiative	Gray	Gray		Black	Gray
Dealing with a threat to organizational survival		Gray	Gray	Black	Gray
Vicarious experiences	Gray		Black	Black	

Figure 2. Knowledge Created by the Categories of Experiences
Gray shading indicates a contribution to the category of knowledge. Black shading indicates a heavy contribution to the category of knowledge. Source: Goldman, E. F. (2005). *Becoming an expert strategic thinker: The learning journey of healthcare CEOs.* Available from ProQuest Dissertations and Theses database. (UMI No. 3181551)

There was no particular order to the occurrence of these categories of experiences, nor were all of them universally encountered (Goldman, 2008a). The only commonality was having at least one experience at each level of interaction: that is, at least one experience from among the three categories identified on Table 2 as "personal," one from the two identified as "interpersonal," one from the three identified as "organizational," and one from the two identified as "external." The experiences were often repeated in various types of organizations.

Habits

Over time, individuals develop their own particular approaches to addressing strategic issues and situations (Goldman, 2007). Three different habits were identified.

The first habit, "the development of understanding," can be visualized as a series of small circles around one large circle. The large circle is the issue of concern, and the small ones are various perspectives taken to understand the issue. Prior experiences contribute to the exploration of different perspectives. As perspectives are exposed, they alter the angle from which the issue is viewed and enable the identification of alternatives. Utilization of this habit strongly reinforces the "questioning" activity of strategic thinking.

The second habit, "the application of rational planning" to situations, can be visualized as an upside-down triangle. The top left corner asks the question "Where are we going?" and concerns the current direction of the organization. The top right corner asks the question "How are we getting there?" and identifies current strategies in use. Together these lead to the bottom corner, asking the question "Is execution efficient?" and focusing on the status of implementation. Each corner is informed by different prior experiences. Utilization of this habit strongly reinforces the "conceptualization" and "testing" activities of strategic thinking.

The third habit, "the completion of a hierarchy of challenges," can be visualized as a staircase. Each step denotes a particular challenge; the space at the back of the step, which gives it height, denotes reflection after achieving the challenge. The underside of the staircase contains prior experiences that inform the actions taken. Utilization of this habit can reinforce any of the four major activities of strategic thinking depending on the content of the reflection.

The habits were informed by two of the personal experiences identified above. Family upbringing, specifically the way the individual's father approached life, encouraged the first and second habits. Making sense of general work experience encouraged the third habit. Habits were not consciously applied at the onset of responsibilities that required strategic thinking; the realization of their use developed over time, representing metacognitive knowledge.

Developing the Ability to Think Strategically

Given that strategic thinking is different from operational thinking (Garratt, 1995; Hanford, 1995), its development requires time. Garratt noted that those who have been rewarded over the course of many years for being action-oriented do not suddenly become "intellectually omniscient" (p. 4) just because they are given a new job title. Behaviors previously learned and stored in knowledge structures need to be unlearned (Crouch & Basch, 1997; Hanford, 1995;

Steiner, Miner, & Gray, 1982). Time is also necessary to participate in the requisite experiences and gain the required knowledge to think strategically. To this end, the 10- to 15-year timeframe of practice with feedback and repetition required to gain expertise in many fields (Ericsson, Krampe, & Tesch-Romer, 1993; Skovholt, Ronnestad, & Jennings, 1997) does not seem unreasonable when one considers what must be developed. In addition, since strategic thinking is contextual (Liedtka, 1998) and contexts are ever-changing, development is an ongoing learning process.

A Learning Model

Using the components identified above as important to strategic thinking, Casey and Goldman (2010) developed a learning model. An updated model that more fully reflects the literature is shown in Figure 3. The model includes the following components:

- *Work experiences.* These are the main catalysts to developing strategic thinking based on the empirical literature. The model notes the importance of the characteristics, not just the experience itself, and also denotes the requirement for experience at each of the four levels of interaction.

- *Knowledge creation.* The work experiences generate several or all of the four types of knowledge required to think strategically. This knowledge informs future work experiences, which is denoted by the reciprocal arrow.

- *Strategic thinking.* The knowledge generated by the experiences is used to improve the application of the activities involved in strategic thinking (scanning, questioning, conceptualizing, and testing), which in turn creates additional knowledge, which is denoted by the reciprocal arrow.

- *Individual factors.* Family upbringing/education was identified as a category of experiences that contributes to the ability to think strategically. The activities involved in strategic thinking (scanning, questioning, conceptualizing, and testing) are consistent with the core elements of Kolb's (1984) experiential learning theory (Goldman, 2005). According to this theory, individual differences in learning can be explained by different learning style preferences; thus, the model includes the individual's Kolb's learning style as a factor that influences knowledge creation and strategic thinking. Learning style can also influence the work experiences to which one gravitates (detailed discussion provided in Casey & Goldman, 2010). Individual habits in approaching strategic issues were identified as important to expert strategic thinkers and identified as developing from work experiences; thus, the arrow from work experiences to individual factors is reciprocal. As individuals practice the activities of strategic thinking, they may develop additional metacognitive knowledge and their habits may be refined. Therefore, the arrows between strategic thinking and knowledge are also reciprocal.

- *Organizational influencers.* Workgroup and organizational support were identified as an important characteristic of several categories of work experiences. As these are topics of other papers being prepared, only the elements in the original model are included.

- o At the workgroup level, diversity (of age, gender, education, experience, tenure, knowledge) enhances team creativity, judgmental quality, and outcomes (Levi, 2007). Specifically related to strategic thinking, diversity enhances the perspectives brought to bear on a situation and expands networks used for information. However, teams benefit from diversity only if power is shared (versus leader-centric). These requirements are specified in the model and, if present, can impact knowledge creation as well as the activities involved in strategic thinking. Team diversity can support certain work experiences and may be a requirement of others, which is denoted by a reciprocal arrow.

- o At the organizational level, typology (Miles & Snow, 2003) specifies how the organization sees itself, what activities and knowledge it values, and how it adapts to environmental change. Typology impacts the activities of strategic thinking the organization engages in and the knowledge created and, in so doing, can also influence the range of work experiences that are available to individuals.

- o The organization's culture can have a similar influence (discussed in detail in Goldman & Casey, 2010). Both typology and culture can be influenced by strategic thinking activities and knowledge development, reinforcing the dual direction of the related arrows.

The model reflects the development of the ability to think strategically as a dynamic, interactive, and iterative process of learning from experience. Thus, both the practice of strategic thinking (scanning, questioning, conceptualizing, and testing) and the development of the ability to do it exhibit the same properties in a nonlinear, continuous development.
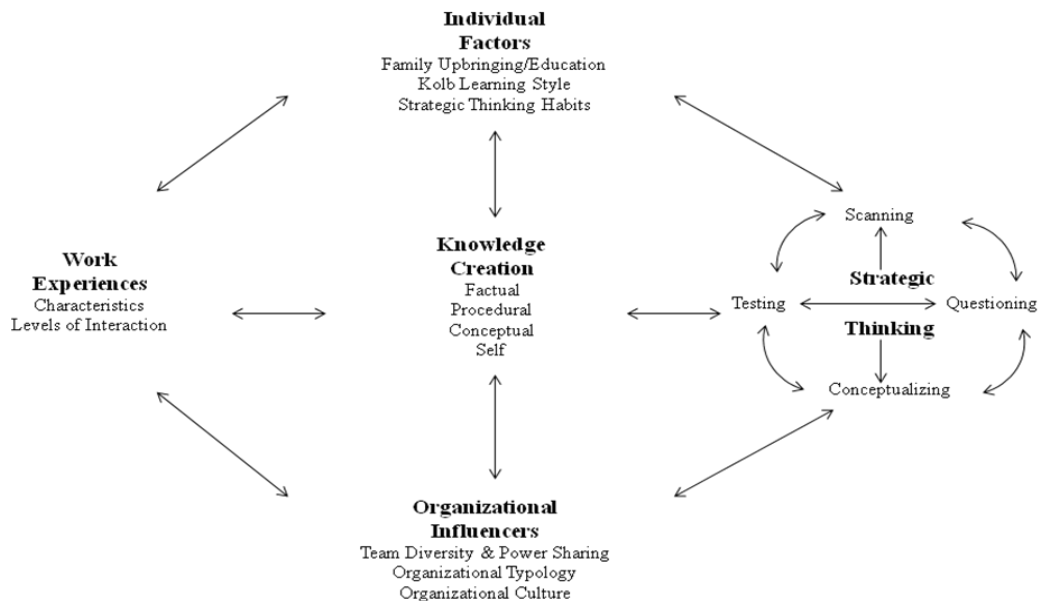

Figure 3. Model of Learning to Think Strategically. Source: Adapted from Casey, A., & Goldman, E. (2010). Enhancing the ability to think strategically: A learning model. *Management Learning*, *41*, 167-185.

Implications

The individual and collective components of the learning model have several implications for helping individuals enhance their strategic thinking ability, as itemized below.

1. Developing the ability to think strategically is a journey; proficiency may require 10+ years. At the same time, the ever-changing context that strategic thinking seeks to influence indicates that expertise is a transient state and development is a constant requirement. To maximize development, coursework and other types of training that focus on strategic thinking skills and knowledge requirements should be integrated with work experiences, not isolated from them.

2. Organizations can facilitate the development of strategic thinking by establishing and maintaining an environment that encourages new thinking and is willing to let mid-level professionals take on significant responsibility without suffering harsh criticism for less than optimal results. Organizations can use the learning model diagnostically to understand what aspects of strategic thinking the organization's typology favors or overlooks and to identify work groups where enhanced diversity and power sharing could improve strategic thinking.

3. Organizations should support the specific interpersonal characteristics required to enable the mentoring and challenging of individuals to contribute to their ability to think strategically (i.e., timing and frequency of contact, nature of interaction). Organizations should also encourage the requisite characteristics of vicarious experiences (i.e., frequency, exposure to other industries).

4. Organizations should ensure that key processes, such as monitoring results/benchmarking and strategic planning, have the requisite characteristics to develop the participants' ability to think strategically. For benchmarking, this includes comparative analysis completed by the individuals themselves (not by staff who issue a report). With respect to strategic planning, frequent engagement with focused topics is called for, along with review of background materials in advance so meeting time can be used for discussion, idea development, and mental rehearsal (i.e., questioning, conceptualizing, and testing). In the private sector, where everyone cannot be involved in strategic planning all the time, participation in community boards is encouraged.

5. Individuals should specify their own plans for enhancing their ability to think strategically so that the experiences in those plans have maximum value. In so doing, the learning model can help individuals identify how their strategic thinking ability is being developed or thwarted.

6. Individual development plans should ensure that experiences at all four levels of interaction (personal, interpersonal, organizational, and external) are considered and the requisite characteristics of each experience are incorporated.

7. Individuals should be encouraged to consider their own habits in dealing with strategic issues and identify how these habits and their personal learning style influence their preferences for each of the strategic thinking activities (i.e., scanning, questioning, conceptualizing, testing).

8. Educators and trainers should utilize a taxonomy that integrates knowledge used in strategic thinking with that gained in work experiences to select teaching strategies, analyze learners' progress, and help learners establish targeted goals and identify post-classroom experiences to continue their development.

9. Educators and trainers should evaluate the effectiveness of teaching and training strategies in terms of the strategic thinking activities developed, versus more general abilities used in a wide variety of situations. This changes the relevant question from "How do we increase critical or creative thinking?" to "How do we develop scanning, questioning, conceptualizing, and testing?"

10. Organizations, educators, trainers, and individuals should support ongoing research regarding the development of the ability to think strategically. The empirical foundation for all of the above recommendations is fairly slim. Given the importance of context, further contributions to the literature could be significant.

Assessment of the Ability to Think Strategically

Several properties of strategic thinking have been defined in this paper: It is an individual activity, is developed in an ongoing manner, is context-specific, involves mental processing and performance of specific activities, can take place at any time, and is undertaken to develop strategy for the entire organization or its sub-components or levels. These properties indicate many options for appraising strategic thinking at a given point in time, but also point to the difficulty in developing a universal tool for such assessment. The components of mental processing have not been proven, their timing is not predictable, and the activities performed may vary with the situation. Attempts to evaluate the strategy that is ultimately developed are subject to the influences of others and factors beyond the individual's control, and it may require years to determine the effectiveness of the strategy.

Techniques in Use

Assessment techniques have focused on four areas: typology development, measurement of cognitive processes, identification by experts, and consideration of behaviors. Within these approaches, the tools used as indicators of strategic thinking consist of dedicated measurements as well as tools that measure broad abilities. No uniform definition of strategic thinking is used; some of the approaches offer no definition at all.

At least two attempts have been made to identify strategic thinking typologies. The first, developed by Hogan Assessment Systems in 1988, stipulated four "styles of strategic thinking" and measured an individual's capability and disposition to use strategic thinking (Bates & Dillard, 1993). Only one study was found that used this tool. Robert Hogan indicated that he

replaced the tool with a measurement of overall leadership ability (personal communication, 2003). More recently, a study conducted with managers of Iraqi public organizations indicated strategic thinking to be measurable using Jung's personality types (Daghir & Al Zaydie, 2005), with the intersection representing "strategic thinking type." The conceptual underpinning of this measurement is not clear.

A second approach uses proxies of cognitive processes and related personal characteristics to indicate strategic thinking. Four different tools or tool combinations were identified in the literature. One method combined six measurement tools to indicate strategic thinking: the Watson-Glaser Critical Thinking Appraisal Scale, the Torrance Test of Creative Thinking, the NEO-Personality Inventory, the intuition scale of the Meyers-Briggs Type Indicator, the risk-taking portion of the Sensation Seeking Scale, and autonomy indicators from the Edwards Personal Preference Schedule (Pellegrino, 1996). The second method developed measurements of "strategic knowledge" as proxies for strategic thinking (Morgan, 1998). The third method combined personality and leadership profiles (Rosche, 2003). The fourth method, the Pisapia Strategic Leadership Questionnaire (Pisapia, Reyes-Guerra, & Coukos-Semmel, 2005), used measures of systems thinking, reflection, and reframing to indicate successful strategic thinking. Recently, a fourth indicator referred to as adaptive reflection has been added to the questionnaire. The measurement indicators used in these studies are not consistent with the elements generally associated with strategic thinking and, in some cases, the validity measures are weak.

A third approach to evaluating strategic thinking relies on the perceptions of informed others. Stumpf (1989) used supervisors' perceptions of their managers' ability to find and overcome environmental threats and to be entrepreneurial as before-after indicators of the effectiveness of training in strategic thinking. Goldman (2005) based the identification of expert strategic thinkers on "social labeling" as advocated by Shanteau (1988) and Sternberg (1994). The obvious consideration in using others to identify strategic thinkers is that they have a common understanding of strategic thinking and consistently apply it.

The final approach in use to assess strategic thinking considers the behaviors of the individual. Queries of the Mental Measurements Yearbook reveal tools that have been developed to measure leadership (i.e., Leadership Competency Inventory, Leadership Spectrum Profile) and entrepreneurialism (i.e., Entrepreneurial Quotient) described as scoring strategic thinking. Upon closer examination of what is actually measured, elements such as developing goals and communicating a plan are revealed, not a full assessment of strategic thinking. Among publicly available tools used by practitioners, similar issues exist. For example, Haines (2011) offers a "Best Practice Assessment" for strategic thinking in which individuals can self-assess their performance against 31 questions. The questions address some of the thinking and activities associated with strategic thinking but are more concerned with effective group processes, communication, and project and task management. Thus, the behavioral indicators developed to date are much broader than the assessment of strategic thinking ability and may not be based on an identified conceptualization of strategic thinking.

Considerations for Development

The major issues with the techniques in use are their lack of conceptual underpinning and associated oversimplification of strategic thinking. Based on the definition of strategic thinking, the requirements identified, and the developmental model discussed in this paper, the appraisal of an individual's ability to think strategically should include three features: It should be formative in nature, use a multidimensional framework, and be part of an integrated assessment model.

Given that the development of the ability to think strategically is (or should be) an ongoing learning process, appraisal should be conducted as a formative activity and used as the basis for improvement. Hence, this section was titled "assessment" in lieu of the summative term "evaluation." Whether delivered by self or others, assessment should be conducted for the purpose of refining and improving the effectiveness of the individual's ability to think strategically.

The model of learning to think strategically depicted two categories of outcomes from experience: cognitive (enhanced knowledge) and behavior (enhanced activities of strategic thinking). Accordingly, assessment should use a multidimensional framework that address *both* knowledge developed (i.e., factual, procedural, conceptual, and self-knowledge) and performance of the activities of strategic thinking (i.e., scanning, questioning, conceptualizing, and testing).

To develop a complete understanding of the individual's developmental progress, assessment should be constructed as part of an integrated model that considers the organizational level about which the individual is thinking strategically (i.e., the purpose of strategy development: grand strategy vs. a sub-component) and the context within which the individual is thinking strategically. In so doing, the model should include assessment of the organization's culture and typology, and the diversity and power sharing in the individual's immediate work group. Inclusion of these factors, which are part of the model of learning to think strategically, will provide a comprehensive picture of the individual's developmental opportunity and identify organizational factors to be addressed to maximize the individual's development potential.

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Chapter Three

Recruiting, Training, and Developing Strategic Thinkers

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Introduction

Within the military, the subject of strategic thinking is highly debated. Some think that strategic thinkers are members of an elusive group who are hard to identify, let alone train and retain. Still, others believe that everyone is or can be a strategic thinker. Normally the expectation is that by the time a person is selected for a position as a Strategic Thinker they are expected to simply have the skills by osmosis by virtue of their previous experience. That premise is flat wrong. Currently, the services are struggling to develop the type of strategic thinkers necessary at the highest levels of leadership (Yingling, 2007). However, given the right criteria, personnel can be tested, identified, and recruited for the development of strategic thinking. In academia, and in major businesses, strategic thinkers are sought after and hired because their skills matter to leadership and help drive the bottom line. Unfortunately, within the Department of Defense (DoD), they are often seen as a threat to the status quo and are suppressed. Strategic thinkers' ability to synthesize seemingly disconnected and sometimes abstract concepts and discern a comprehensive way ahead is their niche. The good ones in the civilian world are fought for in almost exactly the same way that top athletes are fought over by sports teams. The great ones, like Steve Jobs, change the world. Great thinkers are, unfortunately, not highly valued in the military; at least, not when they are at lower levels of command. But, it is likely that right now, there is a Major or Lt Commander Steve Jobs somewhere in our ranks with the skills and abilities we need to make a real and permanent difference in the way we think about the role the military should play for the next 50 years. We need to change the culture to seek out and identify that officer and put him or her in the right positions rather than suppressing his or her brilliance.

There are several major differences between the military, industry, and academia with regard to the position and status of strategic thinkers. One is that, in the business world, a company hires engineers with a specific degree in a specific field to perform a specific task – a super technician. Such an employee's task is in a narrow field in which he will likely remain during his career, climbing the ladder in that company or perhaps jumping between firms, but usually within that task or field. However, in the military, the services accept officers from all types and sizes of colleges and universities with diverse fields of study, every type of science – "hard" and "soft" sciences alike. For the initial part of an officer's career, up to the first 10 years, an officer is expected to develop leadership skills in the practice of commanding small groups of service members through mostly tactical and technical application of specialized (career-field centric) skills. These initial gates are virtually required in order for a young officer to be viable for any significant role immediately or in the future. It is later in an officer's career that he will be expected to synthesize his experiences, seek out and incorporate the experiences of others, and apply that knowledge in the development of and often the implementation of strategies.

Under this framework, strategic thinkers are often found via "happy accident." There is no "strategy" to select those who will guide the long-term effectiveness of an individual department,

or the overall trajectory of the DoD. The services know how to recruit and retain propulsion engineers, those with specific degrees and certifications to perform mostly technical tasks. But critical thinking for strategy development is not a board-certified specialty. To the services, it seems as though there is not a clearly applicable college major, field of study, or even a simple way to test or measure aptitude for strategic thinking. While it is clearly established that academia and business do in fact develop strategic thinkers, the military culture can be one of near term expectations focused on nearly immediate results. Developing strategic thinkers is a long-term endeavor, but in the military long-term goals are often overtaken by the short-term tactical or guerre de jour, the endless budget-driven cycles in Washington, or the pressurized tactical/battlefield expectations of a current conflict.

The current benefit/reward system in the United States military emphasizes short-term/ immediate tactical success and is inherently impatient, unwilling to wait for a strategy to play out and to evaluate its long-term success. There is a very well known and oft-repeated Vietnam assessment in which the U.S. military won every single battle and lost the war because we were focused on sequential short-term goals and suppressed those who argued that we should fight a different kind of war, or else go home altogether. Likewise, today we reward those who win the short-term battles even when short term successes have no overall connectivity to a grand strategy (if one even exists) or is even counter-productive to it. In the 2004 Campaign Progress Review conducted at the Coalition Headquarters in Baghdad, the British and American officers interviewing every civilian and military senior leader and planner on the staff were told almost universally that all we needed were more resources, to execute the tactics better and to stick with the effort longer (Mowle, 2007). More, better, longer—NOW. The approach (which was billed as strategy) was, really, short-term thinking by nearly every senior leader on the general staff. When asked how much more money, how much longer, how many more forces, there were often no answers other than "just more." Those who offered up guesses never matched any other person's guess as to how much more was going to be enough. That approach still pervades what currently passes for strategic thinking.

Because of this emphasis on the short-term, I propose that the services need to deliberately take a long-term approach to recruiting, training, and developing strategic thinkers. I first propose criteria for identifying strategic thinkers. I then offer a training template to turn the average strategic thinker into a good strategist – and perhaps the good strategic thinker into a great strategic thinker. Finally, I lay out a long term professional development path to ensure true strategic thinkers both have access to and influence with senior decision makers and even better, become senior decision makers themselves. Creating effective and successful strategic thinkers and strategists is not only important to the future of the DoD and the services, but is also vital to the long-term success and survival of our nation.

Recruitment – Who is best suited to be a strategic thinker?

The first action senior leaders should take to build strategic thinkers is to embrace, or better yet, create a test to determine potential success as a strategic thinker. Clearly, there are many tests to identify aptitude for many areas of study and many professions. Among them are well known ones such as Scholastic Aptitude Test (SAT), Graduate Record Examination (GRE), and Board exams. All are designed to assess both knowledge and potential success. These exams use a

variety of techniques to establish potential (National Association for College Admission Counseling, 2008), but in the end standardized tests are most effective as part of the selection process, not the totality of it.

For example, major universities use Graduate Record Examination (GRE) scores to predict who will complete graduate programs. Though testing does not always ensure success in graduate education, high-standardized scores have been modestly correlated with graduate degree completion (Kuncel & Hezlett, 2007). While one might argue that graduate schools ought to allow anyone in the program as long as they can pay the tuition, universities are extremely selective for a reason. They want only to allow entry into their programs to those whom they have some degree of confidence will complete their course of study. The percentage of students who complete their degree is one of the metrics used to rank graduate schools and schools are covetous of their high rankings (Hazelkorn, 2009). Like graduate schools, the DoD must be courageous enough to screen for aptitude and success via testing. I do not propose screening all military members; rather I propose screening only officers for their potential strength in strategy and doctrine development.

For schools, developing strategic thinkers is a business decision. For the DoD, it is a national security decision. Higher education only accepts those who they think are more likely to finish their degree programs, and even then the average length for PhD completion approaches 8 years and nearly half of the students do not complete their programs within 10 years, if ever (Council of Graduate Schools, 2008). Like graduate schools, senior leaders should focus their personnel resources for the most critical positions only on those most likely to succeed in strategic thinking duties. We should administer a standardized test to all officers in an effort to identify those with promise regardless of their career field.

Another challenge is that, currently, there is no specific college or university that offers students a degree program aimed at helping them to become great strategic thinkers. Nor is there a field of study most suited for training. A Google search on "Degrees in Strategy or Strategic Thinking" produced more than 18.5 million hits, but found no actual degree programs. However, most graduate programs require research, analysis, writing, and predictive study skills. Such degrees will at least provide the basic tools for developing as a strategic thinker. The more diverse and rigorous the program the better prepared the student will be. Most important is writing and presenting ideas and then opening them to peer scrutiny as well as instructor/expert critiques.

As students progress in this initial selection phase, what emerges is the nascent capacity to do three things that I believe are vital to the strategic thinker. First, a strategic thinker must possess the capacity to put current events in context – historically, culturally, and in relation to world events. Second, an emerging strategic thinker must be able to evaluate the multiple potential implications of selected courses of action. Finally, and most importantly, a strategic thinker must be able to seek out and incorporate new ideas into his strategic approach (Tetlock, 1996). These people exist today in the military and they work hard at their jobs. They are very often successful in their careers simply because they have mastered these traits; yet they are seen simply as the smart officers. The DoD needs to deliberately seek these people out and see them as a pool to develop into strategic thinkers.

Obstacles to Developing Strategic Thinkers

The current standard of success in the military is focused on battlefield achievement. During the last ten years of the US involvement in the Central Command Area of Responsibility (CENTCOM AOR), leadership has essentially been focused on a "one year campaign fought 10 times" (Woodward, 2010, p. 311). This modality of fighting is a result of the policy of rotating all the units in both wars into theater and then back home every year. While the units being rotated are staggered throughout both Iraq and Afghanistan, every unit is responsible for a specific geographical region. The net result is that every piece of ground in both Iraq and Afghanistan is handed over every year from one unit to another. These one-year deployments result in fighting the first year of the war over and over again every year.

American society is driven by the achievement of short-term goals[1]. One needs merely to observe the political process in America to realize that achieving short-term goals is now the pervasive measure of success in our government. Strategic thinkers are driven by long-term, eternal ideas, whereas tactical thinkers are action driven and defined by the near term. For the purpose of this paper, I will use the following conceptualization from Colleen J. Shogan (2007). Intellectualism is "dedication to acquiring knowledge from reason, contemplation, or analytical thought. Anti-intellectualism is the attainment of knowledge through instincts, character and moral sensibilities" (p. 295). Richard Hofstadter, in his Pulitzer Prize winning book, *Anti-Intellectualism in American Society*, comments that "the leading anti-intellectuals are usually men deeply engaged with ideas, often obsessively engaged with this or that outworn or rejected idea" (1969, p. 21). He further points out that throughout American history "an immediate engagement with the practical tasks of life was held to be more usefully educative, whereas intellectual and cultural pursuits were called unworldly, unmasculine, and impractical" (p. 33). While even long-term strategies must necessarily lead to action and be made up of many short-term actions, part of our problem is that we are very often unable to make the courageous decision to take that action (or not take action) that is counter to the strategy at the end of the strategic thinking process. In essence, the prevailing standard in the DoD is the immediate rather than the long run. Adhering to strategy takes discipline and focus and the immediate does not afford the time to see a plan through.

Understanding the totality and complexity of strategy is critical to the overall effectiveness of everything we do as a nation—and everything we do in the DoD. The main problem we have found in the last decade is that some leaders do not like the strategies that strategic thinkers come up with. Furthermore, because you cannot prove a counterfactual argument, it is not possible to go back and say that the thinkers' strategy would have worked because you can't prove that after the fact. The critical components of strategic thinking are (in my opinion):

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[1] For a discussion of this, see Klein, J. (2011). The failure of American schools, *The Atlantic*, http://www.theatlantic.com/magazine/archive/2011/06/the-failure-of-american-schools/8497/.

1. Short and long term goals and objectives are linked.
2. Second and third order effects of actions must be evaluated.
3. Short-term successes may result in medium/long term failure.
4. Establishing overall goals/effects/desired outcomes is vital.
5. Understanding how strategic/operational/tactical actions and objectives fit together is the only way to succeed in the long run.
6. Relationships with both our allies and enemies are more effectively managed with clear and consistent strategy.

But, as any student of the last decade can attest, both civilian and military national leaders cannot stomach the notion of waiting several years to find out if a strategy works. This near-term drive, the annual budget cycle and ever-impending elections force a direction away from critical thinking and strategy development towards short-term victories, even if those victories are meaningless with respect to ultimate strategic objectives. Any officer who proposes a long-term, deliberate outlook is ridiculed as one who does not understand political imperatives inside the Beltway. That is the sad reality.

Given the environment of tactically focused promotion, intellectuals have limited access/influence in the Air Force and Navy and Marines. The Army appears to be alone in having made it a point to deliberately seek out, find, and promote their thinkers. However, as noted by Kaplan, the template of Brigadier General H. R. McMaster and the delay in his promotability and the lack of promotion of a strategic thinker like Colonel Doug MacGregor indicate that the process even in the Army is imperfect (2008). Strategic thinking is an intellectual pursuit—comprehensive, long-developing and somewhat evolutionary and affected by unseen and unintended events. Strategic thinking is also difficult to nail down as the desired ends change with every new President, Secretary of Defense, Chief of Staff and commander. Each time the desired ends change, the strategy must change—but a good long-term strategy allows for changes within the context of a set of long-term objectives. If we have no stated desired ends other than "Win the Nation's Wars," then any short-term tactic to overpower the enemy of the moment will be sufficient. The obvious result is that there is often a lack of discipline sticking to a strategy that takes a long time to develop or to see clearly its success or failure. In the current environment, "a long time" means anything outside the Program Objective Memorandum (POM) cycle which is approximately 5 years—way too short to validate the quality of a strategy.

Training Strategic Thinkers

Although there is no reason it should be so, there is often a clear distinction between strategists/strategic thinkers and commanders. Ultimately, we WANT our commanders to all be strategic thinkers because someone who can contextually place decisions into the near and long term can be invaluable both on the battlefield and in the Headquarters. Though it is rare, there have been leaders with skills in both arenas, most leaders tend to favor one over the other. Eisenhower was a far better strategic thinker than tactical, but was skilled at both. MacArthur was far better at strategy than battlefield performance; Patton was excellent in battle, poor with grand strategy.

At the time of this writing, there are limited specific formal training opportunities in strategic thinking. The DoD takes a mix of officers from various college majors and puts them on staffs in the hope that by extended exposure to strategy and critical thinking they will be successful. So far, nobody questions this rationale or challenges the success of this manning strategy. There are a few formal strategic/Advanced Analysis/critical thinking training venues in the DoD, such as Advanced Analysis training currently taught at the intelligence training centers at Goodfellow AFB/Ft. Huachuca, Service School education, and some senior leader exercises. There is also the opportunity to hone these skills at some theater OPLAN exercises. But, specifically focused training in the intricacies of developing a long-term strategy and assessing its value is lacking in the current catalog of training and education in the DoD.

Some point to the School of Advanced Air and Space Studies (SAASS) or the School of Advanced Military Studies (SAMS) as places that teach strategic thinking. Perhaps notionally these schools have a component of long-term strategy; however, they tend to gravitate to what is in vogue now, at this moment rather than working through the rigors of long-term strategy. More importantly, at least as far as the SAASS graduates are concerned; graduates are not effectively tracked nor are there many specific positions allocated exclusively to graduates. Each student is tracked to a SAASS slot after class is complete, but after that there are limited places for more senior former graduates to go and there is not a designated career track for them to progress to places of increased responsibility.

What is lacking in the DoD is a clear template for strategy development similar to what was developed for research design in King, Keohane and Verba (1994). Just as King et al is a standard reference for social science graduate programs around the world, the DoD must accept and promulgate a standard reference from which all strategists can work. Such a template enables disparate training and education experiences to be linked together to produce similar results and a cadre of strategic thinkers and planners having broad applicability both within services and in the Joint community.

Though there is a need for specified training to develop the cadre of strategic thinkers, every officer should get training in strategic thinking. This process should start at the accession sources such as the Service Academies, ROTC, OTS/OCS, etc. Further, at each stage of Professional Military Education (IDE, SDE) coursework in analytical processes, strategy development, and strategic implications should be included. There must be a capstone exercise, including intelligently designed simulations to determine the quality and thoroughness of the strategy developed and the implications of the success or failure of a plan. Such foundational training would allow even non-strategists to understand the value and purpose of strategic planning/thinking. It would then have the second order effect of enabling all levels of the organization to recognize strategy through the rising officers who have completed PME. In order to be effective each strategist must be fully trained and educated. A rigorous formal education and training component to become a strategic thinker must be in place to refine strategic thinking skills and identify the strong swimmers. A thorough understanding of how to develop and subordinate battlefield/campaign strategy to national objectives must be included in the growth process.

Developing Strategic Thinkers – Can there be an effective career path for strategic thinkers to take them to the highest levels of influence?

Strategic thinking training (and by extension the strategic thinkers) must be valued by the force and have genuine rigor. Graduates must attain "special" status and be given the opportunity to progress in a non-traditional career path. In the long run, graduates must be tracked and given specialized jobs and career programs to better ensure their skills and education are fully used. Further, there must be a winnowing process that enables those who make it through the training and are not able to perform at higher levels to move on to other aspects of military life. The strategic thinkers must be highly competitive among themselves and standards must be known and adhered to so that only the very best are offered positions of national strategy development. The long-term results of such a course would be that, just like most senior managers in businesses earn an MBA, all senior leaders would eventually become critical thinkers and strategists.

Like effective commanders, developing strategic thinkers will take significant time to successful navigate a rigorous educational process, advanced training, and practical experience. The vetting of the strategic thinkers must be done through several gates. First, they must prepare individually or as part of a team an actual real-world strategy. Second, a plan they were part of must submit to a peer review and be evaluated for quality, thoroughness, and effectiveness. Then, an additional assessment will be done based on the success of the plan they developed.

In my opinion, there are currently few great strategic thinkers in the DoD to point to as role models. Some point to General Petraeus or General McMaster as archetypes for great strategic thinkers. When compared to great strategic thinkers throughout history Petraeus and McMaster are successful strategists. Obviously there are numerous factors in the development of strategic thinkers. Four significant characteristics can be observed in the biographies of Petraeus and McMaster. These qualities are commonly found in the great strategic thinkers throughout history – but are decreasingly present in current leaders.

First, Petraeus and McMaster both have strong academic credentials – both have Ph.D's. Of course, a Ph. D. does not automatically make an officer a strategic thinker, but it does force the individual degree candidate to take on a difficult topic, research it, and draw significant conclusions and be able to successfully articulate them. Second, both officers have spent time as college professors, researchers, and educators. This enables them to regularly discuss and, more importantly, defend their ideas both in the classroom and among peers. There is no stronger crucible for validating (or invalidating) ideas than a room full of freethinking undergraduate students or critical peers. Third, they each have repeatedly bounced between operational jobs, tactical and strategic planning jobs, and academia. That experiential gauntlet forces officers to be able to develop and articulate their ideas to a wide variety of audiences and see (often in real time) whether their plans are good or bad. Finally, these two examples have presented their strategic ideas at the highest DoD and national political levels. What is important about having to make your strategies work at this level is that the decision makers at the top choose courses of action that have wide reaching and long-term implications. To provide a strategy to senior joint and political leaders is the "super bowl" of successful strategists. If a thinker can make a

successful case and carry the day with a decision at the national level, then his ideas will have enduring and permanent value.

Obviously assessing the potential of the DoD strategic thinkers is a priority, and it must be determined whether or not they have the capability and capacity to succeed. In fact, assessment is the foundational element to determining whether or not a strategic thinker will contribute. The successful strategic thinker needs to have operational experience so that they have an understanding of the implications of any plan. They need to have been part of a coalition since it appears that is how the U.S. will conduct wars in the future. They must have written about their own assessment of existing or historic strategies and submitted that evaluation to a peer review. They must successfully present their strategies and/or strategic assessments to decision-makers at every level. Finally it is important that the highest-level strategic thinkers routinely publish their assessments and present them in military and academic settings. They must be assessed in each of these categories.

To demonstrate competence there are some basic expectations for all strategic thinkers that need to be established. They need to have operational experience in order to see the impact of their plan, but at a minimum a plan they understand and have personal equities in. A serious strategic thinker should have experience in coalition operations planning and execution since that is the way the U.S. will fight in perpetuity, and incorporating coalition participation brings a new level of complexity.

Successful strategic thinkers should be steeped in the contemporary literature of strategies as well as be fully versed in successful strategies of the past. Linkage between the two is vital. History does not repeat itself in the strict sense, but there are patterns, trends, analyses, and commonalities that can be capitalized on by a strong student of history. The ability to present strategies to decision makers at every level of planning and implementation must be practiced and refined. The ability to stand the scrutiny, questions, and critique from those responsible for approving and initiating execution of the plan allows the strategist to understand components of the plan he had not heretofore considered. It also adds to a strategist's tool kit to use when designing future plans. A complete strategist will also have published both original plans and assessments of others plans adding to the intellectual capital on the subject.

Of course, the proof is in the pudding and a strategist demonstrates capability in the production of solid strategies, using clear strategic thinking, and understanding the far reaching comprehensive nature of strategy. The strong strategic thinker will write an accepted strategy at each level of command above Division/Numbered Air Force to the Theater-level. What is also valuable is to not pigeonhole strategic thinkers to one or another career field, academic background, or experiential lane. Strategic thinkers can come from any of those areas. Equally important is to give the military strategic thinker exposure to all the areas of warfighting including logistics, communication, intelligence, education and training, combat operations (including ground operations for Airmen/Sailors, and air/naval operations for Soldiers/Marines), international relations, and with industry. It cannot be overstated that at each level across their career development strategic thinkers must be objectively evaluated so that the exceptional ones will reveal themselves and be given increased opportunities.

Among the most effective methodologies for vetting a strategic thinker is the effective use of modeling and simulation to evaluate the potential success or failure of a strategy (Easterby-Smith & Davies, 1983). There has been ample research and writing in this lane and clearly the technology is there to assess the quality of a plan. Strategic thinkers can be tested by developing a plan and initially running through a series of agent-based modeling and causal mapping. Using this refined technology, the results and causation of various aspects of the plan will generate a series of results. When those results are known to the planner the next phase of the evaluation can kick in which determines the success by which a strategic thinker adjusts the near and far term goals to fit the results and conditions on the ground. Such mapping and results-oriented assessments are virtually limitless both in depth and scope and have proven highly effective in assessing strategic plans in a variety of commercial and government applications (Druckenmiller, Acar, & Troutt, 2004).

Developing a strong strategic planning cadre could take a generation. In the absence of elevation of strategic thinkers, there is no "strategy" to find, nurture, improve, challenge, and grow them. We find ourselves across the DoD without strategic thinkers. One only need look at the current national strategic documents to realize that for the most part they are a tour-de-force of regional observations without a comprehensive strategic umbrella holding them, and indeed our nation, together, putting us all on the same sheet of music.

Conclusions and Way Ahead

Developing strategic thinkers is neither easy nor instantaneous. It is entirely possible the next Eisenhower, LeMay, or Halsey may be lurking in our ranks right now or even at a Service Academy, ROTC Detachment, or not connected to the military at all. One thing is clear—the DoD must make every effort to select and groom personnel as strategic thinkers. Those on the strategic thinking track must be set apart and given the opportunity to fully develop as strategists.

What is equally important is to resist the temptation to "anoint" someone to a strategic thinking post without the requisite experience or bona fides. A duty title does not make a person a thinker any more than putting them at the top of the intelligence, communications, or space commands makes them skilled in those mission areas. To be a successful strategic thinker takes time, energy, and effort. It is not an assignment. It is particularly difficult to sustain the discipline to allow a strategist to mature and grow into the challenges of the task. Senior leaders must allow for a certain measure of trial and error, success and failure, and a willingness to allow non-traditional strategic thinkers to rise to the top.

So, to recruit and retain meaningful strategic thinkers will take—surprise—a strategy! In short, here is my template for the accession and retention of a successful cadre of strategists:

1. Identify successful strategic thinkers now and through history
2. Determine common skills, experiences, training
3. Establish an initial vetting process including a test/evaluation/practical component
4. Aggressively approach individuals with potential and give them opportunity

Once that cadre of strategic thinkers has been identified, they must have the opportunity to get away from the normal bureaucratic morass that typifies the current condition in most areas of the DoD. Then once they have been established there must be a developmental process. Once these thinkers have been identified they must have a credential that has credibility in military and academic circles. They must be recognized as actual authorities in this skill.

After the cadre of strategic thinkers has been selected, recruited, vetted, and established, a developmental process must be undertaken to allow them to mature and succeed – or not. Strategic thinkers must have varied assignments to gain both visibility and experience beyond just that of an academic.

In addition, to maintain and effectively use strategic thinkers, a variable organizational structure must be implemented. This would mean that unlike the current structure resident in all the services, a promotion system would have to be based on the proven quality of the ideas and the skill of the thinker. Further, this structure would be a challenge to the existing status quo. What is likely to emerge is a system where the best most capable strategists may not be the most senior officer. Therefore, there will have to be allowances for variations in time and service. This is not uncommon since there are many occurrences where younger officers, due to a variety of reasons, must supervise/command older officers of lesser rank. Finally, it is vital to track and retain the best and most successful thinkers. That might mean a combination of bonuses and other incentives in an effort to keep them doing their thinking for the services instead of the civilian sector.

The potential associated with developing a cadre of strong strategists cannot be undersold. What is clear is that such an august group will drive national security strategies for the long run. They have the potential to change the entire way the DoD thinks and what areas leaders focus on. Currently the focus is fixated on the immediate and tactical rather than the long range and strategic. Strategic thinkers can influence everything from international engagement to weapons development.

A thorough, thought-through approach, taking into account the second and third order effects of the impact on how all the pieces fit together would be especially beneficial, especially if the strategic thinkers are either in a single cadre of all the services or are linked together in some other way. Further, such clarity of strategy enables the successful application of the military instrument of power in support of diplomacy. A complete understanding of how all the instruments of power fit together to successfully achieve national objectives enables a strategy to come together.

The effect of a strong cadre of strategic thinkers is multiplicative. It enables the nation to exercise military power and fold it into larger strategic objectives in an effective and complete way. It creates the environment where not only our national leaders, but also international partners, have a clear and agreed upon approach to problems to provide a consistent set of objectives and a response to crises. In short, a group of strategic thinkers are often known to produce a strategy.

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Section 2
Impact of Culture

Chapter Four

Developing Army Strategic Thinkers

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When the Army's Chief of Staff, General Martin E. Dempsey, was selected for the position of chairman of the Joint Chiefs of Staff—the highest ranking officer in the U.S. military—it seemed to make sense that the senior uniformed advisor to the President should come from the service that has deployed more troops to Iraq and Afghanistan than those provided by the Navy, Air Force, and Marines combined. Moreover, the Army has more general officers than any of the other services, so it appears logical that key billets at the strategic level should also be heavily populated by Army generals.

Interestingly, however, the opposite is true. An analysis of critical, national-level military positions shows that the Army is significantly underrepresented in filling leadership roles in the strategic realm. For example, of the nine combatant commanders—the four-star generals or admirals who command across service boundaries and report directly through the Secretary of Defense to the President (think Norman Schwarzkopf during Operation Desert Storm)—just two are Army general officers. On the military's Joint Staff, the situation is strikingly similar as the majority of the influential positions are filled by general officers from services other than the Army. Overall, 36% of all military officers serve in the Army, yet Army officers fill only a little over 15% of the key joint military positions.

Despite their greater numbers and extensive experience on the ground in Iraq and Afghanistan, senior Army officers are watching from the sidelines as general officers from other services are selected for key strategic thinking positions at a disproportionate rate. Part of the problem is that Army senior leaders have been more preoccupied with fighting insurgencies than making themselves qualified or experienced for national leadership. A decade of back-to-back deployments has left Army colonels and generals with careers missing vital prerequisite experiences such as tours in the Pentagon, time in the inter-agency world, graduate schooling, or almost any assignment away from the war fight. As a result, many Army senior officers lack experience in critical functions requiring strategic thinking such as formulating programs and budgets, superintending acquisition programs, interacting with Congress, or managing strategic human resources. Fortunately, as the wars taper off in the upcoming years, many more Army officers will once again be available for broadening experiences to help prepare them for strategic leadership.

Beneath the preoccupation with fighting two wars, however, a more detrimental development is also emerging—a disdain in Army officers for any leadership position away from troops. Certainly Army officers have always shied away from bureaucratic billets—preferring to command Soldiers in the field. But a decade of making life and death decisions in combat has provided an even starker contrast to the world of consensus and compromise necessary in the Pentagon or Congress. Living a relatively black and white existence on the battlefield has encouraged antipathy towards the gray, untidy world of policy making and thinking strategically.

This attitude is exacerbated by Army personnel policies, emplaced long before the wars in Iraq and Afghanistan began, that inadvertently disincentivize strategic thinking development for the Army's most upwardly mobile officers. In other words, while the wars have provided convenient cover for the lack of Army officers being selected for positions requiring strategic thinking capability, there are preexistent structural and cultural factors that make up the true origin of the decline in strategic thinking in the Army officer corps.

Unfortunately, the rapidly changing world security situation combined with the nation's focus on domestic issues demands military leaders who can think strategically rather than just tactically or operationally. Fortunately, the current situation also presents an opportunity for the Army to assess and adjust its leader development and personnel systems to encourage the strategic leadership critical to the emerging security situation. In the words of General Dempsey (2012):

> This is the point. We're at a strategic inflection point where we find a different geopolitical challenge, different economic challenges, [and] shifting of economic and military power. And what we're trying to do is to challenge ourselves to respond to that shift and to react to that strategic inflection point and adapt ourselves. (Podcast)

This paper attempts to describe a model for the development of strategic thinking in Army officers as the nation enters a new phase of national security. It does so by first examining what strategic thinking is in relation to Army officers and then examines shortfalls in the current Army systems and culture. The paper then discusses possible policy recommendations to address strategic thinking in the Army.

Strategic Thinking

In defining strategic thinking, it is not our intent to review forty years of discussion on the difference between strategic planning and strategic thinking or the debate over whether strategic thinking is more science than art, or vice versa (Waters, 2011). Rather, we start with the assertion that strategic thinking focuses on strategy and that strategy is a problem solving process driven by ends, as opposed to ways and means (Bartholomees Jr., 2010). Strategic thinking focuses on positioning the organization, enterprise, or even nation-state to achieve its goals now and in the future. It is about the quest to maintain sustainable competitive advantage. This description implies that when a strategic leader thinks or makes day-to-day decisions, it is not necessarily strategic thinking. In fact, unless the leader focuses intellectual energy on the short- *and long-term viability* of the enterprise, it is not strategic thinking.

Strategic thinking is high in cognitive complexity. As author Jeanne Liedtka (1998) asserts, "Strategic thinking…is a synthesizing process, utilizing intuition and creativity, whose outcome is 'an integrated perspective of the enterprise'" (p. 121). Based on this discussion, we therefore assert that strategic thinking is: *The ability to synthesize and imagine the effects of relevant factors in pursuit of a strategy to achieve enterprise sustainable competitive advantage.* We also assert that while some strategic thinking is useful at all ranks, it is imperative that Army officers exhibit such thinking especially at the senior ranks.

We informally dichotomize the knowledge, skills, and abilities (KSAs) of strategic thinkers into the categories of innate and learned. Some KSAs are more of a personality trait and thus the selection of leaders must take this into account. Some KSAs are more predominantly gained over time and thus the Army must develop these KSAs in officers. We realize that some KSAs overlap the innate and learned categories and the KSAs are certainly not mutually exclusive. The three innate abilities we think are the best indicators for strong strategic thinking are: conceptual skills, openness, and courage. We suggest three learned competencies: frames of reference development, future orientation, and enterprise understanding.

Conceptual skills. Strategic thinkers have strong conceptual skills and are exceptional thinkers. Leaders will have a tough time synthesizing and imagining the relevant factors in their environment if they are weak or marginal in this area. Wageman, Nunes, Burruss, and Hackman (2008) describe conceptual thinkers:

> With little apparent effort, they synthesize disparate information, arranging pieces of an organizational puzzle into a coherent and interesting mosaic. They listen carefully to the various concepts, perceptions, and arguments that their peers toss about and then succinctly offer a synthesis or solution that is far more powerful than the sum of the individual suggestions. (p. 89)

Remembering mounds of information, connecting disparate ideas often presented months apart, and seeing unique patterns across the enterprise imply that cognitive power is a necessary, but not sufficient ingredient in conceptual thinking. Jaques (1989) defines cognitive power as "the raw mental power that enables you to sustain increasingly complex discretionary processes" (p. 37). General Mental Ability (GMA) is clearly central to cognitive power. Empirical studies have consistently demonstrated that the more complex the job, the more salient GMA is in predicting success (Schmidt & Hunter, 2004). Because GMA remains generally constant across an individual's lifespan (Murphy, 1989), we assert that if the Army requires strong strategic thinkers—especially at the senior levels—it needs to evaluate the selection of individuals into the officer corps. Assessing more officers into the Army with the requisite amount of intelligence to exercise discretionary judgment at the strategic and enterprise levels would increase the cohort of capable officers available to the Army.

Unfortunately, the Army places very weak demands on the conceptual skills of those who want to become an officer. Despite the mostly innate nature of conceptual skills, the Army has very lax standards in the officer accession process. To qualify for an Air Force Reserve Officer Training Corps (ROTC) scholarship, candidates must have a minimum SAT score of 1100 (out of a maximum of 1600 using the Math and Critical Reading portions only). The Navy ROTC is close behind with a minimum score of 1050. The Army's minimum score is a mere 920. Such a low minimum SAT score results in two outcomes. First, it lowers the potential for strategic thinking in the entire officer cohort. With fewer officers possessing the conceptual skills upon accession, there will be fewer capable officers available to take strategic positions at the senior levels. Second, and probably more importantly, the low minimum score sends a message to the officer corps that GMA and conceptual skills are not important to the Army as an institution.

The message that conceptual skills are not valued by the Army is inadvertently reinforced with the choice of majors for those receiving ROTC scholarships. The Army makes no demands on the academic major or courses chosen by Army ROTC cadets. Cadets learn quickly that attaining a high grade point average by majoring in criminal justice brings more rewards than a lower grade point average with a major in international relations or engineering. Unfortunately, the Army does not need any more criminal justice majors and yet it remains the most common major in Army ROTC. Navy ROTC, on the other hand, reserves 85% of its scholarships for those students choosing engineering, math or science programs. By not applying more stringent selection standards to the pool of incoming officers, the Army unnecessarily limits the number of officers achieving senior ranks who have strategic thinking capability.

Ironically, such policies that limit the availability of officers capable of exercising strategic thinking result from the lack of . . . strategic thinking. Many accession policies are focused more on filling positions than giving the Army a cohort of officers with strategic thinking potential for the senior ranks. From a tactical thinking viewpoint, college GPA is a good enough measure regardless of the degree or school it came from.

Openness. In order to imagine the effect of relevant factors on the enterprise, strategic thinkers need to see the world from many perspectives. The second generally innate ability critical to strategic thinking is openness to experience, or more simply—openness. Openness is one of five empirically derived, independent factors that describe one's personality— the typical way that an individual responds to situations (Landy & Conte, 2007). We consider openness a trait because, much like an individual's general mental ability, it is fairly stable throughout a person's life. Openness is "the recurrent need to enlarge and examine experience" (McCrae & Costa, 1997, p. 167). It is curiosity and imagination; the flexibility in considering novel ideas, behaviors, or feelings. Leaders high in openness search for relevant and conflicting perspectives. Not only are they imaginative, but they also solicit alternate points of view and are comfortable in debating with those whose perspectives differ from their own.

The Army values openness and has made great strides in encouraging it during training exercises through the use of the After Action Review (AAR). AARs are debriefings following an event designed to process what happened, why it happened, and how it can be done better. Army AARs, especially in the informal realm, are unusually brutal with superiors inviting feedback and criticism from even the most junior Soldiers.

Despite the impact that the AAR has made in bringing openness to the forefront in the training arena, however, the willingness of Army leaders to encourage, elicit, and act on the ideas of others has made less progress in areas outside of training. For example, a 2010 Center for Army Leadership study found that of 22,000 leaders surveyed across the Army, only about half thought that their unit or organization encouraged the frank or free flow discussion of ideas (Center for Army Leadership, 2010). At the U.S. Army War College, assessments conducted on classes of lieutenant colonels and colonels show that successful Army officers exhibit less openness than the societal norm. Especially troubling is that Army officers selected for brigade command—the officers most likely to continue on into the general officer ranks—have even lower average openness scores than the Army War College mean. Although openness is a key trait required by strategic thinkers, it ironically becomes less prevalent as officers progress through the ranks.

Courage. Strong conceptual skills and high levels of openness are not sufficient without courage, for it takes courage to tackle difficult problems, and to speak truth to power. Unlike GMA and openness, many researchers do not categorize courage as a trait. Given the impact of organizational climate and culture on the willingness of individuals to assert their ideas, courage could easily be placed in the "learned" as opposed to the "innate" category. We, however, have chosen to place this characteristic under the innate column because of its association with *assertiveness*, a central descriptor of extraversion, another of the five factors of personality.

Courage has often been described as having two types: physical and moral. Physical courage is the quality of willingly putting oneself in danger in adherence to a duty or responsibility despite the risk to one's life or health. Few will doubt the physical courage of military officers, especially given the exceptional performance of officers during the recent wars. Moral courage, on the other hand, is the quality of standing up for what is right despite popular opposition. Just as strategic thinkers require a high degree of openness to the ideas of others, strategic thinkers must also be willing to dissent and disagree when appropriate.

In strong, pervasive cultures, exercising "voice" (to use Hirschman's term) and challenging orthodoxies is often interpreted as disloyalty (Hirschman, 1970). Strategic thinkers need moral courage to assert their ideas, to present their vision for the organization, and to allow and even encourage cognitive conflict. Courage and assertiveness allow Army officers to present controversial opinions while simultaneously maintaining respect for the code upon which all military action depends. Secretary of Defense Robert Gates (2008) described moral courage this way:

> One thing will remain the same. We will still need men and women in uniform to call things as they see them and tell their subordinates and superiors alike what they need to hear, not what they want to hear . . . More broadly, if as an officer you don't tell blunt truths — or create an environment where candor is encouraged — then you've done yourself and the institution a disservice. (invited address)

Unfortunately, many aspects of the Army culture of self-sacrifice and loyalty may also make it more difficult for officers to challenge the views of their superiors and peers. General Bruce Palmer, a former commander in Vietnam commented on the difficulty of exercising moral courage at the senior levels during a lecture to the Army War College in 1979. He noted:

> Not once during the [Vietnam] war did the [Joint Chiefs of Staff] advise the Commander in Chief or Secretary of Defense that the strategy being pursued most probably would fail and that the United States would be unable to achieve its objectives. The only explanation of this failure is that the chiefs were imbued with the 'can do' spirit and could not bring themselves to make such a negative statement or appear to be disloyal. (quoted in Atkeson, 1999)

More recently, the "Revolt of the Generals" (Bacon Jr., 2006) reflected concern that the military culture had stifled opposition to the war in Iraq. Retired Marine Lieutenant General Greg Newbold (2006) called for the officer corps to exhibit moral courage through dissent:

I offer a challenge to those still in uniform: a leader's responsibility is to give voice to those who can't—or don't have the opportunity to—speak . . . It is time for senior military leaders to discard caution in expressing their views and ensure that the President hears them clearly. (p. 43)

Frames of reference development. Unlike innate abilities, learned competencies can be developed, so they need not be a basis for personnel selection. Important among them is frames of reference development. Frames of reference are built on complex knowledge structures, and influence every aspect of our thinking about strategic situations (Sloan, 2006). These frames are formed through professional and personal experience, education, self-reflection, and feedback from colleagues. It is hard to synthesize and imagine relevant factors to the organization without understanding the nature of the organizational system, appreciating the unintended consequences of strategic choices, exercising creative thinking to develop innovative ideas, and assessing the validity and relevance of data.

Although officers high in openness may more readily develop and broaden their frames of reference, other officers can still significantly build these knowledge structures. In both cases, future strategic thinkers can develop frames of reference by studying and applying critical, creative and systems thinking. Of course, strategic thinkers need to have the self awareness to reflect on their frames of reference and constantly challenge, test, and refine their frames based on exposure to new perspectives.

In today's Army, officers have greatly developed their frames of reference through the nature of counterinsurgency wars requiring them to cross cultural, service, and agency boundaries. For junior officers, drinking chai with the locals has almost become routine. For senior officers, coordinating with the Department of State or non-governmental agencies is no longer a novel concept. And yet the uncertain nature of future conflict demands even broader frames of reference that build upon the expanded horizons brought about by conducting counterinsurgencies. Strategic thinking officers need to be exposed to not just different people and cultures, but also different theories, organizational practices, and systems.

One way in which Army officers have broadened their frames of reference is through advanced civil schooling. Removing officers from the military culture and sending them to civilian graduate schools reaps many benefits. Civilian graduate degrees develop frames of reference not only through the actual course content, but also by immersing student officers in environments where professors could be Marxists, fellow students could be pacifists, and neighbors could be anarchists—not the types of people that Army officers typically associate with. And yet it is the exposure to differing frames of reference that allows Army officers to refine their own outlooks and assess their role in the larger military institution and society.

Unfortunately, the number of officers with full-time civilian graduate degrees who progress through the ranks is dwindling. For example, Figure 1 shows the number of Infantry officers attending the U.S. Army War College who had obtained a fully-funded civilian graduate education. Trends in infantry officers at the Army War College are an important indicator of the

officer corps since it is out of this subpopulation that many of the Army's senior leaders will emerge.

The chart divides the cohorts of infantry officers into three groups. The first group is those who obtained a fully-funded graduate degree. In other words, the Army sent these officers to an assignment with no duties except to attend school (and develop their frames of reference). The second group consists of officers who were assigned as ROTC Professors of Military Science as their primary duty, but obtained a masters degree on their own time during that assignment. These officers essentially experience the same frames of reference development as fully-funded graduate school attendees. The final group consists of officers who did not obtain a civilian graduate degree, or if they did, it was a part time degree—at night or online. The frames of reference development for this last category is significantly less than the two previous categories. Note that in the mid-80's about two out of every three infantry officers attending the Army War College had a fully-funded or ROTC assignment civilian graduate degree. By 2012, only one in ten infantry officers had a fully-funded or ROTC civilian graduate degree. Today's emerging senior leaders are exceptional tactical and operational leaders, but they are not being deliberately developed to be senior strategic thinkers.
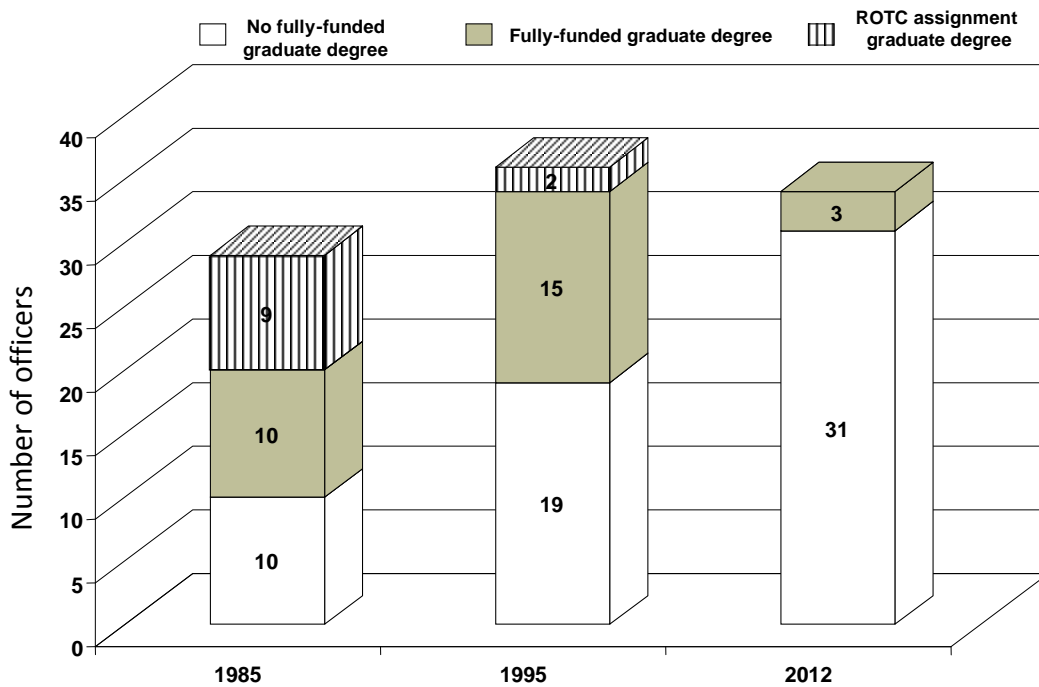

Figure 1. Infantry Officers at the U.S. Army War College and Civilian Graduate Degrees

Chairman of the Joint Chiefs of Staff, General Martin E. Dempsey recently reflected on the benefits of his time spent in fully-funded civilian graduate school. Note how the immersive experience affected his development as a strategic thinker and his commitment to the Army:

> I came back a clearer thinker, a better communicator. I came to the conclusion that this career was right for me because I had seen other possibilities; interacted with some of the best and brightest of America; and came to the conclusion that I thought that Army was right for me. (Hargrove & Sitkin, 2011, p. 530)

Future orientation. Strategic thinking also requires a future orientation and long time horizons (Jacques, 1989). In our definition of strategic thinking, we were very intentional about stating that strategic thinkers create "sustainable" competitive advantage. Officers who lack a strategic orientation to time—the past and the future—lack an essential component of strategic thinking. Making decisions to benefit the enterprise in the short term, without regard for the long-term success of the organization is not strategic thinking. Implied in this competency is a deep appreciation for history. Liedtka (1998) asserts, "Thinking in time… uses both an institution's memory and its broad historical context to think well about creating its future (p.123)." Army strategic thinkers should be well-versed in the past while simultaneously understanding the limitations of the lessons of history. They should also have a tendency to look at issues, challenges, and opportunities from a long term perspective. A senior officer who comes to work each day with a focus of crossing off "to-do" items on a daily basis probably does not have this future orientation.

While Army leaders devote much of their time and energy preparing for the future, the institution is often distracted from orienting towards the future by the pressing demands of the present. A recent example of this tendency was evident in the aftermath of the invasion of Iraq. Lieutenant General Kellogg was one of the senior members of the staff of the Joint Chiefs of Staff, overseeing systems for the command and control of forces. In his book, *Fiasco*, Ricks (2006) chronicles General Kellogg's view of the planning process for Phase IV—the post-war reconstruction plan:

> "I was there for all the planning, all the execution" of the Iraq war plan, and then later served in Iraq. "I saw it all." But what he never saw was a real plan for Phase IV--that is, what to do after toppling Saddam Hussein's regime. "There was no real plan," Kellogg said. "The thought was you didn't need it. The assumption was that everything would be fine after the war, that they'd be happy they got rid of Saddam (p. 109)."

Lieutenant General Scott Wallace, the Army's V Corps commander, described the Army's shortcomings in foreseeing the long-term implications after the invasion:

> The military did their job in three weeks. I give no credit to the politicians for detailed Phase Four (the reconstruction of Iraq) planning. But I don't think that we, the military, did a very good job of anticipating [that] either. I don't think that any of us either could have or did anticipate the total collapse of this regime and the psychological impact it had on the entire nation. (Frontline, 2004)

As the Army was confronted with a growing counterinsurgency in Iraq, it became apparent that the lessons of history had been forgotten. Future orientation includes looking to the past for clues to the future. As Arquilla (2007) put it:

> Even an unconventional war can fall prey to conventional wisdom. In this first great global struggle between terror networks and nation-states (the "global war on terror", or GWOT), it has taken the form of two basic, widely held assumptions: 1) that terror has just emerged as a full-blown form of warfare in its own right; and 2) that this conflict is utterly unique. Both of these assumptions are dismissive of history. Being guided—or rather misguided— by them overlooks important lessons from earlier periods in the long history of the use of terror as a military tactic and the history of terrorism more generally. (p. 369)

Enterprise understanding. Achieving a sustainable competitive advantage requires that strategic thinkers understand how decisions impact the entire enterprise. Leaders must understand the interaction of the major commands and functions across the Army as well as other organizations in the national defense structure. They should see themselves as enterprise-level thinkers, not a representative of the Army or one of the Army's many stovepipes. Enterprise understanding implies moving from the tactical or operational realm into leading the institution as a business or system—with the savvy of a leader who understands the needs of Soldiers and the nuances of the profession.

Unfortunately, the Army can be very clumsy in its enterprise understanding. For example, the Army acquisition process is emblematic of a system in distress with "too many cancellations, schedule slippages, cost over-runs and failures to deliver timely solutions to the warfighters' requirements" (U.S. Government Print Office, 2011). Since 1996, the Army spent more than $1 billion annually on programs that were ultimately canceled. Since 2004, between 35% to 42% of the Army's Development Test and Evaluation funding was lost annually to cancelled programs (2011).

A key factor in the failure of the Army's acquisition process, according to a review directed by the Secretary of the Army, is the lack of Army leaders with institutional enterprise understanding.

> During the period when these programs were being cancelled, the Army experienced erosion in the core competencies of the personnel responsible for the development of requirements and the acquisition of systems and services. . . The primary reasons for this erosion were the initiatives begun in the mid-1990s to reduce acquisition personnel and the drive since 2001 to reduce the generating force and increase the operating force to cope with the Global War on Terror. . . As a result of these problems, Army leadership, OSD, Capitol Hill and industry have lost trust in the Army's acquisition processes and capability to effectively provide warfighters the equipment and services they require in a timely manner. (USGPO, 2011, p. xi)

Restoring Strategic Thinking

The previous paragraphs have described six specific facets of the knowledge, skills, and abilities needed in Army strategic leaders. Developing these competencies in the Army officer corps requires an approach that acknowledges the changing leadership environments during an officer's career as well as the existing military education opportunities available to officers.

Figure 2 depicts a sequential, progressive approach to developing strategic thinking in the Army officer corps. Three aspects of the approach should be noted.

First, the approach does not equally emphasize each of the strategic thinking KSAs during each stage of an officer's career. Lieutenants fighting a counterinsurgency do not require a detailed understanding of the Army enterprise and it is probably fairly futile to attempt to improve the conceptual abilities of officers when they are colonels. The approach concedes that junior officers exercise tactical leadership, mid-grade officers exercise operational leadership, and senior officers exercise strategic leadership. Thus, the introduction, development, and screening of strategic thinking KSAs changes as officers progress through the ranks.

Second, the approach emphasizes the role of screening for strategic thinking competency during times of selection. The Army routinely screens the physical and medical qualifications of its officers, but as stated earlier, it gives scant notice to key criteria such as the general mental ability of its incoming members. Screening is critical throughout an officer's career as different strategic thinking KSAs become more salient. Screening is easily accomplished during the start of already established milestones in an officer's career such as attendance at a senior service college or consideration for general officer rank.

Finally, the approach realizes that adjustments to the leader development of Army officers are too often expected to be inserted solely through the Army school system. This approach will instead rely on a combination of screening during key selection points, developing KSAs during Army schools, and exercising KSAs during assignments. While the professional military education system plays a valuable role in leader development, strategic thinking in the Army will advance only with concomitant effort in Army units and screening.

Strategic Thinking Knowledge, Skills, and Abilities	Selection	Pre-commissioning	Basic Officer Leader Course	Lieutenant Time	Captain Career Course	Captain Time	Intermediate Level Education	Major and Lieutenant Colonel Time	Selection	Senior Service College	Colonel Time	Selection	Army Strategic Leader Program	General Officer Time
Conceptual Ability	Screen	Encourage	Develop	Exercise	Develop	Exercise	Develop	Model			Model			Model
Openness	Screen	Encourage	Develop	Exercise	Develop	Exercise	Develop	Model			Model			Model
Courage		Encourage	Develop	Exercise	Develop	Exercise	Develop	Model			Model			Model
Frame of Reference Development						Introduce	Develop	Develop	Screen	Develop	Exercise	Screen	Develop	Exercise
Future Orientation						Introduce	Develop	Develop	Screen	Develop	Exercise	Screen	Develop	Exercise
Enterprise Understanding							Introduce	Develop		Develop	Exercise	Screen	Develop	Exercise

Figure 2. Development of Strategic Thinking in Army Officers

Figure 2 shows the general approach to developing strategic thinking skills in Army officers. It also highlights the recognition that strategic thinking KSAs can be innate or learned. Of course, providing details such as how to develop curriculum for the different military education schools, or how officers should be screened for specific KSAs would exceed the scope of this paper. There are, however, two specific areas that need extra emphasis in the myriad changes that need to be enacted to drastically improve the strategic thinking capability across the Army.

Make the best officers exemplars of strategic thinking. First, change will not happen unless the rising leaders of the Army embrace *and model* the development of strategic thinking. Given the antipathy towards any assignment or experience away from troops, the most successful leaders will have to be forced to take assignments that develop their strategic thinking skills (e.g., advanced civil schooling) and then exercise them (e.g., time on the Army, Joint, or DoD staff). After sufficient cohorts of successful officers are developed and serve in critical strategic thinking positions, the remainder of the officer corps will follow suit. Initially, however, successful officers will have to be directed to step off the path of muddy boots. This can be accomplished through leader development panels that examine each successful officer's portfolio and determine the best development for them without removing them totally from a troop-oriented career track. Additionally, it is time to bring back "secondary" specialties for all officers. While the Army has some officers specializing in areas such as operations research, acquisition, or public affairs, not all officers have to declare a secondary specialty. As a result, officers can devote their entire careers to troop-oriented assignments and avoid development and utilization in leading the Army enterprise. All officers should be required to serve at least one tour in a strategic thinking assignment prior to being selected to colonel.

Screen at key points in the officer personnel lifecycle. As stated earlier, the Army does not take advantage of opportunities to screen for strategic thinking potential. Screening begins with assessment into pre-commissioning programs and continues up to being selected for general officer. Screening is especially critical given the pending downsizing of the military. As the demand for Army officers decreases, the Army will be presented with an excellent opportunity to tighten strategic thinking screening throughout the officer personnel lifecycle. With smaller cohorts of officers entering the Army, the Army can no longer assume that there will be a sufficient number of officers with strategic thinking potential in each cohort.

Army leaders have dedicated the majority of their lives to service. But service and duty extend well beyond leading Soldiers in battle. The Army's duty is to the Nation and the Nation needs the wisdom, experience and strategic thinking of Army leaders. As the Army recovers from the wars of Iraq and Afghanistan, it is imperative to revitalize strategic thinking in the Army officer corps. It is time to apply more stringent standards during assessments and it is time to send the Army's best and brightest warriors to assignments that will prepare them not just for the next tactical command, but also for leadership at the national strategic level. For Army officers accustomed to running towards the sound of the guns, any assignment or experience away from Soldiers may appear to be an undesirable sacrifice. But today's Soldiers understand sacrifice and the Nation will be better served with Soldiers willing and able to lead in the messy, yet critical realm of national strategic leadership.

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Chapter Five

The Sociology of STRATEGY: Romancing the Image

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…simplicity is not an inevitable hallmark of truth…but merely a methodological tool of inquiry. …We need not certainly presuppose that the world somehow is systematic (simple, uniform, and the like) to validate our penchant for the systematicity of our cognitive commitments.
          -- Nicholas Rescher (2001, p. 201)

Introduction

There is a certain irony to the situation today where the U.S. Army Research Institute is commissioning a study (for which this essay is part) to investigate a concept that was originally proprietary to armies. I assert that the idea of "STRATEGY" began with a literal meaning—reflecting the rather romantic image of an ancient Greek general standing on a hill overlooking the field of battle, able to see and send orders to the sub-*strata* below in order to maneuver his forces to a positional advantage.

Graphic by author
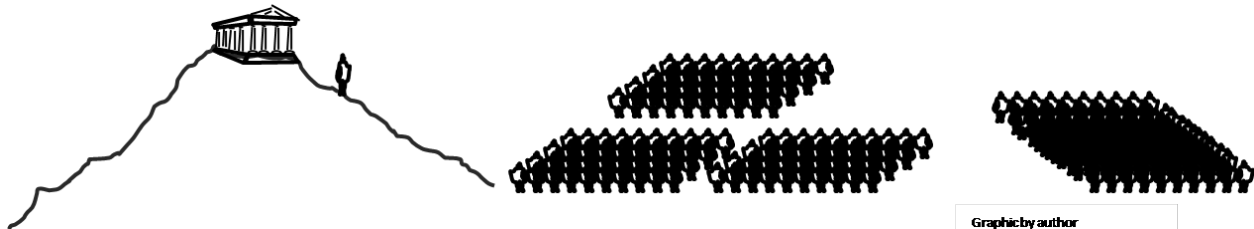
Over the centuries, the physical idea has been extended and displaced conceptually (Schon, 1963) to the point STRATEGY has become, in an elaborated rationalist abstraction, a *general theory of relative advantage* to achieve a desired end. Indeed, the idea migrated across many nonmilitary realms, to include sports (ends: winning the season), management (ends: best use of resources), business (ends: high profits), leadership (ends: influenced behavior), politics (ends: winning power through elections and re-elections), and so forth.

In this essay, I treat STRATEGY as a manifestation of a single sociological paradigm--*functionalism*. My assertion is that without a functionalist worldview, there is no such thing as strategy. My intent, henceforth, is to investigate STRATEGY as a concept associated solely with the functionalist paradigm, critiqued through journeys across three other sociological paradigms (Burrell & Morgan, 1979)—*radical humanism*, *radical structuralism*, and *interpretivism*. My sub-thesis is that conceptual offshoots from the meaning of STRATEGY (e.g., strategic thinking, strategic leadership, strategic forces, strategic level of war, etc.) may be better appreciated if we can critique the idea of STRATEGY from these three perspectives. Let us begin with some philosophical notes about sociological paradigms.

Paradigms are the way a particular community of practice assumes the world "is" (Kuhn, 1996). There are at least three interlaced logics associated with paradigms: ontology, epistemology and methodology. Ontology may be construed along a continuum between beliefs of a purely objective world (involving the physical construction of reality, a.k.a. objectivism) and subjective world (the social construction of reality, a.k.a. subjectivism). Epistemology is the ensuing belief about what legitimates understanding answering the question, "what constitutes knowledge for practice?" For example, to understand the physical world, the knowledge structure is often judged "objectively" by the coherency of taxonomies – categories and subcategories, analytic levels of causality, and so forth. To understand the literary world, epistemology is based more in manmade, interpretive concepts – such as irony, tragedy, comedy, and so on. The third aspect to paradigms, methodology, involves *how* knowledge is constructed. Examples would include the employment of the "scientific method" to the natural world and the employment of "interpretive methods" to learn and translate meanings in the social world.

As individual humans, we are not "stuck" in a single paradigm and move seamlessly among these worldviews all of the time. When I watch a football game, I enjoy it because I understand the rule structure. I know that the rules are a subjective creation because I notice the NFL changes them all of the time. I observe how the rules are enforced – the methodical physical hand and arms signal of the referee coupled with their subjective interpretations of what just happened. I am attentive to the physical prowess of the individual players and their integration of their positional tasks into a team effort. I also appreciate how the coaches and quarterback seem to intuitively know when to run the ball, pass the ball, or even when to intentionally ground the ball. I also can watch the dynamic physical interactions of the opposing teams while reflecting how both sides faked each other out (I interpret, in my own mind, that this surprise is a very subjectively-interpreted experience as it seems only a surprise to the other team and the audience). I also reflect on how the passage of time (measured by a human creation) is controlled by the rules (there can be a start, time-outs, resets, overtimes, and a finish). There is a certain irony that an "hour" of official football time may sometimes turn into more than three. I am aware that there are always ongoing, behind-the-scenes tensions between the players (labor) and the owners (executives) of the teams which sometimes affects whether the players will strike (unite in revolt against those in power). Finally, I know that in the 1950s-60s the League was transformed (implicit in the creation of the Super Bowl) with the advent of television, which made the game commercially successful and accessible by virtually anyone.

While I may intuitively feel comfortable journeying among multiple paradigms – such as between objectivity, subjectivity, various forms of knowledge, and methods in a single football game – I cannot easily categorize these views into a single paradigm. I am singly mindful that one descriptive sentence above can fall into several paradigmatic views (for example the objective experience of watching the players interact is subjectively interpreted by my sense of the rules as they play). On the other hand, I note that *institutions* (a form of collective mind) can get "stuck" in single paradigms or in the illusion that there is only a single paradigm to make sense of the world (such reification is the very definition of institutionalization) (Tolbert & Zucker, 1996). One observer, Donald A. Schon, in fact, claims that there is a crisis in professional knowledge and schools because the institutionalized programs (and note the imbedded mechanistic meanings in the word "program") tend to get mired in "technical

rationality:" (1) ontologically believing there is only the "objective" world; (2) epistemologically there is only "natural science;" and, (3) the legitimacy of that science is only proven through the "scientific method."[1] Members of such technically-rational institutions over time are habituated into the singular paradigm to the point they are deemed successful as certified principally by standards of technique as typifications of the believed "proven" science. Others and I have argued that the Department of Defense, particularly its Army, is an institution tied to the same crisis (e.g., Paparone & Reed, 2008). I will not justify those arguments again here as I would like to return to my intent, to take an "inter-paradigmatic journey," promoting three critical views of STRATEGY. My first stop will be the functionalist paradigm—the home of how the U.S. Army institutionally has reified the concept of STRATEGY.

Functionalism

The functionalist creates knowledge of STRATEGY that epitomizes the ideal of technical rationality. Functionalist-derived epistemologies of STRATEGY are derived from a host of other functional "grand theories" to include the grandest of all, *general systems theory* which I will highlight here.[2] The functionalist believes in ontological realism: that the world is systemically structured; thereby, objective and unemotional understanding of the total world is based on synthesis-through-analysis of the subsystems and their contributory sub-subsystems (and so on) that make up the whole. Epistemologically, the idea is to engineer knowledge taxonomies that mimic that structure. STRATEGY is functionalized as a compilation of tiered interventions into some advantageous aspect of the higher order system. A STRATEGIST breaks the identified system down into subsystems. In political-military terms, the STRATEGIST would describe the nation as a subsystem, and try and predict the causal effects of a nation's "grand STRATEGY" on another nation or on the overall "international system." The methodology for "strategizing," then, is to gain epistemological understanding by oscillating between an imagined-synthesis based in additive-analysis of causality at various levels of the system (e.g., "tactical-operational-strategic").

Appreciating this sociological view, one should be able to find technologies and many artifacts of functionalism in our military institution. Indeed, one does not have to go far to find evidence that the U.S. military has "functionalized" its own system's niche and its institutionalized identity as an "instrument of national power" in terms of its stratified, systemically-designed-in-effects on other systems. The military strategist concentrates the oscillation of synthesis-analyses on particular niches of the whole system's "environment;" while the "grand strategist" links military STRATEGY to other "instruments of power" (economic STRATEGIES, diplomatic STRATEGIES, and so forth) that are ideally unified toward a holistic effect to change other systems to the desired *end state* (e.g., "stabilized," "disrupted," "democratized," etc.). True to the functionalist paradigm, "ends-based rationality" is another name for technical rationality.

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[1] Donald A. Schon wrote a two-volume primer on the subject (1983, 1987). His original charter was to write about architectural education (particularly how to incorporate "art" alongside the technical aspects of professional education). But his study went beyond as he realized that ALL professions were suffering to some degree with the blinders of technical rationality.

[2] Believed to be the unified science of everything, general systems theory was comprehensively documented by Ludwig von Bertalanffy (1968).

Teaching the techniques of STRATEGY involves having students envision a desired system *end-state* (how the targeted whole system *should* function as a result of tiered capabilities intervening at their designated levels, a.k.a. *strata*) by systematically applying functional ways and means to cause that desirable end state. Here is where the taxonomy of knowledge, derived from stratified systems theory (Jaques, 1976, 1986) comes to bear. Figure 1 reflects only a sampling of the hundreds of functionalist artifacts of a stratified systemic approach to STRATEGY:

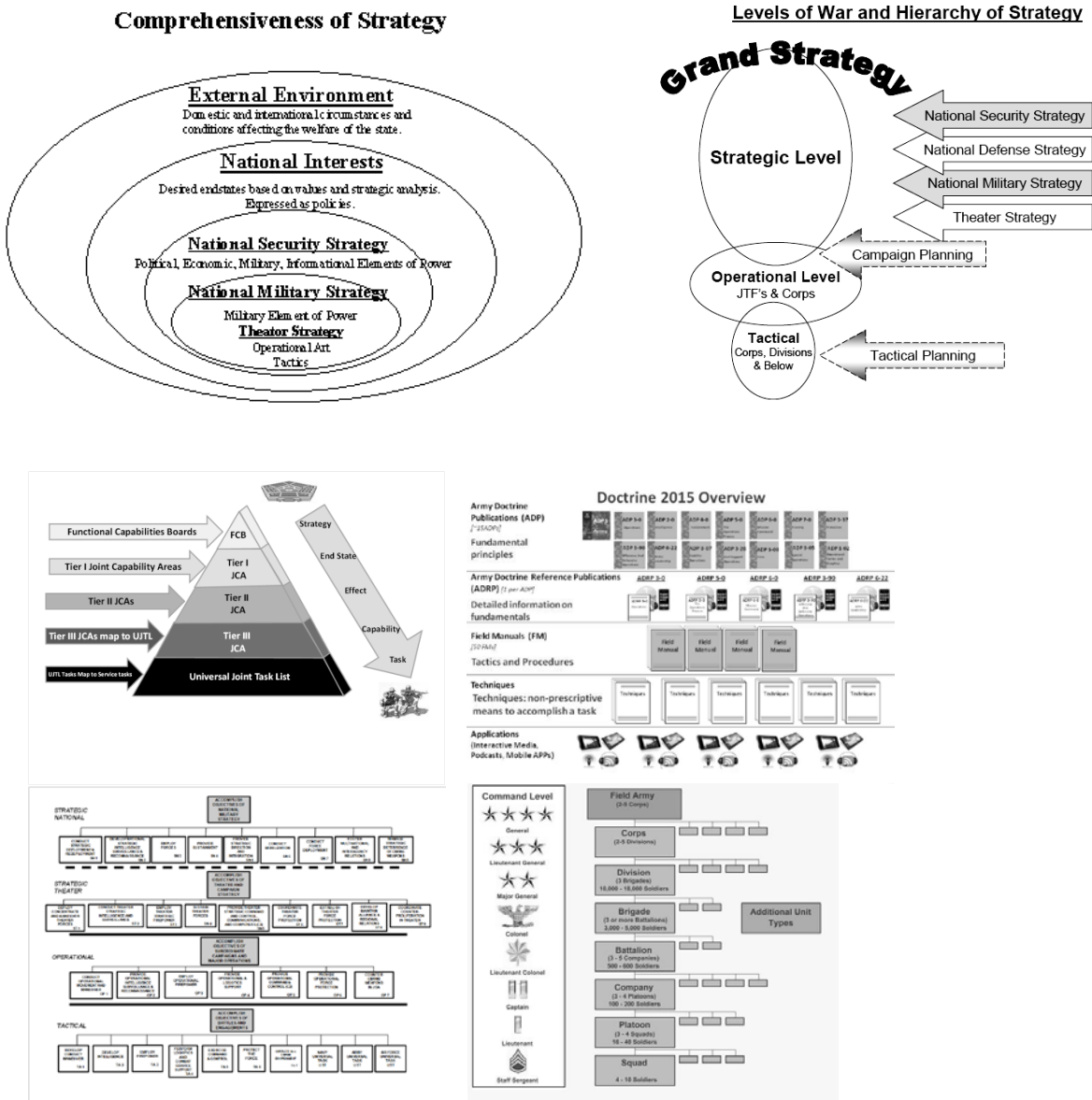*Figure 1.* Artifacts from the Stratified-Systems View of STRATEGY. (The top two diagrams are from Yarger, 2008, p. 46 and Yarger, 2006, p. 12, respectively; the middle left from U.S. Department of Defense, 2005, p. A-7; the middle right from US Army Training and Doctrine Command News Release, 2011, p. 2; the lower left from U.S. Department of Defense 2002, p. B-A-3; and lower right is from US Army, 2012 .)

There are several revealing attributes to the functionalist conceptions of STRATEGY. Foremost is the belief in *synoptic planning* – that is "integrated comprehensiveness …a conscious effort launched by top executors to integrate decisions that compose the overall STRATEGY to ensure that plans are consciously developed, mutually reinforcing, and integrated into a whole" (Roberts, 2000, p. 299). Creating a hierarchy of plans is seen as the only way to assure objectives at lower orders of one's own internal system are functionally linked to larger, external end states, ultimately comprising the overall military STRATEGY and to the grand STRATEGY. The rule of thumb for "strategic thinking," then, is that suborders in an environment are subject to the rule of higher orders (i.e. hierarchy). This is analogous to "architectural thinking" that serves also as a meaningful way to design and manage one's own organizational capabilities in a matching-tiered manner: national governments provide **ends** to the next stratum (military commands) that rule over the **ends** of subordinate units and which rule over individual soldiers – each functionally considered as taskable-**means**-of-intervention at various levels of the overall highest order system. This layering of capabilities and controlling authorities simplifies the teaching of STRATEGY as a kind of reverse-engineering of lower level tasks (**ways** called "military tactics") that roll-up into intermediate-order tasks (**ways** called "military operations") that all together lead to an ends-based STRATEGY. To a functionalist, STRATEGY is viewed as a problem of synopticism and being able to detect the right linkages up, down and across complicated systems (interiority) and also an effort to predict and control first-, second-, and third- "order" (i.e. levels) effects (exteriority).

It should be no surprise that the epistemology and methodology of the functionalist institution mimics that of the physical sciences, particularly those of systems engineering and biological eco-systems, wherefrom much of the language is borrowed. The science of organizational design, training, education, and so forth are rationalized around processes of task analysis and task assignment (for the U.S. Army those rationalizations are called the military decision-making process, Army/Joint Integrated Capabilities and Development Process, Army Universal Task List, and so forth). The overall "strategic problem," once defined by the highest ranking figure in the hierarchy (after all, they are in the best position, or stratum, to "see" the "big picture"), is believed to be solvable through technical rationality (the logic of technique at each level)— breaking the problem down into smaller operational and tactical problems.[3] The STRATEGY becomes a hierarchy of objectified tasks (that are interventions engineered to solve "problems" at each level), rolled into task groupings called missions that must be in turn assigned and performed by those lower in the hierarchy and controlled by higher-ups in the system as they are executed until the strategic problem is solved. The functionalist rationalizes staff work (intelligence, logistics, etc.) and pre-structured collective work also at each level and task

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[3] Problems become "objects" and we "objectify" ways to solve them (calling these goals "objectives." In functional management theory (developed in the first half of the twentieth century and elaborated by Peter F. Drucker, 1954), this process is commonly referred to as "management by objectives" or MBO. The Army officer evaluation system is based in MBO – again a functionalized approach.

grouping (offensive-, defensive-, stability tasks) in light of a biological or ecological systems heuristic: the more complex the "task environment," the more complex the array of functionality must be designed to match that complexity.[4]

The functionalist also views outside institutions in a similar way. For example, if the opponent does not structure its plans, tasks, and organizations as would the functionalist, they appear to the functionalist to be "asymmetrical." If viewed as symmetrical (more or less operating by the same "rules"), the issue then becomes which side can employ ways and means in an advantageous fashion much like a football team will play symmetrically with a like-minded competitor. The next paradigm, *radical humanism*, offers a drastically different (and suspicious) view of STRATEGY and its big brother, functionalism.

Radical Humanism

Radical humanists see the world as a subjective (social) creation and any claim to objective knowledge is disbelievingly seen as a tool of manipulation used by the powerful elite. Institutions are not created as "form follows function" as the functionalist would argue; rather, institutions are structured to keep the elite in power and suppress, particularly the emotions of, the weak mass (in the military organizations, for example, the enlisted class). Knowledge is a manifestation of political-economic dominance. The "radical" in the humanist paradigm comes from an eventual unification of the weak to overthrow the suppressors along with their control of knowledge and methods.

The functionalists claim that STRATEGY is a rational undertaking is seen by the radical humanist as nothing more than a "language game" designed to manipulate others (Lyotard, 1984). Machiavellian tactics includes "educating" senior officers in a ritual of sharing a little taste of elitist power as they attend war colleges and telling them, through the logic of a metanarrative,[5] that they are now "strategic leaders." As graduates they are better-controlled though the "coming-to-the-dark-side" promises of the perquisites of higher rank and position. Knowledge of STRATEGY is better described as an *epistemic script* that enables the fledgling elitist to learn the story that enables them to stay in power.[6] Like war colleges' claims to expertness in developing curricula on STRATEGY, operational and tactical claims to "military doctrine" as the "authoritative" body of "professional knowledge" simply serve as more control mechanisms for

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[4] In biological systems theory, this is called *differentiation* and *integration*—the logic is extended from the theory of evolution which calls for environmental adaptation by organisms at various levels of an eco-system. So the functionalist's stratified systems view of strategy presumes that through command control of subordinate interventions at various levels of the targeted system, the whole intervention can be managed/controlled as an "adaptive process," and assumes that the approved, highest-order end state remains relatively stable during the process (because it can take a long time for the hierarchy to appropriately adapt). This adherence to biological functionality (adaptation) is a good explanation for the growth in headquarters staffs and specialties within those staffs.

[5] *Metanarrative* is a phrase borrowed from critical theory and particularly the postmodern (arguably radical-humanist) views of French philosopher, Jean-François Lyotard (1984).

[6] *Epistemic scripts* "capture shared assumptions about the production of new knowledge" (Boxenbaum & Rouleau, 2011, p. 279).

the oligarchy. After all, there is no "authoritative" curriculum or doctrine without a flag officer's signature of approval.

"Levels of war" are really levels of the hierarchical power elite. Some have called U.S. geographic combatant commanders the modern-day *proconsuls*, signifying their immense power over entire regions of the world (e.g., Wilcox, 2004). Those in such "strategic positions," who have (even in so-called combat zones) chauffeurs, access to helicopters and global-reaching jets, personal cooks, aide-de-camps, additional entertainment allowances, spacious mansions, office suites with executive bathrooms, and so forth, are the ones who demand that the masses of the enlisted are indoctrinated with "values" such as "selfless service."[7] A soldier writes confirmationally of an existing "class resentment" from their recent perch in a war zone:

> Don't even get me started on our "Rock Star Generals" and their battlefield tourism…it is ridiculous, and worthless. They wander around, searching for adventure and glory- only to return to their "Bat Caves" and not even inform their staffs on what they did, what they saw, what they understand now. The staff sits on the forward operating base, grinding out products and work- often to affect locations and sites they have never seen themselves; yet, their commanders have often. Their commanders are too busy to be action officers themselves, so a positive feedback loop forms of greater and greater lack of communication and confusion- the staffs spin and produce more briefings, more orders, and develop more processes- only to be frustrated by Rock Star Generals that return from their whirlwind tours with just enough time to sit in a brief and tell the staff how wrong they have it. I may sound a little bitter here- but I am sick of generals visiting sites to "visit their men" or "assess the situation" which constitutes staying in VIP quarters, giving a handful of coins out, having their public affairs officers snap photos of them presenting awards, and then dining on far better fare of food than their men ever get to see. (anonymous Soldier, personal correspondence with author)[8]

The definition and use of the concept of "strategic leadership" itself is unmasked by the radical humanist as being a euphemism for the purposeful instilling of mindless dependencies on hierarchical-, primarily *masculine*-, authority figures. Critical feminist theory (based in the radical humanism paradigm) has developed a supporting epistemology. To a radical feminist STRATEGY is another ploy for men's dominance and control as this anonymous author-soldier indicates:

> Clearly then, policies are not the only instruments of gender-based exclusion from the military. Facets of military culture itself, particularly those found in models of military leadership, can marginalize women. Anyone familiar with the military quickly recognizes its hierarchical structure and decision-making processes, arguably modeled on a Western patriarchal family structure. One explanation for this organizational style looks at the conscious and unconscious processes that fuel organizational life. [We should consider]

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[7] "Selfless service" is formalized as an espoused value of the U.S. Army, and is indoctrinated into all recruits.

[8] I use anonymous quotes in this paper to protect the soldiers who wrote them. I selected them because they are controversial to illustrate there are "taboos" that the radical humanist would try and expose as threats to those who enjoy the existing power structure.

such processes "psychic prisons" and [encourage] an examination of both conscious and unconscious "blind spots" that motivate us to organize in certain ways. Using a psychology based metaphoric "psychic prison" of a patriarchal family, one sees how it supports a clear division of male and female roles. The patriarchal family view socializes men to function where there is a need for aggressive and forthright behavior while subordinating women to perform roles that satisfy various kinds of male narcissism. Like a patriarchal family, male leadership is the expectation; female leadership is the aberration.... In the Army, the patriarchal family model sustains a dichotomy of leadership and servantship (the former a male role, the later a feminine one). In the process of reifying this mental construct, patriarchal organizations do not grow leader role models for women, nor do they create incentives for them to sacrifice for the organization. (anonymous Soldier, personal correspondence with author)

Furthermore, from the radical humanist view, the use of STRATEGY across other fields of practice is part of a metanarrative designed to militarize our culture:[9]

As political scientists, we need to put popular culture on the table. Frequently, it is the militarization of popular culture that provides the nurturing soil for elite and institutional militarization, though the flow of causality should be constantly questioned. Imagine, therefore, these questions being placed on the research agenda of serious political science: Do civilian football matches start with a bomber fly-over? Are those graduating seniors going from secondary school directly into the military given special mention at their public school commencements? When suburban homeowners plant patriotic flags and "support our troops" signs on their lawns, are they admired by their neighbors? Do wives of male soldiers who support their husbands' missions garner more familial and public support than the soldiers' wives who voice reservations about those missions? The questions multiply: What proportion of the society's civilian teenagers think wearing camouflage pants and t-shirts make them look fashionable? Do commercial institutions— beer brewers, telephone companies—craft popular advertisements showing their products in close proximity to uniformed soldiers? (Enloe, 2010, p. 1109)

A serious scholar investigating the functionalist sociology of STRATEGY should include the radical humanist perspective, such as that afforded by critical feminist theory, and investigate the "dark-side" potentially masked by functionalism. A second alternative point of view can be taken, but in a different way: from the *radical structuralist* paradigm.

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[9] Lyotard (1984) defines *postmodern* as "incredulity toward metanarratives" (p. xxiv). His method was to deconstruct metanarratives as mythical stories of progress espoused by modernists (or structural-functionalists). My favorite example of how a "metanarrative" works is Darwin's theory of evolution (subsequently included in Herbert Spencer's approach to sociology) which has been so absorbed into our institutionalized logic that we can no longer detect its presence. The main concepts of this functionalistic theory are arguably (and I'll leave it to the reader to detect influence on "how the Army thinks"): *dualism*, *conflict*, *hierarchy*, *displacement*, *response*, and *development* (described in Boorstin, 1994, pp. 132-136).
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Radical Structuralism

The radical structuralist's is an objective ontology and sees the world as complex to the point that the functionalist's determinisms and reductionisms are distortions of real life, giving false sense of understanding. STRATEGY is criticized as producing linear expectations of causality. Its disambiguation methods of explaining and validating its epistemology, often most based in systems theory, are flawed. To the radical structuralist any claim to permanency of knowledge is an illusion and it is just a matter of time before "normal military science" will be revealed as misleading after an inevitable, but unpredictable, "revolution of military affairs" (RMA) that will surprise all. As the functionalist can only strategize with known ways and means, s/he cannot account for the inevitability of a revolutionarily-disruptive, gestalt-like "paradigm shift."

The epistemic script of the radical structuralist is exemplified in the following statements:

> … our conventional superiority creates a compelling logic for states and non-state actors to move out of the traditional mode of war and seek some niche capability or some unexpected combination of technologies and tactics to gain an advantage (Mattis & Hoffman, 2005, p. 18).

> Technology in the military sphere is developing as rapidly as the changes reshaping the civilian sector. The combination of scientific advancement and the globalization of commerce and communications has contributed to several trends that significantly affect U.S. defense strategy and planning. Falling barriers to competition caused by ubiquitous, low cost information technology contribute significantly to the compelling need for military transformation…. Transformation is yielding new sources of power. Because the global pace of change is accelerating, new sources of power will fuel our ability to maintain the advantage in a competitive landscape where yesterday's winner is tomorrow's target. (Cebrowski, 2003, pp. 2-3)

Note the attention of the radical structuralists (in the popular literature also called transformationalists who speak to RMA as "punctuations" in otherwise systems equilibrium) to the role of disruptive technologies to the ways and means of military intervention (e.g., Knox & Murray, 2001).[10] In a real sense, ways and means not-yet-conceived make deliberation on "ends" meaningless. It is the breakthroughs in ways and means (i.e. technology) that will revolutionize military interventions and any ends not-yet-conceived. This makes ends-based rationality, the essence of the functionalist-based concept of STRATEGY, entirely unreasonable from the point of view of the radical-structuralist purist. Transformation never "ends."

What might be quite startling to the functionalist is that the radical-structural purist will claim that strategic planning is the equivalent to a "rain dance." Military interventions interact with the social milieu – with interacting variables and the reality of "mutual causality." The realities associated with emergence, complex adaptive systems, swarm intelligence, breakthrough technologies (high and low) yet-to-be-invented, make the functionalist love affair with planning absurd. Military planning is a process that depends on probability and foreknowledge. Both are

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[10] One radical structuralist theory is "punctuated equilibrium theory" (PET) derived from a radical view of biological evolution and applied to sociology. Knox and Murray (2001) use PET to describe RMAs in history.

absurd when dealing with "wicked problems" (Rittel & Webber, 1976). Instead of writing an Army field manual on staff planning and rational decision-making, write one on "muddling through" and "garbage can decision-making" (Lindblom, 1959; Cohen, March, & Olsen, 1972, respectively). Instead of attending a war college, a radical structuralist might advocate sending officers to participate as research fellows at the Santa Fe Institute (the interdisciplinary home of complexity theory—for the story of SFI, see Waldrop, 1992).

There is at least one more point of view to critique that of the functionalist's – that is, through the subjective perspectives of the *interpretivist*.

Interpretivism

Instead of the functionalist's question, "What is the structure of strategic reality?" the interpretivist asks, "How is strategic reality socially constructed?" (*à la* Brown, 1977, p. 19). The ontological basis of reality for the interpretivist is subjective; hence, all knowledge (and the language and other symbolism that describe it) is considered socially constructed or cultural.[11] The difference between the radical humanist (who also sees the world through the lens of a subjectivist) and the interpretivist is the relatively conservative (incremental) view of epistemology for the latter. As part of a culture, we can only interpret the world based on past conceptualizations (language, other symbols, metaphors, categorizations, etc.) and we tend to do this retrospectively and incrementally as past sensemakings have seemed to work well. However, when faced with new situations that make past interpretations and theories for action inadequate, we face a *collapse of sensemaking* (Weick, 1993).

This collapse of sensemaking, in the institutional context, may explain why the U.S. Army Research Institute has sponsored the present research – the collective mind (the institution) with its cultural reification of functionalized sensemaking (and the "strategic understanding" that was believed to accompany it) has all-but-collapsed. The institution and its functionalist-inculcated members have so objectified their functionalist view of the world, they have lost any ability to sensemake in improvisational ways (an ethic that a mindful-interpretivist would embrace).[12] In terms of the Weickean firefighting allegory, members have failed to "drop their tools" of normal sensemaking even when faced with life-threatening situations that require tool-dropping.[13]

Whereas the functionalists would argue that STRATEGY is the only toolkit, the interpretivist would help the institution "see" that STRATEGY as having been objectified and that there are countless artifacts that demonstrate an undying investment and emotional commitment.[14] The

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[11] My previous use of the football metaphor is an example of interpretivism at work.

[12] *Objectification* has a few synonyms in the interpretivist literature: *reification* and *hypostatization*, to name two. These refer to the way cultures or institutions assume that their interpretations are objective when they are social constructions.

[13] Weick (1993) tells the story of some firefighters who failed to drop their tools to the point they were slowed down and could not escape the encircling fire; while others that did survived.

staff and war colleges (across all the Services) practically worship the idea and have invested years to teach their officers the "toolkit" of STRATEGY.[15] The entire system of supporting military doctrine is deeply vested in the functionalist stratification of budgets, concepts, categories, organizations, beliefs about the "strategic environment," education and training programs, materiel acquisition, and so forth. To suggest any other way of interpreting events and what to do about them would be as foreign to the institution's "natives" as would Chinese language and cultural norms seem to the English-speaking Occidental in the 1700s. STRATEGY, from the view of the interpretivist, is an artifact signifying that a principal functionalist clan ethic is to appear to be *technically rational*. To study the U.S. Army, an outsider interpretivist would have to do so similar to the methods of an anthropologist – idiographically studying the rituals, myths, emotions, and legends of a remote Pacific island culture. A military strategist might be interpreted as a kind of shaman; his strategizing a rain dance.

Coda

My aim here has been to try and sociologically "poke around" the functionalist's creation of STRATEGY using the Burrell & Morgan (1979) multi-paradigmatic framework. The critical views that the other three paradigms (radical humanism, radical structuralism, and interpretivism) provide are compelling or at least provocative. These critical views, if regarded as heedful, can promote institutional critical reflection. Figure 2 is a schematic showing them ontologically relational with some examples of various "sciences" contained within them.
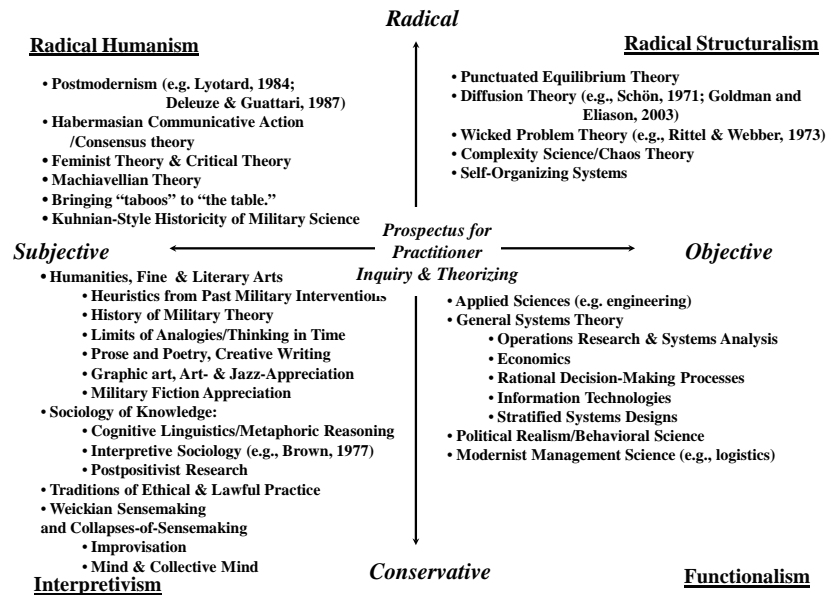
Figure 2. The Various "Sciences" Revealed Through an Inter-Paradigmatic Journey (plotted on my adaptation of Burrell & Morgan charts, 1979, pp. 29-30).

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[14] In my studies of culture, I like to think of *artifacts* as a portmanteau: "artificial facts." In other words, these are manmade facts created through social interactions and institutionalization processes. For more on this social constructionist view, see Searle, 1995.

[15] The US Army War College (2011) is explicit: "…'The **Strategist's Toolkit**,' builds on the concepts introduced in the first block to initiate our in-depth study of strategy and its relationship to war" (emphasis added).

What the institution could do is encourage critical reflection on the proposition that STRATEGY is a product of the functionalists' collective mind. This is asking a lot after almost a century and a half of an institution building upon an elaborated functionalized paradigm that arguably began with Auguste Comte's 1840s/50s Darwinian arguments that sociology can be a positive science. The military science of strategy today is institutionalized in the same Comtean ilk. Finding ways to deconstruct what has been socially constructed for so many years will require reflexive, "inter-paradigmatic journeys" (Burrell & Morgan, 1979, p. 24) toward the Army's deinstitutionalization of functionalism as the sole paradigm to develop meanings-for-action.

One approach to institutional reflexivity would be to evaluate curricula at the staff and war colleges in terms of how much attention is paid to the other three paradigms mentioned above (and to others, such as described by Mannheim, 1936, Pepper, 1966, and Rescher, 2001). I estimate that a strong disproportional amount of Defense educational resources are geared to functionalism and its derivatives of technical rationality, stratification of systems, synoptic planning, and so forth.

I examined critically the current "Officer Professional Military Education Policy" (OPMEP) (U.S. Department of Defense, 2009) and attempt to interpret the content of the policy and its list of learning objectives. Note the functionalist (particularly systems theory) dominance in this OPMEP quote:

> a. PME Levels. The continuum relates five military educational levels to five significant phases in an officer's career. The PME Continuum posits the production of the largest possible body of fully qualified and inherently joint officers suitable for joint command and staff responsibilities. (1) Precommissioning. Military education received at institutions and through programs producing commissioned officers upon graduation. (2) Primary. Education typically received at grades O-1 through O-3. (3) Intermediate. Education typically received at grade O-4. (4) Senior. Education typically received at grades O-5 or O-6. (5) General/Flag Officer (G/FO). Education received as a G/FO. b. Levels of War. The continuum portrays the focus of each educational level in relation to the tactical, operational, and strategic levels of war as outlined in joint doctrine, especially as described in Capstone and Keystone Joint Doctrine (particularly JP [Joint Publication] 1, 2-0, 3-0, 4-0, 5-0, and 6-0). It recognizes that PME and JPME curricula educate across all levels of war. (Department of Defense, 2009, p. A-A-2)

Why should one believe that we can stratify knowledge and learning requirements as if the environment (if "environment" is an appropriate construct in itself) is stratified accordingly? Why should a complex social milieu, such as those that military interventions are part, be systemically compliant?

What is also striking to me is that out of the 224 OPMEP learning objectives that govern several courses and colleges that educate midgrade officers (majors and Navy lieutenant commanders) to senior officers (three-star flag rank), I find that only a few seem to address critical and creative

aspects of practice. Even those that require *evaluation* (mentioned 68 times) tend to orient on existing, functionalist frames of reference.[16] For example [my criticisms in brackets]:

> *Evaluate the DOD and intergovernmental systems and processes by which national ends, ways, and means are reconciled, integrated, and applied* (p. E-D-1). [Note the requirement to evaluate using the traditional rationalist frame of ends, ways, and means.]

Even when some forms of *art*, *creativity* or *criticism* are required (9 times, once, and 11 times, respectively), their meaning is wrapped and trapped in functionalism. Some excerpts include:

> *Comprehend the art and science of developing, deploying, employing, and sustaining the military resources of the Nation, in conjunction with other instruments of national power, to attain national security objectives* (p. E-D-1). [Note how the writer of this objective frames art as a cognitive skill – "comprehend." In other words, the writer assumes one can find the science of art.]

> *Evaluate critical, creative, and complex thinking and decision making by strategic leaders* (p. E-G-4). [This is the only objective with the word *creative*. And note that this sole objective is arguably not focused on the learner's quality of feeling (the essence of the aesthetic domain), but on the rationality of existing "strategic leaders" – again seemingly with the assumption that one can learn critical, creative, and complex thinking by evaluating others' who have made it to the top. I would imagine that case studies used here would include Pascal's "Cleopatra's nose" fallacious selections (e.g., General William Westmoreland) as well as romantic characters—of course the universally epitomized is General George C. Marshall. This approach, only found in the objectives of the Industrial College of the Armed Forces, ignores opportunities for the learner to collaborate and to intentionally criticize military science in general, be creative in doing so, and to investigate what "complexity" means from the radical-structuralist view.]

Being fond of the interpretivist paradigm, I admit disappointment that requirements for learners to *interpret* are few (mentioned only 6 times in the learning objectives) and even those are framed by functionalism.[17] An example follows:

> *Interpret the perspectives and challenges of the combatant commanders in their national, international, and administrative roles* (p. E-K-2). [Note the ever-present functionalist view – pertaining to hierarchical roles in an existing bureaucracy. I could find no objective that explicitly or implicitly required cognitive-linguistic, idiographic, hermeneutic, phenomenological, literary, and emotional forms of finding meaning in texts or in context.]

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[16] The policy subscribes to another hierarchical scheme – Bloom *et al.* (1956) taxonomy – that lists evaluation at the highest level of cognitive learning.

[17] However, Bloom *et al.* (1956) did not use "interpret" in the same way. The taxonomy considers "interpret" as a second tier learning objective (under the "comprehend" rubric). The interpretivist would argue that all learning is interpretive as all knowledge is subjective.

One can also critically examine several more of the official, stratified learning objectives selected from the various schools and "levels" of PME:

Apply appropriate strategic security policies and guidance used in developing joint operation plans across the range of military operations (to include traditional and irregular warfare) to support national objectives (p. E-J-1). [This learning objective assumes an objectivistic ontology as well as the efficacy of the stratification of military missions and tasks. The statement also assumes that those who have formulated the written national security policies and guidance should be heeded without question or critical dialogue – bordering on mindless obedience. Where is the requirement for the participation in developing of – and the critical evaluation of – those policies and guidance, particularly in light of how political decision-making is not a rational process; it is a fluid, relational process. How can plans be rational if the policy making process is not? Is this not an important ethical dilemma?]

Analyze the capabilities and limitations of all Services (own Service and other Services—to include [special operations forces] *SOF) in achieving the appropriate strategic objectives in joint operations* (p. E-H-2). [Again, this requires compliance with a hierarchy of objectives (assumed to be "appropriate?" … who decides appropriateness?) that are made up of an amalgamation of missions and tasks matched to the stratification of levels-of-war.]

Analyze the theater area of responsibility using current national strategic guidance to compile a regional assessment as the foundation for theater strategy, campaign planning, and security cooperation planning (p. E-J-2). ["Analyze" assumes the reduction of situations will lead to disambiguated understanding. The use of "regional assessment" is a geographic form of systems theory – that regions will comprise larger systems that make up specified areas of responsibility.]

Analyze the appropriate mix of joint functions to develop joint operation plans (p. E-J-2). [Note the explicit functionalism incorporated in this objective leaving no room to critically question whether one can functionalize plans in military interventions.]

One could also criticize the U.S. Army's published STRATEGIES and futures concepts (each a functional artifact, constituting synoptic planning), such as its Training and Doctrine Command's (2011) Pamphlet 525-8-2, *The U.S. Army Learning Concept for 2015*, (short name, "ALC") from non-functionalist viewpoints. From the radical humanist point of view, this document is an epistemic script from those at the top of the hierarchy attempting to "program" those at the lower end with "authoritative" knowledge and methods of learning. From the radical-structuralist view, the document is another shaman rain dance and such attempts at prescience seem ridiculous (2015?…really?). For the interpretivist, the document is just another artifact of ethnocentric functionalism. The following three quotes from the ALC are a sampling of how the document reflects deeply-habituated functionalism [I provide my critical questions and comments, from the three other paradigmatic points of view, in brackets]:

The Army's learning model must be clear in intended outcomes that are rigorous, relevant, and measurable. … Fundamental competencies must be reinforced by maximizing time on

task (p.6). [**Radical-humanist critique**: Who decides what the "intended outcomes" are? "Clear" signifies technically defined. How do they know they are the right ones and they are "clear"? Who determines what "fundamental competencies" are? How do they know these "tasks" are the correct ones? Why should more time equal more competence in ambiguous, complex situations? Just because the intended outcomes, relevancy, clarity, competencies, time, and tasks are dictated by the oligarchy, is this a masked attempt to make the signers of the document appear prescient and even more powerful to the compliant followers?]

Inferior technology, outdated processes, and antiquated policies hamper today's program (p. 7). *...The next generation of [distance learning] requires a massive transformation of policies, products, and support structure to deliver engaging, relevant professional development products that Soldiers can access as easily and accept as willingly as their personal digital devices, computers, and game systems.... The Army will not prevail in the competitive global learning environment unless it sheds outmoded processes and models and replaces them with a more adaptive learning model.... ALC 2015 needs to drive the Army to keep pace with changes in the Operational Army by being proactively adaptive, not through reactive systems and processes.* (p. 8). [**Radical structuralist critique**: How can anyone know the status of one's own technology—that includes "policies" "products, and "today's programs"—when no human can have situated-foreknowledge (a.k.a., "pre-science") of breakthrough, asymmetrical, transformative, third-wave, and next-generation technologies? Wave theory shows us there is no way of forecasting "next generation," society-changing technologies, so how can you know how to transform policy, products, and support structure to be "relevant" to them? How can one know how outmoded their technologies (e.g., processes and models) are if one cannot project what is transformative (like the Al Qaeda attacks of 2001) even a year from now? Is it impossible to be "proactively adaptive" without involving mysticism?]

Convert most classroom experiences into collaborative problem-solving events led by facilitators (vice instructors) who engage learners to think and understand the relevance and context of what they learn (p. 9). *...Leaders must be adept at framing complex, ill-defined problems through design and make effective decisions with less than perfect information* (p. 10). [**Interpretivist critique**: How can we expect those "facilitators" (tribal medicine men?) and "learners" (adolescent clan members?) from the same cultural background to interpret the context differently beyond the usual sensemaking tools that the culture has sanctioned, such as approved doctrine (center of gravity, lines of operation, etc…)? This will likely lead to collapses in sensemaking as novel situations present themselves and those present would have to know to "drop their tools." "Framing" can only be based in past framings that are culturally sanctioned, particularly those found in artifacts such as doctrinal manuals and pre-engineered organization designs (a.k.a. military tables of organization and equipment). How can a culture know what "effective decisions" are without using the inculcated values that bias its definition of effectiveness? "Less than perfect information" implies there is an objective reality that can eventually be known; how do you account for socially-constructed, ephemeral "information."]

Military educational administrators and curriculum developers could inquire and subscribe more to balance purely functionalist philosophies with postpositivist educational ones, such as that

primed by Donald A. Schon (1983, 1987). There are others as well: methods of phenomenology in education (Mitchell, 1990); experiential art (Dewey, 1934); postpositivist research (Philips & Burbules, 2000; Lundberg & Craig, 2005); education in hermeneutical methods (Fairfield, 2011); and, so on.

Via the "inter-paradigmatic journey" afforded by the Burrell and Morgan (1979) framework, we can "see" the present study was perhaps too narrowly commissioned – specifically designed to find ways to make STRATEGY more efficacious through critical and creative thinking *within* the paradigm of functionalism. Such an endeavor will only lead to more detailed attempts to disambiguate – through technical rationality – toward: better ORSA-styled decision processes;[18] an even more systematized set of codifications; a more elaborated stratification of causality; more functional "tools" of STRATEGY; and "better" ways to set hierarchies of goals and then programmatically manage-by-objectives. A functionalist's improvement on what STRATEGY "is" and "is supposed to do" will be otherwise reinforced through more and more adjective-noun tautologies, such as:

1. Performing *strategic analysis* of historic cases studies (convenient folktales?);

2. Romanticizing *strategic leaders*, such as capturing the traits and methods of the legendary George Kennan (an "N=1");

3. Claiming there is such a thing as *strategic art* (unappreciative of Claude Bernard's poem "art is I; science is we");

4. Sponsoring clinical brain studies concerning cognitive aspects of *strategic thinking* with understanding only gained by operationalizing variables as additional assumed context-free objects of study (a close-variant is actually being pursued in the Department of Defense);

5. Influencing populations by functionalizing *strategic communications*;

6. Criticizing politicians for not being unambiguous and unemotional in their *strategic goal* setting, complete with counterfactual rehashes of what they could have done to make the military strategists' job of planning more of an "objective" undertaking;

7. Blaming the past lack of *strategic thinking* with the inability of key decision makers to find the right connections between lower level tasks and purposes with higher order (i.e. "strategic") ones (and don't forget to measure them) – "Oh, if only we can be more rational by 2015!";

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[18] ORSA, or *operations research and systems analysis*, is the premier military functionalist's "science" (developed since WW I) of optimizing resource application. ORSA provides the logical underpinnings of the Army's military decision making process (MDMP) and the DOD's planning, programming, budgeting and execution (PPBE) process, the joint capabilities and development system (JCIDS), materiel Acquisition system, and the joint strategic planning system (JSPS). See Shrader (2006)—the first of his three volume history of Army ORSA.

8. Reporting on what should constitute 21st century **strategic organizations** and **strategic forces** and how they are configured in the other levels of war, empowered likely in terms of their expected contributions to **strategic decisiveness**; *et cetera*….

Indeed, being **strategic** in the functionalist U.S. Army has perhaps become too comfortable of a dead metaphor – an extension of a romanticized image of the Greek visionary-, heroic-, general watching and controlling the battle from the top of the hill. My hope is that this text describing an inter-paradigmatic journey will spur the Army to deemphasize STRATEGY and begin to critically deconstruct the massive functionalist, technically-rational world it has built around it. The process of discovering ways to do so will be emancipatory in itself.

I offer a few recommendations to get started:

- Particularly in PME, reduce the propensity for "standardization" and the use of stratified learning objectives (the functionalist's scientificized Utopia reminiscent of management-by-objectives or MBO).

- Careful also not to over-engineer training, again in the likes of MBO.

- Use the quadrants (Figure 2) to "plot" training objectives, learning objectives and curricula subjects to check for balance across paradigms. Take measures so that functionalist's approaches to training and education do not dominate.

- Remove (or at least balance) the stratified systems view of everything. Use stratification as a functionalist example, not the only paradigm and theory available. This will require a major shift in moving away from ORSA-style decision making routines.

- Encourage "taboo" discussions in group sessions or in "protected" online sessions so people can vent what would otherwise be socially sanctioned ideas (like: "there really is a class structure in the military hierarchy that keeps an elite, privileged class of officer in power – is this class system necessary?"). This will open up the world as seen through the eyes of a *radical humanist*.

- Incorporate complexity science and chaos theories into training and education (to help bring insight from the *radical structuralist* point of view) (e.g., Bousquet, 2009).

- Incorporate social construction theory as a viable theory of collective meanings-in-action to help gain insights from the *interpretivist* point of view (e.g., Berger & Luckmann, 1967).

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Chapter Six

Creating an Organizational Culture to Support Strategic Thinking

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Today's organizational decision makers are interacting with increasingly complex and rapidly changing internal and external environments (Lundberg, 2005) as they plan and take actions to create their organization's strategic futures. Although strategy is often discussed as an outcome or a process of senior organizational leaders, strategic thinking as a component of the decision-making process is increasingly important across hierarchical levels and roles in organizations as critical decisions are driven to lower levels in organizations (Goldman & Casey, 2010). Nowhere is this more critical than in the Armed Forces. In late December 2011, Pentagon officials said that "they have eliminated 27 jobs for generals and admirals since March" (Whitlock, 2011, p. 1) as part of their efforts to thin the top ranks. This is partly a cost-saving effort, but such efforts are also "necessary to make the military more nimble" (Whitlock, 2011, p. 1). As quoted in the *Washington Post* (December 29, 2011), Vice Admiral William E. Gortney, director of the Joint Staff at the Pentagon, stated, "If 10 years of combat have taught us anything it's that flat is faster" (p. 1).

While there are efforts underway to thin the top ranks and drive strategic thinking to lower levels in the Army, others have identified a shortage of strategic thinkers across levels in the Armed Forces. To address this shortage, the Armed Forces has instituted formal education programs and has noted the need for "institutionalizing a place for strategists to live" (Bethel, Prupas, Ruby, & Smith, 2010, p. 83), or organizational cultures that support the practice of strategic thinking. As the need for strategic thinking increases across levels in the Armed Forces, it is essential that we better understand how to create organizational cultures that support strategic thinking practices as well as how to develop this capacity in individuals (Goldman & Casey, 2010).

For the purposes of this paper, strategic thinking is defined as "conceptual, systems-oriented, directional and opportunistic thinking (Hanford, 1995; Liedtka, 1998; Mintzberg, 1978) leading to the discovery of novel, imaginative organizational strategies (Heracleous, 1998)" (Casey & Goldman, 2010, p. 3). This definition is based on a model that allows for an "emergent view of strategy identification (Mintzberg, 1994b)" (Casey & Goldman, 2010, p. 3), which integrates strategic thinking and implementation of strategy. Recent literature suggests that informal education and experiential learning are key to developing an individual's strategic thinking capacity (Casey & Goldman, 2010; Goldman & Casey, 2010). Formal education programs can also be influential, but it is the day-to-day experiences in organizations that are most valuable in developing an individual's strategic thinking capacity, as well as enhancing these strategic thinking practices in decision making across the organization.

While organizational factors such as culture may influence the development of individuals' capacity to think strategically, this paper focuses not on that aspect, but on how organizational culture can foster strategic thinking practices in the organization as a whole. It's essential to create an organizational culture that supports the formal and, more importantly, informal

experiences and routines in organizations that enhance and support the practice of strategic thinking in decision making in the complex conditions that Army personnel encounter daily.

This paper reviews the mechanisms of organizational culture change and stability processes and then explores the implications of these mechanisms in generating organizational cultures that support strategic thinking practices. The first section of the paper discusses Hatch's (2004, 2010b) and Schein's (1992) theoretical models of organizational culture, followed by a more specific discussion on organizational identity as a lever for organizational culture change. The second section of the paper explores the implications of these theories for creating organizational cultures that support the practice of strategic thinking.

Theory

The Evolution of Organizational Culture Theories

In the early 1980s, culture researchers viewed culture change as a form of "value engineering" (Hatch, 2010a, p. 81) where leaders, through their language and actions, could change and then direct values across the organization. In the mid-1980s, organizational culture research underwent a resurgence and transformation in both the United States and Europe (Hatch, 2010a; Martin, 2002) in response to interests of both academicians and practitioners. This resurgence led to multiple theories and models of organizational culture and definitions as well as to the articulation of related constructs such as organizational identity (Albert & Whetten, 1985; Corley et al., 2006; Hatch & Schultz, 2002; Whetten, 2006) and organizational memory (Casey, 1997; Walsh & Ungson, 1991).

Theories of organizational culture moved toward either proposing organizational culture as a variable or to considering culture as a metaphor for studying organizations (Martin, 2002). Studies of organizational culture as a variable usually take a more functionalist approach, focusing on one manifestation of culture such as values and linking organizational culture to outcomes such as effectiveness or performance (Martin, 2002). Theoretical approaches that suggest using culture as a metaphor for studying organizations acknowledge the complexity of culture, focus on patterns of meaning of symbols and artifacts that lie below the surface in organizations, and focus on the breadth and depth to understand culture (Martin, 2002). More recently, theories exploring culture as a dynamic process are promising in understanding how organizational cultures are an ongoing process of stability and change (Hatch, 2010b). Such theories incorporate a relationship with organizational identity and take a cultural construction approach to understanding the role of history and legacy as part of this approach (Weber & Dacin, 2011).

The various theoretical approaches often define organizational culture differently. Those that see organizational culture as a variable tend to focus on cultural manifestations such as values or practices that are shared across the organization, while theories that see patterns of meaning and the depth and breadth of interpretations might focus on subcultures and their different interpretations and ambiguity in understanding issues as well as their shared understandings (Martin, 2002).

This paper explores a dynamic process model of organizational culture change, focusing primarily on Hatch's model of culture change dynamics (Hatch, 2004, 2010b) and how practices such as strategic thinking can be fostered through culture dynamics.

Models of Organizational Culture Dynamics

Hatch (2004) indicated that several models focus on the dynamics of organizational culture stability and change, including those of Schein (1985, 1992), Gagliardi (1986), and Hatch (2004, 2010b). This section discusses Schein and Hatch's extension of Schein's model.

Schein (1985, 1992) took an anthropological view of culture, acknowledging its complexity and the underlying aspects of organizational life that influence what might on the surface be seen as irrational actions of individuals and resistance to change even in severe environmental circumstances. He proposed that a deeper understanding of organizational culture will offer leaders ideas regarding how to recognize critical issues and identify mechanisms for potential change. Schein (1992, p. 5) believed that "organizational cultures are created in part by leaders" and that the "only thing of real importance that leaders do is to create and manage culture" through their understanding of organizational culture dynamics.

Schein (1992) defined organizational culture as follows:

> A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p. 12)

Schein (1992) asserted that in very large organizations, multiple subcultures can surface, but overall a common set of assumptions emerges across the organization, particularly in times of crisis. Schein further theorized that culture is primarily about stability through integrated patterns of meaning and action, with these patterns representing the shared learning of a collective about solutions to external and internal problems. "A group has a culture when it has had enough of a shared history to have formed such a set of *shared* assumptions" (Schein, 1992, p. 12, emphasis in original).

Schein (1992) proposed that culture can be analyzed at different levels, from the unconscious, invisible level of basic assumptions to espoused values such as strategic goals and finally to artifacts, which are "visible organizational structures and processes," language, or products (p. 17). Artifacts are the easiest to observe yet difficult to understand (Schein, 1992). Espoused values also are an outcome of the process of a collective's shared learning about solutions to an issue. Some values change as part of this learning process and the interaction with changing internal and external environments. "If the espoused values are reasonably congruent with the underlying assumptions, then the articulation of those values into a philosophy of operating can be helpful in bringing the group together, serving as a source of identity and core mission" (Schein, 1992, p. 21). It's important, though, to know which values are congruent with the basic assumptions and which are merely articulations of espoused ideas. To understand culture and how it changes at a deeper level, the basic assumptions of the collective needs to be understood.

Basic assumptions are not articulated, nor can direct relationships to these assumptions be drawn from the behavior of individuals or groups. As Schein (1992) stated, "When we observe behavior regularities, we do not know whether we are dealing with a cultural manifestation" (p. 14). Irregularities may be a product of individual differences or the situation, as well as the culture. Basic assumptions are difficult to change; changing them requires a deep evaluation of underlying assumptions of the basic nature of reality and human beings and "temporarily destabilizes our cognitive and interpersonal world, releasing large quantities of basic anxiety" (Schein, 1992, p. 22). Schein (1992) asserted that "culture as a set of basic assumptions defines for us what to pay attention to, what things mean, how to react emotionally to what is going on, and what actions to take in various kinds of situations" (p. 22).

Organizational culture changes through the interactions of these levels of culture and the internal and external environments as well as with the actions of the leader(s) in the organization.

Hatch's Dynamics of Organizational Culture Model

Hatch's model of the dynamics of organizational culture was developed from the anthropological theories of Herskovits (1948, 1964) as well as Schein's (1992) organizational culture model. Herskovits (1948) proposed a circular dynamic of culture change through the dynamic interactive processes of enculturation in a collective and the creativity or self-expression of the individual, "thus to extend the scope of his [*sic*] culture without breaking down its basic orientation" (p. 64, as cited in Hatch, 2004, p. 206). Applying Herskovits's idea of the circularity of the processes for culture stability and change, and incorporating the basic elements of Schein's model of organizational culture—assumptions, values, artifacts—Hatch added a fourth element, symbols, to highlight the importance of interpretation and meaning making in culture. Instead of focusing primarily on the four elements or components of the model, she expanded the model by adding the processes or interactions between the elements of the model: manifestation, realization, symbolization, and interpretation (Figure 1).

Hatch (2004) explained:

> In the domain of the top half of the model, assumptions and values shape activity such that artifacts of these influences are created and maintained within the culture. In the domain of the lower half of the model, organizational members choose some (but not all) of the artifacts available to them and use the selected artifacts to symbolize their meanings in communication with others. (p. 206)

The Dynamics of Organizational Culture: How do cultures come about?

- Culture as stability *and* change
- Processes define cultural dynamics
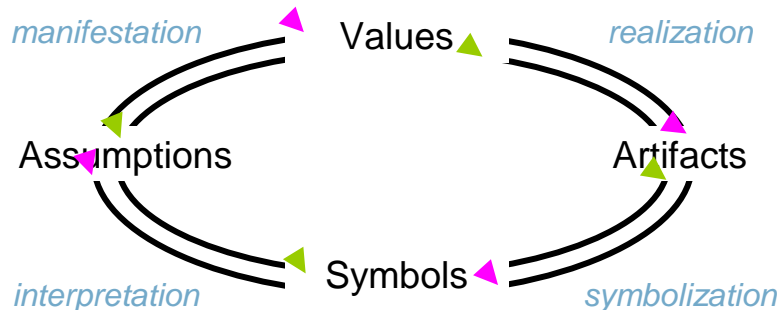- Proactively and retrospectively constructed

manifestation   Values   realization

Assumptions   Artifacts

interpretation   Symbols   symbolization

Figure 1. Hatch's model of cultural dynamics. Adapted from: Hatch, M. J. (2010b). Material and meaning in the dynamics of organizational culture and identity with implications for the leadership of organizational change. In N. Ashkanasy, C. Wilderom, & M. Peterson (Eds.), *The handbook of organizational culture and climate* (2nd ed., pp. 341-358). Thousand Oaks, CA: Sage Publications.

The processes of manifestation, realization, symbolization, and interpretation are depicted in the model with double-headed arrows, suggesting that the processes are proactive. Individuals use the material aspects of their current experiences as well as their memories of past experiences to create meaning. (This idea is further explored in adaptations of the 1993 model; see Hatch, 2010b.) These dynamic cultural processes of meaning making in organizations are ongoing, and "old cultural meaning leaks into new cultural material, and old material is reimagined in light of new meanings" (Hatch, 2010b, p. 344) through individuals' experiences with their environment.

As an example of these processes, the espoused values of "duty, honor, and country" are articulated as part of the mission of the U.S. Military Academy. Hatch's model would suggest that the assumptions of the Army become manifested in the values of "duty, honor, and country" and then become realized through artifacts such as the mission statement of the U.S. Military Academy, as articulated on the U.S. Army website (an artifact). A member of the organization, such as a cadet in the academy, might choose the mission statement to communicate to another member what the academy is about and what it means (symbolizes) to him or her. These actions and the meaning that is attached to a symbol in turn may reinforce the basic assumptions of the U.S. Military Academy. The individual interpretation process draws both from the individual's past and current experiences as well as the past and present of the organization, allowing for a degree of variation in understanding of the values. The mission statement is one of the extensive number of artifacts that may be realized from the values and has the potential to be chosen by an organizational member for symbolization.

The Role of Organizational Identity in Organizational Culture Dynamics

More recently, organizational identity, defined as organizational members' answer to the question "who are we" as an organization, has been recognized as a key factor in understanding organizational culture dynamics, particularly in connection with how artifacts are chosen and the meaning attributed to them by organizational members (Hatch, 2010b). Although organizational identity is primarily focused internally, in that it is how organizational members view "who are we" as an organization, the meaning is often created through interactions with the external environment and how the organization is viewed by external stakeholders. The artifacts chosen by organizational members and how they are symbolized are connected to perceptions of the organizational identity as well as to how external stakeholders perceive the organization. Therefore, organizational identity offers a window into understanding the influence of external environmental factors and organizational leaders' identity-related actions in organizational culture dynamics (Figure 2) (Hatch, 2010b; Hatch & Schultz, 2002).
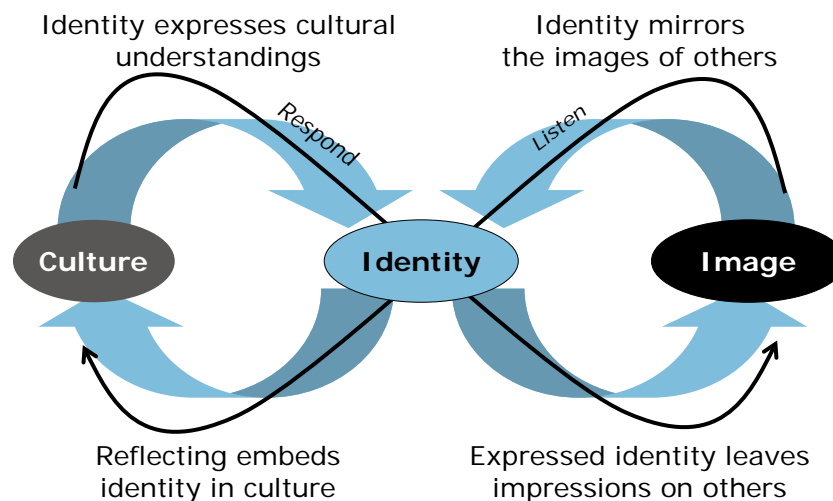
Figure 2. Combined model of organizational identity and cultural dynamics. Adapted from: Hatch, M. J., & Schultz, M. (2002). Organizational identity dynamics. *Human Relations*, *55*, 989-1018.

In an empirical study of cultural change in an organization in the carpet industry, the organization transformed from depending on refined oil to using sustainable business practices. External environmental forces triggered the "redefinition of organizational identity" (Hatch, 2010b, p. 348). A key part of the cultural transformation process was the leader's openness to criticism from external stakeholders and their perception of the organizational identity. The researcher in this study "concluded that identity dynamics incrementally change the organizational culture at its deepest levels transforming basic assumptions about who they are as an organization and how they are going to work together toward newly defined goals" (Hatch, 2010b, p. 349).

In a related example, based on the Army's website, the organizational identity claims of the Army could be articulated as defending our country and serving the American people. Consequently, the Army's practices in support of its identity are to "fulfill national military responsibilities, sustain global commitments, protect vital national interests, build effective multinational coalitions, and prevail in the war on terror" (MilitaryAdvice.org, 2012). Based on Hatch's (2004) model, it could be interpreted that the Army's organizational identity claims evolved during the past 100 years to include the focus on global commitments and building effective multinational coalitions in response to dramatic global events and technology. This expanded interpretation of the claims or additional claims regarding global commitment is also manifested in new awards such as the Afghanistan Campaign Medal and Korea Defense Service Medal. The expansion or reinterpretation of organizational identity claims can influence the realization process of organizational values in Hatch's (2004) model and the manifestation of these values in artifacts and symbols.

The Role of Leaders in Organizational Culture Processes

Both Schein (1992) and Hatch (2004, 2010b) asserted that leaders play critical roles in organizational culture processes. As noted in their models, organizational cultures may evolve in areas impacted by critical environmental changes or through ongoing interpretation of values and artifacts, as highlighted by organizational leaders. Hatch (2004, 2010b) acknowledged that leaders have power in organizations to direct attention to artifacts or values and in doing so can create change in organizational cultures. Because leaders are attended to and "so often symbolized (as a consequence of their power, authority and access to others)" (Hatch 2004, p. 206), they can "allow themselves to represent focal issues within the culture [and] can act as lightning rods for change" (p. 206).

In order to be an effective part of this process, leaders must be aware of the cultural manifestations and their interpretations in the organization. Hatch (2004, 2010b) noted that intentional culture changes by leaders are initiated in the relationships between values and artifacts and between artifacts and symbols. These processes of realization and symbolization can occur as a leader introduces a new idea through artifacts such as language or physical objects, which are then symbolized and interpreted by those either initiating the change or those responding to it or rejecting it (Hatch, 2004). If the change is in line with current assumptions or values, the change can be relatively easy. If the change is more radical, the shift may not be as easy; through the realization and, in particular, the symbolization processes across the organization, staff may identify artifacts and then symbolize and further interpret them to counter the proposed changes (Hatch, 2004). Which artifacts are chosen and how they are symbolized is a fluid, open process that may not be directly controlled or managed but can be influenced. The leader must be sensitive and in tune with the organizational culture to be effective in influencing emerging culture changes. As Hatch (2004) noted, "the control of the power of leadership lies in the sensitivity of managers to their own symbolic meaning" (p. 207)—and their willingness to be open to and reflect on the perceptions, interpretations, and potential challenges of internal and external stakeholders (Hatch, 2010b).

As noted earlier, Hatch's view on the role of leaders is supported by Schein (1992), who asserted that one key to a leader's success is his or her ability to deeply understand the interaction of the

cultural components of espoused values and artifacts in particular and how to use these interactions to surface levers for culture change, as needed particularly in response to strategic internal and external environmental issues. Schein also acknowledged that if the leader does not attend to these cultural interactions, he or she may be ineffective. As in the case study of the carpet manufacturer (Hatch, 2010a), the transformation in the organizational culture and redefinition of organizational identity occur through the leader's actions of reflecting and questioning, as well as initiating, facilitating, and being open to the current organizational culture and the external environment—rather than through actions of structuring planned change or implementing systems of control. As Hatch notes, "the implication is that when a leader works with and respects the organizational culture in which he or she is embedded, lasting change of culture is possible—and identity dynamics is key to how leadership and culture interact" Hatch, 2010b, p. 353).

Implications for Building a Culture of Strategic Thinking

Using Schein's (1992) theory of organizational culture and the six behaviorally focused actions a leader can take to create or change an organizational culture (Schein, 2004), Goldman and Casey (2010) suggested actions leaders can take to facilitate the process of learning to think strategically, including what is focused on and measured, related bases for resource allocation and rewards, and coaching. For specific leader behaviors in these areas, see Table 1 (Goldman & Casey, 2010, p. 122).

While these leader actions may develop cultures that facilitate individuals' learning process to think strategically, this section uses Hatch's (2004, 2010b) organizational culture model to enhance and expand the discussion to include the actions of not only top leaders, but also members across the organization, and how these actions might influence the cultural processes of realization, manifestation, and symbolization. This section builds on the assumptions that "the actions of strategic thinking are complex and must be developed at multiple organizational levels" (Goldman & Casey, 2010, p. 123) and that strategic planning is essentially "sequential sensemaking" (Lundberg, 2005, p. 290) and sensegiving (Gioia & Chittipeddi, 1991). This section suggests that the Army can tailor similar actions to create cultures to encourage and sustain strategic thinking in organizational decision making.

Table 1

Leadership Practices That Establish a Culture of Strategic Thinking

Schein's primary culture-embedding mechanisms	Examples of leaders' behaviors that encourage strategic thinking
What is focused on and measured	• A strategic direction to be something materially different and the tracking of outcomes against that vision • The impact of that direction on society • 5- to 10+-years operating and financial performance targets • Continuous review and discussion of external changes that will affect the organization 5- to 10+-years hence
The basis for resource allocations	• Products, services, ideas, and approaches that will prepare the organization for success 5- to 10+-years hence • External education/assistance with issues coming 5- to 10+-years down the road • Developing contingency plans before rolling out new initiatives
The basis for hiring, promotion, and firing	• Asking job candidates questions to gauge their ability to think strategically • Having employees who reflect a mix of those new to and those long tenured in the organization • Identifying specific annual personal development plans/education to enhance strategic thinking • Making clear when promotions are based on strategic thinking
What is modeled and coached	• Behaviors related to scanning the environment and identifying patterns affecting the future • Behaviors related to questioning to gain different perspectives • Behaviors related to conceptualizing different possibilities • Behaviors related to testing the impact of changes on performance
The basis for rewards and status	• Rotating leadership of projects/activities that require strategic thinking • Including an assessment of strategic thinking ability in annual performance evaluations • Financially rewarding individual and team strategic thinking • Publicly recognizing individual and team strategic thinking
Reactions to crises and events	• Openly discussing what occurred, involving different points of view and open-ended questioning • Considering how organizational policies and procedures have contributed to crises

Note. Adapted from *Organizational Culture and Leadership* (3rd ed.) (p. 246), by E. H. Schein, 2004, San Francisco: Jossey-Bass.
Source: Casey, A., & Goldman, E. (2010). Enhancing the ability to think strategically: A learning model. *Management Learning*, *41*, 167-185.

The Leader's Role in Building Strategic Thinking Cultures

In Hatch's (2004, 2010b) model, intentional culture changes are often initiated in the relationships between values and artifacts (realization) and artifacts and symbols (symbolization). Individual actions to facilitate the processes of realization and symbolization are frequently part of the leader's role as he or she introduces a new idea through artifacts such as language, physical objects, or practices that are then symbolized and interpreted by organizational members who might be initiating the change or who are responding to or rejecting it (Hatch, 2004). As we consider how to facilitate a culture change in the Army, one step is to address the relationship between espoused values and artifacts. Strategic thinking may not be a key articulated value of the Army, yet through introducing specific practices (artifacts) to foster and enhance strategic thinking, these practices or artifacts could be chosen as symbols and interpreted by organizational members as a way to "realize" or translate into action the current articulated values of defending and serving the American people.

As one practice, leaders could ensure that aspects of strategic thinking are included in meetings, particularly strategic planning sessions (Goldman & Casey, 2010). Another practice is modeling strategic thinking through their interactions with others and in critical planning meetings. Leaders could reflect on their own thought process in making critical decisions and articulate their process as decisions are being made or in debriefings. In addition, leaders can "encourage subordinates who will challenge their assumptions and biases during the thinking and learning process" (Waters, 2011, p. 6). These simple practices are types of artifacts that organizational members can use as symbols, assigning meaning to the importance of strategic thinking. This process can also further enhance and support the evolution of the current espoused value of defending our country.

Additionally, leaders and other organizational members could instill the practice of reflecting on the degree to which they focus on external environments as a part of systems thinking in making critical decisions as well as reflecting on how the organization is embedded in larger systems such as industries and countries. In this way, they could support the understanding of the interconnectedness of actions in these arenas (Bonn, 2005). As part of this practice, organizational members could focus on the language used when referring to aspects of strategic thinking. Language is an artifact that can be used as a symbol, with meaning assigned to the relationship between aspects of strategic thinking and current values.

In introducing and sustaining these new practices or artifacts, leaders in particular need to develop their sensitivity to which artifacts are chosen as symbols by members of the organization and how these artifacts are being used (symbolization). These cultural processes are ongoing, in flux, and may vary depending on any subcultures that may exist. A leader who is open to the multiple interpretations and is attuned to these processes rather than trying to control them will be more effective.

The Role of Stories in Communicating Cultures of Strategic Thinking

Stories are powerful artifacts in organizational culture change processes, as they communicate subtle aspects of organizational culture and identity. Stories of critical events from the past usually characterize strategic choices the organization has made and the context and rationale for these decisions. These decisions are often framed as the organization needing to choose one path versus another—a decision that would forever change or sustain the current organization. Stories of irrevocable choices or commitments reflect the organizational identity (Whetten, 2006) and other key components of organizational culture (Ravasi & Schultz, 2006) and are most frequently used in commemoration, anniversary celebrations, and informal and formal socialization practices for new members.

These stories are artifacts that also reflect key components of strategic thinking in that they often describe crises in which organizational members made systems-oriented decisions or created opportunistic or novel strategies to adapt to or solve crises in the organization. Research on organizational memory and identity emphasizes that these stories of critical events are understood and recollected as strategic choices or change points by new as well as the most tenured members of the organization (Casey, 1997). It is important for organizational leaders to be attentive to which stories are told and then chosen as artifacts to symbolize the significance of aspects of strategic thinking in the organization's past and future.

The Role of Organizational Structures in Fostering Cultures of Strategic Thinking

Creating or using organizational structures such as policies, procedures, and processes is another way to influence the ongoing organizational culture processes of manifestation, realization, symbolization, and interpretation. Organizational structures are by definition a type of artifact in organizations and one that is routinely available to organizational members to use as symbols as part of the culture change processes.

Using Socialization Practices to Create Organizational Cultures

Informal and formal socialization practices are critical structuring mechanisms used to introduce new members to the culture of the organization. Formal socialization practices include orientation and other induction exercises for new members. Informal socialization practices include informal discussions between new members and staff to talk about how "things are really done" in the organization. Stories of critical events and strategic decisions described in these events are fundamental parts of formal orientation practices. Often the history of the organization is told along with recollections of more tenured members and leaders in the organization's history. As noted above, which stories are told and how they are told most often reflect the organizational identity claims and the values of the organization. In creating an organizational culture to support strategic thinking, these stories could be analyzed to surface elements of strategic thinking. These elements could then be highlighted as the story is told and then used to enhance and further embed articulated organizational values. Stories, as artifacts, chosen for these crucial socialization events for new members can then be further used by these new members to communicate their understanding of the significance and meaning of strategic thinking to the organization and in their new roles. The actions described in this section could be

relatively easy to initiate since they fit with the current Army culture that respects history and its role in the future with an emphasis on artifacts that support tradition, ceremonies, and training.

Anniversaries as Forms of Commemoration

Anniversaries of critical events in the organization, memorials, and retirement celebrations for significant figures are further examples of socialization practices and represent another opportunity to influence organizational culture. At these ceremonies, stories of critical events are related. These ceremonies are important because they link the organization's past to the present as well as its future directions or vision. These commemorations are also points to further embed the interpretation of values to support strategic thinking in the organization as members learn about why and how crucial decisions were made as well as the implications of these decisions. These practices help members better understand what has worked in the past and, as Bethel et al. (2010) noted, "how to apply past experience to present situations and knowing when that does not work" (p. 86). Organizational websites can also highlight stories as a form of commemoration along with historical timelines of critical events and decisions made.

Structuring Tasks and Technology to Support Strategic Thinking

Tasks and technology in organizations are also fundamental components in structuring organizations and can be used as artifacts to further embed or influence the evolving meaning of organizational values. Although formal roles and functions in organizations may change slowly, the tasks that make up these roles are frequently changed or are reinterpreted depending on the internal and external environment.

Tasks comprising critical roles or functions can be routinely reviewed and analyzed to see how components of strategic thinking could be incorporated into the designated responsibilities. For example, the importance of seeking sources and reviewing information from the external environment could be built into specific tasks, particularly before and as critical decisions are made. Decision trees that might already be incorporated into different tasks could be assessed to ensure they include critical components of strategic thinking, such as information seeking, reflecting, increasing different types and sources of knowledge, and relating tasks to the broader environment. Longer time horizons such as 5 to 10 years could be emphasized and structured in appropriate assignments and emphasized in how they are articulated. These tasks and how they are changed and understood by organizational members could be used as artifacts to symbolize the importance of key aspects of strategic thinking and how they support the overall values of the organization. These tasks could also be incorporated into checklists, formulas and other analytic methods that are traditionally used by the Army.

Knowledge management (KM) technology is an increasingly important structure in organizations. Various technologies and systems store information about the roles and related tasks in the organization. As the components of strategic thinking are built into relevant tasks, roles, and performance appraisals and stored in KM systems they will become part of the knowledge available across the organization. In addition, knowledge management systems are sources for the critical information needed to facilitate strategic decision making including results of after-action reviews. As the Army takes steps to enhance strategic thinking practices, it

will be incumbent that they enhance the usefulness and accessibility of these systems as well as the increase the relevant information stored such as knowledge of the external environment focused on historical and current information about national cultures and ethnicities and internal knowledge regarding long-range performance and financial initiatives, goals, and objectives. Knowledge management systems and other forms of social media technology can also provide multiple perspectives on Army initiatives, issues, and interventions as well as facilitate connections with diverse stakeholders.

These structures and practices related to them are types of artifacts that are available to organizational members to use as symbols to communicate the importance of aspects of the strategic thinking process and how it is related to the past, current, and future successes of the organization.

Recruiting and Retaining Strategic Thinkers in Organizations

As noted at the beginning of this paper, the Pentagon is taking steps to continue to reduce the top military positions. A related unintended outcome is that military leaders are now "concerned that drastic cuts in the numbers of admirals and generals could make it more difficult to promote and retain promising officers" and that "these effects are already being acutely felt further down in the ranks" (Whitlock, 2011, p. A5).

Organizational identity and culture are critical in both recruiting and retaining employees. Potential employees as well as current employees who consider strategic thinking part of their professional identity are more likely to join and identify with an organization that has components of strategic thinking as part of its organizational identity claims or recognizes how strategic thinking supports a core value, such as defending our country and serving the American people. The Army needs to highlight these connections to attract, recruit, and retain strategic thinkers, as well as support the dynamic cultural processes that facilitate an ongoing culture of strategic thinking.

As an example, the Army's website suggests that Army identity claims could be articulated as defending our country and serving the American people. To emphasize the importance of strategic thinking to these claims, recruiting sessions could emphasize strategic thinking practices such as building long-term multiple partnerships across different groups and national cultures and how to allocate resources over a 5-10 year perspective that support this claim. These practices would also be congruent with the other practices articulated on the website such as "…sustain global commitments, protect vital national interests, build effective multinational coalitions, and prevail in the war on terror" (http://www.militaryadvice.org/joining-us-army/joining-us-army.html).

Structures that can be created to assist in retaining strategic thinkers are identifying specific work experiences that research has shown enhances the capacity to think strategically (Casey & Goldman, 2009) and building these into individual's personal development plans as well as how these experiences might be obtained through education programs. The Army has extensive systems in place to support different types of formal leadership development education. The need appears to be in systematically requiring and offering work experiences through job and task

rotations to build strategic thinking capacity and to support the practices of strategic thinking. Developmental experiences such as these should assist in recruiting as well as retaining strategic thinkers.

Additionally, promotion criteria across the three cohorts of Army leaders (i.e. officers, warrant officers, and non-commissioned officers) as well as other levels, as appropriate, could be examined to determine the extent to which these criteria emphasize aspects of strategic thinking as relevant to the position. Revising the promotion criteria as needed and also highlighting the aspects of strategic thinking as part of these criteria might also facilitate retaining strategic thinkers.

The Army expression "we grow our own" emphasizes the Army's focus on developing its own leaders. Through structures such as those described in this section the Army could continue to develop their future leaders not only through formal education, but also through structures that support and reward the informal experiences that support the practice of strategic thinking.

Reflections and Conclusions on Organizational Culture Models

Facilitating strategic thinking in organizations has mostly been addressed at the individual level through formal and informal education. This paper proposes that organizational variables such as organizational culture can facilitate and enhance strategic thinking practices. More complex models of organizational culture such as that of Hatch (2004, 2010b) offer great potential for leaders and other organizational members to understand key components of organizational culture and the dynamics involved in stability and change. In this paper, the discussion of Hatch's (2004, 2010b) organizational culture dynamics model and the revised version of the model including organizational identity (Hatch & Schultz, 2002; Hatch, 2010b) has primarily focused on the processes of realization of values into artifacts and the symbolization process as artifacts are converted into symbols. Hatch proposed that these processes are at the disposal of leaders and individual members of the organization as they begin to introduce changes in the organization. The other processes (manifestation and interpretation) are related to the basic assumptions, which are both slower to change and less decipherable.

Models such as Hatch's (2004, 2010b) do not translate cleanly to predictive step-by-step plans for leaders to follow, nor do they offer sequential stepwise development programs for leaders in organizations. These models do propose, though, that organizational culture change is a complex process that takes time, and leaders and other organizational members interested in facilitating organizational change must be reflective and sensitive to their surroundings, paying close attention to the critical components of culture and the dynamics between them. Such dynamics include how organizational members choose artifacts such as organizational structures that are available to them, how and for what purposes they use them as symbols, and how these are interpreted to further embed or evolve organizational values and, ultimately, basic assumptions. Many aspects of the current Army culture such as the emphasis on growing their own leaders through experiences and education, the focus and respect for history and narratives of the critical events in history, and the emphasis on traditions and ceremonies as part of socialization processes can all work to support the increased emphasis on strategic thinking practices.

Organizational identity, or who the organization claims to be, is a critical factor in this process and brings in the influence of the external environment on the culture dynamics process. Recent culture theories that take a similar cultural orientation to organizations support the relationship of organizational stories (Wry, Lounsbury, & Glynn, 2011) in these processes as well as individual agency at all levels and the use of culture as a resource to create change in organizations (Weber & Dacin, 2011).

The Army has a strong culture which provides multiple opportunities for leaders and other members to use the artifacts, symbols, and values to further enhance and support the key aspects of strategic thinking practices as outlined in this paper as well as to continue to develop the capacity of individuals in these roles to think strategically.

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Chapter Seven

Implementing a Culture of Strategic Thinking in the U.S. Army

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Introduction

Why are some organizations known for their outstanding strategic thinking and others not so much? Is it a special type of people trained in the elite MBA schools and consulting firms? Is it a magical strategy process? Is there something about the DNA or culture, an elixir that everyone drinks regularly? Is it a charismatic CEO like Apple's Steve Jobs that seemed to see a future that few else could foresee? Is there a rigorous training regimen like McDonald's Hamburger University that turns out perfect strategic thinking clones?

Well, it is a little bit of this and a lot of that based on my personal experience working in the restaurant group (KFC) of PepsiCo for eight years in the late 1980s and early 1990s, a time of great competitive intensity and rapid strategic change in the fast food, beverages, and snacks businesses. PepsiCo is an organization known for its outstanding strategic thinking. It boldly spun off a very profitable restaurant group in 1997 (now Yum! Brands: KFC, Pizza Hut, and Taco Bell). It subsequently acquired Quaker Oats and Tropicana to focus on developing products for a broad range of eating preferences, dayparts, and life stages. KFC focused on expanding into China to become the #1 fast food chain there. Was it successful? You bet. Just prior to the restaurant group spinoff in 1996, PepsiCo's market capitalization was $49B. In 2011, the combined market capitalization of PepsiCo and Yum! Brands was $128B, a phenomenal 161% increase. Both organizations were much more successful separately. They were better able to focus on their core strengths and adapt to changing consumer tastes and global middle class development.

For the past nine years, I have developed and delivered mid-level and senior leader executive education courses for the U.S. Army, U.S. Air Force, and U.S. Navy. Most of the leaders (O-6/7/8 and Senior Executive Service) have multiple masters degrees from war colleges and universities. The U.S. Army War College curriculum does include courses in strategic thinking and strategic leadership. Yet we teach strategic thinking skills in all our courses because strategic thinking is an identified skill gap and an obvious deficiency in our class discussions. Why don't senior Army leaders become proficient strategic thinkers? Are there lessons that can be learned from PepsiCo's strategic thinking acumen? The Army's cultural challenge is described aptly in a U.S. Army War College paper on developing critical thinking skills:

> Unfortunately, the combination of our diversity and emphasis on MDMP [Military Decision Making Process], which should help the Army elicit strong critical thinkers, does not seem to overcome the wealth of challenges the Army faces as it attempts to become better at critical thinking. Our biggest obstacle lies in the hierarchical nature of the Army and its accompanying cultural norms. Reflective skepticism as a technique to improve judgment, and hence decisions, is very difficult to embrace if you are not

comfortable disagreeing with your boss, or even the boss's boss. This becomes especially difficult if ranking senior leaders, because of continued accolades and promotions bestowed, tend to represent the egocentric tendencies described earlier….For the Army to develop its critical thinking capability, it needs to educate, train and select officers who are comfortable with putting their position power (i.e., rank) to the side in an effort to facilitate better judgment through reflective skepticism. (Gerras, 2006, p. 24)

Comparisons of Strategy Processes

Let us begin our exploration of these questions by looking at some comparisons and trends. Before we begin, I want to acknowledge what I have heard from military leaders dozens of times. I do get it that PepsiCo and the U.S. Army are different. PepsiCo produces products and profit and oversight comes from a Board of Directors, stock holders, and customers. The U.S. Army produces services and freedom for our nation and oversight comes from the Secretary of Defense, Commander in Chief, Congress, and many other federal agencies, a significantly more constrained decision-making environment than PepsiCo. Yet both have business operations including strategy development processes that are essential to creating value for stakeholders and operating effectively and efficiently. Comparing business operations to discover best practices and new insights is helpful with due consideration of how the organizations differ in purpose, operations, inputs, and outputs.

The characteristics of traditional versus enlightened strategy processes are instructive (Liedtka, 1998, p. 120-121):

Table 1
Comparison of Traditional and Enlightened Strategy Processes

Traditional	Enlightened
Chokes initiative	Inspires initiative
Results in incremental change	Results in substantive change
Focus on analytics and extrapolation	Focus on creativity and innovation
Minimal stakeholder voice	Robust stakeholder involvement
Lulled into complacency about external world	Embraces uncertain world

The PepsiCo process, an enlightened one, is dynamic and flexible. Creativity, innovation, personal initiative, and constantly challenging the status quo are clearly evident in the following stories I frequently heard during my time at PepsiCo. Many times I heard CEO Roger Enrico or his top executives say these things. They were passed on and frequently repeated. Some were quoted in books that Roger Enrico published. In my opinion, they are the foundation of PepsiCo's culture of outstanding strategic thinking and world class brand management.

1. **"There are no mature markets, only mature minds."**
   [Message—We are focused on growth in all our businesses. We do not accept that growth cannot be achieved. Our growth is only limited by our ability to innovate and do new things. We will be relentless in looking for profitable growth and the first in the market with innovative ideas.]

2. **"Many leaders make small changes to big things. Others make big changes to small things. Great leaders make big changes to big things."**

     [Message—We are about making big bets on big things that will overwhelm our competitors. Prioritize and focus on the big ideas. Avoid the tyranny of incrementalism.]

3. **"The only good competitor is a dead competitor."**

     [Message—We will be relentless competitors. We will respond to every competitive move with overwhelming force. Our competitors will see us as the 800 pound gorilla in the market.]

4. **"What's the strategy?"**

     [Message—State the strategy in ten words or less. If you can't do that, you don't have a clear, well thought out strategy. You can only lead people if you have a clear strategy that everyone understands and embraces. Tell everyone your strategy and ask what they think about it – will it work; how can it be made bigger and better? Be open to new possibilities and insights as others may see things that you don't.]

5. **"We hire only two level promotable people."**

     [Message—We only want the most talented people on our team. We will make no compromises in who we hire. We want everyone we hire to be capable of rising to the job of their bosses' boss.]

6. **"Don't pass on problems."**

     [Message—Each leader is expected and required to deal with poor performers – improve their performance or transition them out of the company. It is never acceptable to pass a problem on.]

In contrast, the Planning, Programing, Budgeting, and Execution System (PPBES) is the center piece of the traditional process in the Department of Defense (DoD). The bureaucratic process results in an emphasis on working the process as opposed to creative thinking. It has been depicted in the following ways:

Exhibit 1[1]
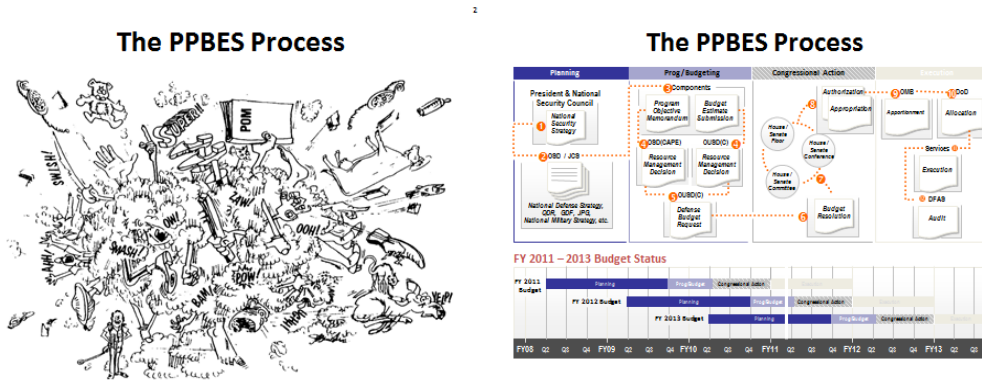
A clear distinction between strategic planning and strategic thinking in the academic literature describes how strategy development has evolved to a greater mix of strategic thinking in organizations known for their robust strategies. "Strategic thinking…is a synthesizing process, utilizing intuition and creativity, whose outcome is an integrated perspective of the enterprise" (Liedtka, 1998).

Table 2
Comparison of Strategic Planning and Strategic Thinking

Category	Strategic Planning	Strategic Thinking
Definition	Organization configuration and programming resource allocation within given parameters based on a pre-determined strategic direction	Envisioning different potential futures, questioning parameters and assumptions, and assessing internal capabilities to develop an integrated enterprise perspective with unique capabilities to effectively compete
Focus	Short-term urgent issues Incremental change Plans and programs	Long-term important issues Transformational change Developmental process
Type of Thought	Programmatic, analytic, convergent	Creative, synthesizing, divergent
Essential Skills	Data-driven analysis, information processing	Intuition, creativity, imagination, exploration, understanding discontinuities, seeing connections, analogies, qualitative similarities
Value Created	Organizational alignment Action roadmap	Shaping organization future direction Developing strategic thinking capability of leaders

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[1] The images in Exhibit 1 are provided courtesy of Dan McCarthy (VADM, USN, SC, Retired and UVA Darden School of Business Visiting Lecturer)

In PepsiCo, I experienced an 80%/20% time allocation mix of strategic planning to strategic thinking. Strategic planning is more time intensive as the final strategy developed from strategic thinking is operationalized in strategic planning. In contrast, the DoD PPBES process and governance structure (requirements determination, resource allocation, and acquisitions) result in what appears to be a 98%/2% time allocation mix of strategic planning to strategic thinking. Contrasting typical PepsiCo and U.S. Army approaches to strategy development yields many insights:

Table 3

Comparison of PepsiCo and U.S. Army Strategy Processes

Category	PepsiCo	U.S. Army
Organization Levels	Top-down—overall goals Bottom-up—strategy thinking and planning at business unit level	Top-down—strategic thinking dominates Bottom-up—strategic planning dominates
Timing	Every year: strategic plan Continuous: strategic thinking—off sites, competitor deep dives, top 5 strategic initiatives	Every year: POM and unit—strategic planning Every 4 years: QDR—strategic thinking
Focus	Challenge status quo, Innovation, growth	Maintain status quo
Thinking	Expansive thinking Zero basing Unique capabilities that create value for stakeholders and outdo competition	Prescriptive thinking Incrementalism Ends-Ways-Means
Leader Competency Development	On-the-job: Annual business unit strategic planning and thinking process, review and challenge process	War Colleges University Executive Education On-the-job—QDR, POM and unit level resource allocation

In PepsiCo, strategy development is pushed down to the business unit level with the top executives and the Board of Directors setting overall goals and direction only. A broad cross section of business unit leaders are continuously involved in strategic thinking off-sites and competitive "deep dives" (i.e., in-depth examinations on a topic) quarterly or more often and annually meet to develop the strategic plan. The focus is on innovation, growth, new ideas, and developing unique capabilities. Leaders at all levels develop robust strategic thinking skills through annual strategy development activity that includes senior leader reviews and peer challenge meetings.

In the U.S. Army, the PPBES process includes strategic planning in the form of the annual Program Objective Memorandum (POM), and strategic thinking in the form of the Quadrennial Defense Review (QDR). These are primarily Pentagon staff projects with some involvement of field activities. Thus, a limited number of leaders get exposure to strategic thinking processes

and only for a few years in Pentagon assignments and at War Colleges and university executive education programs. Army leaders do get involved in strategic planning at the unit level.

Strategic Thinking Competency Framework

My PepsiCo experience and the academic literature clearly indicate the importance of frequent strategic conversations on issues of long term importance and strategic choices. Three components are critical for those conversations to be productive (Liedtka, 1998):

- **Diversity of Thought**—Dialogue must involve individuals with diverse perspectives derived from wide ranging personal life experiences, geographic background, socioeconomic background, cultural knowledge, educational background, work background, language abilities, physical abilities, philosophical and spiritual perspectives, age, race, ethnicity, and gender.

- **Inclusive Dialogue**—The dialogue must embrace openness, free thinking, dissent, and open conflict. Every idea regardless of the source must be considered, validated, and discussed. Rank and hierarchy must be suspended during the conversations.

- **Reciprocal Inquiry**—Inquiry rather than advocacy should be the norm (Garvin & Roberto, 2001). Every idea should be examined for unstated assumptions and mental models by using the five WHYs approach. The 80/20 principle should apply with 80% of the time spent asking questions and 20% spent advocating a given position. Adopting a learner rather than a knower mindset is critical.

Table 4
Alternative Decision-Making Approaches

Elements of Decision-Making Approach	Advocacy	Inquiry
Concept of Decision-Making	A contest	Collaborative problem solving
Purpose of Discussion	Persuasion and lobbying	Testing and evaluation
Participant's Role	Spokespeople	Critical thinkers
Patterns of Behavior	Strive to persuade others	Present balanced arguments
	Defend your position	Remain open to alternatives
	Downplay weaknesses	Accept constructive criticism
Minority Views	Discouraged and dismissed	Cultivated and valued
Outcome	Winners and losers	Collective ownership

Now we need a set of purposeful, skill-building activities so Army leaders develop the necessary skills to conduct productive, strategic conversations. These activities would fall into three areas (Liedtka, 1998):

- **Learn Strategy: Repertoire-Building**—Leaders need a set of intellectual tools, strategy concepts, and techniques to think about the future. They also need a set of process tools to conduct productive conversations and make strategic decisions. These skills get leaders ready to do strategic thinking. They also create a strategically valuable capability that will create superior stakeholder value, will be hard for the enemy to duplicate, and will create an Army more adaptable to change.

Table 5
Repertoire-Building Tools

Category	Relevant Concepts and Techniques
INTELLECTUAL TOOLS	
Systems Perspective: Value Creation System and Interdependencies	Stakeholder and strategy mapping Value stream analysis (McManus & Millard, 2002) and value proposition development (Barnes, Blake & Pinder, 2009) Five forces analysis (Porter, 2008) Future search conference
Intent-Focused: Direction, Discovery and Destiny	Story writing
Thinking in Time: Past, Present and Future Consideration	Alternative futures and scenarios building Gap and portfolio analysis Seeing analogies, comparisons and connections Pattern recognition Sweet spot analysis (SWOT) Capabilities to keep, lose, create, do more of and do differently
Hypothesis-Driven: Sequential Creative and Analytical Thinking	What if…if then Knowns, unknowns, presumed Alexander's question—What new knowledge would change a presumption? (Neustadt & Fineberg, 1983) Design thinking—visualization, journey mapping, value chain analysis, mind mapping, brain storming, concept development, assumption testing, rapid prototyping, customer co-creation and learning launch (Liedtka & Ogilvie, 2011)
Intelligent Opportunism: Open to New Emerging Strategies	Share and compare Simulation techniques
PROCESS TOOLS	
Listening	Taxonomy of Listening (Scharmer, 2009)
Inquiry	The Toyota Way Five WHYs (Liker, 2003)
Group Dynamics	Belbin Team Roles (www.belbin.com), DISC (www.discprofile.com) and Myers-Briggs Type Indicator (www.cpp.com) influence styles
Decision-Making	Quantitative decision traps—anchoring, framing, sunk cost, visibility (Keeney, Raiffa, & Hammond, 2006)

Category	Relevant Concepts and Techniques
Decision-Making (continued)	Ethical decision-making framework—principles, character, consequences, analogies (Wicks, 2004)
	Ethical decision tests—publicity, reversibility, generalizability (Wicks, 2004)
	Allison-Zelikow Model—rational, standard operating procedures, political (Allison & Zelikow, 1999)
	Six Illusions—attention, memory, confidence, knowledge, cause, potential (Chabris & Simons, 2011)
	Deliberate decision-making versus intuition
	Mental models—seven principles (Hutchens, 1999)
	Use of history—known, unclear, presumed, likenesses, differences (Neustadt & May, 1988)
Engagement	Four Levels—physically, intellectually, emotionally, spiritually (Loehr & Schwartz, 2005)
Choices	Four Daily Choices—energy, enthusiasm, attitude, hopefulness (Glasser, 1998)
Collaboration and Negotiation	Cooperative-assertive matrix (Thomas, 1976)—avoiding, competing, compromising, accommodating and collaborating
	Primacy of preparation and probing
	Identifying, understanding, respecting and exploiting differences
	Creating and claiming mutual value

- **Do Strategy: Strategic Issues Agenda Management**—This is about taking control of the management of strategic issues by choosing appropriate and context-specific intellectual and process tools to think about the future.

- **Implement Strategy: Programming the Strategy**—This is developing the detailed implementation timelines for the new strategy.

Strategic Thinking Competency Development

Given the comparison of PepsiCo and Army strategy processes and the strategic thinking competency framework, the recommended Army path to developing a culture of strategic thinking would have three elements—leader behavior, training, and processes. The emphasis must be on continuing practice and involvement in strategic thinking at every level. In strategic thinking, like so much in life, practice makes perfect and Malcolm Gladwell's 10,000-hour rule (Gladwell, 2008) certainly applies. As a KFC leader in PepsiCo's restaurant business, I spent hundreds of hours each year on strategic thinking and strategy development. Over 25 years, that would easily equate to 10,000 hours and that should be the goal for senior Army leaders.

Leader Behavior

Set Expectations—Embedding strategic thinking in the Army culture begins with leader behavior. Leaders at all levels must embrace strategic thinking as a vital element of how they think, talk, engage, conduct meetings, and interact. Senior Army leaders must continuously

emphasize that strategic thinking is at the core of what makes a great Army and that Army leaders at every level are to become proficient at strategic thinking and teach their people to be strategic thinkers.

Language Matters Most—PepsiCo leaders practice and teach strategy every day by the language they use and the questions they ask. In every PepsiCo meeting, "What's the strategy?" was a typical opening question. A good answer was a strategy statement of 10 words or less or a one page strategy graphic. A 50-page slide deck was scoffed at and unacceptable. Great strategy is simple and understandable. Other typical questions are listed in Table 6.

Table 6
Strategic Thinking Questions

Strategy Summary	What's the strategy?
Assumptions	What are the assumptions? What will we do if one of our assumptions is incorrect? What are the risks involved? How will the risks be mitigated?
Alternatives	What other alternatives are there? What are alternative visions of the future? What other ways are there to do this?
Value Creation	What's the value proposition? How do we create value for stakeholders? Can we create value at a reasonable cost?
Stakeholder Analysis	Who are the stakeholders? What are stakeholder's needs and interests? How do we know they have these needs and interests?
Productivity	If the budget is 10% or 20% less, how will we produce the same results?
Justification	Why should we do this at all? What would happen if we stopped doing this? What do we need to stop doing, do more of, do differently, do less of and start doing? What's the business case? What's the business model? What if we zero based (i.e., justified every budget line item from scratch) this and started from scratch? That appears to be off strategy. Why is it in the plan?
Execution: Capabilities	Do we have the capabilities to execute the strategy? What new capabilities do we need to build? Can we realistically acquire the budget required?
Defensibility	What are competitor's capabilities? How will we be better than competitors? How will competitors react to our actions?

Inclusive Behavior—Great strategy begins with inclusive dialogue, not a bunch of slides presented with the strategy already predetermined. Leaders must become skilled at conducting "white board" meetings where strategy is evolved through team interaction, not imposed by the leader. Questions must comprise 80% of leader dialogue so everyone is continually challenged to think strategically. Every person's comment should be written on the white board and discussed objectively—What are the merits of this idea? How can we make it better? Writing comments and ideas on the white board endorses their consideration and encourages everyone to participate. Going around the table to ask everyone to comment is another best practice—Have we missed anything? What else should we consider? Dividing the group into PRO and CON teams to develop arguments for and against an approach is another effective group technique. Leaders must be willing to take the time with diverse groups of people to evolve a strategy through extensive conversations, rather than forcing a strategy without adequate dialogue. Table 7 is a contrast of good and bad leader behaviors in strategic thinking activities.

Table 7

Good versus Bad Leader Behaviors (Hess, 2011)

Good Behaviors	Bad Behaviors
Generating Constructive Dialogue	
Active open-minded listening	Being close-minded and not listening
Engaging in critical inquiry	Avoiding critical inquiry
Participating in critical debate	Avoiding debates
Having difficult conversations	Avoiding difficult conversations
Continuous Improvement	
Asking "why" and being curious	Accepting the status quo- rarely questioning
Challenging underlying assumptions	Rarely examining underlying assumptions
Embracing new experiences and learning	Avoiding new experiences and learning
	Being comfortable with status quo
Thinking about ways to improve	Thinking you know what customers need
Exploring customer needs	Waiting to be told what to do
Looking for ways to improve	Disliking uncertainty
Being comfortable with uncertainty	
Being Trustworthy	
Acting humbly	Acting arrogantly
Sharing knowledge	Hoarding knowledge
Engendering trust	Acting inconsistently
Being Action Oriented	
Having an action bias	Having a procrastination bias
Participating in experiments	Avoiding experiments
Participating in idea generation	Infrequently participating in new idea generation
Treating mistakes as learning opportunities	Hiding mistakes or fearing mistakes
Having a proactive mindset	Having a reactive mindset
Encouraging Diversity	
Seeking different opinions	Being comfortable doing it my way
Forming cross-functional teams	Avoiding collaboration
Encouraging different opinions	Stifling different opinions

Hold Leaders Accountable—Measuring how well leaders practice strategic thinking, develop strategic thinking among their people and the quality of their strategic plans will ensure that leaders take strategic thinking seriously and devote appropriate effort to it. There should be quantitative measures in annual performance goals and performance reports. Goals can be quantified by the number of strategic thinking sessions conducted, the number of people that participated in the sessions, the length and frequency of the sessions, a survey of opinions about strategic thinking being practiced, and peer evaluation of strategy quality. In addition, an on-line annual assessment of how well strategic thinking is being done in each unit should be conducted. A notional assessment questionnaire is included in Table A1 in the Appendix.

Leader Stories—As noted earlier, PepsiCo leaders told the same stories repeatedly about the PepsiCo strategic thinking mindset, the expectations of PepsiCo leaders, and how PepsiCo approaches the world. The Army needs to develop a set of similar stories about strategic thinking.

Training

Basic to Professional Military Education—Strategic thinking training needs to be part of the curriculum at every level for military enlisted and officer ranks and civilians. The curriculum must teach everything in the repertoire skills list noted in Table 5 in a tiered fashion of basic skills for junior leaders to more advanced skills for senior leaders. A tool kit of common concepts and frameworks should be built and reviewed at every level as leaders progress in their careers. Both intellectual and process tools must be taught at every level. Process tools are just as important and must teach how to do a strategy review.

Strategic Conversations: Cases—A set of cases (25-50) should be developed that are taught at each level. Cases, rather than slide lectures, are recommended as the interactive dialogue and critical thinking in case discussions mimic the strategic thinking discussions that leaders need to learn to do in their own units. The cases should discuss both low and high level strategies across a wide variety of situations from combat to logistics efficiency. There are already a number of cases and technical notes available that can be adopted readily as listed in Table A2 in the Appendix.

Strategic Thinking Examples—Army War College faculty should be charged with developing and communicating outstanding examples of strategic thinking drawn from the Army, other military services, government agencies, and the private sector. Select examples should be framed and posted in every Army installation. The emphasis should be on great strategic thinking that is communicated simply, clearly, and thoroughly.

Processes

Formal Annual Experience—PepsiCo has an annual strategic thinking and strategic planning cycle that all leaders participate in. It includes planning guidance, standard plan formats, a planning cycle timeline, and specific deliverables. The Army needs a similar comprehensive process.

Bottom Up—The PepsiCo strategy process is 90% bottom-up driven. Unit and function leaders are provided planning guidance and process details. Unit and function leaders drive planning and plans are aggregated at the corporate level. The Army needs to adopt more of a balance between bottom-up and top-down planning so that leaders at all levels are involved every year.

Sequential Reviews and Challenges—The PepsiCo strategy process includes a series of rigorous, sequential reviews where the business unit presents and defends its strategy to peers and superiors. That challenge process is done in the spirit of asking tough questions to refine and improve the strategy. There are typically 3-4 meetings like this each year.

Three Plan Options—Every PepsiCo plan must include three options—an optimistic one if things go much better than expected, a mid-range one based on normal projections, and a pessimistic one if actual conditions end up being much worse than expected. The optimistic one often involves spending 10-20% above norm and the pessimistic one 10-20% below norm. This is a great exercise that the Army should adopt as it forces thinking beyond the 1-3% incrementalism mentality and often produces innovative thinking.

Annual Productivity Increases—Annual corporate planning guidance requires every PepsiCo business unit at a minimum to adopt a flat spending budget while producing the same or greater output. With annual cost inflation (salaries, materials, utilities, etc.) typically at 3-5%, that meant there was a continual search for 3-5% annual productivity increases. The Army would be well served to adopt this rigor. It is amazing how creative ideas flow and waste is eliminated at every level.

Roll Ups and Final Challenge—At PepsiCo, I never saw a year where the business unit plan roll ups (aggregation of individual business unit plans) produced the target goals. The gap between the roll up and targets was often substantial. In the final challenge, top leaders began by asking business units to step up and volunteer to raise their goals. This seldom covered the total gap. Then top leaders issued gap covering quotas to each business unit based on their optimistic scenario plans and their broader judgment. Business units then reworked their plans to the new goals, reconsidered their strategic direction, and made new risk assessments.

Subject Matter Expert Briefings and Reviews—During business unit strategy development each year, subject matter experts are sourced to deliver briefings on relevant topics and to review the strategy while it is being developed. Those experts could be from the advertising agency, prominent universities, think tanks, or market research firms.

Evolving and Socializing Strategy Development—Typically, a core group of 8-12 people in each business unit are directly involved in developing, debating, and writing the strategy. The strategy is further refined by a series of business unit level meetings where a broad cross-section of individuals reviews and debates the strategy. Buy-in increases as more people get involved.

Communicating the Strategy—After the strategy is fully developed, reviewed, and challenged, sticky communication (i.e., a sticky idea is one that is easily understood, remembered, and that changes opinions, behaviors, or values; Heath & Heath, 2007) is developed in 1-page, 10-page and 50-page formats.

Appendix

Table A1
Strategic Thinking Assessment Questionnaire (Hess, 2011)

Which statement best describes your organization or yourself?	OR	Which statement is more true or correct?
CULTURE		
Our culture encourages debate and dissent	vs.	Our culture encourages conformity and "go along-get along"
Our culture encourages trying new ways of doing things	vs.	Our culture discourages deviating from established ways
Our culture accepts mistakes as a necessary part of learning	vs.	Our culture punishes mistakes
Our culture rewards diversity of opinion	vs.	Our culture rewards conformity
Our culture encourages teamwork across units	vs.	Our culture does not encourage cross unit collaboration
Our culture encourages broad knowledge sharing	vs.	Our culture encourages knowledge sharing on a need to know basis
Our culture results in a "one way" mentality	vs.	Our culture encourages challenging current practices
Our culture is inward focused	vs.	Our culture is outward focused
Our culture values its people most	vs.	Our culture values results most
Our unit is risk averse	vs.	Our unit encourages taking measured risks
We are paranoid about any mistakes	vs.	We accept that mistakes are a given when trying new things
Before trying new things, we have to study them and prepare a detailed plan	vs.	We have a fast way of trying new things
Our unit is driven primarily by monthly results	vs.	Our unit is driven primarily by a long-term view
We are a proactive unit	vs.	We are a reactive unit
We value speed and action	vs.	We value deliberation and caution
We value learning	vs.	We value not making mistakes
STRUCTURE		
Our structure enables speedy, flexible responses to changing needs	vs.	Our structure inhibits speedy, flexible responses to changing needs
Our structure gives authority to value-creating people	vs.	Our structure gives little authority to value-creating people
Our structure transfers new ideas from the field to senior leaders quickly	vs.	Our structure does not quickly transfer new ideas from the field to senior leaders
Our structure enables quick decisions	vs.	Our structure inhibits quick decisions

Which statement best describes your organization or yourself?	OR	Which statement is more true or correct?
Our structure requires many levels of approvals on small matters	vs.	Our structure gives leader's authority to make many types of decisions
LEADERSHIP BEHAVIOR		
My manager encourages different opinions	vs.	My manager discourages opinions different than his or hers
My manager frequently seeks my input on changes	vs.	My manager just informs me of changes
My leader punishes all mistakes	vs.	My leader understands that mistakes will occur in trying new things
My leader rewards compliance and "going along"	vs.	My leader rewards constructive inquiry
My leader likes to learn and actively listens to my ideas	vs.	My leader only cares about meeting his performance goals and seldom listens to my ideas
EMPLOYEE ENGAGEMENT		
Most people I work with feel that the measurement and reward system is differentiating and fair	vs.	Most people believe the measurement and reward system is political and does not fairly differentiate.
You can advance here and be all you can be	vs.	Advancement is limited to those who play the game the best and who do not make waves
My leader seeks my feedback on how he performs as a leader	vs.	My leader rarely seeks my feedback on those issues
MEASUREMENTS		
I am measured on learning and constant improvement	vs.	I am not measured on whether I constantly improve
I am asked to give 360-degree reviews of my leaders	vs.	I am not asked to do these reviews
I am measured as to whether I create cost savings or productivity ideas	vs.	I am not so measured
I am measured as to whether I create new, creative ideas	vs.	I am not so measured
IDEATION PROCESSES		
I am encouraged to submit ideas for growth and improvement	vs.	It is not important that I submit ideas for growth or improvement
People who submit ideas for improvement are thanked	vs.	People are only acknowledged if their idea is deemed a good one
We have a process to develop ideas	vs.	We do not have such a process
Everyone is expected to think innovatively	vs.	Innovation is the responsibility of a special group

Which statement best describes your organization or yourself?	OR	Which statement is more true or correct?
We teach, measure, and reward strategic thinking not just doing the job every day	vs.	We primarily measure and reward doing the job every day

TRAINING PROCESSES

I have received training on strategic thinking	vs.	I have not received such training
I have received training conducting strategic conversations	vs.	I have not received such training
I have received training on strategic decision-making	vs.	I have not received such training
I am encouraged to spend some of my work time on thinking about new ideas	vs.	I am not encouraged to do so
New ideas must go through a long, complicated process before they are tried	vs.	New ideas can be tried without a long, complicated process
Leaders have the authority to try new ideas	vs.	New ideas must be approved by a senior leader

Table A2

Strategic Thinking Cases and Technical Notes from Darden Case Collection

Cases	Technical Notes
"PepsiCo: The Challenge of Growth through Innovation", UVA-S-0133	"The Strategist's Toolkit", UVA-S-DRAFT
"IBM's Enterprise Transformation: Gerstner Gets Going", UVA-OB-1010	"A Note on Ethical Decision-Making", UVA-E-0242
"Southwest Airlines: Singin the (Jet)Blues", UVA-OM-1150	"Scenario Planning", UVA-BP-0501
"James Madison and 'The Business of May Next'", UVA-OB-0968/0969	"Human Capital Strategy", UVA-OB-0848
"Naval Supply Systems Command: Leading Change", UVA-S-0148/0149	"What is Strategy", UVA-S-0183
"The Business Case for the F-22 Raptor", UVA-S-01888*	"Developing and Nurturing Strategic Capabilities", UVA-S-0167
The Business Case for Confronting Irregular Challenges", UVA-S-0186*	"The World is Flat...The World is Lumpy?", UVA-S-0191
"Mine Resistant Ambush Protected Vehicle", UVA-S-1375*	"Competing for Advantages: From Industry Analysis to Competitive Dynamics", UVA-S-0168
"VIRGINIA-Class Submarine: Two for Four in 2012", UVA-S-1384/1385*	"Creating Value for Stakeholders", UVA-S-0169

Cases present real world problems that need to be solved. Technical notes describe concepts and frameworks summarized from a wide variety of sources. Technical notes often accompany a case as background reading.
*These cases were written in partnership with the DoD. The case copyright permits usage by DoD without any usage fees.

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Section 3
Insights from Outside the Military

Chapter Eight

Strategic Intuition in Army Training

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This paper introduces strategic intuition as a form of strategic thinking, and contrasts it with traditional strategic planning and "expert intuition". It then applies strategic intuition to the problem of assessing and developing strategic thinkers in Army units. Last, it shows how to use the method of strategic intuition for a third and more difficult problem: retaining strategic thinkers for longer periods within the Army.

There are many definitions of strategic thinking. Here we will use this one: *the mental method for developing a feasible course of action toward a worthwhile goal in the face of a strategic problem or opportunity*. In a strategic problem you face a new situation that requires a creative answer to some degree; no two strategic problems are ever exactly alike.

There are many competing methods of strategic thinking. Each one gives a different set of instructions for what to do. Training in strategic thinking necessarily chooses among those many methods. Teaching them all would only sow confusion in the learner's mind and lead to chaos in the field as everyone applies a different method. Let's see what methods the Army currently favors.

Strategic thinking is a form of problem-solving. The Army's FM 5-0 (U.S. Department of Army, 2010) instructs officers to first conduct a situation analysis and then generate options:

> B-83: Brainstorming is the preferred technique for generating options. (p. B-16)

But this leaves us with a mystery: how exactly should I brainstorm? If I'm sitting in a brainstorming meeting, what mental method should I use to generate an option to propose at the meeting? FM 5-0 does not say.

For higher-level strategy, the Army has guidelines rather than formal doctrine. For example, the Army War College's "Guidelines for Strategy" (Cerami & Holcomb, 2001) went into great detail on strategic analysis to assess the current strategy and then concluded:

> Based on this assessment, present policy recommendations for national diplomatic, economic, and military policies that must be changed currently and in the future to protect against threats and to take advantage of existing opportunities. (p. 225)

But how do we generate a "policy recommendation?" The Guidelines do not say. In practice, the usual method is brainstorming.

We can see that in both cases—for problem-solving and higher-level strategy – the Army's preferred method of strategic thinking begins with some kind of analysis and then offers no instructions for creating an "option" or "recommendation" for action other than brainstorming.

However, the preferred method is silent on how you actually think up an idea. The Army is not alone in this. It is almost universal, among all kinds of organizations around the world: analyze, then brainstorm (Duggan, 2005). As a result, most training in strategic thinking—in the Army and elsewhere—is actually training in strategic analysis. The second step—coming up with an idea—remains mysterious. This paper offers a solution to the mystery. It presents "strategic intuition" as a method for creating a feasible course of action toward a worthwhile goal in the face of a strategic problem or opportunity. It is the missing link in strategic thinking: how to create your strategic idea.

Strategic Intuition as Strategic Thinking

To see how strategic intuition works, let's start with expert intuition. Herbert Simon (see Simon, 1989) won the Nobel Prize in Economics in 1978 partially for his research on how experts think, and in the 1990s Gary Klein (1998) took to the field to study experts in action: firefighters, emergency-room nurses, and soldiers in battle. In the past decade, expert intuition has become a significant field of study in its own right. Malcolm Gladwell's (2005) popular book *Blink* gives a recent summary of that research.

We now know that expert intuition is the rapid recall and application of thoughts and actions from direct experience in similar situations. The more experience, the better and faster your expert intuition. So a nurse can walk across the emergency-room floor, glance at a child, and rush over to save the child's life. How did she do it? She noticed something she had seen before: something in the child's eyes, how the child was sitting, and so forth. Expert intuition happens so fast that experts can seldom pin down what exactly they recalled, but Klein developed an interview method that succeeds to a surprising degree.

We develop and use expert intuition every day, in all kinds of skills and tasks. Most military training increases expert intuition. But expert intuition can be the enemy of strategic thinking. We see a new situation and quickly see what's familiar within it, and act accordingly. But if the situation is different enough, we've just made a big mistake. Expert intuition cannot solve a strategic problem, which by definition is a new situation. What if our nurse's emergency room is dirty, crowded and losing money – and she's never experienced that before? She cannot just walk across the floor and recall the answer from her past experience. Expert intuition won't work.

She needs strategic intuition instead. This is a particular form of learning-and-memory that has strong roots in strategic theory and empirical cases. We can define strategic intuition as the selective recall and projection of past elements into the future as a course of action in a new combination that fits previous goals or sparks new ones, with the personal commitment to follow through and work out the details along the way. It typically occurs as one or a series of flashes of insight that occur when the mind is relaxed. The past elements come from both direct experience and from the experience of others that you learned, recall and combine.

We can go back to some classics of strategy theory and see elements of strategic intuition within them, in particular Sun Tzu's (c. 512 BC/2003) *Art of War* and *On War* by Clausewitz (1832/1976). Modern brain research shows that Sun Tzu's Dao philosophy promotes a state of

mind that favors flashes of insight. Modern Asian martial arts feature the same mental discipline: the "do" in judo, aikido, tae-kwando and the like means "Dao." And Clausewitz gives four keys to strategic intuition that translate well into modern strategy in any field of endeavor: examples from history, presence of mind, coup d'oeil, and resolution.[1]

Examples from history are a form of learning-and-memory where you especially retain and recall the specific tactics that others combined for a successful strategy in a previous situation. This happens naturally because we're human. It is how you learned most things in life, from walking and talking to sports and calculus: from what other people did before you. But it can happen actively as well, through study. And here we meet Clausewitz's main example: Napoleon. By studying what Napoleon himself described as the "eighty-three campaigns" of the "great captains whose high deeds history has transmitted to us," he had an arsenal of elements to combine in each new situation he faced (see Duggan, 2002; Herold, 1955).

The second step, presence of mind, translates well to the Dao philosophy of Sun Tzu and Asian martial arts. You must free your mind of all expectation of what might happen: you "expect the unexpected," as Clausewitz (1832/1976) puts it. This is actually very difficult to do. The two biggest obstacles to presence of mind are excessive focus and negative emotions. Excessive focus means you cannot let go of your current understanding of the problem, your goals, your timeline, options you've already listed, and so on. You must free your mind of all that, to let your brain make new connections. And negative emotions of all kinds—anger, frustration, worry, fear—flood the brain with the hormone cortisol, which blocks recall. You literally cannot think creatively (see Dugan & Mason, 2011).

The third element, coup d'oeil—or glance in French—is the term Clausewitz (1832/1976) uses for a flash of insight. Modern brain science shows how presence of mind fosters flashes of insight. In a clear mind, selected examples from history combine in a new way to show you what course of action to take. It is not a complete strategy, but it provides key elements that show you the way. It may be one big coup d'oeil—the famous "Aha!" in the shower—or a series of smaller ones that you do not feel as strongly as discrete cognitive events. But the mental mechanism is the same for both, large or small.

Last comes resolution: that is, resolve, determination, will. The flash of insight sparks a conviction that this is the right path despite the obstacles and resistance you will face, especially from others around you who did not have the idea. Of course, it is hard to distinguish good resolution for a good coup d'oeil from stubborn persistence for a bad idea. But examples from history offer help: if the examples from history that made up the coup d'oeil are solid and in sum cover the new situation, that's a good idea.

We can now look at how analysis really works. Let's analyze the performance of American forces in Afghanistan. You look at the situation and you draw from similar situations in your memory some set of measures and data you judge applies to this new situation. If these parallels

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[1] For a comprehensive review of these sources, see Duggan, W. (2007). *Strategic intuition: The creative spark in human achievement*. New York: Columbia Business School Publishing. For the Asian sources in particular, see Duggan, W. (2008). Strategic intuition: East meets west in the executive mind. *Peking University Business Review*, January.

come quickly, from only your own direct experience, that's expert intuition. If it takes more time, and you draw from situations you know about that are not in your direct experience, that's strategic intuition. In practice you typically draw from both, and you cannot sort out which is which. But the strength of your resolution—how hard you argue your case—depends on how strong those parallels seem to you, whether or not you are conscious of them and able to explain.

It is unlikely that anyone has enough of the right direct experience to analyze well the performance of American forces in Afghanistan solely through expert intuition. So we call that a "strategic" situation, where you need strategic intuition. If the situation is within your direct experience, we call that a "tactical" situation, and expert intuition works. Strategic thinking—as strategic intuition—is thus the search for the right combination of parallels within and beyond your own experience to apply to a new situation.

Strategic thinking has a second step as well: strategic synthesis. That is, after you analyze the situation, you get an idea for what action to take. Quite literally, an idea comes together in your mind. We can see the same distinction between expert and strategic intuition: do the elements of your idea come just from your own experience (expert) or also from the experience of others (strategic)? If we now ask what course of action American forces should pursue in Afghanistan in the future, this is clearly a strategic question where no one person has enough direct experience to give a good answer solely from that source. And we see again how there is no logical answer to the question, just better or worse guesses, whose strength depends on the quality and relevance of the parallels from which we draw.

From Strategic Intuition to Creative Strategy

In ordinary practice, strategists are seldom conscious of the precise examples from history that make up their flashes of insight. But in team situations, it helps greatly to make your examples explicit. Once he was in charge, Napoleon never had to explain his coup d'oeil. In modern organizations, we do. That's why we must convert the four elements of Clausewitz into a more formal method of strategic thinking for teams. The result is "creative strategy," where you apply strategic intuition in a systematic way to find a creative solution to a strategic problem.
The method of creative strategy comes from three diverse sources: "rapid appraisal" in international economic development, a "what-works scan" in social policy research, and a problem-solving matrix from General Electric's corporate university in the late 1990s. Together, these three sources give us a team method that matches well what a single brain does in a flash of insight of strategic intuition (Duggan, in press).

The starting point of creative strategy is an "Insight Matrix," to organize examples from history that the rapid appraisal and what-works scan discover. At the top of the matrix, the team writes down its current understanding of the situation or problem, always as a provisional draft because it might change. This kind of change is normal in strategic thinking: sometimes that insight you have at night is a realization that the problem is actually different from what you first thought. Then comes analysis: you break down the problem into smaller pieces. You list these in rows, also in draft, because they too might change as you proceed.

These first two steps of creative strategy—the problem and its pieces—need not take much time,

but you must do them well, and with the right people. This is where rapid appraisal comes in. It is a set of iterative interview techniques that unearth what a key set of people really think about a problem. The interviewees must include whoever will ultimately decide what strategy to pursue and then take the lead in pursuing it. These are sometimes the same person, sometimes two people, sometimes more. In complex situations and organizations, often you must conduct one quick round of interviews just to find out who these people are. If you then change the problem or its pieces as you proceed, you must go back to that key group to get their understanding and approval.

Next, you ask an important and often overlooked question: "Has anyone else ever made progress on any piece of this puzzle?" Across the top of the matrix, as columns, you list sources to search for an answer to this question, and draft again for they might change. Now the team starts a treasure hunt—the what-works scan. You search the sources for elements that might apply to each item on the list of problem pieces. This is seldom easy, because outside of physical science we lack statistical "proof" that one element works best to yield a particular effect.

This what-works scan has its own specialized methods and techniques to arrive at a set of elements that fit the problem at hand. This scan is quite different from traditional strategy methods, which spend most of their time and effort on research about the problem. In contrast, creative strategy comes after the key leaders in charge of the problem have already done their homework in that regard, by whatever method they think best. Once they understand the problem and decide to try to solve it, creative strategy spends most of its time and effort on searching for solutions, as a what-works scan.

The what-works scan takes as much time as you've got. In urgent situations, that might be one day. For longer-term problems, it can take a week, or a month, or a year. In principle, a what-works scan can go on forever, as there are always more corners of human experience to investigate. In the old days of gold mining, if you had infinite time and money, you would dig a hole everywhere on earth, as deep as possible. The less time and money you had, the fewer and more shallow the holes. So, too, with a what-works scan.

When you run out of time, or when you judge you have found plenty of promising elements, you take the next step: you select and combine. There is no precise formula for that, because this step matches the flash of insight in a single brain, where elements come together in your mind. You connect the dots. But not all the dots. The what-works scan yields a set of elements worthy of combination, but if you combine them all you will just have a giant mess. You see how that one, and that one, and that one together make a strategy that will fit your situation and solve your problem.

This step produces resolution: the will to pursue the strategy you see. This is where most strategy-making falls short. Some expert or group of experts produces a report that concludes with a strategy that they hand over to leaders to make a decision. In other words, the experts had the coup d'oeil and resolution, not the leaders. That's why most such reports end up gathering dust on office shelves.

Creative strategy solves this problem in two ways. The simplest is that the answer comes back to

the leaders in the form they understood and agreed to: the problem and its pieces that the rapid appraisal drew out of them. Then the what-works scan fills in the pieces. The scan might conclude with a select combination of elements. The leaders are in a good position to see the combination, and thus have resolution to act. A way to yield stronger resolution is to present the leaders with the results of the what-works scan, and then lead them through the steps of selecting and combining the elements themselves. You can do this by iterative interviews—a rapid appraisal in reverse—or through a formal workshop.

We are now ready to contrast strategic intuition, as the formal method of creative strategy, with other forms of strategic thinking. In the business world, the most popular form of strategic thinking comes from Michael Porter's (1980) "competitive strategy."[2] This method offers a means of analyzing your industry and competitors. But it says nothing at all about how you then proceed to your strategic idea. In practice, the team digests their analysis and then goes into a room to brainstorm. But what actually happens during brainstorming? If I ask you to quickly throw out an idea about something, what method will you use? Expert intuition. You will draw from your direct experience in some way. If you fill the room with a diverse set of people, we have a diverse set of direct experiences, and that helps somewhat. But what if the element we need is beyond the experience of the people in the room? They need time to let their minds search for it in the deep recesses of memory, which a brainstorming session does not let them do. Or they need a what-works scan to look even further afield.

Although expert intuition is what really happens in brainstorming, you're told to "think outside the box." Use your imagination. Think up something completely new. But is that good advice? I'm now going to think outside the box on the future strategy of American forces in Afghanistan: we'll invent a pill that makes them invisible. But of course that's ridiculous. Why? Because your brain quickly scans examples from history and you know what I propose is impossible. The whole premise of brainstorming is massively misconceived: that is, lots of wild ideas from a group of people will produce a single or composite gem. At best, you get decent ideas from expert intuition. At worst, you get useless fantasies.

Let's see an example from the business world that makes the limits of brainstorming clear. Steve Jobs was famous as a creative thinker, and he was quite conscious of how he did it. For him, "creativity is just connecting things" that you see from various sources (Duggan & Mason, 2011). He wasn't even an engineer. He was an innovator, pure and simple, who mastered strategic intuition. His first successful product was the Apple II: the world's first small, cheap, easy-to-use computer. His partner Steve Wozniak was the one who actually built it. Xerox then invested some money in Apple, and that allowed Jobs to visit the Xerox research center in Palo Alto, California. Jobs saw a big, expensive machine that ran the world's first graphical user interface and mouse. The Apple II had the standard green screen. Jobs had a classic coup d'oeil, where two elements came together in his mind: the small machine of Wozniak, plus the graphical user interface and mouse from Xerox. The result was the Macintosh, an even bigger hit than the Apple II.

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[2] Since Porter, there have been other popular methods of business strategy, but they are all forms of analysis that rely on brainstorming to follow. For example, see Christenson, C., & Raynor, M. (2003). *The innovator's solution.* Cambridge: Harvard Business School Press; Kim, W., & Mauborgne, R. (2005). *Blue ocean strategy*. Cambridge: Harvard Business School Press.

If you look at all subsequent Apple innovations, they have been a series of creative combinations from elements that Apple mostly did not invent. For the Macintosh, the Apple team could have brainstormed forever and never come up with the graphical user interface and mouse. Those elements were beyond their personal experience. To find them, they had to search. And that's what Jobs spent most of his time doing thereafter, once he figured out the secret of creative strategy. Such is the real story of all kinds of successful innovations, in business and all other fields.[3]

Brainstorming can work, when the problem at hand is within the collective experience of the people in the room. For many problems, that's fine. For strategic problems or innovation, brainstorming will give you an expert solution, not a creative one. Unfortunately, brainstorming is still the dominant method of creative thinking in the world today, for all kinds of organizations. Some methods specialize in the brainstorming part. For example, IDEO is a well-known firm that applies "design thinking" to brainstorming. But it amounts to the same thing. These methods all follow the same two steps: some kind of analysis, and then brainstorming.

Assess and Develop Strategic Thinkers

Now that we see how strategic intuition differs from conventional methods of strategic thinking, we can see the problem of both assessing and developing strategic thinkers in any organization. The simplest problem is this: if you use the wrong definition of strategic thinking, then you will find the wrong kind of thinkers and develop in them the wrong kind of thinking. In that case, people who are terrible at your method of strategic thinking might actually be the best strategic thinkers, because they're right and your method is wrong. So the first step is to change your formal methods of strategic thinking to creative strategy instead, then you will see who is good at it. If your organization lacks the understanding or commitment to convert to creative strategy, then master it yourself and look for people who think that way even if they do not follow a formal method—like Steve Jobs.

Of course people differ in their creative abilities and we know enough about how creativity works to assess whether someone seems at ease with creative combination: that is, making new combinations from disparate elements. Unfortunately, there is no formal test of this. If you give me three objects to combine, I might be a whiz at combining, but one of the three objects might be completely new to me; so, I have no idea how to combine it. In this way, all creative tests are partly a test of knowledge—it is impossible to test creativity alone.[4]

Creativity tests fall into four basic categories: divergent thinking, such as the Torrance Test of Creative Thinking; convergent thinking, such as Mednick's Remote Association Task, artistic assessment, such as the Barron-Welsh Art Scale; and specialized personality tests, such as the

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[3] See Duggan and Mason (2011) for the Jobs example and many others in business and other fields.

[4] Gayle Dow has compiled a full set of creativity assessments at Indiana University (see http://www.indiana.edu/~bobweb/r546/modules/creativity/creativity_tests.html).

Lees-Haley Creative Behavior Inventory. The divergent and convergent thinking tests suffer knowledge bias. The artistic tests make the mistake of equating "creative" and "artistic." And the personality tests ask questions that typically include divergent, convergent and artistic questions, which only compound the problem. And all these tests are timed, which might be their greatest flaw. True creative ideas need lots of time to form in the brain.[5]

If you cannot convert the whole Army to the methods of creative strategy, and personality tests and other formal assessments do not work, how do you judge someone's strategic thinking in a scientific way? The answer is: you cannot. Science has yet to advance that far. The only way is informal, through observation. Who seems curious? Who reads and thinks and asks questions outside their core areas of expertise? Who seeks new experiences, for learning rather than thrills? Who solves problems by looking for parallels outside their personal experience? This might help you select a small cohort to learn the method of creative strategy. Only when they learn it and do it will you be able to tell who understands it best, can do it best, and wants to do it more. That might give you a group that can stay in touch as they spread creative strategy to their regular units. This is how any new method spreads through big organizations that do not adopt it formally.

Above all, strategic intuition is something you can learn. Certainly some people can learn it better and faster than others, but there is no easy way to determine who they are ahead of time. And the biggest obstacle to learning strategic intuition is not the innate ability of the learner, but the competing methods of strategic thinking that people learn instead. That was Patton's problem. He found himself in constant conflict with his fellow officers, who used traditional planning methods, learned in the same academies and courses (see Duggan, 2002). Jomini was the main source of those conventional methods, which spread from military to business, with a clear pedigree straight to Michael Porter and beyond. But Patton used strategic intuition instead. And like Napoleon, Patton was quite conscious of his method. He tells us that an officer:

> …must become so thoroughly conversant with all sorts of military possibilities that whenever an occasion arises he has at hand without effort on his part a parallel…to attain this end, I think it is necessary for a man to begin to read military history in its earliest and hence crudest form and to follow it down in natural sequence permitting his mind to grow with his subject until he can grasp without effort the most abstruse question of the science of war. (D'Este, 1993, p. 94)

Patton was a master of examples from history to apply to the new situation at hand; but it got him into trouble:

> For years I have been accused of making snap judgments. Honestly, this is not the case because I am a profound military student and the thoughts I express are the result of years of thought and study. (D'Este, 1993, p. 445)

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[5] Yet Mednick, the author of a popular associative test, gave one of the best descriptions of creativity: "the forming of associative elements into new combinations which either meet specified requirements or are in some way useful". See Mednick, S. (1962). The associative basis of the creative process. *Psychological Review, 69*, 220-232.

Patton is a striking case where expert intuition meets strategic intuition. He studied the experience of others—that is, examples from history—so deeply that he could recall them almost as fast as his own experience. He knew past battles so intimately that he hinted he did so because he was there, through reincarnation. In a way, he was indeed there, by studying them so thoroughly that he could place himself in specific spots at specific times in each campaign. The famous statue of Patton at West Point should remind us of his greatest skill, which all officers need to learn and practice: strategic intuition.[6]

Retain Strategic Thinkers

The three problems of assessing, developing and retaining strategic thinkers are nested, like Russian matryoshka dolls: your strategy to develop includes your strategy to assess, and your strategy to retain includes your strategy to develop. So retaining is the biggest and hardest problem because it includes the other two to some degree. Let's use this problem of retention to demonstrate how to apply creative strategy, with assessment and development as two of the many rows of our insight matrix.

ARI's background material gives clues to other matrix rows:

- *What are the motivators and demotivators for strategic thinking? What are the reward structures for strategic thinkers in non-strategic positions?*

- *How should the Army manage the talent pool to keep strategic thinkers from leaving?*

- *Do natural strategic thinkers need particular assignments to stay motivated? How can they self-motivate in any assignment and find ways to apply their thinking processes to non-strategic problems?*

- *How can the Army socialize the value of early career strategic thinkers?*

We can summarize these problems as motivation, reward structure, talent management, assignment, and early socialization. We add them to the rows of the matrix, with assessment and development. That's a good start. We then need to use rapid appraisal to verify this list with the key leaders who will decide on and have responsibility and authority for implementing the creative strategy that we come up with. That might alter the list. Next, we look for sources that might have solved at least one of the problems in the rows. These are our matrix columns. We then set out on the what-works scan.

Let's pause to contrast this method with a more common one for solving a problem this big and complex: expert opinion. That is, you ask a set of experts in different specialties what they recommend to solve the problem. That's similar to brainstorming, where each person in the room draws on their own expert intuition to answer. The advantage is similar too: a wider range of sources than only one person's experience. But remember the Macintosh: the Apple team could

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[6] Key sources on Patton's thinking are D'Este, C., *Patton: A genius for war*. New York: Harper Collins. Nye, R. (1993). *The Patton mind.* Garden City: Avery. Blumenson, M. (1972-74). *The Patton Papers*, 2 volumes. New York: Houghton Mifflin.

have brainstormed forever and never come up with the graphical user interface and the mouse. If they had put together a panel of experts instead, it would be left to chance whether the right person from Xerox would end up in the room.

For the problem of retaining strategic thinkers in the Army, we cannot predict who will be the right experts to ask for elements of the solution. Only a search can do that: like Jobs did informally, or as a formal what-works scan. Experts are good for coming up with the rows and columns of the matrix, but they cannot possibly have direct experience of all the solution elements you will discover when you actually do the scan. No one has that much experience in all the different fields and kinds of organizations that your search will reach. The opinion of a dozen experts is good, but a search among hundreds of examples from history is even better.

More practically, let's see how ARI might proceed after receiving and discussing the expert papers in this present project. From there, ARI might revise the list of matrix rows and start to fill in the column sources. One likely addition to the rows is "staff reduction," if the Army expects that over the coming decade. The next step would be to conduct rapid appraisal to verify and alter those rows and columns with the set of people in the Army system that are best placed to decide and lead for the range of solutions that might arise.

Like this problem, the Army itself is so large and complex that it might not be easy to figure out who will ultimately decide and lead the resulting strategy. That step might require a rapid appraisal of its own: big complex problems in big complex organizations typically turn up key deciders and leaders who are not obvious at first. The key group might end up so big and diverse—perhaps from within and outside the Army itself—that you need a formal workshop to bring them together to agree on the problem and its pieces that you draw from the rapid appraisal.

ARI would then conduct the what-works scan, to investigate sources that have made progress at some time on these various pieces of the puzzle. Because of the subject, the sources to scan would likely extend far beyond the military; retaining high-potential or high-performing staff is a problem all big organizations face to some degree. Certainly some organizations, somewhere, have made progress on some parts of the problem, especially under pressure of staff reduction. The farther afield you search, the more creative your strategy. For example, traditional churches have faced staff reductions over the past few decades. Have any of them done anything that works to retain their strategic thinkers, even if they do not call them that explicitly? Perhaps religious organizations of all kinds and faith are worth searching, because like the Army, their staff are heavily influenced by official doctrine and personal motivation, but face volatile, complex circumstances that call for strategic solutions.

Given the scope and complexity of the problem, this what-works scan will likely take months. It will likely involve several changes to the problem and its pieces, which you need to run by the set of deciders and leaders for their understanding and approval. And then comes the last step, to select and combine the elements. ARI has the usual range of options here. On one extreme, you can select and combine yourselves and present the set of deciders and leaders with a single creative strategy. On the other extreme, you can give them all the elements you found and lead them through a workshop where they select and combine themselves.

My guess is the solution lies somewhere in between these two extremes. The problem is so big and complex that the solution will be too. If ARI selects and combines, then they cannot possibly expect readers to see what ARI sees. Each reader will see something else. You will lose agreement among them, and the resolution to follow through. On the other hand, the deciders and leaders are probably so many and so busy that few of them would study the elements you give them enough to be able to select and combine them themselves in a workshop. ARI might pare down the elements to ones they see as most promising and suggest partial combinations of different elements to solve different pieces of the problem and then have a workshop from that. But do not present a full combination, or you will lose the resolution of the deciders and leaders.

I do not know ARI well, but I would guess you have the potential to do all these steps. Most likely, ARI's present methods for research and creative problem-solving are not creative strategy. If ARI understands strategic intuition, and decides to learn and try out creative strategy, a strategic solution is well within your grasp.

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Chapter Nine

Creativity in Strategic Thinking

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Creativity is a core component in strategic thinking, so it is important to discuss what is known about creativity and how to foster it in order to advance our understanding of strategic thinking. We know a lot about creativity as a phenomenon that occurs in the head of the individual. We know elements of the social-organizational work environment that may be related to creativity. And we know some of the elements of the physical environment that are possibly related to creativity. But we do not know as much about how tools, techniques, and materials affect creativity.

We do not know much about everyday creativity because the research has focused on the eminently creative (i.e., sole creative geniuses). And another gap in our current understanding of creativity is in the domain of collective creativity. Collective creativity occurs when all the people in a group contribute simultaneously to a big picture or mental model that emerges from a shared mind and body space. We do know that collective creativity is more than the sum of the parts (i.e., the creative individuals).

All military personnel need to recognize and exercise their individual, everyday creativity in order to be better able to think strategically. Collective creativity relies on creative individuals. Collective creativity opens up opportunities for collective long-term visioning which can inform and inspire strategic thinking as well as bring ownership of the participants to the execution of the strategic plan.

Strategic Thinking is a Creative Activity

The distinction between strategic thinking and strategic planning is well documented in the literature (e.g., Liedtka, 1998). Some of the most succinct distinctions come from leaders in the business management community. Henry Mintzberg (as summarized by Lawrence, 1999) argues that "strategic planning is the systematic programming of pre-identified strategies from which an action plan is developed. Strategic thinking, on the other hand, is a synthesizing process utilizing intuition and creativity whose outcome is an integrated perspective of the enterprise." Hamel and Prahalad (1989) refer to strategic thinking as crafting strategic architecture, while Raimond (1996) refers to strategic thinking as creative imagination. It is clear that creativity is a core component of strategic thinking. So, in these times of rapid change and uncertainty it behooves us to explore what we know and do not know about creativity and how to foster it.

What Do We Know About Creativity and How to Foster It?

We know a lot about the creativity that happens in the head of the individual. Psychologists have been studying this since the 1950's. And there are hundreds of books for the lay reader available that describe tips and tricks for increasing one's creativity. But the problem is that creativity is

not only in the head. We also know that the socio-cultural spaces and environmental places in which creativity occurs are important. There is a body of research that addresses these larger contexts of creativity, but the research only addresses the domain of individual (vs. collective) creativity.

Beyond individual creativity there is a whole new domain of collective creativity. Far less research has taken place here, although the interest in this domain is quickly gathering speed because the new communication technologies such as social networks are being used to scaffold collective creativity. Tools and materials become particularly important when we are looking at collective creativity.

To more fully answer the question, *what do we know about creativity and how do we foster it,* three types of source materials will be utilized: published literature in peer-reviewed journals, the popular press (both print and online), and personal experience. As will be evident shortly, the published literature on creativity is not sufficiently broad and not always relevant for answering the question. Everyday creativity (i.e., the creativity that people in non-creative careers possess) is a topic that has gained in popularity among the general public over the last ten years. And in the business communities, the interest in creativity from a collaborative perspective (e.g., using terms such as co-creation and crowdsourcing) is growing rapidly (e.g., Surowiecki, 2005). Because of the uneven support from the literature on creativity, I have also found it to be necessary to draw extensively from personal experience as a design research consultant at the front end of innovation.

What Do We Know About Individual Creativity?

The first big wave of creativity research was in the 1950's and early 1960's. Psychologists focused on the creative individual because at the time it was thought that the source of creativity and innovation was the solitary genius. The research at that time was influenced by earlier studies on the creativity of people who have been accomplished, often eminent, creators (e.g., musicians such as Beethoven, painters such as Van Gogh, and scientists such as Einstein). This focus on the elite has helped to fuel the widespread misconception of the lone creative genius. It has also fueled the belief that many people share in thinking that they are not creative. This wave in creativity research died down later in the 1960s. "Like intelligence, creativity was found in highest measure among the people who framed the term. As psychologists eventually recognized, the prototype of the person they described was none other than the psychologists themselves or other intellectuals who were defining creativity" (Cohen-Cole, 2009, p. 245-246).

In the 1970's, cognitive psychologists shifted the focus of creativity research to the process of creativity, but it was still only concerned with what went on in the mind of the individual. It was not until the 1990's that the role of collaboration in creativity and innovation began to be seriously explored (Csikszentmihalyi, 1996). Sawyer (2007) does an excellent job of describing this new perspective on creativity and innovation and the impact that it will have on schools, organizations, and industries in the future. Sawyer claims that all true innovation originates in collaboration rather than through the efforts of the solitary genius, supporting this claim with numerous contemporary examples. Sawyer (2006) also makes the case for paying more attention to the variety of manifestations of creativity beyond what has traditionally been celebrated in

science and in the high arts. He advocates the study of creativity in jazz, improvisation, and in all forms of visual media, not just the high arts.

Today we have a fair amount of published research that addresses the effects of social and cultural factors on individual creativity. Dul, Ceylan, and Jaspers (2011) conducted a very comprehensive review of empirical studies in management, psychology, engineering, ergonomics and human factors, architecture and indoor design journals. They summarized the elements of the social-organizational work environment that are possibly related to creativity. These elements include challenging job, teamwork, task rotation, autonomy in job, coaching supervisor, time for thinking, creative goals, recognition of creative ideas, and incentives for creative results.

Dul et al. (2011) also summarized findings of numerous studies looking at the effects of environmental factors on individual creativity. They list the following as elements of the physical work environment that are possibly related to creativity: furniture, indoor plants/flowers, calming colors, inspiring colors, privacy, window view to nature, any window view, quantity of light, daylight, indoor (physical) climate, positive sound, and positive smell.

Contexts of Creativity: A Framework

Contexts of Creativity is a framework that was developed in practice to serve as a means of organizing what we know about creativity in order to help clients learn how to facilitate the creativity of others. It is not another theory about creativity. We have plenty of those. It is big picture that holds and organizes what it is that we know about creativity for the purpose of applying it in practice. Figure 1 shows individual creativity as three layers of context around the head of an individual. It shows that individual creativity is not only in the head, but in the heart as well: it involves emotion. And creativity takes place in the body. It is evoked through activity and motion. There is a timeframe for creativity. Creativity can be enhanced through preparation and with the passage of time. And the last layer shows that creativity is in the environment, i.e., it is influenced by the places and spaces and through the props and materials that are available for use.
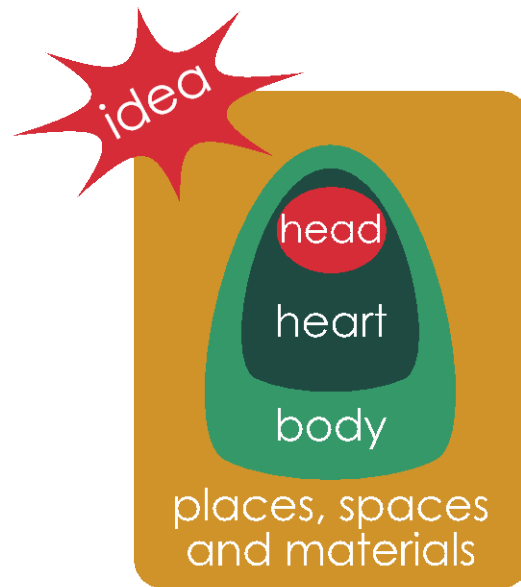
Figure 1. Contexts of Creativity: A framework for individual creativity.

The Contexts of Creativity framework expands into a framework for collective creativity that will be described later (see Figures 2 and 3).

Creativity and Cognition

At the core of the framework for individual creativity is the idea in the head. Ideas are the basic building blocks of creativity. Creative thinking often works by having people make new connections between previously unconnected ideas. Ideas connect to other ideas in two ways: through either association or bisociation. Association links similar or related ideas. Koestler (1964) introduced the concept of bisociation where two apparently unconnected ideas are brought together, and a new connection is explored. Koestler hypothesized that bisociation is the basic creative act and that this act is the same for art, science, and humor. Koestler claimed that every creative act involves bisociation, a process that brings together and combines previously unrelated ideas. Koestler's evidence for bisociation came from a common pattern of intersecting conceptual planes of thought that he has described with many examples showing creative achievements in the arts, sciences, and humor. Other variations on Koeslter's hypothesis about bisociation have been proposed more recently. For example, Michalko (2011) explains the creative act as conceptual blending.

Creativity and Emotion

The second layer in the framework for individual creativity looks beyond the head to the heart, i.e., to one's emotional state and its role in creative thinking and doing. For many years, cognitive psychologists studied the mind while doing their best to ignore the effect of emotions because emotional states were harder to control and to quantify than were cognitive events. But

more recent psychological research has shown that cognition and emotion cannot be separated. In fact, emotion drives cognition, which is shown in the framework by positioning the head within the larger context of the heart. Our emotional states influence not only how we feel but also how we think and act, including our ability to be creative. For example, the link between creativity and positive affect (i.e., emotion) was firmly supported in a meta-analysis of 66 studies about creativity and affect (Baas et al., 2008). In addition, Isen's (1999) work shows that:

- Positive emotion increases the number of ideas available for association and/or bisociation,

- Positive emotion increases the breadth of ideas that are relevant to the problem, and

- Positive emotion increases cognitive flexibility, making it more likely that the ideas will connect.

Creativity in Motion

The third layer in the framework for individual creativity looks at the whole person in action. Here the head and the heart are in the body that is moving through space and time. The implications of this layer for creativity are immense and are just now beginning to be explored, particularly in interactive design domains.

It is important to keep in mind that creativity takes time and that it is not an instantaneous event. In 1926, Graham Wallas introduced what may be the very first model of the creative process. He identified five stages in the process:

1. *Preparation*: preparatory work that focuses the individual's mind on the problem,

2. *Incubation*: where the problem is internalized into the unconscious mind and nothing appears externally to be happening,

3. *Intimation*: the creative person gets a "feeling" that a solution is on its way,

4. *Illumination*: where the creative idea bursts forth into conscious awareness; and

5. *Verification*: where the idea is consciously verified, elaborated, and then applied.

Design involves imagining and creating new life situations for people in circumstances that have never been experienced before. "Design is an inquiry into the future situation of use" (Gedenryd, 1998, p.158). By experiencing new or possible situations in a bodily way, (e.g., Burns, Dishman Johnson, & Verplank, 1995; Diaz, Reunanen, & Salmi, 2009; Suri & Buchenau, 2000; Oulasvirta, Kurvinen, & Kankainen, 2003; Simsarian, 2003), things may become apparent that were not evident under abstract consideration alone. Enacting refers to the use of the body in the environment to express and experience ideas about future use situations. The implications for movement and bodily action as a context for design and creative visioning are just now beginning to be explored (e.g., Jungmann, 2011).

Creativity in the Environment Including Spaces, Places, and Materials

The fourth layer in the framework for individual creativity is described by the environment in which the action is taking place. This layer includes the physical environment with its places and spaces as well as all the stuff in the environment such as materials, supplies, props, and tools. The design of physical environments that facilitate creativity is a relatively new area of architecture and interior space design practice, but one that is being aggressively pursued today by progressive architecture firms and workplace furniture manufacturers (e.g., http://360.steelcase.com/articles/distributed-collaboration-works-future-in-view/).

Beyond the academic literature, there are many books, websites and blogs that are filled with tools, tricks, and techniques for improving one's individual creativity. For example, *A Whack on the Side of the Head* (von Oech, 2008) offers tips and tricks while *Orbiting the Giant Hairball* (MacKenzie, 1996) is more of an inspirational book. And www.lifehacker.com is a good web resource.

How Can Individual Creativity Be Fostered?

Drawing from all three types of source materials (e.g., the academic literature, popular press and practical experience), the following is a summary of what is important in fostering and stimulating individual creativity across socio-cultural, physical, and material spaces (see Table 1).

The Teledyne Brown Engineering Project

A short review of a project in design ergonomics will help to elucidate factors in the space of tools, techniques, and materials with an emphasis on tools, techniques and materials for making future artifacts and enacting future scenarios of use (Sanders, 1992). The first part of the case focuses on individual creativity. The implications of the case for collective creativity will be discussed later.

Figure 2. On the left, Sergeant Coker considers changing the location of several user interface controls within the context of a full-size cab mockup covered in Velcro. The photo in the middle shows that the meeting with Sergeant Coker took place with all the project stakeholders standing around the Velcro-model. On the right is the final appearance model of the redesigned cab.

Table 1

Fostering and Stimulating Individual Creativity Across Socio-Cultural, Physical, and Material Spaces

Individual Creativity in the Socio-Cultural Space
Expertise in the domain
Permission to be creative
Preparation (and incubation) for being creative
Motivation for finding and/or solving the problem
Being in a positive state of mind
Trust in the people who are also a part of the socio-cultural space
Time for the creative process to take place
Flexibility in process and deliverables
Acknowledgement of one's own creativity
Recognition for the creative idea
Incentives for creative results
Individual Creativity in the Physical Space
Views, particularly a view to nature
Light, particularly natural light
Plants and other natural materials
Sensory stimuli (e.g., color, sound, music, smell, breeze, etc.)
Furniture to support a variety of postures
Walls on which to post visual and verbal stimuli
Enough space for activity and motion to take place
Privacy
Permission to make a mess
Control over environmental factors (e.g., personalization , temperature, etc.)
Individual Creativity in the Space of Tools, Techniques, and Materials
Ambiguity
Abundance
Incompleteness
Serendipity
Unexpected events and surprises
Changes in course
Constraints in the process
Changes in the boundary of the problem space
The internet
Sources for personal inspiration (e.g., www.pinterest.com)
Tools for capturing, collecting and storing data, information, images, ideas, and insights
Tools, techniques and materials for *making* future artifacts (e.g., paper collages, LEGOs, clay, Velcro-modeling)
Tools and techniques for *telling* future stories (e.g., "paper spaces", storytelling)
Tools, techniques and materials for *enacting* future scenarios of use (e.g., props used in improvisation)
White boards, walls and sticky notes

I led a team of designers and ergonomists who were charged with a very complex systems problem that gave very little opportunity for learning about the system. The task was to configure the layout of all user interface components in the operator's cab of a large military loader. This involved the placement of over 150 distinct dials, switches, indicators, buttons, and lights. About 40 of the controls were new to the industry which meant there were no precedents from which to learn. It was clear that the problem could not be solved in the one and a half days for fieldwork (i.e., observations and interviews) that had been budgeted, but the project timeline and scope had already been agreed to. In addition, the project took place in 1990 during the Gulf War, making it very difficult to get much useful information during the fieldwork phase due to heightened security at the Air Force Base.

Out of the confluence of factors (e.g., a lack of clarity in systems understanding, inadequate time for field research, a tight budget, and an impending meeting with the client team from Teledyne Brown Engineering: TBE) a new design research method was invented. We created a Velcro-model, a full-sized, three-dimensional model of the loader's cab with moveable walls, windows, seat, steering wheel, control panels, etc. Every user-interface component was color-coded by system and backed with Velcro so it could be quickly repositioned at will on any surface. Even the overall configuration of the cab could be changed instantly, revealing interdependencies between the major physical parts such as the seat, console, windows, foot controls, and door. With this full scale rough prototype, we discovered internal discrepancies in the MIL-STD 1492 Human Factors Guidelines and were able to initiate the change process for that.

Once the components were positioned in the Velcro-model by the design team members to the best of their ability, the preliminary solution was presented to the development engineers from TBE. They refined the solution in about two hours by sitting in the cab and discussing the repositioning of components based on more thorough understandings of the system, the new controls, and the various tasks that the loader needed to support. The refined layout was to be presented in the afternoon to the Officer whose job it was to provide feedback on the design solution as a representative of all military end-users. He did not need a presentation. The Officer immediately sat down in the cab and began to test and to tweak the controls layout. He was able to very quickly refine the layout of all the user-interface components based on his many years of experience operating similar vehicles. He then commented, "This is fun! I feel like a kid in a candy store! No one ever asked me for my input before the design was made!"

The Officer's experience in individual creativity can be characterized by many of the factors listed above as contributors to individual creativity such as: domain expertise, permission to be creative, motivation for solving the problem, being in a positive state of mind, etc. In addition, the ambiguity and flexibility of the 150 Velcro-backed user interface components served as a very powerful toolkit for letting him quickly try out many ideas relating to the layout of the user interface controls. The full-scale physical cab environment also facilitated his enactment of future use scenarios. Iteratively throughout the entire session, he would make a change and then test it by pretending (with his whole body) to run through typical as well as challenging tasks that the operators were likely to encounter in the operations of the Air Force loader. He also came up with some new functions/components that were later added to the design solution. The case demonstrates that creativity is not just in the head, but in the social environment, the

physical environment, and especially in the tools and materials that are made available to support creativity.

What Do We Know About Collective Creativity?

Creative teams are made up of a diversity of people. There is evidence that team creativity is founded on diversity and difference (Nijstad & DeDrue, 2002). In other words, the more diverse the members of the team, the more creative they have the potential to become. The primary advantage of collective creativity is that people with many different ways of thinking and decision making can be brought together, increasing the chances that connections and new insights will occur at many levels. At the same time, with all these people having different perspectives, it may be hard for them to come to agreement. This is where the physical environment as well as tools, technology, and materials can help to foster creativity.
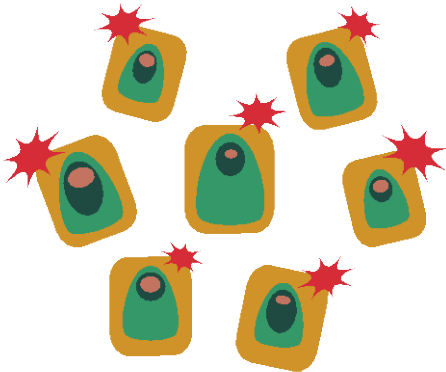

Figure 3. Brainstorming

Figure 4. Collective creativity

The Contexts of Creativity framework explodes in scope and scale when we think about people coming together in creative ways. When people come together, the number and breadth of associations and bisociations that are brought to the table increases dramatically. There are at least two patterns in what happens when people come together for creative activities: brainstorming and collective creativity.

Brainstorming usually looks like the diagram in Figure 3 that shows a group of somewhat different people, each one relying on their individual creativity to come up with thoughts or ideas that get scribbled on a post-it note or written on the white board. When it is going especially well, thoughts from one person can trigger additional thoughts in other people. So you end up with a lot of thoughts and ideas. However, there is usually no big picture that connects the ideas. And there may not be a shared mental model of what was just created.

Collective creativity looks like the diagram in Figure 4 that shows a group of very diverse people connected in thought and action and working together as one on a very big idea or set of connected ideas. Collective creativity has the potential to produce very powerful results when the conditions are right. Collective creativity uses all of the contexts of creativity (heart, body, space, tools, and materials) to support and scaffold the shared space of thoughts and ideas. When collective creativity is working well, all the people in the group contribute simultaneously to a big picture or mental model that emerges from the shared mind and body space. Bissola and Imperatori (2011) are in the early stages of comparing individual and collective creativity. They report that group creativity is more than the sum of individual creative skills.

The co-construction of a visualization of the big picture or shared mental model is essential for collective creativity, and this is where the importance of the tools and materials comes into play. The photo in Figure 5 shows a shared mental model of individual creativity that was made by a transdisciplinary team of graduate students taking a seminar in *Individual and Collective Creativity*. The mind is the radial shape in the middle and the two circles below it are different modes of everyday creativity. The idea is the blue shape in the lower right. Everything else refers to various contextual factors that influence creativity. For example, the *splat!* refers to the use of external memory devices that are used to capture, collect and organize data, information, images, ideas, and insights.
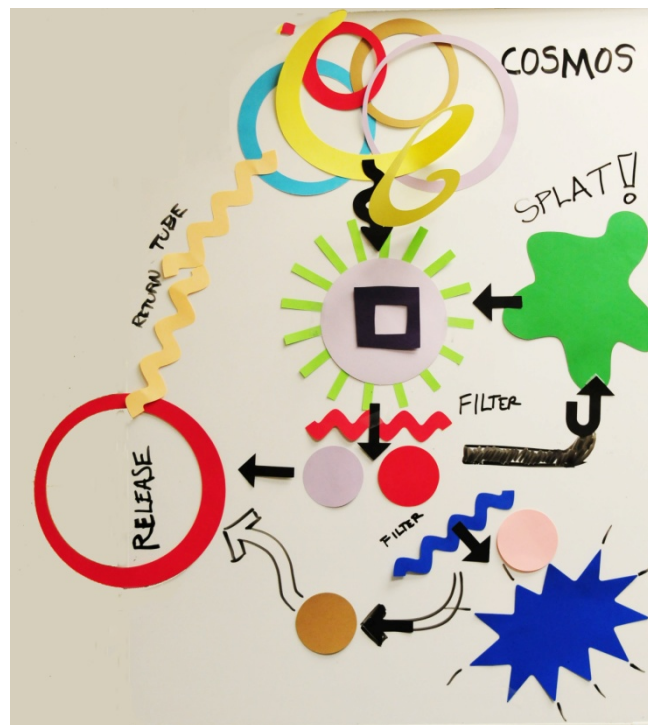
Figure 5. A collective model of individual creativity

There is not much published research on the socio-cultural context of collective creativity, but a few contributions from people representing a wide range of disciplines have recently emerged. Fischer (2011) uses the term social creativity to describe the social spaces of collective creativity. He proposes that "to bring social creativity alive, *cultures of participation* need to be fostered and supported with socio-technical environments in which all stakeholders are able to

express themselves, combine different perspectives and generate new understandings" (Fisher, 2011, p.1). He describes six technology application environments to support his proposition. Parjanen, Harmaakorpi, and Frantsi (2010, p.1) asked, "How is it possible to span the structural holes in cross-disciplined multi-actor innovation?" They conclude, on the basis of a case study in practice, that brokers (both process and session brokers) are needed to exploit the distances that are caused by the structural holes. Sawyer (2006) discusses performance creativity using examples from the performance of jazz and improvisation. It is interesting to note that his expertise in performance creativity comes from practice in the early years of his career.

There are also some recent papers dealing with the physical spaces of collective creativity. For example, Fruchter and Bosch-Sijtsema (2011) discovered that a large wall/physical display surface facilitated dynamic participation in a collaborative work environment. They concluded that "the wall acts as a mediator for individual reflection-in-action and team reflection-in-interaction. It serves as social glue both between individuals and between geographically distributed subgroups" (p. 221). Pang (2010) describes the construction and use of what he calls "paper spaces" based on his experiences in organizing and participating in over 100 future workshops. Paper spaces consist of large sheets of paper and sticky notes covering the walls of a meeting room. Paper spaces allow people to move ideas (written on the sticky notes) around and "turn thinking about the future into a shared experience in constructing a common view of the future" (Pang, 2010, p. 9). Ivey and Sanders (2006) described the use of a physical environment that was designed to promote creative co-experience. The space was characterized by six themes: nature, activity/motion, visual characteristics, social interaction, time/privacy, and sound present or absent in their surrounding.

In the space of tools, techniques, and materials, Sanders, Brandt, and Binder (2010) describe a framework of generative tools for making, telling, and enacting. The tools for making, for example, are designed to support and provoke creative thinking. The *make toolkits* contain a collection of ambiguous (and unambiguous) elements such as images and words that people use for making visualizations in the form of collages or maps that describe their dreams for future experience. The *make tools* are used in visioning sessions to explore future scenarios of use. Generative tools can be used with individuals or with groups of people, and they work equally well with everyday people and with professionals.

The same types of tools and materials (for making, telling, and enacting) can be used for collective creativity and for individual creativity, but the scale and the quantity need to be increased for use in group settings. The short case on the Velcro-modeling of the military loader cab is a good example of this. As a tool for collective creativity, the Velcro-model (see the photos in Figure 2) allowed all the stakeholders to participate directly and simultaneously in the placement and juxtaposition of every single user-interface component. Velcro-modeling was successful not only from a product system point of view, but also from the people point of view. It served as a common ground for communication and understanding for all the stakeholders. It helped in the construction of a shared mind and body space. It is important to keep in mind that the stakeholders in this case had different types and levels of expertise relevant to the loader design, including: mechanical engineering, systems engineering, electrical engineering, industrial design, ergonomics, user research, and biomechanics.

Interest in collective forms of creativity is growing and is of particular interest in the corporate landscape. For example, LEGO Serious Play (www.legoseriousplay.com) is "an innovative, experiential process designed to enhance innovation and business performance" that uses special sets of LEGO building blocks. And www.neuland-world.com sells materials to support and facilitate the visualization of collective sessions. There is a very useful web resource called *Welcome to the Pattern Language for Group Process* (www.grouppatternlanguage.org) that addresses collective creativity. This is a wiki for exploring and documenting "what makes deliberative group conversations more fulfilling and inspiring, more effective and more whole." It is a remarkable set of 91 patterns that describe the social spaces that are needed for collective creativity and visioning. It also addresses the physical spaces and techniques to some degree. Being a collaborative wiki that is structured as a Pattern Language (Alexander et al., 1977), it is an embodiment of collective creativity in its own right. It appears that the contributors are active practitioners of group processes.

How Can Collective Creativity Be Fostered?

Drawing from all three types of source materials (e.g., the academic literature, popular press and practical experience), the following is a summary of what is important in fostering and stimulating collective creativity across socio-cultural, physical and material spaces. Please note that everything that is important for the individual also matters for the collective in fostering and stimulating creativity. See Table 2 for additional factors unique to the collective situation.

How Is Collective Creativity Used In Strategic Thinking?

We can see examples of collective creativity being used for strategic thinking in practice. Here the practices are more likely to be referred to as long-term visioning. Long-term visioning refers to a large and growing set of methods and techniques for exploring and planning for the future. These methods have been selected based on diversity in origin, purpose, and approach and they are listed in chronological order based on the first available publication. These methods all use collective creativity for strategic thinking, but they vary along other dimensions.

Future Workshops (Jungk & Mullert, 1987)

The Future Workshop was developed for use with citizen groups having limited resources who wanted a say in the decision making process. The process steps through the common problematic situation, to the generation of visions about the future, and then to a discussion of how these visions can be realized. The future workshop is particularly suitable for people who have little experience with processes of creative decision making.

Table 2
Additional Factors Unique to the Collective Situation

Collective Creativity in the Socio-Cultural Space
Diversity of participants
Trust among the participants
Mutual respect between participants
Sense of ownership in the collective vision
No executive control
Breakdowns (e.g., Schon, 1983) that offer opportunities for reflection and learning
Participants who have good social skills
Principles of interaction
Group methods with facilitation
Support for a wide variety of behaviors including quiet reflection, relaxation, active collaboration, making a mess, etc.
Support for a range of moods including playful, serious, stimulating, informal, formal, etc.
Collective Creativity in the Physical Space
Walls where materials can be posted for all to see and act upon
Round tables
Furniture that can be easily rearranged
Support for both individuals and groups of varying size working face-to-face
Comfortable and dedicated spaces of collaboration, for retreat, for fun, etc.
Enough space for collaborative physical construction of prototypes and artifacts
Enough space to support collaborative enactments
Collective Creativity in the Space of Tools, Techniques, and Materials
Access to shared content
A common language to support a shared mind and body space
Collaborative visualization capabilities
Physical construction via prototypes (full scale is best)

Scenario Planning (e.g., Schwartz, 1991)

As the Global Business Network relays,

> The purpose of scenario thinking is not to identify the most likely future, but to create a map of uncertainty—to acknowledge and examine the visible and hidden forces that are driving us toward the unknown future. Scenarios are created and used in sets of multiple stories that capture a range of possibilities, good and bad, expected and surprising. They are designed to stretch our thinking about emerging changes and the opportunities and threats that the future might hold. They allow us to weigh our choices more carefully when making short-term and long-term strategic decisions. (http://www.gbn.com/about/scenario_planning.php)

Open Space (Owen, 1997a, 1997b)

"Open Space Technology (OST) is an approach for hosting meetings, conferences, corporate-style retreats and community summit events, focused on a specific theme and important purpose or task—but *beginning* without any formal agenda, beyond the overall purpose or theme" (www.openspaceworld.org). OST is best suited for conditions of complexity and urgency where a diversity of people are needed to make any solution work.

World Café (Brown, Isaacs, & The World Café Community, 2005)

The World Café website states,

> Drawing on seven integrated design principles, the World Café methodology is a simple, effective, and flexible format for hosting large group dialogue. Team members create new points of view through dialogue and discussion. They pool their information and examine it from various angles. Eventually, they integrate their diverse individual perspectives into a new collective perspective. (www.theworldcafe.com)

The Art of Hosting

The Art of Hosting website relays, "Hosting is an emerging set of practices for facilitating group conversations of all sizes, supported by principles that maximize collective intelligence, welcome and listen to diverse viewpoints, maximize participation and civility, and transform conflict into creative cooperation" (www.artofhosting.org).

A quick comparative analysis of these methods reveals a set of dimensions on which the long-term visioning methods can be described and compared.

- *Participants*: The people involved in the collaborative sessions range from domain experts (e.g., Scenario Planning) to everyday people (e.g., Future Workshop). The diversity of people put together for these sessions has been increasing over time.

- *Physical spaces and places*: Some methods, such as World Café, put a lot of emphasis and specificity on the physical environmental qualities of the place where the visioning activities take place, whereas others place less emphasis here.

- *Social attitudes, activities and rules for engagement*: Some methods, such as Open Space and the Art of Hosting, place a lot of emphasis on describing the principles that are needed to support and enable the collaborative session; others do not.

- *Tools, techniques and materials*: Some methods, such as World Café, specify the tools, techniques, and materials that are needed to support and/or facilitate the visioning activities. Others do not describe specific materials to be used, although sticky notes do appear to be ubiquitous. The specificity of tools, techniques, and materials is another area that is growing rapidly.

- *Follow-through*: Some methods, such as Scenario Planning and Future Workshop, explicitly address the decision-making stage that follows the visioning stage, whereas others do not.

Collective creativity in strategic thinking (i.e., collective strategic thinking) will lead to support for and ownership of the ideas and strategies by the people who were involved in their creation. I have seen this pattern manifest itself in the design of new hospitals. Nurses and physicians who were involved as co-creators in the design of a new hospital were able to better handle the transition from the old to the new hospital. This is normally a very difficult type of organizational transformation because new practices must be learned in order for the staff to work in the new hospital. However, when the nurses, physicians, and other staff are involved in co-creating the new hospital, they feel as if they own it and that it was their idea. The situation goes from one of fear of change to excitement for the challenge of the move.

Fostering Individual Creativity

Day-to-day decisions have the potential to be addressed via strategic thinking to the extent that everyone becomes more of a strategic thinker who is capable of exercising his/her creativity. Furthermore, in order to foster collective creativity in strategic thinking, we need creative individuals (i.e., people who believe they are creative). The challenge is that many people believe they are not creative. This perception comes from a variety of sources. One such source is the myth that true creativity is possessed only by the creative genius. Another source is the current state of the educational system where creativity is not encouraged. In the command and control culture of the military, the expression of creativity is also not a way of life. On the other hand, the attitude about personal everyday creativity is changing across generations. A quick review of socio-cultural and marketplace trends shows that members of Generation Y (those born in the 1980's and early 1990's) expect to be engaged creatively, and they do not hesitate to act on opportunities to become co-creators of their own futures.

For people to contribute to collective creative sessions, the first step is for them to acknowledge that they are creative. The framework for everyday creativity can help to lower the barrier for people to conceive of themselves as creative individuals and it can provide stepping stones to a variety of modes of creativity.

The framework of everyday creativity describes four modes of creativity: *doing*, *making*, *adapting*, and *creating* (Sanders, 2005). It was developed based on many years of experience conducting fieldwork using participatory design with everyday people (i.e., people who are not trained in design and are likely to think that they are not creative). We often asked people to take photos of their daily activities and then tell us about them. We asked which activities made them feel creative. A surprising and recurring finding was that people expressed an incredibly wide range of activities that made them feel creative.
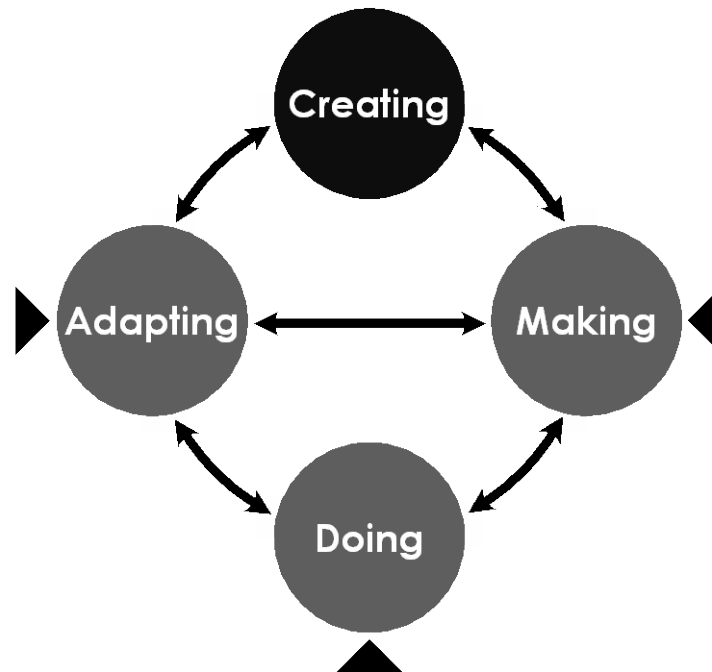
Figure 6. A framework for everyday creativity

The framework for everyday creativity outlines four broad modes of creativity that people recognize in their lives.

Doing is motivated by productivity. It is about getting something done. For example, some people say they feel creative when cleaning and reorganizing their closets. Doing requires a minimal level of expertise and interest in the domain.

Adapting is motivated by the need people have to make things their own. Adapting happens when people change something to make it meet their unique needs or to better fit their personality. For example, many people adapt their car interiors to better suit their needs or personalities. Adapting requires a greater level of expertise and interest in the domain than does doing.

The Culin Hedgerow Cutter is an example of creativity manifested in adapting. According to the story, in 1944 at age 29, Sergeant Culin devised a modification to go on the front of the Sherman tank to drive right through hedgerows without making the tank vulnerable. This was crucial for getting past the Germans in the hedgerow landscape in the Normandy section of France. Culin's invention is at the level of adapting. This is not the most developed mode of creativity, but certainly was an idea that was both ingenious and useful.

Figure 7. The Culin Hedgerow Cutter is an example of the adapting mode of creativity

Making is motivated by people's needs to make things with their own hands. Making generally involves the use of a pattern, recipe, or kit. For example, cooking while following a recipe or building a deck with a plan would be considered examples of making. Making requires a fairly high degree of expertise and interest in the domain.

Creating is motivated by people's needs to express themselves in truly open and creative ways. Creating is generally accomplished without a pattern, recipe, or kit. For example, composing a song or inventing a new game would be everyday examples of creating. Creating requires the highest levels of expertise and passion in the domain.

Most people live simultaneously at all levels of creativity. For example, they may be in the *creating* mode when it comes to cooking, but *doing* when it comes to the use of their car. It is important to keep in mind that all four modes describe creative activities because their execution makes people feel creative. The model is visualized as an action cycle because its purpose is to provide actionable direction for nurturing creativity in all modes. As the pointers indicate, it is possible to get started on the action cycle by either doing, adapting or making. It is also possible to move from mode to mode as the double-headed arrows show. The only path that is not possible is a direct path from doing to creating. The move from doing to creating must be mediated by the other modes of creativity and may take a number of years of experience to accomplish.

People can readily describe their everyday activities in terms of the four modes in the action cycle. Meyers (2010) asked people to write on cards the activities from their everyday lives that they feel creative in doing. Then she asked them to categorize the activity cards into the four modes of doing, adapting, making, and creating. Everyone was able to position the cards in the four creativity modes. They were very interested in the arrangements of their own cards and could easily talk about how they might expand their range of creative activities in the future.

We can use the action cycle of everyday creativity to help people recognize where and how their creativity is being expressed at home and then apply that way of thinking and being to their work. The process can be done either with individuals or in a small group setting. Doing it in a group setting brings the advantage that people become aware that patterns of creativity differ

between people. And the group discussions that take place are usually quite useful and sometimes therapeutic. It is a three-step process that first takes place with regard to the activities they engage in at home.

The first step is to introduce the participants to the model of everyday creativity and share with them the different modes of creativity. This informs them that creativity is multifaceted and usually brings with it the realization that they are, in fact, a creative person. The second step is to engage them in the card sorting exercise described above. Ask them to write on cards descriptions of how they spend their time at home and then sort the cards into the four modes of creativity: doing, adapting, making, and creating. Ask them to comment on the results of the card sorting. For example: How and where is their everyday creativity manifested? Do they consider themselves to be operating in the creative mode in any domain? Which activities bring them the most pleasure and/or satisfaction? The third step is to ask them to describe how they would change the arrangement of activity cards in the future. Are there certain modes of activity that they desire more of? Are there modes that they have too much of? How could they extend the range of their creative activities by trying out different modes?

After they have had the opportunity to discover their pattern of everyday creativity at home, invite them to repeat this exercise with a focus on the tasks, activities, and experiences that make up their workdays. Then ask them to compare the home and the work versions. Do they exhibit more creativity at home or at work? How can they apply the creativity that happens at home to their activities on the job?

The framework for everyday creativity helps people realize that creativity manifests itself in many different ways, and it shows up in different patterns across people. It shows them their own modes and patterns of creativity, as well as, reveals opportunities for alternative modes of creativity within the domains that they already have mastered. The first step to increasing one's creativity on the job is the realization that they are a creative person in everyday living. The next step is to recognize and act on opportunities for trying out other modes of everyday creativity. To the extent that everyone recognizes that they are creative, we will have the potential for far more powerful collective creativity.

Conclusion

In summary, by exploring the current state of creativity research and practice, gaps in our understanding of creativity were exposed. The gaps in knowledge can be seen primarily in the domains of everyday creativity and in collective creativity. In terms of the spaces of creativity, we know more about the social than the physical spaces, and the space of tools, techniques, and materials is particularly underdeveloped. However, it is also clear that interest in the gap areas is growing and that the interest is coming both from everyday people and from the business community.

As our understanding of creativity moves from the individual to the collective, it brings with it the potential to embrace the diversity of people who are needed to tackle the wicked problems that we face in the future. With participation of all those whose lives are at stake, collective

action is more likely to bring about sustainable transformations in the ways that we live, work, and learn.

In these troubled, uncertain times, we do not need more command and control; we need better means to engage everyone's intelligence in solving challenges and crises as they arise. (Wheatley, 2005)

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Chapter Ten

Strategic Thinking. A Design Contribution

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Last year, the world's population passed seven billion. Extrapolations place it at 9.5 to 10 billion by midcentury before it begins to level off. The direct consequences of this almost certainly will be more rapid climate change and resource depletion. Along with an armload of "normal" geopolitical problems, governments will have to plan for the effects of these changes: for climate change—major natural disasters; for resource depletion—population unrest.

Local resources for emergency response will be taxed to the limit, requiring assistance at national or international levels. Diminishing resources, most ominously of water, may force population movements and open strife. Military forces could be the only assistance viable at the scale required.

The military must be prepared for responses that extend from humanitarian relief to all-out warfare. The range of possible scenarios will demand flexible, strategic thinking. Appropriate actions may well include constructive as well as destructive options, placing a premium on leaders' ability to frame problems insightfully and strategically.

Strategic thinking involves stepping outside a problem, seeing it in context, and assuming viewpoints that encourage lateral as well as vertical thinking and the generation of both insights and ideas. At the tactical level, thinking tends to be professionally specific, but at the strategic level, specifics blur and contributions from other professions and fields may be highly useful. Design, in particular, is a field with ideas to offer.

Mappings

There are places where military thinking and design thinking intersect. To see this, frameworks for comparing professions, fields, occupations, and the like can be constructed as "maps" with suitable dimensions as axes. For the military and other direct-action professions, two useful dimensions stand out: a *Planning/Executing* dimension measuring balance in process between the "thinking" and "doing" sides of action; and a *Strategy/Tactics* dimension measuring balance in methodological focus between determining what to do and determining how to do it. Figure 1 shows such a map.

Figure 1. A mapping framework for the comparison of action-oriented professions on how they address *process* (Planning/Executing) and *methodological focus* (Strategy/Tactics).

For most service-providing professions, an ideal balance would have some portion of the profession in each of the four quadrants. Depending on the kind of service provided, however, there may be a need for a stronger presence in a given direction.
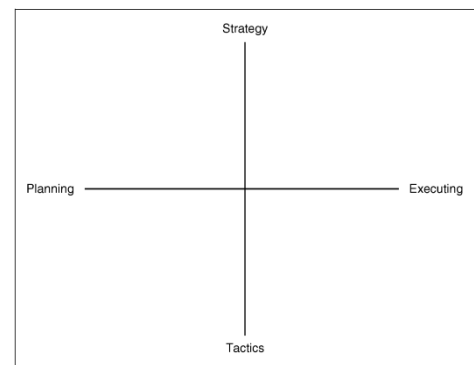
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As examples, architecture and engineering would be positioned to the left and above policing, airline piloting, and firefighting. The military, like the latter three, would be largely in the Tactics/Executing quadrant. But changing conditions in the real world induce changes in position on the map. Current military thinking suggests that the changing threat environment now requires moving to the left and up to a location more concerned with planning and strategic thinking (Figure 2; Bethel, Prupas, Ruby, & Smith, 2010[1]).

Design thinking is evolving similarly from a tactical position to one more strategically focused—in essence, expending more resources on "what to do" before "how to do it." This kind of strategic design thinking may well be shareable with the military as well as other fields. It is worth examining for what it can offer.

In design and similar fields, the work is different from more action-oriented professions, but an analogous map can be made. Two axes for it come close to paralleling those already described. Process is more of a problem-finding/problem-solving activity, with an appropriate axis: *Analytic/Synthetic*. Methodological focus is productively related to the level of content abstraction—how a field works with the information it processes; an appropriate axis for that is *Abstract/Real*. The "Map of Fields" created with these axes is shown in Figure 3.

So, how does design thinking compare with thinking in other fields? What are its special strengths, and how do they differentiate it from other ways of thinking?[2]

The Creativity Framework

One useful way to approach differences in thinking is to examine the roles creativity plays. Creative people tend to work in two different ways. Those who work in the first way might best be called "finders." They exercise their creativity through discovery. Finders are driven to understand, to find explanations for phenomena not well understood. In professional life, they usually become scientists or scholars and are responsible for much of our progress in understanding ourselves and our surroundings.
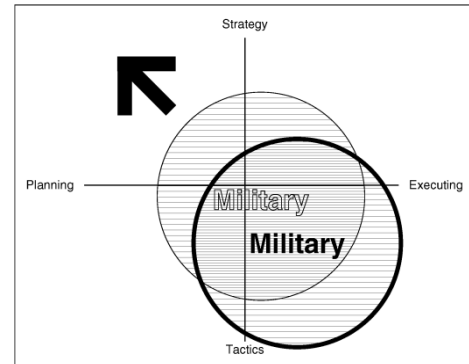

Figure 2. Changing conditions suggest moving the Military's center of gravity up and to the left on the Action Map.
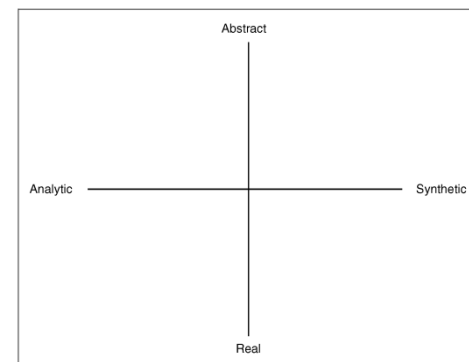
Figure 3. A Map of Fields for comparing Design and other classical academically based institutions can be created with similar axes for *process* (Analytic/Synthetic) and *methodological focus* (Abstract/ Real).

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[1] The authors argue effectively for more inductive thinking and broader generalist preparation to provide the levels of strategic thinking necessary for tomorrow's military.

[2] The word "design" is used and abused with great indifference to meaning. Design is a field that crosses many traditional field boundaries in the creation of artifacts, systems, processes, services, communications, environments and almost anything else that people need. For a discussion of the specific description of design espoused by the author and the IIT Institute of Design, and differences between design and other fields, see *What is design? Some questions and answers* at (http://www.id.iit.edu/141/).

Individuals who work in the second way are "makers," equally creative, but in a different way. They demonstrate their creativity through invention. Makers are driven to synthesize what they know in new constructions, arrangements, patterns, compositions, and concepts. They become architects, engineers, artists, *designers*, and are responsible for our man-made environment and institutions.

The *Analytic/Synthetic* axis maps creative style. Fields on the left are more concerned with "finding" or discovering (i.e., analyzing); fields on the right with "making" or inventing (synthesizing). The *Abstract/Real* axis divides the map vertically. Fields in the upper half are concerned with the abstract and the institutions, policies, and language tools that enable manipulation of information and communication. Fields in the lower half are concerned with the real and the artifacts and systems necessary for managing the physical environment.

The sampling of fields in Figure 4 illustrates how this map differentiates. What distinguishes one field from another is the degree to which its "center of gravity" is positioned away from the map's center and the direction that positioning takes. Fields close to the center are more "generalized"; fields away from the center are more "specialized."

Figure 4. A Map of Fields shows how prominent fields differ in the way they approach process and focus. Science and Design are relatively complementary.

Science, farthest to the left, is strongly analytic. Its focus is also more abstract than real in that subject matter is usually abstracted. Some elements of science, however, are strongly synthetic (materials science and organic chemistry for example), and some divisions, particularly among the natural sciences, deal directly with unabstracted, real content.

Law is located higher on the map, concerned extensively with institutions, policies, and social relationships. It is also more to the right, as a significant portion of its disciplines are concerned with the creation of laws and the instruments of social contract. Medicine, in contrast, is sharply lower on the focus axis, concerned with the real problems of human health. On the process scale, it is strongly analytic; diagnostic processes are a primary focus of medicine. Art is high on the focus axis, strongly symbolic, and almost evenly divided on the process scale, more synthetic than analytic, but very much involved with interpretation.

Design in this mapping is highly synthetic and strongly concerned with real world subject matter. However, because disciplines of design deal with communications and symbolism, design has an abstract component, and because design requires analysis to perform synthesis, there is an analytic component. In recent years, growing capabilities for working abstractly (fueled by developments in computer science) have opened new specialties in design theory and methodology, and design, though still relatively specialized, is moving up and to the left on the map.
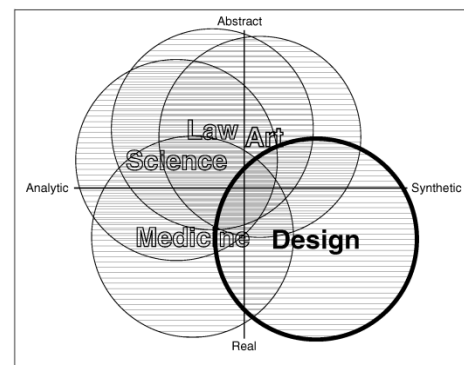
Comparing the military position, with its anticipated changes, from the first map with design, and its anticipated changes, from the second suggests that there may be opportunities to share elements of strategic thinking (Figure 5). Within the design field, processes, methods, and tools for working tactically and strategically have been the subject of intensified research and development in recent years, and strategic thinking is now expected of leading design practitioners. This kind of thinking can be shared. Not to be confused with the professional knowledge, core skills, and sensitivities taught in design courses, strategic design thinking operates at an abstract level shared with other disciplines. What makes it "design thinking" is its origin in the working processes of design.

The following sections will present some of the characteristics and guidelines of strategic design thinking introduced through the project-oriented learning process, the course model, and Structured Planning methodology taught in the Systems and Systematic Design Workshop, the feedback method used in building "trust group" team coherence, and some thoughts on barriers to implementing change and ways they can be circumvented.
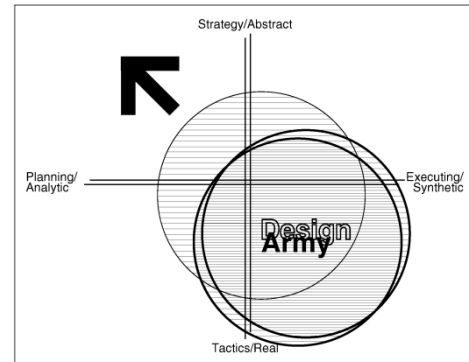

Figure 5. Similarities in position and intent suggest possible shared elements of strategic thinking.

Some Elements of Strategic Design Thinking

While there is no fixed list to work from, the following, derived from my own experiences, is a good starting set of characteristics and principles for strategic design thinking.

Conditioned Inventiveness

Creative thinking for designers is directed toward inventing. Designers tend to be more interested in the "what" questions than the "why's" of interest to science, and in that sense, design creativity complements scientific creativity. Design creativity, however, must cover more than just invention. Design in the 21st century brings to invention a concern that what is produced not only be inventive, but be so within the frameworks of human-centered and environment-centered interests. It is not enough that something works well and looks good. The Hippocratic Oath never to do harm applies in principle to the activities of design. Designers need to think about the impact their work has on individuals, society, and the environment.

This raises ethical questions and requires definitions of what is "good" for humankind and the larger environmental context. Resolution of conflicts created by these limitations is a major task for those working at strategic and policy planning levels.

Human-Centered Focus

Science has few built-in governors. As with the arts, exploration proceeds where discoveries direct. Design and technology, on the other hand, are client-directed. Design thinking must continually consider how what is being created will respond to the needs of the client. At the

tactical level, this means applying the tools of human factors design and engineering. Strategically, it means anticipating the consequences of change at social, economic, and political levels.

Responding to need at any level requires learning to recognize it. Simple inquiries seldom reveal basic problems, and those who would design well-fitting solutions to problems involving people must learn how to see those problems. Much of design research today is concerned with recognizing need. A great proportion of that is directed toward tactical problems associated with systems and components in direct contact with human users. Strategic level research is a newer focus beginning to address the synthesis side of policy planning.

Environment-Centered Concern

In recent years, design thinking has acquired a second un-asked-for, but omnipresent, client: the environment. Present-day thinking puts environmental interests at a level with human interests as primary constraints on the design process. Sustainable design is one very noticeable result. Self-sufficient design is a next step.

Understanding the natural environment as a system is a necessity for sustainability or self-sufficiency. Climate change is driving environmental awareness to new levels of impact, and design thinking, in both tactical and strategic dimensions, is feeling strong pressure to implement environment-centered planning.

The ultimate value of human- and environment-centered-ness is the promise that the best interests of humankind *and* environment will be considered in any project.

Ability to Visualize

Our images of the world around us are primarily assembled from what we see. Designers take advantage of that to explain and communicate ideas. Using a range of media, designers can unify concepts visually to bring clarity to ideas otherwise imagined uniquely by everyone in a discussion. Design thinking, communicated visually, can reveal the whole elephant that the proverbial blind men could only partially and imperfectly conceive.

Learning to give form to ideas is a process mastered by doing. There are many ways to visualize, ranging from drawing to diagramming, collaging, photographing, photoshopping, model building, prototyping, and much more. The essence is "giving form." The commitment is to using what is appropriate and available to coalesce ideas into a form capable of being critiqued. The emphasis is on the giving of form, not to the particular skill with which it is given.

Tempered Optimism

It is difficult to work effectively in a pessimistic, critical mood—especially creatively. Designers are taught to recognize this and to establish optimistic and proactive ways of working. Pronounced mood swings are not unusual among creative individuals, but thoughtful designers

learn to control these to level out both lows and highs in the interests of professionalism—professionals must be able to turn on true enthusiasm, on demand.

As with other characteristics of design thinking, this skill is valuable for almost everyone, but it is seldom given the attention deserved. Designers learn it as a matter of course through project work where uncertainty is the norm and opportunities for failure are always present. By seeing how experienced team members deal with failure and success, observant participants learn to use emotion positively.

Bias for Adaptivity

In recent years, the emergence of adaptive processes in manufacturing and information technologies has greatly reinforced a practice historically followed by progressive designers: the design of adaptive products able to fit their users' needs well at first use and evolve with them to continue to fit well. Design thinking today has accepted the concept of adaptivity, approaching problems with the view that, where possible, solutions should be adaptive—in production to fit original needs uniquely; throughout the life cycle to fit changing needs.

Adaptivity is an alternative strategy to specialization, also used extensively in design. With specialization as a strategy, a system is configured with single-function components optimized for their individual functions; with adaptivity, the system is reduced to a small number of interchangeable components able to perform multiple functions. Both strategies have advantages under different circumstances, but adaptivity grows more desirable given the kinds of emerging technologies and changing societal and environmental needs.

Predisposition toward Multifunctionality

Solutions to problems need not be mono-functional. Designers applying strategic design thinking routinely look for multiple dividends from solutions to problems. This would seem to be an obvious way to proceed, but it has not been. It is still all too common for solution strategies to focus narrowly on problems. A good example was the serious proposal to combat global warming by sending large numbers of mirrors into space to deflect the Sun's rays. That might work, but it would be costly, might have untoward environmental consequences, and would have no other function than to cool the Earth. In recent years, a number of other similarly mono-functional and expensive global warming strategies have been proposed. Good strategic design thinking keeps the big picture in mind and looks for additional opportunities while focusing on the specific problem.

A good solution can often achieve its purpose while at the same time creating additional economic, political, and/or social benefits. Staying with global warming as the example, solar power satellites can produce electric power to replace fossil fuels, but the power can also be sold; re-greened deserts can absorb carbon dioxide, but the plantings can have additional commercial value; floating ocean wetlands can be constructed to absorb carbon dioxide, but they can also be configured to become sheltered nurseries for finfish and shellfish.

Systemic Vision

Design thinking is holistic. In the last fifty years, roughly since the computer began to influence design thinking, designers have moved to undertaking more broadly formulated problems and formulating detail problems more broadly. Modern design treats problems as system problems with opportunities for strategic as well as tactical thinking. Problems thus formulated are likely to have systemic solutions involving mixes of hardware, software, procedures, policies, organizational concepts, and whatever else is necessary to create a holistic solution.

Evolving from the systems thinking of the 30's, 40's, and 50's, the design approach today expands systems analysis and systems engineering from study of functionality with inputs and outputs to the study of a full range of hard and soft components with emphasis on human/system interaction and transformation over time.

View of the Generalist

Common wisdom today holds that the trend of expertise is to greater and greater specialization and, therefore, success will come more readily to those who choose to specialize early and plan their training accordingly. Design thinking, in contrast, is highly generalist in preparation and application, particularly at the strategic level. In a world of specialists, there is a real need for those who can reach across disciplines to communicate and who can bring diverse experts together in coordinated effort. For inventive creativity, the wider the reach of the knowledge base, the more likely will be creative inspiration. A designer is a specialist in the process of design, but a generalist in as wide a range of content as possible.

Generalist thinking is not for everyone—the complexity of human knowledge today requires extreme specialization simply to understand and continue development. However, generalist thinking has value for a surprising portion of the population, particularly those who coordinate, manage, and lead. Becoming a generalist requires learning broadly. Formal courses play a part by presenting rich introductory avenues to new ideas, compact and dense with information. However, the most effective learning process will be that which instills curiosity and the desire to continue broad self-learning outside formal structure.

Ability to Use Language as a Tool

Language is usually thought of as means for communication. For design thinking, it is also a tool.

Visual language can be used diagrammatically to abstract concepts, reveal and explain patterns, and simplify complex phenomena to their fundamental essences.

Mathematical language can be used in "back of the envelope" form to explore "what if" questions and questions of feasibility established by approximation. Calculations using estimations produce inexact results, but come close enough to support an idea or change a line of reasoning.

Verbal language can be used as description where explanation goes hand in hand with the creative process. Description both forces invention where detail is lacking and defines relationships where they are not visually obvious.

Language as a tool is almost impossible to master in any other setting than the project. Concepts can be learned through lecture and study, but real skill is the product of determined effort and critical review. Diagramming is built upon familiar symbols and forms, but its value comes from their combination using "grammars" constructed and tested through trial and error. Mathematical models built with approximations, simple mathematics, and basic physics can answer questions about the feasibility or unfeasibility of concepts. But skill in their use comes from learning to estimate critical values and build the models. Skill at verbal description is developed by writing succinctly about what things are and what they do. For all three language forms, the value is in what they reveal to be wrong or missing in the current model and, by implication, directions to take for rectification.

Affinity for Teamwork

Because designers work for clients, it is natural that good interpersonal skills become tools in the professional toolkit. An additional impetus toward teamwork has been a movement in the design professions over the last forty years toward team-based design, spurred by developments in industry. Design thinking today is highly influenced by this, and designers routinely work closely with other designers and experts from other fields. On multi-discipline teams, designers are a highly valuable asset because of their characteristic abilities to generalize, communicate across disciplines, work systematically with qualitative information, and visualize concepts.

Learning to be a good team member, however, may not be easy. The complexities of human behavior are such that no amount of reading about it can substitute for real, hands-on experience. As a case in point, it is often true that team members learn most about themselves and the dynamics of team operations when their team is dysfunctional! Psychological principles and operational stereotypes can provide guidance, but ultimately, individuals learn to be good team players in real projects conducted in a learning environment within which they can receive in-progress, constructive feedback.

Facility for Avoiding the Necessity of Choice

The job of the decision maker is to choose among alternative proposals, usually the products of different problem-solving approaches. Strategic design thinking takes the view that making that choice should be a last resort. Before moving to choice-making, the designer looks for ways to "have your cake and eat it too"—a seeming paradox (exactly what you cannot do, as pointed out in the old English aphorism). The optimistic, adaptive designer, however, searches the competing alternatives for their essential characteristics and finds ways to reformulate them in a new configuration. When this process is successful, the result is a solution that avoids the decision and combines the best features of competing alternatives.

Much like deciding upon adaptivity as a design strategy, choosing to synthesize alternative solutions rather than select among them requires a conscious decision. The norm is to select, but that often leaves valuable ideas on the table. Positions can be reformulated and synthesized in many ways to accommodate seemingly opposing views. Like negotiation in any field, negotiations over design strategies can move from simple to more complex plans, from one system level to another, from zero-sum models to models with a win for all. Forms of combination can be as creative as the original solutions. Competing ideas inevitably appear in project work, making the project an ideal environment for trying out strategies for synthesizing and having your cake while eating it too.

Self-Governing Practicality

Design is a field in which inventiveness is prized. In very few fields is there the freedom to dream expected in design. The best design thinkers understand this and learn to govern flights of fantasy with a latent sense of the practical. The flight is to the outer reaches of what can be conceived; the tether is to ways that the conceivable might be realized. This is embedded in a strategic style of thinking that explores freely in the foreground, while maintaining in the background a realistic appraisal of costs that can be met and functionality that can be affected.

For design, strategic and tactical, the judgment of the real world stands as a sobering test. For those first exploring the possibilities of creative thinking, it is easy to become overly cautious if real-world limitations are aggressively introduced before confidence in innovation has been built. The problem is to introduce the practicality of real-world "street smarts" without destroying the innovation possible with high-flying imagination. As one dimension, practicality has scientific and technological background knowledge strong enough to support "workability" judgments. As another, it has real-world common sense able to balance costs and benefits from the perspective of those who might have to pay for and use a new concept. Projects can introduce the use of self-governing practicality naturally with realism unavailable in the conventional classroom.

Ability to Work Systematically with Qualitative Information

As much as quantitative information is desirable in planning, it isn't always available or obtainable. Especially when the subject is human behavior, research tools may produce qualitative insights rather than numeric results. Having tools to use this form of information effectively has become just as important as having the tools of quantitative information processing.

Sophisticated design processes with methods for handling qualitative information have come into use tactically and now strategically as design research has matured. One example for strategic thinking is Structured Planning,[3] a tool-kit of methods for a full range of planning tasks covering ways to find information, gain insights from it, organize it for conceptualization, synthesize solutions, evaluate results, and communicate a plan to follow-on tactical development teams.

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[3] Structured Planning is the name given to a computer-supported advanced planning process developed at the Institute of Design over a period of years beginning in 1966.

Processes such as this handle information qualitatively and are applicable to practically any conceptual problem where thorough system solutions are a desirable output. Usable by strategic planners in any field (not only design), Structured Planning methods can be used independently or collectively. Because they work almost exclusively with information in verbal, qualitative form, they can become the central information handling process for a project, integrating quantitative and qualitative results from all sources, including tools specialized to the field.

Structured Planning will be examined in more detail as the process of teaching strategic design thinking is examined in the next section.

Teaching Strategic Design Thinking

Design thinking is taught throughout the Institute of Design's graduate program. Strategic design thinking is a specialty of the Systems and Systematic Design Workshop. The course teaches the use of Structured Planning as a systematic information handling process for planning at the system level. Course procedures are based on the premise that the best way to learn strategic design is to employ it, hands-on, in a demanding project. Over the years, the course has been both a teaching vehicle and a laboratory for studying the planning process. Over 110 projects have been undertaken with Structured Planning, and as the process has evolved, it has become an increasingly useful tool for business, institutions, and government.[4]

The Course

The semester-long Systems and Systematic Design Workshop is a project course in which teams of graduate students, deliberately of mixed international origins and a variety of academic backgrounds, apply the computer-supported Structured Planning process to complex design planning problems. The goal for each project is to develop information thoroughly, propose innovative solutions that take maximum advantage of the information, and integrate those ideas into system concepts that can both be evaluated in their own right and (in a real situation) be comprehensive strategic specifications for follow-on, detailed tactical development and implementation.

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[4] Among early published projects was one for Chicago's transit authority (CTA): Getting Around: Making the City Accessible to Its Residents (1971). In 1983, the House of the Future project won the Grand Prize (and 10,000,000 yen) in the Japan Design Foundation's First International Design Competition. In 1985, the design of a habitation module for Space Station was undertaken for NASA. In 1987, the Aquatecture project won the Grand Prize again in the Japan Design Foundation's Third International Design Competition. In 1991, Project Phoenix (on global warming) was honored as Environmental Category Grand Winner in Popular Science magazine's "100 Greatest Achievements in Science and Technology" for the year. In 1993, two award winning projects, NanoPlastics and Aerotecture, were widely publicized in Europe and Japan; in 1995, the National Parks Project developed plans for the future of the U.S. National Parks Service. In 2001, Access to Justice, sponsored by the National Center for State Courts, was implemented for use in state courts in Chicago and across the United States, and in 2005, four projects on Home, Play, Work and Health were finalists in four of the five competition categories for Denmark's INDEX Awards, the world's richest design prizes. More recently, the 2006 project on Massive Change studied adaptation strategies for global warming in Chicago and similar cities, the 2007 project outlined design planning concepts to complement policy planning for national health care, and the 2008 project took the opportunity of the Burnham Plan centennial in Chicago to look ahead to planning possibilities for the next 100 years. Reports on many of these projects may be viewed at the Institute of Design web site: (http://www.id.iit.edu/131/).

Course Goals

Three major learning goals control the direction of the course:

- **Systems**. What is the nature of "systems concepts" where policies, products, processes, activities, events, services, and communications act together to achieve multiple goals? What can be done to ensure that a system as devised is as complete as possible, covering all functions and attaining a high degree of wholeness and organic reliability?

- **Systematic methods**. How can Structured Planning as a tool-kit of systematic methods be used to collect, structure, and synthesize information in projects of greater complexity than can be comfortably dealt with intuitively? How can such methods be used by a team to extend the effectiveness of all?

- **Teams**. How do individuals with different cultural backgrounds and academic preparation work together successfully on teams? What roles are there to be played and what difficulties must be overcome? What behavioral characteristics are important and what principles of group interaction need to be put into practice?

The Planning Process

Structured Planning seeks to create well-formed strategic concepts. A well-formed concept answers the question "what?" that should be asked before the "how?" questions of development are addressed. "What should be developed?" is a question too often answered inadequately or even unasked—with all the attendant consequences. The product of Structured Planning is a strategic "brief", a concept description for further design and development at the tactical level to follow.

A diagram of the process, shown in Figures 6 and 7, sets out activities along with working documents and final products produced along the way. Reports for specific projects may be seen at the Institute of Design web site (www.id.iit.edu/131/). Far greater detail on the process can be found in the 351-page book, *Structured Planning. Advanced Planning for Business, Institutions and Government*.[5]

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[5] The book *Structured Planning. Advanced Planning for Business, Institutions and Government* is available from the Institute of Design at: (http://www.id.iit.edu/news/)—scroll down to find the title and link to purchase. A series of 17 articles on the key ideas behind Structured Planning were published by the Business Process Management Institute. They can be found under "Articles" and the author's name at (http://www.BPMInstitute.org). Downloadable .pdf versions of them are also at (http://www.id.iit.edu/141/) under "Publications".
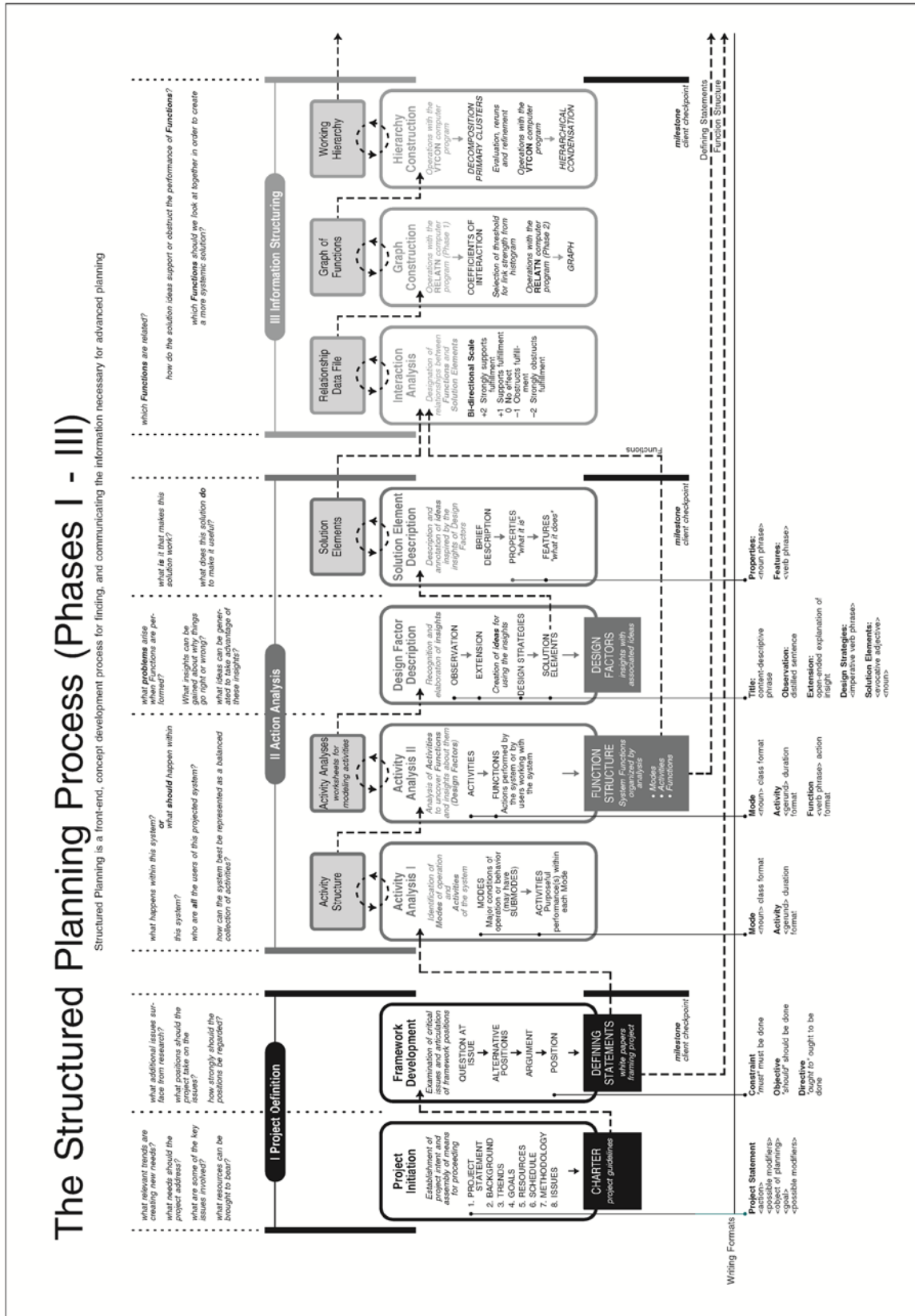
Figure 6. Project Definition, Action Analysis and Information Structuring phases of the Structured Planning process.

The Structured Planning Process (Phases IV - VI)

Structured Planning is a front-end, concept development process for finding, and communicating the information necessary for advanced planning
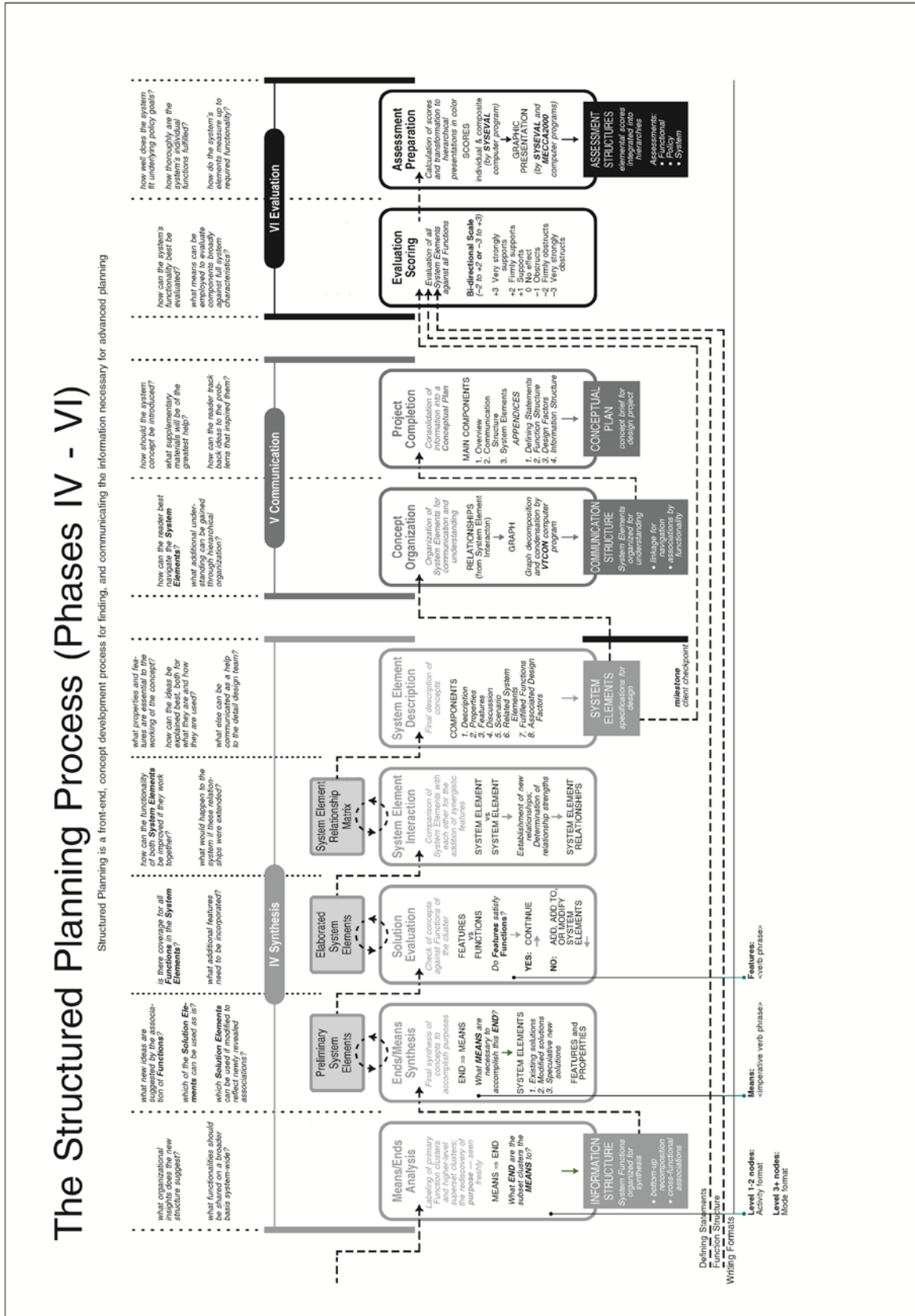
Figure 7. Synthesis, Communication and Evaluation phases of the Structured Planning process.

Phase I: Project Definition. The Structured Planning process begins with project initiation and the acceptance of a Charter. This is an initial brief that serves as the opening communication between client and planners. It contains background, context, basic goals, a project statement that cuts to the heart of the strategic planning task, resources to be used, a schedule and an initial set of issues to be investigated. It introduces the Project Definition phase.

Defining Statements (Figure 8) are mini "white papers" produced in the Framework Development portion of Project Definition.[6] They focus the project within the direction of the Charter, concentrating on the issues and arguing specific positions that the project should take with regard to them. Together with the Charter, they frame the project.

Figure 8. Defining Statements identify issues, establish viewpoints and take positions.

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[6] The Defining Statement and all other examples of Structured Planning tools shown in explaining the process are from the Access to Justice project. The full report is published as a book (Owen, Staudt, & Pedwell, 2001). The report can be viewed at http://www.id.iit.edu/131/ as one of the projects archived for 2001.
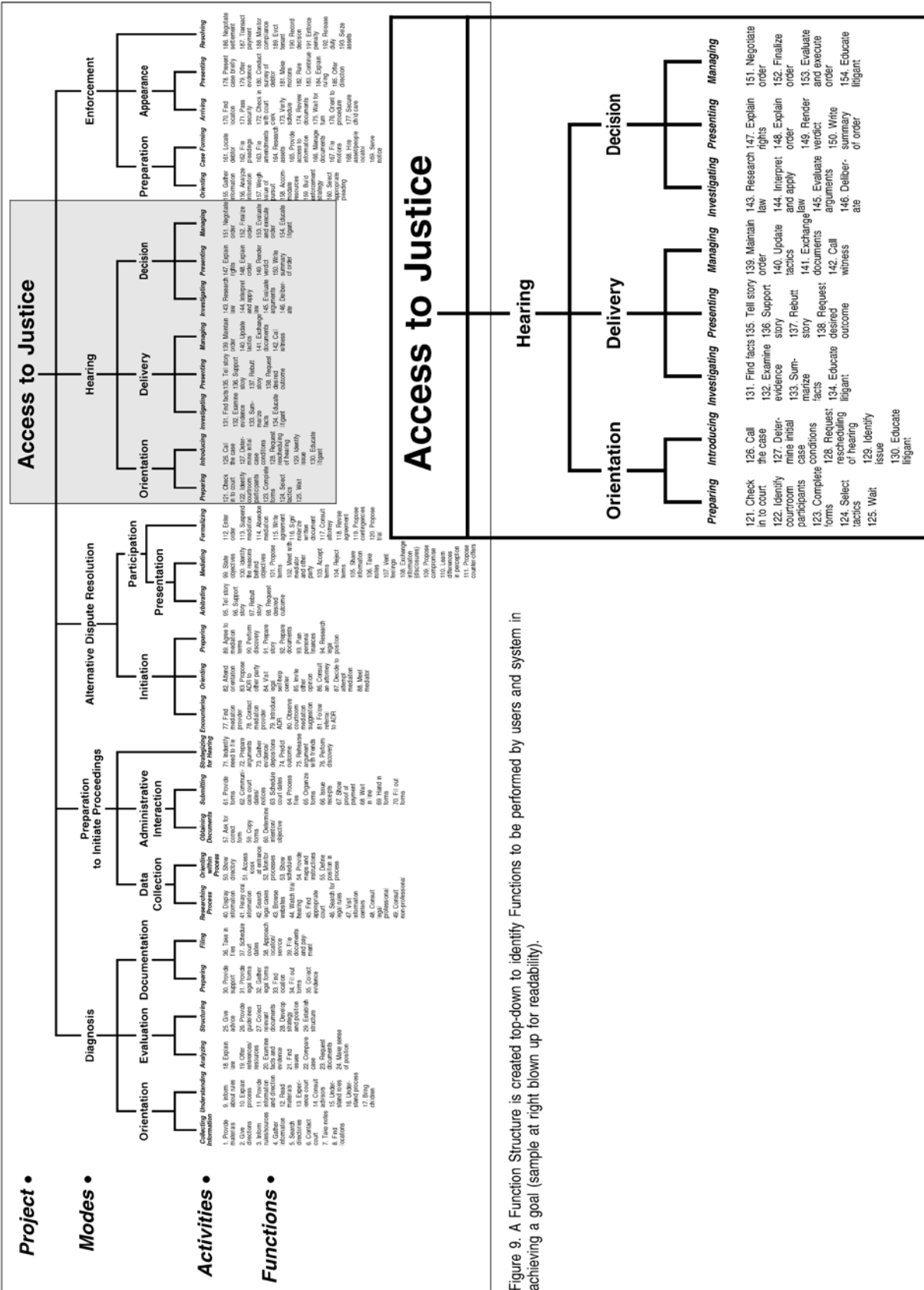
Figure 9. A Function Structure is created top-down to identify Functions to be performed by users and system in achieving a goal (sample at right blown up for readability).

Phase II: Action Analysis. Any system can be viewed as a complex entity working with its users in ways appropriate to its modes of operation. To plan effectively, a planning team must recognize these Modes, identify Activities that occur within them, and isolate the Functions that users and system are expected to perform within each Activity. The result of the Activity Analyses is a Function Structure (Figure 9).

Half of the purpose of Action Analysis is the enumeration of Functions. The other half is the development of information about them that reveals insight about what happens as they are performed. During Action Analysis, insights are sought about why things go wrong in performing some Functions, and how other Functions manage to be performed well. These insights are uncovered in the Design Factor Description procedure and developed in one-page documents that become part of a qualitative knowledge base. Activity Analyses record information at the Activity level and identify Functions that must be performed; Design Factors document insights (with observations and extended discussion) and ideas associated with the Functions (with design strategies for using the insight and speculative preliminary solutions embodying the strategies).

To capture the ideas suggested on Design Factor documents while they are fresh and clear, Solution Element documents are prepared. These are also written on simple one-page forms designed to collect enough detail about ideas to give them substance when they are needed later. They have three important sections: "Description"—a short explanation of the idea, "Properties"—what it is, and "Features"—what it does.

The products of Action Analysis are three sets of critical information: a set of Functions (the Activity Analyses with a Function Structure), a set of insights (Design Factors) and a set of preliminary ideas (Solution Elements). Together, they form a knowledge base allowing ideas to be traced to their sources. Figure 10 shows how these are inter-related.

Activity Analysis — Activity: Orienting — 26

Project: **Access to Justice**

Mode: Enforcement

Originator: Holly Roeske

Contributors

13 Feb., 2001 — Loren Gulak — Michael Heller — Jennifer Joos — Jin Lee

Scenario: A self-represented litigant seeks to understand the enforcement process and form a strategy to pursue a judgment made in his favor.

Development

Functions
↓
Design Factors
↓
Solution Elements

Trace Back

Functions
↑ ↑
Design Factors
↑
Solution Elements

Users (Players)
- Self-represented litigant
- Plaintiff's family/friends
- Court staff
- Other self-represented litigants
- Assistance program staff
- Facilitators (in some states)

System Components (Props)
- Forms
- Brochures
- Computer station
- Printer
- Database
- Work surface

Environmental Components (Set)
- Lighting
- Space configuration
- Work space
- Storage units
- Computer network
- Library

Functions — Associated Design Factors

155. Gather information — 136. Unable to Locate Information
158. Accommodate resources — 138. Resources Not Consolidated
— 137. Space Not Provided
159. Build enforcement strategy — 139. Tools Not Available
157. Weigh value of pursuit — 135. Unable to Assign Value to Options
160. Select appropriate pleading
156. Analyze information — 140. Unable to Comprehend Material

Version 3 — Date: 1 May, 2001 — Date of first version: 31 January, 2001

Design Factor — Title: Unable to Assign Values to Options — 135

Project: **Access to Justice**

Mode: Enforcement (Preparation)

Activity: Orienting

Originator: Holly Roeske

Contributors

16 Feb., 2001 — Loren Gulak — Jin Lee — Jennifer Joos — Michael Heller

Source/s: Heller, Shapiro and Firsone Ltd. **Notes on Collection.** Chicago: Unpublished notes, 2000.

Associated Functions
157. Weigh value for pursuit
160. Select appropriate pleading

Observation: When more than a few options are available to self-represented litigants for enforcing a judgment made in their favor, it can be difficult to select among the options.

Extension: Enforcement of a judgment can be a time-consuming and expensive process. Many self-represented litigants are unaware of the significant additional commitments they may have to make in order to collect on a judgment made in their favor. Assuming that a favorable judgment is the end of the process is a not-uncommon mistake of litigants working on their own behalf.

Enforcement of a judgment can be made in a number of ways including: mediation, additional court proceedings leading to the setup of payment plans, garnishment of wages, and several other means. Each procedure has different time and effort requirements. Some judgments may be so small relative to the time and resources necessary to collect them that the self-represented litigant may well consider not even pursuing collection.

Design Strategies — Solution Elements — E Existing — M Modified — S Speculative

Provide means to identify options and decide among them — Pursuit Evaluator
Match impacts of enforcement strategies to self-represented litigant's life style — M Enforcement Checklist

Version 3 — Date: 29 April, 1999 — Date of first version: 15 February, 2001

Solution Element — Status: Existing / Modified / Speculative — Title: — Pursuit Evaluator — 242

Project: **Access to Justice**

Mode: Enforcement (Preparation)

Activity: Orienting

Originator: Holly Roeske

Contributors

29 Apr., 2001 — Charles Owen

Description: A tool to assist self-represented litigants in identifying the means for enforcement of a judgment made in their favor. Helps them to decide whether or not to pursue enforcement.

Source (if existing or modified): New concept.

Properties — what it is:
- A decision support tool
- An interactive computerized data base
- Access via internet or intranet (within court facilities)
- Software for calculating and comparing user resources with estimated resources required for enforcement actions
- Multiple interface modes
- Means for comparing user input information with information in data base

Features — what it does:
- Provides a means for self-represented litigants to evaluate their personal priorities
- Identifies the financial, time and travel resources that self-represented litigants have available
- Identifies the various means that can be used to pursue enforcement of a judgment
- Identifies the potential financial, time and travel investments associated with the various means of enforcing the judgment
- Overlays personal means (resources) with the investments that must be made for each potential judgment collection route
- Provides information for self-represented litigants to make an informed decision regarding enforcement of a judgment

Associated Function/s
157. Weigh value of pursuit
160. Select appropriate pleading

Source Design Factor/s
135. Unable to Assign Values to Options

Version 2 — Date: 29 April, 2001 — Date of first version: 20 February, 2001
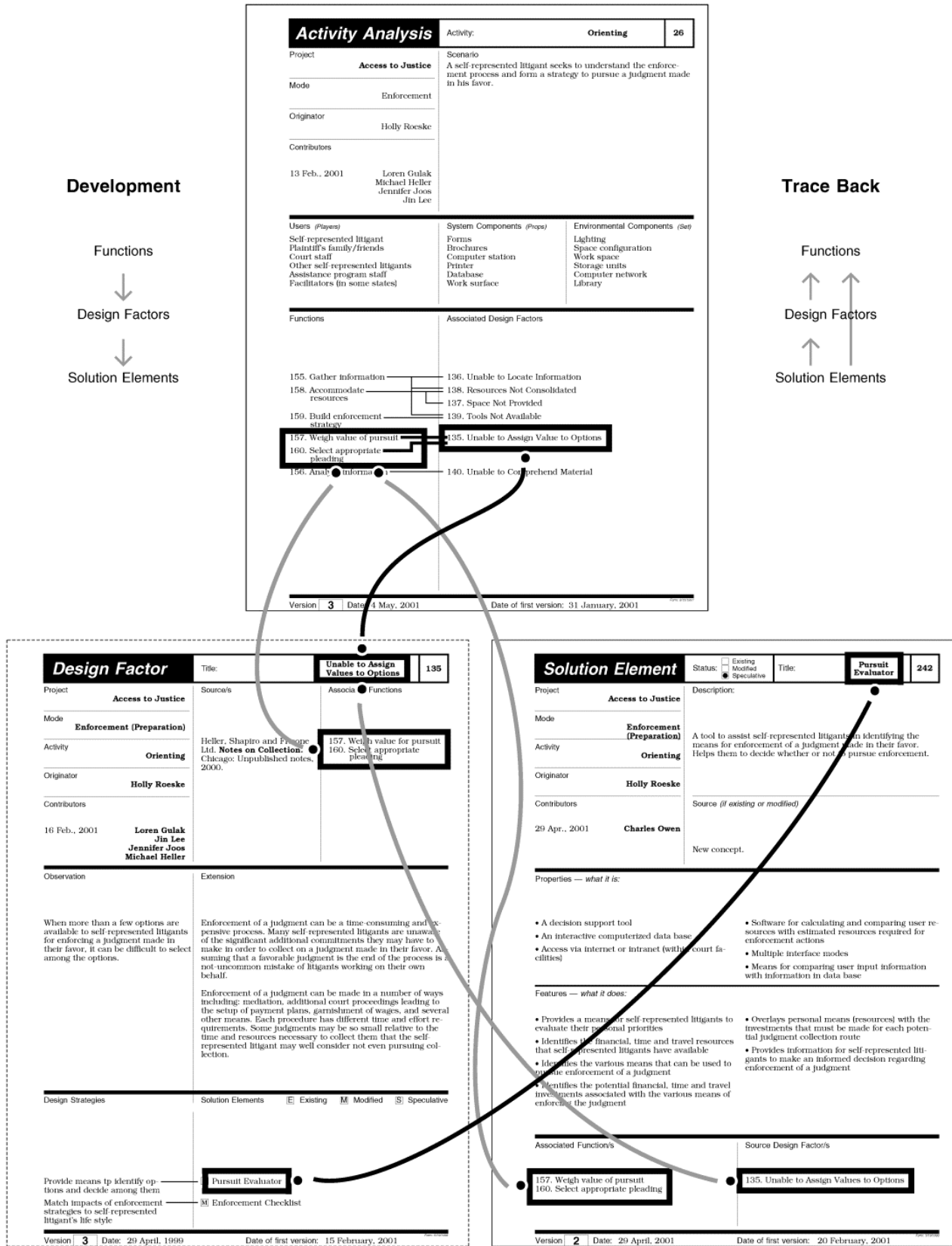
Figure 10. Activity Analyses establish Functions to be performed; Design Factors explore insights about functionality; Solution Elements capture ideas for how to use the insights. Black flow lines follow the flow of information forward; gray flow lines record source documents and suggest ways to use them.

Phase III: Information Structuring. Paradoxically, as useful as a Function Structure is for establishing system coverage, it is not the best form of organization for developing concepts. Reorganizing information for use in concept development is the job of two computer programs, RELATN and VTCON.

The controlling factor for whether two Functions are associated from the planning standpoint is not whether they are categorically related in some manner, but whether a significant number of their potential solutions are of concern to both. Which Solution Elements are of concern to each Function is established in an Interaction Analysis procedure. The RELATN program then uses this information to construct a graph establishing links between Functions.

Another program, VTCON, completes the information structuring process. In its Hierarchy Construction activity, VTCON finds clusters of highly interlinked Functions and then clusters the clusters at higher levels until the reorganization is completed with a node representing the complete system. The revised organization is called an Information Structure (Figure 11). It is a hierarchical model designed for synthesizing.
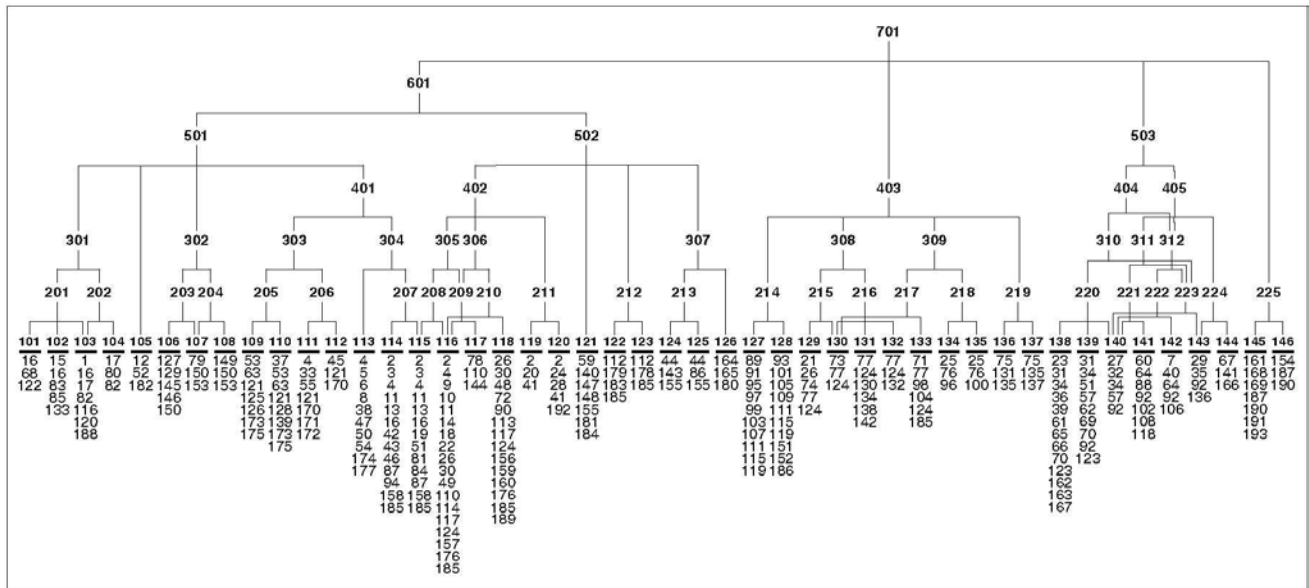
Figure 11. An Information Structure reorganizes the Functions from the Function Structure into clusters based on their likelihood to benefit from the same solutions. It then clusters the clusters hierarchically to form a structure ideal for creative synthesis.

Phase IV: Synthesis. In its form from the VTCON program, the Information Structure is simply a hierarchical reorganization of Functions. Nodal points above the Function level do not have names. The task of Means/Ends Analysis is to create labels for these nodes. Moving bottom-up from the known Functions in the bottom level clusters, names are found to label nodes as "ends" for which next lower-level nodes (or, at the lowest level, Functions) are "means." The process continues to a completely labeled Information Structure.

The process is then reversed as a top-down, structured brainstorming procedure: Ends/Means Synthesis. This process and Means/Ends Analysis are illustrated in Figure 12.

| Functions | *Means* | → | Ends | *Means* | → | Ends | *Means* | → | End |

Means/Ends Analysis

Cluster: 306

Project: Access to Justice

2 Give directions
4 Gather information
9 Inform about rules
10 Explain process
11 Provide information and direction
14 Consult advisors
18 Explain law
22 Compare case
26 Provide guideline
30 Provide support
49 Consult non-professional
110 Learn differences in perception
114 Abandon mediation
117 Consult attorney
124 Select tactics
157 Weigh value of pursuit
176 Orient to procedure
185 Offer direction

78 Contact mediation provider
110 Learn differences in perception
144 Interpret and apply law
26 Provide guideline
30 Provide support
48 Consult legal professional
72 Prepare arguments
90 Perform discovery
Suspend mediation
117 Consult attorney
124 Select tactics
156 Analyze information
159 Build enforcement strategy
160 Select appropriate pleading
176 Orient to procedure
185 Offer direction
189 Evict tenant

116 Assisting preparation

117 Exploring resolution options

118 Strategizing

209 Identification of legal options
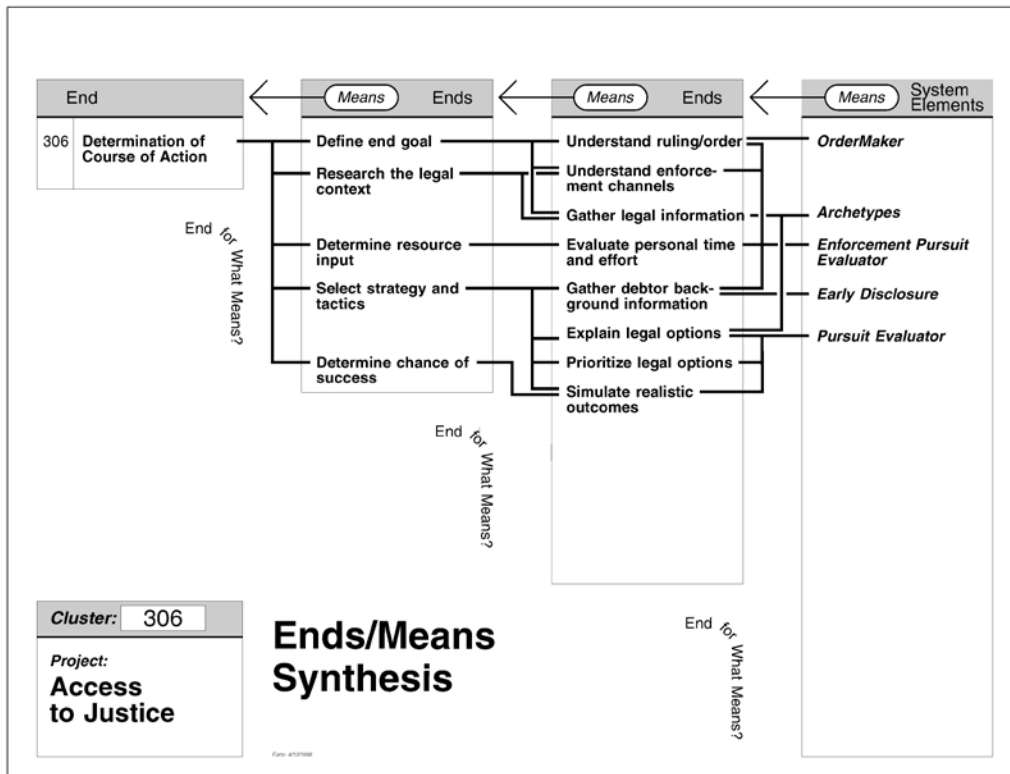
210 Preparation of strategy

306 Determination of course of action

Means to What End?
Means to What End?
Means to What End?

Ends/Means Synthesis

Cluster: 306

Project: Access to Justice

| End | | *Means* | Ends | | *Means* | Ends | | *Means* | System Elements |

306 Determination of Course of Action

Define end goal
Research the legal context
Determine resource input
Select strategy and tactics
Determine chance of success

Understand ruling/order
Understand enforcement channels
Gather legal information
Evaluate personal time and effort
Gather debtor background information
Explain legal options
Prioritize legal options
Simulate realistic outcomes

OrderMaker

Archetypes
Enforcement Pursuit Evaluator
Early Disclosure
Pursuit Evaluator

End for What Means?
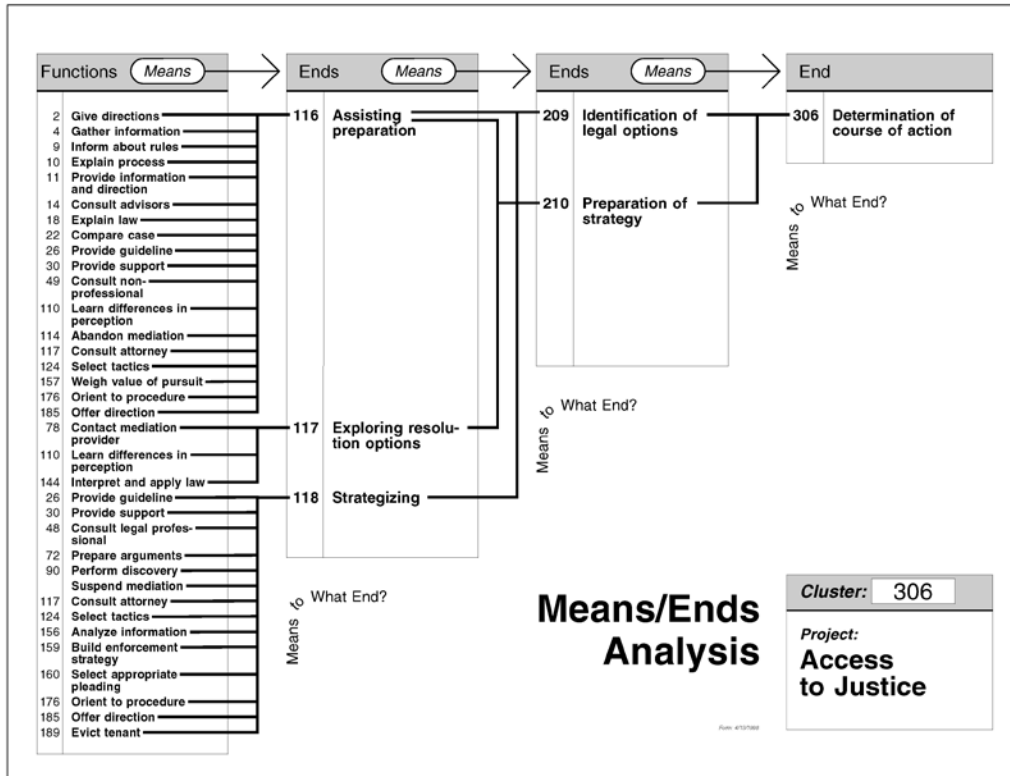End for What Means?
End for What Means?

Figure 12. Means/Ends Analysis (above) finds labels for the nodes of an Information Structure, working bottom up from the clusters of Functions. Ends/Means Synthesis (below) works top down within the labeled Information Structure to synthesize existing, modified and newly devised solutions.

In Ends/Means Synthesis, the planning team asks of high level nodes, "what means do we need to meet this end?" As means are established, they are treated in turn as new ends for which lower level, more specific means must be found, until the means become concrete enough to be described as final elements of the system (System Elements). Existing Solution Elements are reviewed as potentially usable directly, usable with modification or usable in combination, and new ideas are developed to fill needs or opportunities newly recognized because of the restructuring.

System Element Interaction (Figure 13) compares System Element with System Element in a search for additional synergies that can contribute to systemic qualities. More than simply recognizing relationships, the planning team proactively seeks out inventive new ways for System Elements to work together—the invention and design of relationships. Changes and additions are incorporated in the properties and features of the individual System Elements.

The last Synthesis task, System Element Description, completes the specification of System Elements with succinct Descriptions, essential Properties and Features, and extensive Discussion and Scenario sections that contain detailed expositions of the ideas in both conceptual and operational form.

Phase V: Communication. Because the result of the Structured Planning process is a complex system, usually with a number of System Elements, a Communication Structure is frequently included as an aid to understanding. This is created during Concept Organization by the VTCON program from an assessment of how important the System Elements are to each other's operation. Using this structure, the reader can understand the system more easily and navigate its concepts with efficiency.

The product of the Structured Planning process, assembled in the Project Completion section, is a Conceptual Plan, made up of an Overview that provides background (primarily from the Charter) and introduces the system, the System Elements that describe ideas and relationships, and Appendices that contain all relevant support information, including the Defining Statements, Design Factors, Function Structure, and Information Structure.

Phase VI: Evaluation. Structured Planning incorporates evaluation within the steps of the process (self-governing practicality) most notably during Synthesis. It also offers an optional full-system evaluation technique that can be employed to evaluate final results against policy-level and/or function-level criteria. Used for this, it provides merit values hierarchically for the system, its component parts and individual system elements. It can also create similar hierarchical evaluations for the assessment of functional performance and policy performance.

Used to compare systems, it can provide system, functional, and policy assessments for multiple competitive candidates measured against common function and system structure frameworks. The evaluation process is taught in a separate 8-week project course also incorporating hands-on evaluation of a full system.[7]

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[7] A detailed description of the evaluation process can be found in Owen (2007). A downloadable version is also available at http://www.id.iit.edu/141/.
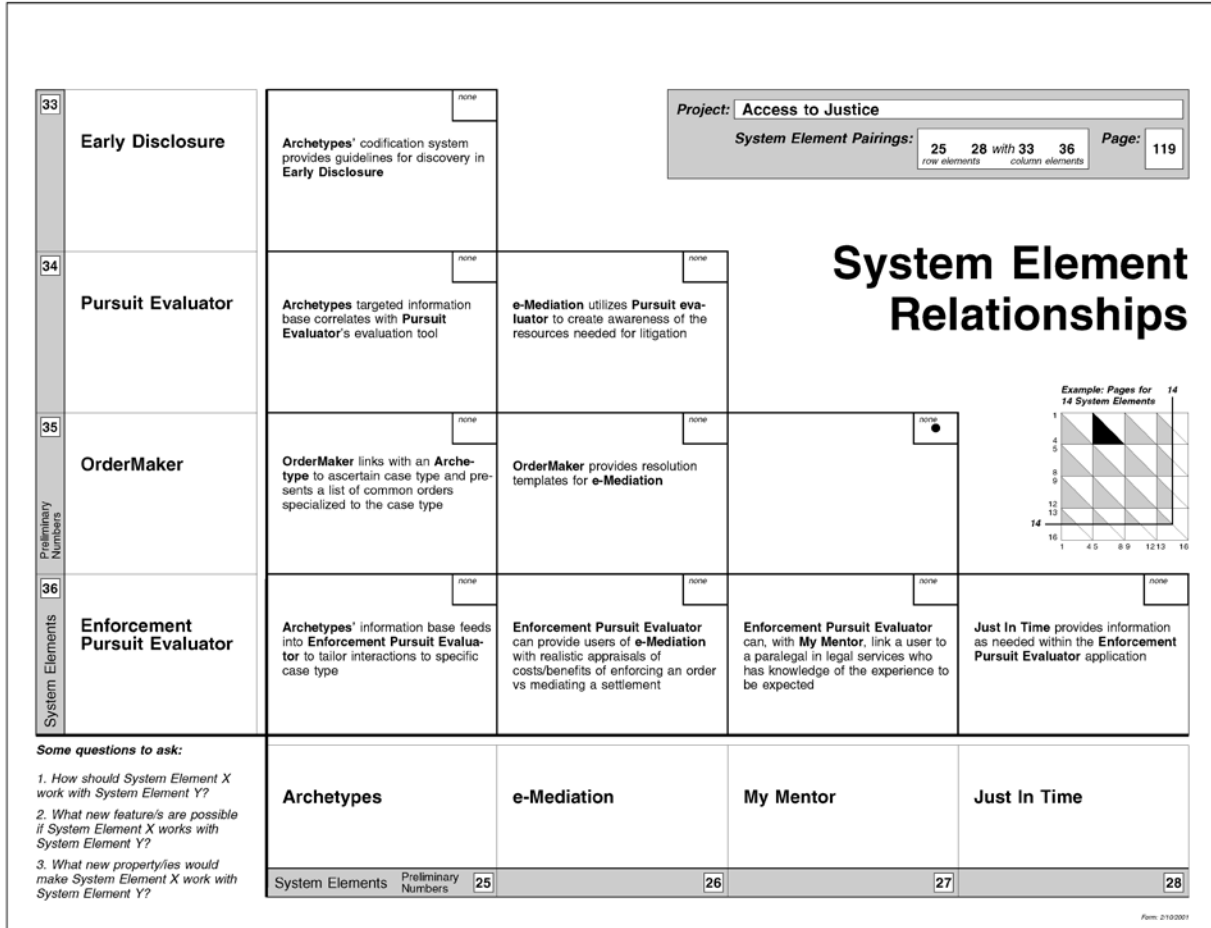
Figure 13. System Element interaction forces comparison of working System Elements with each other to search for ways that they can work with each other, applying creative synthesis to relationships as well as entities.

Note. An important point to emphasize is that Structured Planning is a flexible, modular process. While it looks complicated in the diagrams (and it is complex), its individual methods can be engaged or not, modified to suit the situation, used in different ways, and used as complements to conventional methods. The process provides an information-handling backbone as planning moves through the stages of collecting, interpreting, organizing, and using information.

Organization of the Workshop

To optimize learning, project participation is restricted to a group size small enough to allow every participant to have a turn as team leader. This usually means 20 - 25 class members, although smaller classes can be accommodated, and slightly larger classes have been managed successfully. Projects are typically divided into two parts: an 8-week, 3-segment first part for research and analysis, and a 7-week, 2-segment second part for synthesis and communication. In the first eight weeks, teams of four or five work on separate aspects of the problem, establishing the Functions the system should perform, gaining insight about them along with on-the-spot ideas for how to use the insights, and organizing the Functions into a Function Structure.

In the 7-week second period, after the Functions have been reorganized by computer into an Information Structure, the teams are reformed to include at least one representative from each of the original teams, enabling each new synthesis team to have knowledge of the entire project to date. The newly constituted synthesis teams devote Phase IV to developing component solutions for the sections of the Information Structure assigned to them.

In the fifth, final phase, teams are reconstituted once again to optimize team communication skills. Needs of communication typically break down into organization, visualization, writing, and technical support. The reformed teams take the developing conceptual System Elements from the synthesis teams and, working with representatives of the original teams, turn sketched-out concepts into finished descriptions for a final presentation and report.

Development of Team Skills

Good teams do not just happen. They develop when team members work at being good team players, and team leadership provides just the right amount of direction, organization, and support to build positive associations among members and enthusiasm for team goals.

A team becomes a real team when it becomes a trust group—when a level of trust has been reached that permits team members to say things in meetings that they would be unlikely to say normally for fear that they might be ridiculed, embarrassed, or even just thought to be not well enough informed about the subject. In a trust group, members can take chances with thoughts and ideas that are not completely air-tight, but may have a kernel of importance that shouldn't be lost.

To build that kind of trust and working effectiveness requires sensitivity and personal interaction skills. These can be acquired on the job through self analysis and reflection, but it helps to have some formal support. The team evaluation process described here has been developed in the Systems and Systematic Design Workshop. In its present form, it has proven able to move learning along quickly and to contribute to the development of strategic design planning skills.

Four premises pinpoint problems to be overcome:
- Team members do not easily see themselves as others see them.
- Honest criticism may be hard to take directly from peers.
- Annoyances, unchecked, can drain group productivity.
- Cultural insensitivity can lead to misunderstanding and miscommunication.

Four steps make up the process:
- A project is divided into phases, at least one for each team member.
- Evaluation forms are filled out at the end of each phase. Team members and leader evaluate themselves as well as other team members. Scaled evaluations are given for fixed criteria (e.g., participation in the process, use of time, overall performance, overall contribution to the group). Narrative comments are written about notable behavior, positive and negative.
- Reports are assembled from team members' forms by an instructor or project administrator. Composite values are calculated for fixed criteria and reported graphically.

- A summary synthesis of narrative comments is offered along with written recommendations for behavioral changes to improve performance.

In order to give all team members practice at being team leader, a project must have at least as many formal phases as there are team members. For projects with high expectations for insightful analysis and creative solutions, a team should be neither too large nor too small. Experience suggests no fewer than three, but no more than five or six members. Any smaller, and there are not enough members to get the work done; any larger, and it becomes difficult to make decisions. Four or five members are optimal, and the Structured Planning process can be nicely fitted to that many phases. For numbers less than five, phases can be combined or some members can be team leaders more than once.

Instituting Change

Significant change almost always means culture shift. While organizations such as businesses, institutions, and the military have their differences, one characteristic common to all when making changes is resistance.

Although it is well understood that organizations that fail to evolve will be left behind, resistance to change is so ingrained it is almost impossible to convince some leaders that the wisdom of change also applies to them. John Kenneth Galbraith said it well: "Faced with the choice between changing one's mind and proving that there is no need to do so, almost everyone gets busy on the proof."

This section will discuss some of the ways that implementation of change can fail and some ideas for how to increase the odds that changes will stick. Observations are from my personal experience and are primarily from the business world, but, with allowance for differences, most have relevance for change introduction in the military.

Paving the Path to Failure

Too simple; too complex. Sometimes it is hard even to get started. When a process change is to be introduced, there always has to be a beginning. The question is how to present it. Will the audience be disdainful if the process seems too simple—or will it be turned off if it seems too complex?

Almost any useful change will have to be extensive enough to provide real gain over current practice, but that will bring to everyone's mind the questions: "How hard will it be to learn and implement this? Will it be worth it?" Senior decision makers will be weighing potential benefit versus disruption. All too often, the perceived cost of disruption overrides the potential benefit. Disruption is hard to estimate, but benefit—especially for more complex processes—is much more difficult to gauge. The process may be implemented regardless of how it is received, but the seeds for rejection may be planted if it gets off to a bad start.

Ahead of its time. On one occasion, I was asked to present a project for which a student team had received a high-level international design prize. The interest was actually in the process

(Structured Planning) which had been used to develop the concept, and the invitation was from a Fortune 500 company's CEO. He had also invited the company's Vice Presidents of R&D and Marketing. After the presentation, the CEO turned to the VP's with the question, "Are we doing anything like that?" The answer was "No, but we think we are doing all right". Actually, they weren't doing that badly at the time, but they weren't staying ahead of their competitors, either— as events proved out.

Another occasion involved several demonstration projects for business undertaken simultaneously in the Systems and Systematic Design Workshop. The impetus was a remark made by a corporate leader who had seen some of the more advanced, large-scale projects done at the school—most notably Project Phoenix on climate change in the late 1980's. He commented, "Can you use that process for more down-to-Earth projects? We build widgets!" His remark led to five demonstration projects using five leading companies (Sony, HP, Apple, Siemens, and Xerox) as the projected clients. Most company contacts were interested in a planning horizon of about 3-5 years, but one asked especially that we look ahead a little further for them. When the project was completed and results were transmitted up the corporate ladders, the result that came down from that company's board chairman was that our proposal was "a little too far in the future!" The team thought otherwise and, sure enough, the key conceived software component appeared in the market two years after the project—but not from that client.

In both cases, conservatism ruled. In the first case, the process was considered ahead of its time relative to what was needed for the company. In the second, management underestimated the rate of technical development underway globally and mistakenly branded a timely proposal too far ahead of its time. Experience shows that the competition is usually closer than you think. Strategic design planning needs to be clearly advanced.

Don't be the first. Whatever happened to risk-taking? Nobody wants to be first anymore. Really, to be globally competitive, an organization now must take risks, even to the extent of routinely making its own products and services obsolete. That requires a long step out on the risk-taking plank. Ultimately, it means treating the processes of planning in the same way as the products of planning. Committing to the early adoption of new tools, methods, and processes is becoming just as important as committing to staying ahead in the roll-out of hardware and services. It is about staying ahead in all elements of development. Yet, there is still strong resistance to being the first to try out the "new."

One of the first questions researchers get when they give talks about new tools for advanced planning is, "Who are using these tools now?"   My answer often is, "no one yet," both a reminder that what has been discussed is ahead of the curve, and the implication that those in the audience have an early opportunity. Smart organizations recognize that global competitiveness requires more risk taken carefully to stay ahead of a growing field of competitors.

Good times/bad times. A related observation that continues to confound me is how advanced planning budgets follow the business cycle just like every other budget. Even for the military, budgets follow a wax and wane cycle, with political and economic differences, but similar in fashion as private sector budget cycles. When times go bad in the cycle, advanced planning slows down in business and tightened belts are applied in the military. Understandably, when

times are bad, costs have to be cut. But all costs? Could there be some costs that might actually be gainfully maintained or could funding even be increased in opposition to the cycle?

When the elements involved in bringing a product from inception to implementation are considered for business—advanced planning, design, engineering, manufacturing, distribution, etc.—advanced planning provides considerable bang for the buck. In fact, it may be the most cost-effective element in the whole process. For the military, upstream planning is similarly cost effective in comparison with what has to be spent to obtain and introduce new policies and the equipment and training to implement them. When an organization must reduce costs, the savings to be gained from significant budget reductions are not evenly distributed. The advanced planning function is small in terms of staff and cheap in terms of resources required. Reducing its effectiveness at the bottom of a funding cycle is exactly what an organization should not do! Not much is saved, and a lot is lost. Advanced planning is the future, and the best time to work on the future is when others are not, at the bottom of the economic cycle.

There is an opportunity to be realized here. In good times, personnel and the organization are maxed out, and it is hard to institute change, whether it is a revolutionary new product to obsolete a presently good one or a revolutionary new process to replace a functioning procedure. In bad times, both time and personnel are available (if downsizing has not prevailed), and advanced planning and the dissemination of its results can be most effective.

The chosen few. Internal people-problems can seriously compromise attempts to implement change. They often arise when the change is initiated insensitively in a compartmentalized "selected" group within the organization. The idea that some are the chosen and others are not can cause subtle barriers and defenses to be raised that can block adoption of new ways once the early novelty and support have subsided.

An example of this several years ago in our university community involved the introduction of a new approach to teaching undergraduate engineering. The change required all undergraduate students from the freshman year on to undertake team projects in which learning was project-oriented. As students matured, they assumed greater leadership roles, culminating in full project leadership in their senior year. Subject matter normally taught in lectures (such as mathematics and engineering sciences) was committed to modules for self study undertaken as needed by students working one-on-one with faculty member "tutors". The process was radical, but results were extremely good. Nevertheless, when funding from the National Science Foundation ended following the multi-year project award period, the program only continued for a few more years before being terminated by the more traditional general faculty.

What happened? The program was teaching-intensive and highly interdisciplinary; faculty worked much more closely with students than under traditional practice. And while they were doing so, they were away from their home departments and the usual organizational politics. When they came up for promotion, they did not have the internal networking of their competitors, and when the program itself needed departmental support for continued life, it failed to receive it.

Divided loyalties. A related problem develops when a pilot project to test out new planning techniques is staffed with team members from different units within an organization. Typically, none of the organizational units involved has ownership, and the team members are on loan for the duration of the project. The project usually starts out well, but as time goes on, the need for individual members to spend more time with their home units for "emergencies" grows. Since the home unit leaders don't have responsibility for the pilot project's success, they find it ever easier to "need" their members for internal problems.

When projects are organized in this way, the time allowed for the project should be doubled and additional outside resources should be prepared to be injected when, usually at the end, there is more work to complete than team members can manage. Even then, there usually is loss of team morale, noticeable in the quality of the work. The ultimate loss may be the success of the project itself which fails to achieve its potential.

Rotating managers. The nightmare problem for change-makers is one totally outside their control: loss of the manager responsible for commissioning and overseeing the project.

The rotating manager problem widely infects American business practice, but it exists in other organizations too, including the military. The scenario proceeds as follows: far-thinking leader champions promising new process; negotiations determine conditions for experimental project; project begins under guidance of leader; midway through project, leader is transferred to new position; replacement neither understands new process nor shares interest; project terminates with incomplete or scaled-down results; new process is abandoned. Change introduction is a delicate process. Beheading the team is no way to nurture it.

The wrong champion. Having a champion is the next best thing to being in charge—well almost. But it does help with internal competition. In the western world, competition rules as the evolutionary mechanism for achieving success. Besting opponents is a necessity. Cooperation, as an alternative mechanism, comes in far second. Given this competitive environment, having someone in the organization interested in and supportive of your goals confers a valuable competitive advantage. But that advantage can vaporize if the champion does not him- or herself enjoy a favorable power position.

Introducing change with the support of a champion works better top-down than bottom up. If the change is minor or easily mastered, championing usually works either way, but if the change is major and/or requires a significant learning effort, it is very hard to introduce bottom-up. For a tough sell, it helps (and may only be possible) when the champion carries some clout.

Some Steps along the Way.

Vaclav Havel, playwright, essayist, and first President of the Czech Republic put it cleverly, "Vision is not enough. It must be combined with venture. It is not enough to stare up the steps; we must step up the stairs." Here are several steps that can help to make change easier to institute and accept.

1. Find a high-level champion. Vice presidents, directors and, by implication, their equivalents in the military and institutions other than business have proven to be the best level champions—especially Vice Presidents for R&D and other leaders who have had responsibility for planning or development. They usually understand best and have the vision to see the value.

2. Establish an advisory committee. Key people can provide insight into an organization's operations while, at the same time, helping to prevent problems from developing. Coming to them for advice while reporting on progress also leads to positive information distribution.

3. Include key leadership in milestone events. If those in the decision chain—including potential replacement leaders—can be kept up to speed, the rotating leader problem may be eased (but not eliminated).

4. Make sure change benefits are known. In the process of information collection and operations analysis for a project (or planning for the implementation of a change), candidly work into interviews and discussions how changes will benefit all. "What's in it for me" is a natural question, and a good answer builds support.

5. Make progress visible and involving. To the extent possible, display progress where others in the organization will encounter it. On one advanced planning corporate project, an in-progress Function Structure was created on a wall outside the project workroom. Employees passing by couldn't resist checking parts relating to their work and confirmed or helped the team to improve the model.

6. Give credit where it is due and make it visible. In documents—and anywhere it is feasible—identify sources of information, insights, and ideas. Not only is it important for the record (and building the knowledge base), it helps to motivate providers to buy into the project.

7. Provide feedback to information sources. Beyond documentation, those who provide information for the project should be made aware personally of how their help has been beneficial. This takes time, but if it is handled informally as opportunities arise, it is both possible and effective.

Aim high!

"The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it". Michelangelo Buonarotti.

Summary and Conclusions

Concerns within the Army for what the balance should be between tactical and strategic thinking are mirrored in the design field. The changing scale of problems to be faced and the range of emerging technologies that may have impact require a new emphasis on strategic thinking. The experience of those working with the transformation of design education may have direct value for the Army. At the strategic level, differences between fields and professions tend to vanish in the face of common purposes. Four topics from design are particularly relevant.

First is a set of high-level characteristics and principles for thinking strategically that can be used to frame policies or problems and approaches to solving them. Fourteen of these used in strategic design thinking are discussed. All offer ways to prepare mentally for strategic problem solving and policy making. Where they are governing principles, they provide over-all direction; where they are characteristics of thinking, they prescribe good models of behavior.

Second is a way of teaching strategic design thinking. The lecture model for teaching has its place, but for inculcating strategic thinking, project-oriented learning is far better. And because strategic thinking usually involves groups rather than individuals, team projects are the most appropriate learning vehicles. In team meetings, governing principles can be introduced, embodied in strategies, discussed, applied, and the results critiqued.

Third is an approach to building team skills that involves leader experience, peer evaluation, self evaluation, and a review process designed for positive reinforcement based on candor, trust, and training sincerely committed to improving interaction skills.

Fourth is a list of potential pitfalls that can befall well-intentioned change makers. All have been observed by the author. Insights gained from them can prevent repeat occurrences, and a set of suggested proactive steps along the path to implementation can help to smooth the way.

Experience has shown that a serious project at a strategic level can be undertaken successfully by small teams in a 15-16 week period. Given a process tailored to the information handling needs of strategic planning, teams structured for learning as well as doing, a set of strategic guidelines to guide thinking, and a procedure for evaluation to focus team interaction, learning takes place in the best way—where the learner is personally invested, tangible results flow from the team's own invention, and the intensity of the experience embeds the learning irrevocably.

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Section 4
Ways of Thinking

Chapter Eleven

**Professional Military Education's Imperative of Linear/Nonlinear Thinking Style Balance
for Improved Strategic Thinking**

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Introduction

In all sectors of our highly interconnected global society—military, government, for-profit, non-profit—we face an increasing maelstrom of apparent chaos, where there is tremendous uncertainty, growing complexity, rapid change, daunting competitive forces; and we are constantly barraged by a tremendous amount of information with various levels of clarity and credibility. The U.S. Army in particular is facing increasing pressures for budget reductions and competing demands, forcing strategic and operational paradigm changes to ensure security in the often mystifying face of rapidly transforming and emerging geopolitical environments. Gone is the era of strategic thinking and planning that relied upon logical, systematic strategy formulation by a few top officials viewing predictable, long-term horizons. Strategic thinking for today's U.S. Army, and other branches of the military, must be both multidimensional and holistic, give interactive attention to both strategy formulation and implementation that involves all levels of personnel. In view of today, even Napoleon likely would have agreed that both good officers *and* good foot Soldiers are essential in the strategic thinking mix. More than ever before, U.S. professional military education (PME) in all branches and for all human talent levels must build strategic thinking skills that emphasize flexibility, innovation, and entrepreneurship for identifying and acting upon opportunities in a timely manner to maintain competitive advantage.

In facing today's rapidly changing, highly complex, and uncertain global environments, sometimes characterized as "nonlinear dynamical systems" (Horgan, 1989), military personnel often are required to make quick decisions, both strategic and tactical, with an insufficient amount of data. Using a traditional *linear* decision-making approach characterized by experience-based rules, rationality, analysis, logic, reason, and cause-effect predictability, we no longer can hope to compete with those who now also actively employ alternative *nonlinear* thinking and decision-making tools such as expertise-based intuition, emotion, imagination, and creativity. In order to meet the demands of our nonlinear world we must adopt a dualistic, versatile, linear/nonlinear thinking approach, relying in decision-making on a balance between deliberate rational and nonlinear thinking.

There has long been a major distinction between the two general linear and nonlinear forms of human thought underlying such essential activities as learning, problem solving, and decision-making. The ancients from both the East and West were dealing with linear and nonlinear thinking when they emphasized the importance of balance between mind and heart. Pythagoras, the Greek philosopher and mathematician of the 5th Century B.C., believed that our human soul functioned through a necessary mind and heart connection, where intuition and reason best work in harmony. And he was predated by Chinese Taoists and even earlier Indian thinkers who pointed to helpful and insightful guidance for life's journey by merging our logic and rational thinking with inner processes of imagination and intuition through meditation.

But until now our thinking style in Western society has been greatly influenced by a worldview grounded in the Newtonian reductionist, determinist, and equilibrium-oriented tradition in which any system is composed of divisible parts and relying on an analytical methodology. This prevailing scientific perspective pervading current education and practice assumes that the relationships between variables are one-dimensional and linear. However, this strictly linear thinking approach is less useful for understanding complex and unpredictable nonlinear dynamical systems where the behavior of the whole is not necessarily equal to the sum of the parts.

Contrary to more recent models of scientific and rational management inherited from our Western Age of Reason, we are increasingly noting that leaders and managers who are able to tap into their nonlinear thinking processes, and to encourage and coach those around them to do likewise, are able to maximize their strategic pool of viable alternative solutions for problem solving and decision making. Cooper and Sawaf (1997) assert that in effective problem solving and opportunity sensing "…our innermost feelings activate or drive the process, enabling us to instinctively scan for hidden possibilities in every setting and circumstance…" (p. 237). On much broader levels of organizational and national competitiveness, many business leaders identify creativity as key to future success. As Robert Reich (2000) asserts in his book, *The Future of Success*, competitive advantage will not come through knowledge workers, but rather through the contributions of creative workers.

But we also can go overboard in relying too much on nonlinear "outside-the-box" thinking to assess the waters and chart our course. In his recent book, *Thinking, Fast and Slow,* Daniel Kahneman (2011), recipient of the Nobel Prize for his seminal work challenging the rational model of judgment and decision making, nevertheless cautions us against a bias toward the use of System 1 (fast, intuitive, and emotional) in our thinking and decision-making at the neglect of System 2 (slower, more deliberative, and more logical). And despite its clear value and continuing popularity, it is possible to embrace the EQ (emotional intelligence) movement too enthusiastically. Excessive dependence on intuition and emotion-based cues may lead to eventual disaster when important external cues and critical facts are not adequately considered. In some cases (such as with an impassioned drive under visionary, charismatic leadership to achieve higher levels of performance) major organizational chaos can result. Without careful analysis, organization, and measured risk taking, charismatic leadership can catapult any field mission or organizational effort into irretrievable disarray. In reality, current models of emotional intelligence emphasize an active interplay between middle brain and forebrain—emotional and rational—activities.

Successful value-adding entrepreneurs and innovators (including *intrapreneurs* within large organizations and institutions), with their highly valued talent for new opportunity recognition, are commonly stereotyped as relying heavily upon such nonlinear thinking style patterns as intuition, insight, creativity, imagination, vision, and optimism that support risk-taking and dogged perseverance in the face of failure. However, research also indicates that successful entrepreneurs depend upon highly technical, scientific skills that demand analytical, data-driven, linear thinking, and decision-making. In fact, my recent research demonstrates that successful entrepreneurs employ rational, linear thinking to help them avoid detrimental, illogical cognitive biases, such as the "law of small numbers" (i.e., basing decisions on an inadequate sample). In

risk taking, successful entrepreneurs also wisely include linear thinking to maintain a solid foothold on reality and not succumb to the twin perils of unchecked high optimism: overconfidence and complacency, leading to arrogance, delusions of infallibility, and lack of vigilance—often attributed to the eventual military undoing of Napoleon (Kroll, Toombs, & Wright, 2000). Clearly, effective strategic thinking for today's U.S. Army that employs innovative planning and problem solving for today's highly complex, rapidly changing, and uncertain global environment requires reaching beyond merely an analytical framework to include nonlinear tools in an overall balanced approach. Linear and nonlinear thinking style balance and integrated thought can yield a powerful synergy toward optimal strategic thinking and decision making. Without a concentrated focus on building linear/nonlinear thinking style balance, Army efforts at improving strategic thinking will result in limited and haphazard results at best.

The aim of this paper is to help raise awareness of the importance for the Army and broader military contexts of bridging the often wide chasm between the two fundamental styles of linear and nonlinear thinking, by which individuals perceive and process their reality. We first will examine important contributions to effective strategic thinking of linear and nonlinear thinking style approaches, including distinct dimensions of nonlinear thinking that recently have been identified. We then will review two practical instruments for assessing the degree of balance in an individual's linear/nonlinear thinking style profile, as well as, for diagnosing relative strengths within various dimensions of the nonlinear domain for guiding more customized training and meeting individual development needs. We finally will consider competency development ideas among the various nonlinear dimensions for building helpful versatility as well as for gaining overall linear/nonlinear thinking style balance for enhanced strategic thinking ability.

Examining Linear and Nonlinear Thinking Style

Thinking style is frequently defined as an individual's predominant and habitual pattern of using mental abilities to manage daily tasks, including perceiving, understanding, and solving problems. Thinking style involves both the source of receiving information (e.g., external observable data versus an "inner voice" or "gut feeling") as well as how that information is processed. To some extent socialized and often used without conscious choice, thinking styles may vary depending on the conditions and demands of a given situation. In our examination of linear and nonlinear thinking style and the need for balance and versatility, we will frequently note how these two general approaches interact and are closely integrated in effective strategic thinking.

Linear thinking style

By linear thinking we refer to thoughts progressing in an orderly, logical line or direction, inferred from prior thoughts, and based on tangible or observable data. Common terms for this thinking orientation include analysis, logic, reason, and inference. The general linear approach in strategic thinking involves carefully and systematically, without influence of emotion or preconceived notion or bias, examining the relevant facts to come to a conclusion. In strategic thinking, analysis breaks complex systems into component parts. It is central to how organizations function and how field missions are carried out by making explicit the division of

labor among groups and individuals. Analysis helps us to understand subsystems and their various contributions, and how to make them mesh productively. Analysis reveals critical communication links and internal and external interdependencies for ensuring successful goal achievement.

A linear approach can be particularly helpful in decision making when factual evidence is lacking. For example, when your instincts suggest that a candidate being considered for hire lacks needed leadership qualities, it would be prudent to ground your final decision in more solid evidence than an intuitive hunch. You might, therefore, take a linear approach and gather additional evidence, such as arranging for interviews by others with diverse perspectives, as well as conducting thorough background and reference checks. A linear approach also can be used when high emotion is involved that may interfere with desired thinking and performance. In fact, there actually is an important rational side of EQ.

According to the widely recognized model proposed by Mayer and Salovey (1997), emotional intelligence calls upon both the *nonlinear* ability to sense emotion in ourselves and others and use it to facilitate thinking and appropriate behavioral responses, as well as the *linear* ability to understand or diagnose feelings and logically manage and regulate them in ways that ultimately support desired performance. As an extreme example from WWII, American troops in active combat involving heavy casualties were at times advised by commanders to consider themselves already dead, as a way for them to change their linear cognitive outlook to better cope with their otherwise debilitating fear. As another illustration, Tom Landry, the successful coach of the Dallas Cowboys, reportedly once recognized (i.e., linear assessment) an excessive level of stress and anxiety within his football team, leading to difficulty in concentration and potentially destructive conflict, as they prepared for a crucial playoff game where concentration and cooperation were essential. To productively manage this excessive emotion in his players, Landry arranged for the next practice to be conducted without equipment in an extremely muddy field, resulting in fun and humor for the players that provided an effective catharsis and stress release to allow them to more effectively focus together on the upcoming game.

Nonlinear thinking style

The general nonlinear approach in strategic thinking departs from the logical line of thought, but in itself is not "illogical." Thinking "outside the box" is a process that can generate a vision of what is possible beyond the traditional way of doing things that otherwise restrain or "box in" our alternatives. This nonlinear thinking orientation is qualitative and holistic. Well acquainted with linear thought, the great 17th Century French mathematician, physicist, and philosopher, Pascal, was speaking of this nonlinear approach apart from reason and logic when he made his famous assertion, "The heart has its reasons which reason knows nothing of."
However, the literature on this alternate non-rational perspective has lacked a unifying framework, and frequently lumps together under one general category different aspects of this perspective (e.g., intuition, creativity, holistic thinking, emotional intelligence, etc.). Much past work on the rational (linear) and non-rational (nonlinear) dual processing theories has characterized the latter as intuitive and involving largely automatic and unconscious mental processes. Yet our use of imagination, creativity, or commitment to particular core values—all nonlinear in nature—certainly can involve our conscious, deliberate choice. Even my past work

asserting that balance and versatility of linear and nonlinear thinking styles are essential for effectiveness in such areas as leadership, building and sustaining innovative organizational cultures, and ethical and entrepreneurial decision-making has been limited by the treatment of nonlinear thinking as one large amorphous construct (Vance, Zell, & Groves, 2008). Just as a Soldier's mediocre overall test score on "Warrior Tasks and Battle Drills" would not be very helpful in identifying specific skill areas for improvement through customized training, individuals diagnosed with a high linear thinking style profile would have little targeted guidance for how to strengthen their nonlinear thinking to achieve greater balance.

My colleagues and I therefore conducted further research to better understand the nature of nonlinear thinking and the important dimensions that comprise this major thinking style. As a result, we now have identified seven distinct, yet highly interactive and interrelated, key dimensions of nonlinear thinking style: intuition, insight, creativity, flexibility, imagination, emotion, and values. These thinking style dimensions are certainly not new, but their combination into the broader construct of nonlinear thinking now provides a more useful picture of balanced linear/nonlinear thinking style for effective strategic thinking. Let's now take a look at each of these important nonlinear dimensions and their contributions to effective strategic thinking.

Intuitive thinking. Much research has examined the role of intuition in information processing and decision-making, and particularly as it concerns executive-level strategic decisions. Where complex decisions need to be made under a tight deadline and in the midst of an overwhelming mass of often confusing and conflicting information, successful leaders and managers often rely on intuitive judgment based on their past rich experience. Holistic in nature, intuition often is the result of an automatic and unconscious assessment of the interrelated parts of a complex nonlinear system where an individual scans the integrated "big picture" to point to appropriate decisions and new directions, rather than getting bogged down in the detailed analysis of huge and complex data sets.

The use of intuition is most appropriate for larger, unstructured and complex tasks with relatively high uncertainty and multiple variables, rather than small tasks that likely have clear associated, tested, and validated rules. The use of intuition also is not for the novice, but is reserved for experts with years of experience and applied to tasks within their domain of expertise. A particular challenge to the credibility of one's intuitive judgments is the fact that intuition reveals the answer, but doesn't explain why. Through experience we learn to trust this inner sense of what to do (or not do) and decide accordingly. We may even invent explanations to help satisfy ourselves and others. But true intuition reveals the answer before the rational explanation is known (if ever).

Although much of the literature discusses intuition as highly related to feelings and emotion particularly associated with initial cues, such as an "inner feeling" or "gut feeling," intuition is considered here as distinct from the nonlinear dimension of emotion. To illustrate, a retired firefighter friend of mine, Bob, often was involved in battling the deadly late summer and fall wildfires of Southern California that are fomented by the hot and dry Santa Ana winds. On one particular occasion he was serving as a captain leading a crew of about 20 men, and working to contain a particularly challenging fire. Suddenly one of the men shouted out that the fire had

turned and now was quickly moving toward them. The crew member anxiously asked, "What should we do, Captain Bob?" Bob quickly scanned the situation, and immediately knew the answer. He didn't really know why, but he knew as clear as a bell in which direction the crew should evacuate, yet without any associated feeling of dread when considering one option versus a positive feeling for another option. The only problem was that Bob's decision pointed to an unburned area, and all of his and the crew's scientific and rational experience-based training recommended evacuation under these circumstances over ground that had already been burned. It must have been hard for the crew to follow Bob's command, but they did so with Bob taking up the rear. Suddenly the winds again changed, and the fire quickly engulfed the area that had been assumed to be already completely burned. In following his intuition in this particular situation rather than his linear mode, Bob led his crew to safety, avoiding what could have been a very costly, tragic outcome.

Insightful thinking. Insight is the formation of an answer to a problem that suddenly appears after a combination of initial rational analysis, and typically followed by an "incubation period" of continued unconscious problem work before a solution suddenly presents itself. According to some studies, this incubation break in conscious attention and active problem solving primarily provides a productive diversion, releasing the person from a restrictive mindset and erroneous set of assumptions, allowing fresh new perspectives upon returning to the problem. Other formal studies, as well as several anecdotal accounts, propose an incubation phenomenon that automatically follows from an initial, rational, but fruitless problem-solving effort. This incubation period involves an unconscious processing of information and data in non-logical and non-rational ways—more easily permitted by the subconscious—until a solution suddenly emerges and is realized in a "eureka!" experience.

Whereas intuition, arising from the unconscious, results in a sense of direction and knowledge without a clear linear understanding and ability to offer rational justification, insight ultimately is conscious and explicable, representing an enlightened solution to a previous uncertainty. Also, whereas intuition typically involves using integrated and holistic thinking on an unconscious basis, insight is gained by initially consciously examining as many relevant parts of a system as possible, and eventually followed by an uncontrolled, natural rushing together of the pertinent parts or variables into a "big picture" of understanding. Although induction or inductive reasoning, the famed trade of the mythical Sherlock Holmes, often is included in the linear thinking category, it also involves an unconscious incubation period followed by a more nonlinear sudden gestalt or holistic perception of the answer.

Creative thinking. Nonlinear dynamical systems are filled with uncertainty and are highly unpredictable, where seeming chaos eventually evolves into new, more orderly patterns. As an appropriate thinking style for nonlinear systems, creativity is characterized by unconventional, nontraditional, and innovative thinking patterns combined with rational analysis. Many past writers have discussed creativity and creative processes in ways involving deep reflection and meditation, incubation, and illumination that cross into our nonlinear dimensions of intuition, imagination, and insight. But as we consider here, creative thinking is simply predisposed to novelty, as in the Apple, Inc. mantra, "Think different." Individuals following a creative thinking style are readily able to release the old and to consciously experiment with and adopt new perspectives, and reassemble interrelated parts of a system in new and unusual ways leading to

viable solutions. In his version of this nonlinear style termed "lateral thinking," Edward De Bono (1992) describes thinking techniques that involve consciously changing concepts and perception in novel ways where reason is not immediately obvious—in taking a "lateral step to the side" to gain a new perspective on a problem. Highly creative individuals often are characterized as having the ability to let go and break out of old ways of thinking, and have the propensity to venture into new directions even before the well-worn track begins to lag in productivity.

Imaginative thinking. Whereas creative thinking involves the conscious search and selection of new and unconventional approaches or perspectives to a problem, decision, or task performance, imaginative thinking features the deliberate formation of visual mental images, models, words, ideas, feelings, and other forms of symbolic representation that may support creative thinking. As a strong advocate of linear thinking, Aristotle also held that imagination bridges the gap between images and ideas, and provides an inner stage for the work of logic and reason. Yet as a nonlinear dimension, the focus of imagination is on mental processes within an inner world that may simulate reality to a great degree, but is not reality.

Compared to linear thinking approaches, imagination permits a more effective use of unstructured, diverse, random, irreverent, blasphemous, uncensored, and even contradictory information within an unstable, free-wheeling internal environment potentially leading to enhanced understanding. In addition, imaginative thinking provides the mental space and open flexibility where creativity can experiment with multiple novel re-combinations to form innovative, productive solutions, and where an otherwise overwhelming array of data in the actual environment can be simplified and explored. As Albert Einstein reported, he was able to imagine himself traveling on a light beam, and then convert his fanciful galactic journey into a rational, testable theory.

The use of metaphors and analogies play an important role in imagination. They increase mental flexibility by pulling the individual away from a familiar context and into a new world where novel and unusual applications and relationships can be freely and uncritically explored. Metaphors can be helpful in increasing flexibility by bringing a comparison of a problem with a seemingly unrelated object or system, providing new perspectives for gaining better understanding of complex systems, and generating multiple creative solutions. They have been found to be particularly helpful compared to traditional analytic techniques in improving the quality of strategic planning and decision-making when facing environmental uncertainty. Management scholar Karl Weick, in his seminal work analyzing crisis crews fighting wildfires, has drawn from this powerful contextual analogy valuable strategic lessons for leaders of businesses and other organizations that are foreign to this very vivid context (Weick, 1996).

Emotional thinking. Apart from intuition, there is considerable evidence that feelings and emotions can affect thinking and decision-making at unconscious and conscious levels, both of which being potentially useful to strategic thinkers as they face complex challenges within a seemingly endless array of data and probabilities in nonlinear systems. Impaired emotional functioning can lead to a continual search and analysis of data and their myriad permutations, with the inability to make a decision in a timely manner and move on by being satisfied or comfortable with an acceptable level of uncertainty. To assist with this tendency toward indecision amidst uncertainty, our brain's limbic system, much older in evolutionary

development and playing a major role in human emotion, often automatically employs feelings-based mental processes to scan an otherwise overwhelming presentation of data from a nonlinear system and predispose an individual to focus attention more deeply on a more realistic amount and arrangement of data.

On the other hand, emerging work in the area of neuroeconomics points to the subliminal and potentially negative effects of emotions on negotiation and consumer behavior, suggesting the value of increased awareness of these less productive feelings-based tendencies and the need to then counter them for outcome optimization. Nevertheless, emotions can be helpful in directing our attention for productive reflection, insight, and learning. As mentioned earlier, emotional cues can spark and facilitate the use of intuition. Finally, recent work on positivity in personal and organizational life suggests that cognitive models, feedback, and other activities that promote positive emotions can lead us from moribund inactivity and destructive pessimism to confident and measured risk taking, realistic enthusiasm, and confidence in addressing a complex, chaotic, and turbulent world that demands constant adaptation and innovation.

Our consciousness of raised feelings, whether positive or negative, resulting from a broad preconscious scan of the data can influence our decision to reject a proposed direction, to accept the direction and move forward with confidence, or to delay in the interest of gathering additional evidence. As mentioned earlier related to an often overlooked rational side of EQ, emotional intelligence also involves our effectively managing our emotions, allowing us to overcome fear of the unknown and venture out to explore new possibilities. Successful strategic management requires the input and commitment of people at all levels for effective strategy formulation and implementation. However, their inability to manage their unsettling fear of the unknown in the face of strategic change often results in stubborn resistance and even sabotage. Therefore, the importance of organization-wide competence with this nonlinear dimension associated with managing fear of change and discomfort with uncertainty cannot be overly emphasized.

Values-centered thinking. Unlike the typically fleeting nature of feelings, other values-based aspects related to human emotion may be more enduring in influence on thinking style, and include emotion-laden beliefs, virtues, and perceived priorities. Ethics involves the use of linear thinking logic that ultimately stems from a nonlinear system of embraced values. The core values of an organization to which leaders and their employees are committed for the long-term can serve as a productive influence in effective strategy implementation. Core values can constitute a compass providing common decision-making guidance and collective alignment, unity, and stability during otherwise dizzying environmental storms of significant challenge, change, and uncertainty. Many successful multinational organizations such as Johnson & Johnson actively use mission and credo statements that highlight core values and priorities that facilitate communication, understanding, and common goal commitment in their operations around the world despite widely diverse national and cultural environments. Many organizations, including the U.S. military, use stories, slogans, and many symbols that represent core behavioral values that encourage continued commitment and support long-term purposes and strategic goals. Notable within the context of the U.S. Army are "Army of One," and "Army Strong," as well as the soul-stirring core values of liberty, bravery, courage, cherished heritage, sacrifice for the

greater good, and persistence represented in the Army's official song, "The Army Goes Rolling Along."

Models of value-based leadership, widely endorsed as contributing to effective leadership across cultures, describe the relationship between a leader and one or more followers based on strongly internalized ideological values held by the leader, as well as follower identification with and commitment to those values. Strength of character can be described as the degree of enduring emotional commitment to particular virtues and values in considering decisions and guiding subsequent behavior. Returning to positive psychology, healthy optimistic personalities are characterized by enduring commitment to particular virtues, attitudes, and practices that are not dependent on a rational analysis of external conditions and circumstances.

Flexible thinking. In my recent work to gain a clearer picture of the multidimensional nature of nonlinear thinking style, an unexpected finding was the identification of the distinct dimension of flexibility. This dimension is an essential prerequisite to innovation, and involves the capacity to change and to adapt to a challenging environment. It can be either adaptive in response to challenges or opportunities posed by the environment (e.g., "necessity is the mother of invention"), or spontaneous, as with a personal preference for a change without any external prodding or pressure. Individuals high in flexibility are able to easily zoom in and out in the course of problem analysis, getting a clear assessment of the details yet also maintaining the big picture; they are able to take in both the forest and individual trees. They have open demeanors and are easily accommodating. They are comfortable with uncertainty and the unknown, and have little difficulty in holding final judgment in abeyance.

From my past research on the "status quo" cognitive bias that impedes innovation and needed change, it became clear that individuals high in a linear thinking style were less comfortable with change than those who expressed either a high nonlinear or a balanced linear/nonlinear profile. Of course, the aspect of change is a common feature of strategic thinking, planning, and management. Emotionally-based resistance to change arises among many when they face the prospect of letting go of something known that is functional or acceptable in favor of something less familiar yet nonetheless likely more advantageous (e.g., "If it ain't broke, don't fix it"). Moreover, where needed change is acknowledged, the term "analysis paralysis" often has been used in strategic planning to describe the tendency to postpone moving ahead with action in a new direction and to continue with a seemingly endless process of data gathering and analysis, due to the disquietude, stress, and even fear associated with uncertainty surrounding the new direction.

High "linears," under the influence of the faulty status-quo bias, often respond to stress and anxiety in the face of uncertainty associated with change by touting the "sunk cost" rationalization, where a proposed change should be passed up since it is reasoned that too much has already been invested in the current approach to abandon it (e.g., "We have come too far to turn back now," or "How could we pull out now? It would be a dishonor to so many Soldiers who have lost their lives in this conflict"). In risk taking situations, this status-quo bias and accompanying sunk cost rationalization are expressed by individuals also desiring to avoid embarrassment to ego (thus also involving the emotion and values dimensions), where continuing along the same path is somehow preferable to cutting one's losses and moving to a

more productive direction. One is reminded of President Lyndon Johnson's purported defiant answer to Secretary of Defense, Robert McNamara, when the latter proposed not continuing and increasing troop deployment after concluding that it would not be possible to win the war in Vietnam: "I will not be the first American president to lose a war."

An important aspect of the nonlinear dimension of flexibility is its facilitative influence upon the other dimensions, as well as being a critical antecedent to the broader important pattern of linear/nonlinear thinking style balance, which requires a versatile movement between linear and nonlinear modalities. For example, a flexible orientation is necessary to withstand the temptation of forcing a "satisficing," yet not optimal, decision based on immediate logic, and to temporarily leave the linear domain and, in the case of using insight, allow nonlinear unconscious processes to operate and finally present a better solution.

In addition, within nonlinear thinking style, flexibility plays a key role in the assessment of possible nonlinear thinking style approaches given the unique demands of a particular problem situation, followed by the selection of the most expedient nonlinear approach or approaches to guide problem solving and decision-making. For example, where creativity would involve the consideration of a novel approach in problem solving, flexibility is first required to permit the novel consideration. Or especially in the case of the nonlinear dimension of imaginative thinking, the use of metaphors and analogies to promote understanding and insight toward problem solving requires flexibility in letting go of the current reality and considering the problem within a completely different and even fanciful context.

Measuring Linear and Nonlinear Thinking Style

Based on our recognition of the importance of linear/nonlinear thinking style balance for optimal performance in numerous areas, including strategic thinking, my colleagues and I developed and validated across several different student and professional groups the Linear/Nonlinear Thinking Style Profile Assessment© (LNTSPA) instrument (Vance, Groves, Paik, and Kindler, 2007). This 26-item forced-choice self-report measure of thinking style includes five initial behavioral statement pairs followed by eight word or phrase pairs representing linear and nonlinear sources of information and decision-making processes. An example of initial paired behavioral statements includes, "I primarily rely on logic when making career decisions" and "I primarily rely on feelings when making career decisions." Example word or phrase item pairs include "Feelings" and "Facts," "Inner Knowing" and "Logic," and "Felt Sense" and "Reason." For each of the paired behavioral statements or words/phrases, respondents are asked to allocate exactly three total points to each pair, the allocation of which indicating the perceived priority of each statement or word/phrase relative to the other in the pair. To assess an individual's linear/nonlinear thinking style profile we simply add the point allocation scores for the linear and the nonlinear statements and words/phrases. A person's degree of thinking style balance is indicated by the absolute value of the difference between the overall linear score and overall nonlinear score—the smaller the resulting number, the greater the linear/nonlinear thinking style balance. We have found this instrument to be very easy to administer and, with its simple self-scoring capability, effective in providing immediate individual feedback to optimize meaningfulness on our subsequent instruction on thinking styles and skill development exercises for building linear/nonlinear thinking style balance.

To provide deeper understanding of one's multidimensional nonlinear thinking style profile, as well as to provide a picture of overall linear/nonlinear thinking style balance, we more recently developed and validated across multiple different groups the Linear/Nonlinear Multidimensional Thinking Style Assessment© (LNMTSA) instrument (Groves & Vance, 2011). This diagnostic tool, composed of 40 items reflecting linear thinking style and each of the above seven nonlinear thinking style dimensions, asks respondents to indicate (on a 5-point Likert-type scale of 1 = disagree strongly to 5 = agree strongly) the extent to which various statements on decision-making styles and preferences accurately describe their own thinking and decision-making style. Examples of linear thinking style statements include, "My understanding of a problem tends to come more from my rational analysis than my intuition," and "I primarily rely on logic when making important decisions." Table 1 features example statements from each of the seven different nonlinear thinking style dimensions.

Table 1
Examples of Nonlinear Dimension Statements from LNMTSA©

Intuitive Thinking	I primarily weigh my intuition when making a decision about a major purchase. When making decisions about issues with which I am very familiar, I often rely on my intuition rather than quantifiable, objective evidence.
Insightful Thinking	When I don't arrive at an immediate answer to a difficult problem, I often put the problem aside to return to it at another time. When I am unable to come to a satisfactory answer to a problem, I often let it go for a while, and later the solution often suddenly presents itself when it is least expected.
Creative Thinking	I prefer to solve problems using nontraditional methods. I like to consider new ways of doing things rather than remaining with the same familiar way.
Imaginative Thinking	I use metaphors to enhance my logical understanding of difficult challenges. To help maintain my motivation, I like to visualize the successful completion of a project I am working on.
Emotional Thinking	When I meet with others to make a group decision, I encourage a friendly atmosphere to support effective collaboration. My dissatisfaction with a situation keeps me working toward a satisfactory solution.
Values-Centered Thinking	Whenever considering competing options, I tend to go with the option that is most consistent with my core values. I prefer to let my personal principles guide my decision making.
Flexible Thinking	Most people would describe me as flexible when it comes to adopting various approaches to solving problems. To fully understand a complex problem, I consider hard facts as well as my gut feelings.

In a similar fashion as in the simpler LNTSPA instrument, an individual's degree of overall thinking style balance on the LNMTSA is computed by taking the absolute value of the average of the linear thinking style item scores minus the average of the nonlinear thinking style item scores, again the lower the resulting number indicating the greater the degree of linear/nonlinear thinking style balance. The relative strength of a particular nonlinear dimension is provided by computing the average of the rating for the statements corresponding to that nonlinear dimension, and comparing this average with the average rating of each of the other dimensions. An individual's relative strength picture for each of the nonlinear dimensions thus provides helpful diagnostic guidance for further individualized training for building specific nonlinear thinking style dimensions.

Developing Linear/Nonlinear Thinking Style Balance

High performing officers and administrators must apply both linear and nonlinear thinking approaches in strategic thinking to clarify objectives, uncover hidden opportunities, systematically investigate and resolve stubborn problems, reach difficult decisions, and work with a variety of stakeholders on strategy formulation and cost-effective implementation strategies. When there is an imbalance in thinking style, leaders and professionals do not address the above highly demanding activities with full strength and versatility. The challenge for officers, administrators, and all personnel alike is, upon thinking style profile diagnosis, to develop their less-preferred thinking modalities and integrate them into their overall thinking style to achieve a synergistic pattern that fully takes advantage of the strengths of all styles. There is considerable literature providing helpful guidance on developing the various dimensions of nonlinear thinking style discussed in this paper. However, it is important that training be customized to the needs and performance requirements of individual learners. Although thinking styles are habits that have been developed over many years of use, they can be changed through conscious, deliberate effort and practice. The various dimensions of nonlinear thinking style discussed above can differ greatly in requirements for competency development, both in approaches and time. For example, while workshops on techniques in insightful thinking, creativity, and imagination can yield immediate improvements in participant skills, true intuition requires years to form.

The knowledge and competence underlying effective intuition is implicit or tacit and hidden from everyday awareness. It is the resulting accrual of inner knowledge about patterns and interrelationships of variables within an individual's focus of expertise. The long duration required in the formation of intuitive skill is filled with repetition of tasks involving holistic judgments and enacted within an interplay of a multitude of variables—many of which are irrelevant to a particular situation or task at hand. A necessary feature associated with this task repetition is feedback, which allows a continued honing of the intuitive judgment skill. Various training programs exist that facilitate individual access to intuitive awareness and decision-making through exercises in meditation, relaxation, visual imagery, awareness of feelings, and mindfulness. For example, training programs can focus on avoiding habitual, mindless behavior by increasing awareness of the "here and now" and of what one is currently doing and feeling, and remaining neutral and nonjudgmental to avoid distraction due to programmed biases and prejudices, and preexisting misconceptions. Useful recent descriptions of these approaches for building intuition skills include work by Heydenfeldt and Herkenhoff (2011), and Sadler-Smith

and Shefy (2007). Recent descriptions of approaches for building the other identified nonlinear thinking style dimensions include the following: for creativity, Kerr and Lloyd (2008), and Mayfield and Mayfield (2008); for insight, Segal (2004); for imagination, Gibb (2004); for emotional intelligence, McEnrue, Groves, and Shen (2009); for values-centered thinking, Urbany, Reynolds, and Phillips, (2008); and for flexibility, Georgsdottir and Getz (2004).

In our workshops for building general linear/nonlinear thinking style balance we give participants the simpler self-scoring LNTSPA instrument and provide immediate feedback on the nature of their predominant thinking style, whether linear, nonlinear, or balanced. We then work with the participants to understand and practice complementary perceptual and decision-making processes in specific situations or imaginary settings—using a style that they normally would not employ. For example, to begin building awareness of a complementary thinking style, we present paired words or phrases affecting behavior from the survey such as the above "Feelings" versus "Facts," or "I primarily rely on logic when making career decisions" versus "I primarily rely on feelings when making career decisions." We then ask participants—especially those who indicated a strong preference either way—to share why they responded the way they did. This sharing in groups and in total participant discussion typically opens up some new perspectives on thinking style modeled by fellow participants.

To build strengths in using a nonlinear thinking style, we provide exercises and techniques for understanding and harnessing creativity. We also provide training in dealing with ambiguity and holding problems in abeyance for effective incubation, full use of the senses for expanded perceptiveness, and relaxation techniques for enhanced flexibility and mental preparation to receive insights. For augmenting linear thinking skills, we provide training in rational and critical thought involving a systematic process of analysis in problem solving. Here we have participants practice solving various problem vignettes using different criteria or lenses for analysis—including technical, economic, social-psychological, political, and legal-ethical perspectives—and systematically applying each lens for analysis before coming to a solution to the vignette.

In subsequent work-related and personal problem vignettes, we provide practice for the participants in identifying and using complementary approaches to problem analysis and decision making for building synergistic thinking. For example, Figure 1 features a sample vignette for each participant to analyze and come up with an initial approach or solution for handling the situation (linear and nonlinear thinking style approaches are also illustrated here). Then each participant is asked to try to formulate a reasonable complementary approach for dealing with this situation, and these complementary approaches are discussed and shared in small groups and among total participants. This exposure to broader perspectives promotes thinking style flexibility.

Vignette: After a long career with a high-tech company, Bill's manager is about to retire. Bill is doing such an outstanding job that his manager has just recommended to upper management that Bill replace him as group leader. Bill gets the promotion. He is excited but feels hesitant to manage the team, particularly because several members are considerably older than he.

       1. How should Bill's manager approach this situation?
       2. Now consider and indicate how a complementary (linear or nonlinear) thinking style approach might reasonably address this situation?

Sample Linear Approach: Bill's outgoing manager should tell Bill that he has all the knowledge and skill needed to do an outstanding job. However, if Bill feels he needs more training, special leadership courses can be arranged.

Sample Nonlinear Thinking Approach: Bill's manager should probe into Bill's concerns. He is likely to learn that Bill feels ambivalent about managing people who are old enough to be his parents. During his first several months on the new job, Bill should be assigned a mentor who can help him to deal with this common concern, one that many young and talented people experience.

Figure 1. Sample Work-Related Vignette for Practicing Synergistic Linear/Nonlinear Thinking

For participants for whom the LNTSPA instrument already indicates a balance in linear and nonlinear thinking skills, we also involve them in the above nonlinear and linear thinking skills training to raise their awareness and to help them maintain this balance. Additionally, through significant participant interaction, we aim to employ their thinking style to model and reinforce the learning of the other participants. We have found that through effective sharing and interaction among participants in our training process, those with predominant nonlinear styles can help the linear thinkers build greater awareness and use of balance, and vice versa. The active participant interaction and sharing also clearly lead to a greater affirmation and appreciation for others possessing a predominant complementary thinking style.

Our workshop participants often report appreciation for an increased awareness of useful alternative thinking tools for expanding their capabilities in problem solving and decision making. To encourage retention of new complementary skills and positive transfer into actual work applications, we include workplace application assignments to be reported in subsequent follow-up and refresher skill training, or through reporting of individual assignment results via e-mail or telephone communications. Participants typically describe a greater flexibility and broader, balanced repertoire of perspectives in their workplace and personal life problem analysis and decision making. Managers and supervisors also have reported an inevitable rubbing off of their own more balanced thinking styles upon their direct-reports who observe new styles in group discussions and problem solving, and through their manager's effective example learn to employ more balanced approaches in their own thinking styles.

Conclusion

In the U.S. Army and elsewhere, balance and versatility in linear/nonlinear thinking skills provide an essential foundation in supporting strategic thinking that leads to effective strategy formulation and implementation. And as all personnel can contribute to both strategy formulation and implementation, there is a strong imperative for all to build strengths and versatility in linear and nonlinear thinking style. Leaders, officers, and administrators who possess this linear/nonlinear thinking style balance will demonstrate greater ability in such important operational areas as coaching and mentoring, building employee trust and commitment, effective innovative behavior and risk taking, and even ethical and responsible decision making. Pertinent to all Army personnel, strategic thinking and problem solving behavior leading to ongoing quality improvements and innovation require a balance and synergy of nonlinear and linear thinking skills for both effective strategy formulation and implementation.

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Chapter Twelve

A Science of Context:
The Qualitative Approach as Fundamental to Strategic Thought

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Introduction

Much of the reason the Army struggles with true strategic thinking and views such thinkers as outsiders in its ranks is because the prerequisites to strategic thinking are antithetical to the Army's dominant professional culture. That culture privileges a techno-scientific quantitative/predictive worldview. Yet strategic thinking requires a fundamentally different worldview, one that is oriented around a qualitative way of thinking about problems.

More specifically, strategic thinking involves the evaluation of "political, economic, psychological and military forces," to reach a state of national advantage (Luttwak, 1987, pg. 239-41; q.i. Heuser, 2010, p. 9). The disciplines that define strategic thought, political science, economics, psychology, and military science all require grounding more in qualitative social science methodology than the quantitative.

This paper argues that, despite this, military culture continues to conflate strategic thought with a flawed, quantitative/predictive model of the social sciences. The result is that when this inherently impossible predictive standard fails to be met, rather than question the basis of the model, strategic thinking that is self-critical about the military's approach is in turn suppressed. *Thus a pseudo-scientific understanding of how qualitative research and analysis is done in turn perpetuates a model of pseudo-strategic thought.* The challenge is to understand the basis of the quantitative/predictive versus qualitative/descriptive models of social science, their relationship to true strategic thought, and the organizational routines of the profession that hamper the establishment of a culture that recognizes and promotes such thought.

Contemporary social science over the past century has come to understand social phenomena as comprising not independent and dependent variables, but interdependent ones. This is arguably the most crucial "discovery" of the social sciences. But it creates an irreducible tension for users of social science work who want predictability akin to the natural sciences. Interdependent variables disallow such possibilities because their very interdependence makes establishing a clear cause and effect relationship impossible.

Quantitative v. Qualitative

There is a large literature on the development of and use of qualitative and quantitative methods in European intellectual history. In a sense this debate goes back to the (overstated) difference in method between Plato and Aristotle. For the purposes of this argument, though, the relevant question is to clarify what is meant by each. Quantitative methods rely on mathematical and statistical approaches. They are variable-oriented and mirror the methodological approach of the "hard" sciences. Since these same statistical and mathematical models are the *sine qua non* of

fields like physics, chemistry, and biology; the empirical advances of the sub-fields associated with them (e.g. aerospace engineering, petro-chemistry, or pharmacology) are assumed to apply to any discipline using the same statistical and mathematical modeling approach. The standard narrative explains the advancement of science as a direct result of the application of the basic quantitative method every school child knows: observe, report, hypothesize, test, repeat (Feyerabend, 2001). "Real" science is understood as having only one method, "the" scientific method, and it is based on the quantitative mode of knowing.

Qualitative methods employ a wholly different way of examining a problem. More importantly, they are a way of exploring a wholly *different kind of problem*. Or, to be absolutely clear, strategic questions are themselves never about "problems", they are always about the same set of meta-problems. This is often easier to get at by looking first at what a meta-problem is not.

Problems in the normal sense of the word involve the quantitative mode of thinking. Even extremely difficult problems are like this. "How do we invade Japan?" is an example. The basic process is quantitative/predictive according to the standard narrative of "the" scientific method. It starts with a defined highest-order problem (invading Japan) and breaks it down into smaller problems (How do we get there? How long would a trip by boat or plane take? How many weapons and supplies will we need? What kind?) and uses a reductive approach along with the analytical tools of mathematics and statistics in a repeating process until a series of answers can be summed together to solve the original problem presented.

By contrast, qualitative questions are of a wholly different type. Further, *qualitative questions are functionally the same as strategic questions*. Rather than ask "How do we invade Japan?" a qualitative/strategic question broaches, if only for the sake of discussion, the question of *if* Japan should be invaded. In this way, a qualitative/strategic orientation asks first-order questions, (Should we invade Japan? What would doing so achieve? Are there other alternatives to invasion (e.g., bombing alone)? Should we seek the dissolution of the Imperial Institution?).[1] These are not the type of questions any hierarchical organization naturally encourages be asked down the line. But they are fundamental for generating good planning because they probe the basic issue of strategic aim: What change in the military and political context a series of military operations ultimately intends to achieve. Put another way, strategic questions ask the same basic meta-question: What is the change in qualitative condition (e.g., destruction of Japanese war-making capability to include or not the death or abdication of the Emperor) war plans intend to achieve?

Further, the nature of qualitative evidence is different. All qualitative methods can be understood as having two facets. First, the basic skill of qualitative research is to accurately interpret text. To interpret text means to accurately understand its meaning or meanings. Any subsequent categorization of text a researcher may do in order to allow for statistical analysis requires that the text be interpreted first.[2] The difficulty of interpreting what is meant by a subject in an

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[1] Thanks to my student, MAJ Eric Fowler, for giving me this suggestion. He offers a brilliant discussion of exactly this kind of qualitative/strategic thinking in his manuscript: "Will-to-Fight: Japan's Imperial Institution and U.S. Strategy at the End of WWII," unpublished, School of Advanced Military Studies Monograph, 2012.

[2] Although most of the time 'text' means 'words' spoken or written, I use 'text' in its broadest, linguistic, sense to mean any symbols needing to be interpreted before they can be categorized for analysis as in the examples of archival research, art history, or opinion surveys.

interview or what an archived memo meant in context is what requires extensive training in languages and cultures (to include the oft overlooked question of organizational cultures). A long-standing joke in the discipline is that while it may take only five years to make a physicist, it takes 20 to make a social scientist! There is at least some truth in this. Second, the basic form of all qualitative research is the gathering or developing of text. Qualitative research either gathers existing text from archives, memoirs, etc., or generates text through interviews or a derivative method like a focus-group or survey (Czarniawska-Joerges, 2004).

The significance of this for military decision-makers was recently made clear in a remarkable speech by Chairman of the Joint Chiefs of Staff Gen. Martin Dempsey. Discussing his experience of how strategic decision-making occurs, Dempsey said, "When I go into a meeting to discuss policy, discuss strategy, discuss operations, plans, whatever it happens to be, he who has the best context generally prevails in the argument, not necessarily who's got the best facts. There's a difference. It's who has the best context in which those facts exist," (Dempsey, 2010). Such context is what differentiates a qualitative from quantitative way of seeing the world.

Technoscientific Warfare and Quantitative Approaches

The modern American military tradition is techno-scientific to the extreme. In practice this means that the American tradition is chiefly defined by its "systemic application of science and technology," as a way to gain "complete predictability and centralized control over armed conflict . . . ." (Bousquet, 2009, p. 33). In the Army this pattern became particularly exaggerated after the Vietnam War. General William DePuy, founder of the Army's Training and Doctrine Command (TRADOC), sought to refocus the new all-volunteer force toward what he saw as a future war dominated by technologically-skilled teams operating advanced weapons-systems as efficiently as they would a lawn mower (Mullen & Brownlee, 1986). The debate over the "Revolution in Military Affairs" (RMA) of the 1990s trod similar ground.[3]

The implication of this institutional commitment to the predictability model of the hard sciences is that it naturally privileges the quantitative way of knowing. In a similar way Depuy sought tactical superiority through systematized training in order to develop generalized, quasi-scientific rules and methods for battle. These rules and methods would maximize the chance of success in any engagement by minimizing moments where forces risk not having control of the situation. This last part is also akin to the kind of experimental control possible in most hard science laboratories. In effect, this reduces tactical engagements down to highly predictable events where the basic variable is the execution of tactical principles and the performance of weapons, both of which can be reasonably well controlled for. Crucially, the validity of the principles themselves are taken as proven.

American forces, especially since Vietnam, have repeatedly been in *tactical* engagements that can be seen as having been overwhelmingly successful. This overwhelming tactical success is the reason why questions about tactical principles need not be asked. These engagements have used and proven the systemic and systematic application of position, cover, fires,

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[3] For an overview of the RMA debate I recommend Tim Benbow, *The Magic Bullet?: Understanding the Revolution in Military Affairs* (London: Brassey's, 2004).

communication, etc., with the result that this success has created a quasi-scientific discipline. More importantly, the sum of all this experience is to reinforce the quantitative approach that has been fundamental in producing such tactical success.

The reason this is not possible in the social sciences is that the fundamental questions of the field involve humans. As Steven Weinberg, a winner of the Nobel Prize in physics, noted, "It has been an essential element in the success of science to distinguish those problems that are and are not illuminated by taking human beings into account," (Weinberg, 2001; q.i. Flyvbjerg, 2005). The problems of war and warfare clearly fall into the category of problems where it is necessary to take human beings into account.

The central question in all social science is to explain why people do things. For students of war and warfare it's why they start wars, end wars, and prosecute them in certain ways at certain times, and not at others. Answering any of these questions involves getting at the subjective motivations of kings, generals, soldiers, and civilians. The ways in which this gets done is, broadly speaking, the qualitative/descriptive method. In plain terms, it is the problem of creating a kind of objective science of subjective phenomena.

Separate from the problem of how to gather and interpret data about human intentions and motivations is the problem of time. Social science questions fundamentally involve time as an interdependent variable. L. P. Hartley's now aphoristic line, "The past is a foreign country," is but one illustration of why time complicates cause and effect arguments (Hartley, 1953, p.1). It's not that there are not causes and effects; it's that explaining complex events like warfare in the kind of generalizable, out-of-time rules that are possible in the natural sciences is impossible. Answering why the Hundred Years War happened is not the same as explaining why Vietnam happened. Whatever the broad similarities, the cross-case differences are always greater.

There is a set of possible causes, and a set of possible reasons why a certain combination of causes seemed to produce a given effect (the American war in Vietnam). But there are irreducible arguments about both the set range of possible causes and the set range of combinations. And the chief reason is that motivations for human behavior change over time. Unlike in physics where what was true about a feather dropped from the Tower of Pisa some half a millennia ago remains true today, in the world of social behavior what was true just yesterday is often not true today. Even in economics, the supposedly "hardest" of the "soft" sciences the inside joke is that economists are, "experts who will know tomorrow why the things they predicted yesterday did not happen today" (Flyvbjerg, 2005, p. 39).

So at its simplest the reason strategic thought is so difficult to inculcate in the Army is that its lack of predictive power makes its value seem weak to commanders tasked to 'do something' and 'do it now'. Like other large bureaucratic organizations the modern Army adopted quantitative methods to guide its expansion. Those methods reflected the larger dominance of the so-called rational-scientific approaches being adopted by industry and the hard sciences together. For a period this included the social sciences, as hopes abounded that a 'behavioralist' revolution was just around the corner. According to some proponents, such a revolution would make the social sciences, particularly political science, into 'true' sciences in the image of physics and chemistry. The key would be to amass a sufficient amount of data about human behavior and

develop sufficient computational abilities to make generalized rules, and the predictions that follow, possible (Eulau, 1969). But as work in these fields proceeded, most came to believe that such a goal was not only not possible, but that its impossibility defined the divide between the hard and soft sciences.

To put this in contemporary terms, arguments about Afghanistan in 2008 led to a decision by the White House to surge 30,000 troops into the country based on a loosely predictive model about the effect of a similar surge into Iraq in 2006. The methodological problem with this way of thinking is that it assumes cause and effect relationships on the basis of scant to zero evidence. As the Center for Strategic and International Studies diplomatically put it, the differences between each country are "considerable," making the ostensible strategic aim of each surge "quite different" (Freier, 2009).

Still a decision had to be made. But the problem of the time lag between assumed cause X (the Iraq surge) and assumed effect Y (success in Iraq) meant strategic-level decision-makers had to rely on little but a guess about cause and effect. And even if the time lag from X to Y is discounted, the internal variables grouped under the title "the surge" meant even more lack of clarity. What about the surge might have caused a drop in violence? The sheer amount of troops? The population density of the key neighborhoods? Or the thousand little different operational approaches individual commands took? These are the sets of variables and combinations that make the qualitative mode of thinking what it is. To get to any sort of defensible answer one probably has to be 10 years out from the present in order to identify the critical variables and have enough information to understand their relationships and interactions. But the decision has to be made *today*. Institutional frustration with a qualitative approach that can provide context but not prediction is understandable.

Strategic Thought and the Qualitative Approach

So what good does a non-predictive method do for a "must show results" world? Unlike the quantitative/predictive model of the social sciences, the qualitative/descriptive approach is concerned with two things: (1) describing the values and interests of social groups, and (2) ensuring that a discussion of the values and interests of legitimate social groups are represented in public decision-making processes. This is what Flyvbjerg describes as ensuring "due diligence" in the public realm (Flyvbjerg, 2005).

Strategic thinking requires the kind of habit of mind that it is concerned with qualitative changes in complex military, social, and political environments. The kind of changes in values and interests that Flyvbjerg argues are at the core of the qualitative approach to science. Further, in this sense there is no static state called "victory" against which progress can be quantitatively measured. Rather, the strategic thinker must *continually* make a judgment about the qualitative changes he is charged with affecting (Dolman, 2005). Those changes, of course, reflect the values and interests of actors and institutions in the public realm. As both the actors and institutions change and/or the rank order of values and interests changes, the strategic proposition itself changes. "Victory" is a changeling mirroring the shifts in values and interests of those who have the power to define it.

Moreover, the nature of strategic thought requires thinking about *systemic* (interrelated) conditions over the course of *time*; a process for which quantitative measures are of only limited use. Most importantly, strategic thinking is less a discrete activity and more a habit of mind. Developing the habit of thinking strategically after matriculating through a professional culture (often rightly) focused on quantitative measures of tactical proficiency is extraordinarily difficult.[4] Each method represents a different way of knowing about the world. The issue is not that one is better than the other. The quantitative approach supports strategic thought, but it cannot be sufficient to ignite or sustain it. Only the qualitative mindset can develop a strategically-focused habit of mind.

Commanders frame questions as "problems" to be solved. This is the language of quantitative algebra. Strategic thinking asks about meta-problems, things like 'is it worth invading Europe?', "Is there an alternative (bombing Germany, letting the Soviets do it)?", "What does doing so gain us?", "For how long does this gain last?" and most importantly "How will having done so qualitatively change our situation?" Though quantitative methods can be used as indicators for whether or not an invasion is worth it, every measure of effectiveness requires a decision first be made about what the standard should be against which the program is measured. Does "worth" mean causalities, money or both? Does "worth" mean territorial gains or political? Could the action in question simply be a moral imperative and thus be outside the standard cost/benefit discourse? That is, even as the strategist uses quantitative methods he must be aware that they reflect a subjective perspective—his boss's, his own, the enemy's command, the enemy's population, etc. The problem lies less in the measure than in understanding its context from the perspective of the key actors in the conflict.

Every measure (quantitative or qualitative) has to be interpreted in context. By their nature qualitative measurements presuppose the kind of theoretical frameworks essential for strategic thought (a theory must exist to justify the measure). And though qualitative methods can certainly be used to generate quantitative-looking measures of effectiveness (MOEs), the process of, say, categorizing focus-group information into numerical scores requires an explicit causal framework as a basis for the categorization. And since there are many different contexts for causal frameworks (e.g., national culture, the professional cultures of the Army/Navy or civilian government, or the view from 10 Downing Street, London), no one answer is definitive. And again, time as a variable complicates the articulation of context. Except in the esoteric realms of cosmology or quantum physics, hard-science rules are rules precisely because they are valid predictors of outcome *regardless* of time. Strategic thinking is fundamentally about thinking *in* time. And thinking in time is about thinking in terms of the *interrelated* nature of variables across time—about context. For a time-pressured commander, knowing tomorrow whether the predictions made yesterday about the enemy's standing today is generally useless.

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[4] It is important to note the idea of matriculating upward through an organization. There are good reasons quantitative measures are privileged in the military. Being able to decisively and repeatedly hit a target with a bullet is a skill that is properly measured with quantitative measures. The issue is knowing what methods of evaluation are best for a each unique situation. As Soldiers 'grow up' in the Army the dominant evaluation method they are exposed to is quantitative.

Scientism and Defensive Routines

Systemic misunderstanding in the larger Army of the differences between approaches has meant that the scientific validity of qualitative inquiry is deeply discounted. What remains is a scient-*istic*, not scientific, view of the role qualitative/strategic thinking can play in military decision-making. To the extent that this view permeates U.S. command culture, it undermines real strategic thought by privileging the false objectivity of quantitative measures. This is not a unique problem to the military or the Army. Decades of work in organization theory have established that formal institutions engage in what are called "organizational defensive routines" (Argyris, 1990). The substitution of a scien*tistic* standard in place of the complicated challenges of doing good qualitative science reflects exactly this kind of defensive routine.

Organizational defensive routines have chilling effects on institutional adaptation and learning because they tend to defend existing modes of thought and causal frameworks in light of radically changed operational or strategic contexts. Defensive routines are what discourage true strategic thought. Defensive routines derive from natural personal aversion to threat and embarrassment. In essence, defensive routines reflect the natural human aversion to admitting to doubt or outright error, something at the heart of the strategic mode of thinking.

At the organizational level such embedded routines entail four basic elements: the crafting of inconsistent, ambiguous messages; actions by organizational leadership that signal such messages do not contain inconsistencies or ambiguities; actions by organizational leadership that makes discussion of any inconsistencies or ambiguities undiscussable; and actions by organizational leadership that make the undiscussability of the undiscussability itself undiscussable (Argyis, 1990).

Army commanders' institutional norms privilege a "can do" attitude backed by quantitative methods and a scien*tistic* causal framework that butt up against the complexity of real conflicts where (1) political and/or military directions (strategic aims) are ambiguously phrased "establish a safe and secure environment," in Ninewa, Iraq for example (FM 5-0, p.3-3), (2) officers are left to respond to the ambiguity of such a mission statement on their own, through the establishment of their own standards and MOEs for determining what "safe and secure" means, (3) discussion of the ambiguity in the mission statement are met with hostile or simply indifferent attitudes (the delayed discussion until the publication of FM 5-0) and (4) the problem of not being able to discuss that attempts to discuss the ambiguity of the mission were met with hostile or indifferent attitudes. All this only serves to further isolate commanders. This often leads to a reversion into known operational approaches because they are comfortable, not necessarily because they are appropriate to the now qualitatively-changed environment. In less abstracted terms, this is the kind of institutional problem FM 5-0 calls out.

This is particularly problematic in times of transition, whether in terms of an operational environment as described above, or in terms of more grand-strategic shifts. Transitional periods are transitional because the variables and trends that were relatively stable in the previous era have begun to shift. Geostrategically, the end of the Cold War represented a shift in the stability of what American policy-makers understood as the chief threat. The Soviet variable disappeared, in effect changing the whole calculus of the security problem(s) facing the U.S. But what the

new calculus was could not yet be seen in any detail. The U.S. security establishment, having co-evolved with a particular military-political ecosystem in the Cold War now faced catastrophic success (Forging a New Shield, 2008). In methodological terms, the security equation had qualitatively shifted. That much was clear. But the key variables and trends that analysts had previously used to help make sense of the security ecosystem had also changed. And before any straight-up analysis of the meaning of the transition out of the Cold War could take place the methodological problem of determining new variables and identifying trends had to be addressed. The geopolitical and military ecosystem had *fundamentally* (qualitatively and strategically) changed. In what way and, most importantly, with what meaning for the U.S. was unclear and continued to be so until a new methodological framework for the new order was established.

Admitting to being in such situations is extraordinarily difficult. The pressure to offer instant prognostication can be immense. And few commanders or political leaders want to be seen as "indecisive". Yet in a real sense strategic thinking requires at least the mindset of someone who is perpetually unsure about what and why something might happen if one decision is made over another.

If politics and warfare were a hard science this would mean there was no reliable quantitative basis for military decisions, strategic or tactical. But politics and warfare are not hard sciences. One need only think about the qualitative questions surrounding Afghanistan to find another, more current example.

The reality of such transitional periods is that people, and the formal and informal institutions they aggregate into, project "data" into assumed "equations" about how the world works. These are the generalized causal theories about international relations and politics that people hold (Stone, 1989). In other words, they are the values that one group of people assumes operate to guide the behavior of another. The key is to recognize that such projections are just that, projections.

This kind of reflexive awareness is where a proper understanding of social science and the qualitative approach is central. Remember, the qualitative approach has two meanings. In its first sense the qualitative is different from the quantitative because it asks "framing" questions. The holistic "why" and "what does it mean" questions intended to answer big questions like, "How has the security ecosystem changed with the collapse of the USSR?" or "What will a pull-out of U.S. forces from Afghanistan mean to the incumbent government?" In its second sense it differs because the actual data-gathering methods cannot escape the "problem" of subjective interpretation. As discussed above, any textual data gathered or generated requires a human researcher to subjectively categorize it.

A Science of Context

Viewing interpretation as a "problem", however, misses the whole point of strategic/qualitative thinking. Exploring the contextual change such a large qualitative shift would have on Afghanistan is precisely the kind of question qualitative approaches are meant to answer. A de-contextualized version of this question might be something like, "What will a U.S. drawdown of

forces in Afghanistan mean?" But the real question is to ask a version of this that puts the question in the context of the key people (agents) we are interested in. What will a drawdown mean to the *Karzai* government? What does Karzai himself *think* about this? Literally, *what words* does he use to *describe his feelings* about this eventuality? Does he describe a drawdown in language *that indicates he fears* for just his job, or his life? Or does he use language that indicates he *sees* a drawdown as *an opportunity to consolidate or expand his power*? In other words, what does the objective description of Karzai's subjective response tell us? Surely he understands his own context better than we can. The goal of qualitative work is to establish a collected and collated description of these kinds of subjective experience, of one man, of select branches in the government, or swaths of the population. Categorizing opinion surveys, interviews, speeches, economic data, etc. is the only way to construct a picture of the strategic implications of a pull-out. The point of the exercise is to go through the process of categorization in order to first get a sense of the range of possible qualitative futures, second to examine what policy orientation would leave the U.S. in the best position under whichever of the futures comes to be, and only lastly to try to rank order the probability of a given future. To return to General Dempsey, the facts mean little without context.

Avoiding qualitative approaches because they can't predict in the same way natural science can misstates the purpose of qualitative work. The qualitative approach is the science of putting facts into context. That this requires subjective choices on the part of qualitative or strategic thinkers is not a weakness. The success of a qualitative approach is not in its predictive capability, but in the questions it raises for decision-makers to consider. Strategic thinking is the art of thinking through questions of context—the "What does Karzai think" or "What's the view from different groups in the Ministry of Defense" inquiries. These are the questions that matter. Alone, the number of humvees in the Afghan National Army (ANA) or even the number of soldiers who passed basic training don't tell us much about what we really want to know (is the ANA of high enough quality—in many different senses of the word—to do its job effectively?). Ultimately what we want to know is why people behave a certain way, and why people behave a certain way is a product of what they think, what they feel. Knowing why they think and feel that way is the only way to have any hope of changing their behavior. Numbers can be indicators of how many people feel or think a certain way, but they can't answer why. Strategic thinking is about those "why" questions and a qualitative approach is the only means science has for answering them.

The challenge is twofold. First, the Army needs to openly embrace the subjectivity of the qualitative approach strategic thinking requires, in full awareness of one's cognitive and institutional biases. Second, it needs to invest much more time into training commanders and their staffs in how to evaluate qualitative work, even if they don't produce it themselves. But dismissing qualitative approaches on the basis of a flawed conception of what science is allows misconception and cognitive bias to undermine the Army's capacity for true strategic thinking. In an era of conflict defined by a unique interweaving of military and socio-political complexity, to ignore the scientific approach designed to specifically address questions of human context would be the worst kind of strategic mistake.

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Chapter Thirteen

The Genome Doodle of Strategic Thinking: Times, Epistemologies, and Narratives

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Introduction

In purposeful activity, strategic thinking is the cognitive component that balances the art and science of becoming. Connolly (2011) imports time as a philosophical construct to explain the process of moving from one state of being to another, the act of becoming. In the temporal process of becoming, humans perceive periods of cascading events and other periods of sparse activities. Absent temporal orientation to frame meaning, we have no measure to explain relationships between events, actions, and outcomes. In a competitive environment, multiple temporal systems engage through neutral, antagonistic, and cooperative interactions. Strategic thinking is the cognitive operation to comprehend how, when, and why activities in one temporal system periodically interact with other systems to induce changes in direction, speed, and intensity of moving from one state to another state. Our personal temporal orientation shapes inclinations to make activities salient from the perspective of an objective present, the documented past or indeterminate future (Thoms, 2004; Whitehead 1978, cited in Connolly, 2011).

In leadership research and theory building, there is growing interest in how time influences leader thinking models (Shamir, 2011). In reflective and perceptive cognitive activities, the tendency is to interpretations that segregate matters of less importance from issues of greater importance. This reductionist-thinking model produces a gap between physical reality and knowledge. As a result, holistic thinking becomes impossible since even when connecting all the known knowledge dots, the remaining dots represent a domain of "unknown unknowns." Strategic thinking consolidates temporal systems to understand the knowledge debris field and apply a "connectionist" outlook to overcome the past in extending the present to a more desirable future (Connolly, 2011). The focus of this paper is to explore the knowledge debris field in strategic thinking literature to reintegrate fugitive ideas into a workable strategic thinking genome doodle—to frame the structure rather than define the process of dealing with problematic situations in a competitive learning environment.

The Problem Is

When we rely on understanding the past to deal with the future, we err. A record of past success increases vulnerability to trust in patterns gleaned from salient experiences. Such trust flags an institutional genetic propensity to overconfidence in lessons learned, or "victory disease" (Karcher, 2003). In the same line of thought, historians observe that in large and small wars American military leaders have more expertise in dominating the present with battlefield success than in influencing the future with strategic insight (Echevarria, 2004). In support, research suggests that leaders tend to employ time as a cue to consider historical cases. The difficulty is that leaders also tend to draw the wrong lessons from history and, thereby, position their organizations for failure (Bluedorn & Jaussi, 2008). When organizational memories guide

decisions in executing and developing current plans, we face a problematic situation (Figure 1). Literature indicates that every leader joins all other humans in having a distinct preference for thinking in the past, present, or future. Like any other preference, our temporal alignment shapes how we understand other people, make decisions, and think. The problem is that we have scant insight into how our time perception affects capabilities and contributions to a thinking process which integrates past, present, and future (Liedtka, 2001).
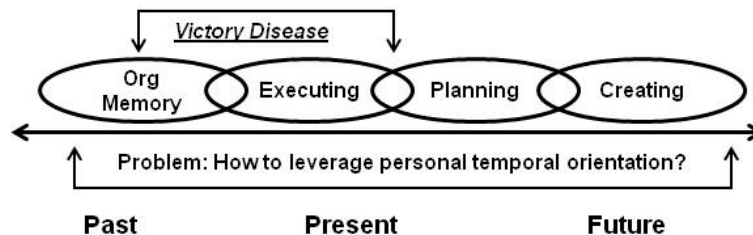

Figure 1: Strategic Thinking Problem

The Context for Strategic Thinking Is

To the extent that uncertainty frames an operational context, the future holds keys to success. Military leaders face a growing problem set that extends beyond historical bounds. *The National Military Strategy* (2011) frames a security environment with an increasing number of state and non-state actors with capabilities to challenge our interests. Military leaders can expect to operate routinely in interest driven alliances and coalitions formed more along "diplomatic, military, and economic power, than by rigid security competition between opposing blocs" (NMS, 2011, p. 2).

The stated expectation and implicit assumption holds that we will have future vision to "act at a time and place" of our choice (NMS, 2011, p. 6). We can also reasonably assume that our adversaries have a similar view to act on a timeline to their advantage. If we plan from historical trends and our knowledge flows only from experience, we will be uncoordinated with the requirement for timeline mastery of both the unfolding present as well as an uncertain future.

Time Perspective Is

Aristotle suggested time exists in two domains. The first captures quantifiable increments associated with motion that causes change; and the second, a before and after experience of change (Sachs, 1995, p. 120; Crocker, 1995). Bergson (1913) described time with concepts of space and duration. Time in space provides the medium to establish order among objects, to see distinctions and to quantify. Duration represents the process of passing between positions under the notion of quality. Duration exists as a connective system of preceding and succeeding states where entities are "melting into one another and forming an organic whole" (p. 128). Kaelin's (1988) commentary suggests Heidegger collapsed the structure of time and events in time. He described all occurrences as simultaneous. For Heidegger, there was no concept of a perception of time that flows or passes. The process of being temporal involved the beginning and ordering of discrete entities connected through intra-temporality. Past, present and future became co-original in a self-enclosed structured reality. Heidegger suggested, "in assuming the

responsibility for one's having-been-there, the acting person determines its own self projection from both ends" (Kaelin, 1988, p. 237; Crocker, 1995).

A time perspective is a meta-cognitive phenomenon that grinds the lens individuals and collectives use to think about and understand the world. Lowe (1982) found culture in the Middle Ages established an epistemology that drew from reality existing within an eternal time framework. Knowledge development was a function of interpretation of visions, analogies, and symbols. People experienced time in terms of cycles and rhythms. The meaning of time took greatest importance from an eschatological point of view. In the Copernican Revolution, time assumed a central role in knowledge development. The Newtonian paradigm outlined a world composed of matter and energy existing in "the void of absolute space and time" (Schwartz & Ogilvy, 1979, p. 31). The nature of knowledge stipulated existence of a fundamental level of reality. Time as a chronological phenomenon was a necessity to verify relationships in this "earlier and later" scenario (Connolly, 2011; Schwartz & Ogilvy, 1979; Lowe, 1982). Crocker (1995) observed that time became "the form of intuition to which objects must conform, and as intuition, it [attained] a status unlike all other things that remain at rest, and stand silent so that the spectator might revolve around them" (Crocker, 1995, p.11).

In the late 19th century, psychologists noted individual temporal orientation as the "specious present" where human spectators take a grandstand view of times past and present (James, 1890, cited in Lauer, 1981, p. 67). Studies in settings that included cultural considerations and economic level all support a belief that "the human always defines situations in terms of the past, present, or future" (Lauer, 1981, p. 68).

Social scientists now question beliefs that space and time form an all-encompassing framework for perception. The new epistemology rests on tenets of events being coeval with neither temporal nor spatial constraints. Relationships are heterarchical and there exists a "plurality of differentiated, partial, and possibly complementary consciousnesses" (Schwartz & Ogilvy, 1979, p. 47). Explanations of knowledge development across chronological time lose relevance because knowledge emerges in gradients of mental perceptions that are neither additive nor sequential (Schwartz & Ogilvy, 1979; Lowe, 1982, p. 11).

Timeline Orientation is Important Because

At the core, a timeline orientation indicates when events become important. Our view of time matters because it frames our outlook on whether we control time or time controls us (Adam, 1990). Timeline orientation indicates the context in terms of past, present or future an individual finds comfort or feels affinity (Cottle, 1968; Thoms & Pinto, 1999; Zimbardo & Boyd, 1999). Individuals hold a dominant alignment with past, present or future as well as a propensity to be more or less time urgent based on a temporal orientation (Waller, et al., 2001).

Patterns in literature suggest wide interest in how temporal orientation affects leader behavior and preferences. Das (1987, 1991) reports a positive correlation between a leader's time horizon and the preferred planning horizon. Time perspective is a distinguishing characteristic in organizational design (Miles & Snow, 1978) and organizational timeline orientation aligns with strategies to expand, maintain or protect an operational approach (Segev, 1989). In comparison

to present oriented management, organizational leaders with future time perspective show more open communication patterns and greater inclination to opt for change in strategic direction (West & Meyer, 1997). In decision making, as the future horizon expands for a given situation, expectations for success rise even as goal difficulty increases (Nisan, 1972).

Individual time perspective is associated with the ability to perform professional development tasks at various life stages. The horizon for events that will occur in a personal future and viewing the future as certain and stable represent basic components of career maturity (Lennings, 1994). In a meta-analysis study, Bluedorn and Jaussi (2008) note that time demands affect a leader's decision-making and, that leaders use time to signal important values. Based on a review of relevant literature, Thoms (2004) concludes that our temporal orientation draws us "into situations in the same way that our skills and interests draw us into certain jobs and life situations" (p. 10). Timeline orientation is an inherent part of human psychological processes (Schiller, 1990) and, we can be reasonably defined as "past oriented, present oriented, or future oriented people" (Thoms, 2004, p. 10). Accordingly, temporal orientation plays a central role in framing how individuals and teams employ strategic thinking.

Thinking Is

The notion of a consensus definition for the various approaches to thinking is like finding the "drain for a swamp." On one hand, there is an ongoing effort to describe unique attributes for strategic thinking. Strategic thinking is a "boundary spanning activity" that brings attention to important issues, concepts, and problems (Kutschera & Ryan, 2009, p. 15). The strategic thinking process is "synthetic, divergent, and creative" (Heracleous, 1998, p. 485). Strategic thinking is to discipline oneself to devote cognitive activities on the issues and decisions that are of greatest importance in identifying, understanding, and achieving the best possible outcomes (Goldman, 2008; Heracleous, 1998; Hix, 1994; Mintzberg, 1994). Strategic thinking is a form of learning that shifts attention to question rules, plans, and procedures (De Geus, 1988; Heracleous, 1998). Strategic thinking brings a systems-level or integrated perspective (Goldman, 2008; Mintzberg, 1987; 1994). Strategic thinking begins with context, involves concepts, and is "more abstract, issues-oriented" than problem focused (Goldman, 2008, p. 220).

On the other hand, a robust literature explains various criteria for critical thinking. Critical thinking often corresponds to problem solving (Whitten & Brahmasrene, 2011). Ennis (1985) frames critical thinking around criteria to be reflective and reasonable with the aim to reach a judgment on action or belief. Ikuenobe (2001) describes critical thinking around abilities for "writing, speaking, understanding, analyzing, reflecting, synthesizing, evaluating, moral and practical reasoning, and decision and judgment-making" (p. 20). Critical thinking tends to be a thought process for planning that is more "analytical, convergent, and 'conventional'" (Heracleous, 1998, p. 485). Linear, reflective logic to reach a judgment about how to solve a problem emerges as a common thread in the critical thinking definitional mosaic (Lewis & Smith, 1993).

Critical thinking appears early in the education process. The aim is to to help children develop cognitive skills that lead to "commitments to impartiality and objectivity, relevance, consistency, and the search for defensible reasons for behavior" (Lewis & Smith, 1993, p. 132). Critical

thinking involves abilities to assess the accuracy, authenticity, and relevance of information. Critical thinking involves persistence in comparing beliefs, knowledge, or observations against a normative standard in order to identify fault lines or flaws (Beyer, 1985).

Alternatively, strategic thinking appears later in the education process, often in higher education and professional schools. The aim is to develop cognitive power to discover, refine, apply, and renew knowledge (Liedtka, 1998; 2001). While critical thinking draws attention to the past in order to improve the present, strategic thinking draws from the past in order to understand and improve the future. When "the dead hands of the past try to strangle the future" (Friedman, 2012, p. A27), strategic thinking fuses multiple temporal orientations in order to reframe a threat into a competitive advantage.

Critical thinking and strategic thinking involve purposeful, goal oriented cognitive activities. While each employs a distinct approach, neither occurs outside an individual drawing on knowledge stored in the mind in order to interrelate, rearrange, renew, or create new knowledge to inform purposeful activities. The thinking goal is to apply cognitive abilities in achieving a competitive advantage under conditions of having too much information, too little information, and information that is at once inconsistent and in conflict with itself (Goldman & Casey, 2010; Heracleous, 1998; Whitten & Brahmasrene, 2011; Young & Warren, 2011). Both go far beyond idle thoughts from an uncluttered mind. While critical thinking emphasizes reflection on the concrete and strategic thinking draws attention to reflection on the abstract, academic discourse seems to declare a difference where a distinction in cognitive skills is invisible.

At an individual level, strategic thinking is a "particular way of thinking" (Goldman, 2008; Liedtka, 1998, p. 122; Ohame, 1982). In theory (Liedtka, 1998; Petranker, 2005) and formal research (Goldman, 2008), five elements emerge as core components in strategic thinking. First, strategic thinkers tend to see and understand how networked components work together in bringing about desired outcomes, the capacity for systems thinking. Second, strategic thinkers seek to identify environmental shifts that point to unforeseen opportunities, purposeful opportunism. Third, strategic thinkers envision models and hypotheses that build a marked path to the future, conceptual thought. Fourth, strategic thinkers bring organizations a genetic-code type direction that melds successes and strengths in maintaining momentum to the future, intention based decision making. Finally, strategic thinkers have an internal drive to orient past and present toward an improved future, strategic thinking is mostly about—thinking in a time-system that orients past and present toward the future (Goldman & Casey, 2010).

In dealing with either the concrete or abstract, the mental path appears reciprocal more than linear in nature. In a situation with any number of cause and effect relationships, capacities for critical thinking as well as for strategic thinking apply. The thinking effect moves invisibly between inductive, deductive, and abductive reasoning. In the search for a consensus view on defining critical thinking and strategic thinking, the inclusive cognitive activity combines all thinking to "achieve a purpose of finding possible answers to perplexing situations"—a thinking construct of higher order thinking (Lewis & Smith, 1993, p. 136; Whimbey, 1984). Nunnally's (1978) collection of eight cognitive abilities combines with higher order thinking (Lewis & Smith, 1993) and temporal orientation (Thoms, 2004) to frame critical thinking (Ikuenobe, 2001) and strategic thinking (Liedtka, 1998, 2001) pacing and enabling cognitive criteria (Table 1).

Table 1

Cognitive Criteria for Critical Thinking and Strategic Thinking

Pacing Cognitive Criteria	Description
Learning	Create, integrate, and apply knowledge to achieve competitive advantage over a thinking adversary or complex situation
Numerical	Incorporate quantitative based charts, graphs, and models to support logic leading to findings, conclusions, and judgments
Emotional	Appreciate and moderate the contextual, challenges, communication, and community factors that trigger a problematic situation (Callahan, 2008)
Verbal	Use and understand professional language to include terms, symbols, and concepts to make convincing arguments in discourse and writing
Enabling Cognitive Criteria	Description
Reasoning	Employ inductive, deductive, and abductive approaches to gain understanding of consequences and implications from relationships between cultural, social, historical, and political factors
Memory	Recall knowledge and information in forms ranging from simple associations, to complex relationships, to contextual dilemmas
Visualize	Describe an image of the future that dissolves conflicts left over from history to motivate purposeful behavior in the present
Perceptual	Discern patterns among and between relationships of people, organizations, movements, and belief systems
Temporal	Awareness of personal, organizational, and group inclinations to adopt purposeful activity with a bias to the past, present, or future

The Integrating Mechanism: The Idea Life Cycle

In higher order thinking, temporal orientation emerges as a unique moderating factor. In critical thinking, the orientation is to reflect on the past to improve the here-and-now. Alternatively, in strategic thinking, the orientation is to reflect in the future tense on a transformative here-and-now. While critical thinking delves into existing knowledge, strategic thinking searches potential for new knowledge. The following discussion frames strategic thinking around an idea life cycle to demonstrate the influence temporal orientation plays in how individuals approach thinking (Birkinshaw & Sheehan, 2002) (Figure 2).

Each organization tends to have a mix of temporal orientations. The effort to integrate multiple temporal orientations in learning those things of higher importance requires common definition to how knowledge emerges over time. Petranker (2005) suggests that past, present, and future each contribute three components that support knowledge development. First, the dynamic component represents a question or idea that orients the search for information that may have greatest importance. Second, a subjective component processes information that offers an emerging explanation to the orienting question. Third, the objective component documents

knowledge along the timeline. In each timeline component of past, present, and future, the dynamic and subjective components are shaping activities for the objective component, which is the main knowledge effort for each "stop" along the timeline. The following sections employ these components in framing strategic thinking profiles. Knowledge fulfills unique tasks in the past, present, and future. This suggests a need for different epistemological methods for strategic thinking to meet the special functions of knowledge in the past, present, and future (de Jong & Ferguson-Hessler, 1996).
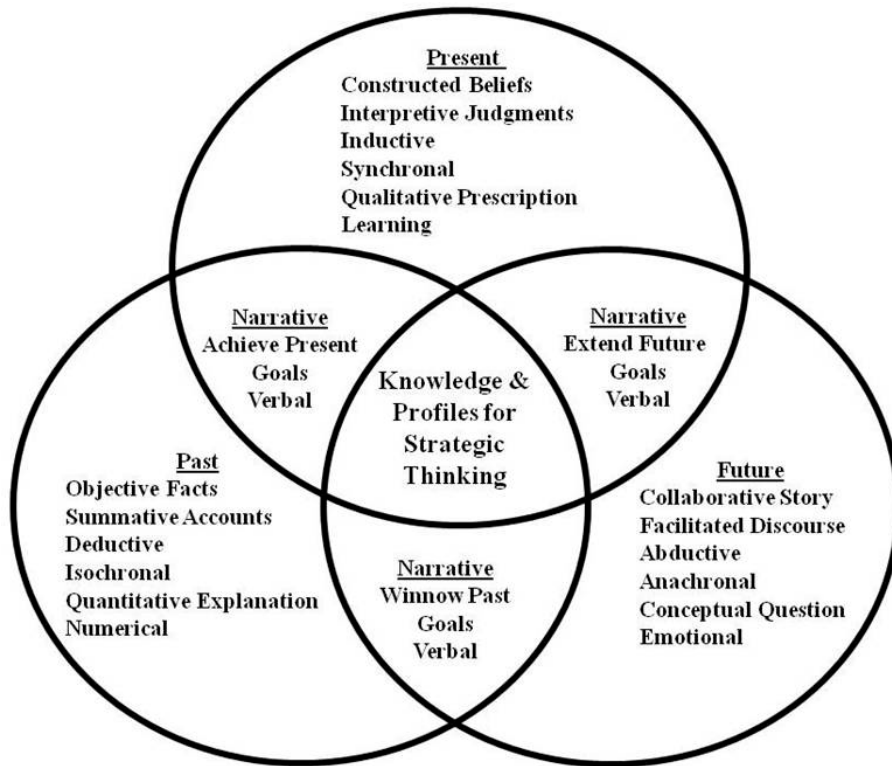

Figure 2: Strategic Thinking Doodle

Profile of Strategic Thinking in the Future: Conceptual Knowledge

In the future strategic thinking profile (Figure 2), complexity from inconsistent and competing goals, objectives, and actions frame reality. The headwaters of strategic thinking begin with "socially formed patterns that impinge on our daily life" and with "what is occurring in the minds of people, such as the dispositions, sensitivities, and awarenesses" (Popkewitz, 1990, p. 56). The future profile defines the essence and unique quality of strategic thinking that begins where the strategic thinker does "not yet know what is unknown" (Goldman & Casey, 2010; Heracleous, 1998; Lincoln & Guba, 1985, p. 209). In simplest terms, strategic thinking begins with creative thoughts that underpin conceptual knowledge (Birkinshaw & Sheehan, 2002; Goldman, 2008; Heracleous, 1998; Liedtka, 1998; Mintzberg, 1994).

Epistemology in the future profile serves to help new ideas emerge from a creative cognitive process operating in a context devoid of content, yet full of undeveloped potential (Petranker,

2005). Transforming ideas into knowledge requires a collaborative story that emerges from facilitated discourse. Abductive reasoning follows an anachronal temporal outlook to pose conceptual "what-if" kinds of questions that challenge accepted practices. The strategic thinking future profile tends to appear messy, is typically at odds with procedural controls, and responds poorly to time management. In the future profile, the measure of effectiveness is to gain appreciation for multiple perspectives, a range of problems, and that each problem may have multiple acceptable responses (Blumberg, 2009). The pacing criterion is the emotional capacity to appreciate and moderate the contextual challenges, communication, and community factors that trigger a problematic situation (Callahan, 2008).

An unfamiliar context or problematic situation triggers strategic thinking. Thinking begins with an idea rattling around in someone's mind. A new idea has the form of an insight that brings a question, hypothesis, or theory of how to change the nature of a problem or important relationship. In the beginning, not even the originator has full understanding of a new big idea. New big ideas are more proactive rather than reactive. Ideas and questions lead to knowledge having potential value, and need refining (Birkinshaw & Sheehan, 2002). These conceptual thoughts suggest relationships; indicate boundaries among beliefs, truths, and facts within context. Contextual knowledge improves clarity of thinking to define the critical factors of a situation that need attention. In strategic thinking, contextual knowledge contributes to identifying the system or systems of interest. Contextual knowledge brings a vision that extrapolates the past into the narrative of a completed future (Blumberg, 2009; Petranker, 2005). As the idea matures, visualization extends contextual knowledge as an intention to improve a situation, without a specific plan on how to reach that condition (Crossan, et al., 2005). Intention communicates contextual knowledge "forward not in the repetition of the past but in the arriving of the future" (Petranker, 2005, p. 251). Knowledge, while still defined by relationships, takes a more bounded and directional quality for application in the present (Fried & Slowik, 2004).

Profile of Strategic Thinking in the Present: Procedural Knowledge

In the present strategic thinking profile (Figure 2), uncertainty from incomplete knowledge frames reality. Thinking has a forward orientation from existing conditions rather than rearward from a vision or goal. In the knowledge present, the idea matures to become unique procedural knowledge that guides professional practice. As accepted knowledge, all organizational leaders begin to find ways to exploit the idea for competitive advantage, and the idea gains acceptance in contributing to success in a larger community (Birkinshaw & Sheehan, 2002).

Epistemology in the present profile orients thinking to observed phenomenon. The aim is to construct beliefs that inform interpretive judgments. Inductive reasoning follows a synchronal temporal outlook to identify patterns in the hear-and-now. The thinking outcome produces qualitative prescriptions to improve a situation. The thinking process uncovers alternatives in a sequential search process rather than beginning with a set of alternatives. The quality of thinking hinges on the goodness of current habits of mind, best practices, and lessons learned (Birkinshaw & Sheehan, 2002; Lincoln, 1990; March & Simon, 1958). The pacing criterion is learning that enables unlearning alternatives that do not work and, equally important, the creation, integration, and application of new knowledge.

Contextual knowledge taking actionable form triggers strategic thinking in the present profile. Although gaps in knowledge remain, the idea has a clearly defined form. In shifting to a slightly more structured form, knowledge rules for developing the idea change. In contrast to discourse and abductive reasoning in the future profile, emphasis now shifts to interpretive judgments and inductive reasoning. The strategic thinking present profile fleshes out the idea with information and requirements to enable analysis and experimentation (Birkinshaw & Sheehan, 2002). Ongoing analysis, experimentation, and use help the idea mature into procedural knowledge that individuals adopt as accepted practice. As these habits of mind mature into best practices, the idea develops to become a recognized approach in achieving superior performance over a range of different settings. In repeated practice, the organizational information exchange system employs negative feedback loops to inform areas requiring improvement while positive feedback loops reinforce activities leading to competitive advantage. At full maturity in the present profile, the idea constitutes "discipline-specific knowledge of skills, algorithms, techniques, or methods" (Blumberg, 2009, p. 95). As widely accepted procedural knowledge and the essence of unconscious competence, the idea is ripe for critical review in the past profile.

Profile of Strategic Thinking in the Past: Factual Knowledge

In the past profile (Figure 2), the overabundance of information that conceals cause and effect relationships frames reality. At this point, the new idea formed in the future profile bears a heavy load of factual knowledge that exists as a commodity on the open market. In the past profile, thinking is more critical with a defining form and normative outputs (Birkinshaw & Sheehan, 2002; Blumberg, 2009; de Jong & Ferguson-Hessler, 1996).

Epistemology in the past profile orients thinking to diagnose problems, develop a range of effective responses, and conduct tests to determine which option brings optimal results. Value-free, summative accounts help to elaborate all facets of the idea as well as to frame facts, procedures, and methods pertaining to problematic situations. Deductive reasoning follows an isochronal temporal outlook to produce quantitative explanations for knowledge in a steady-state form (Campbell, 1990; Greene, 1990, p. 232; Gioia & Pitre, 1990; Guba, 1990). In following deductive reasoning, the past profile collects and categorizes information necessary for analysis that leads to a conclusion that maximizes something a leader values in response to a problem or opportunity (George & Jones, 2002). The pacing criterion is numerical abilities that enable quantitative charts, graphs, and models to support linear logic that illuminates a best-case conclusion or judgment.

A new problem or substandard performance triggers the past profile. To this point in the idea life cycle, leaders work to establish knowledge benchmarks around the idea to enhance competiveness (O'Dell & Grayson, 1998). Best practices are context dependent and allow incremental development of new competencies that do not exist (Brown, 1993). The propensity to adopt a best practice without understanding the governing factors often brings a need to rethink or repair activities to ensure competitive advantage during in-progress activities. A primary focus in the past profile is to ensure the idea and knowledge base respond to contextual changes that serve as indicators for "unlearning" in order to maintain relevant knowledge. This supports an unlearning need framed under the anachronal temporal orientation in the future profile.

Profile of Strategic Thinking: The Narrative

Shipp and Jansen (2011) suggest a narrative incorporates all temporal contexts to capture individuals' perceptions of past fit, experiences of current fit, and expectations for future fit in goal attainment. The measure of strategic thinking is to combine past, present, and future profiles in a goal-focused, overarching narrative. The pacing criteria is to use and understand professional language to include terms, symbols, and concepts to make convincing, if not compelling, arguments in a wide range of communication opportunities. This narrative of narratives or meta-narrative requires recursive thinking over the nine cognitive criteria. Absent the meta-narrative that balances the art and science of becoming, there is no strategic thinking.

The meta-narrative is an application of cognitive power to discover, refine, apply, and renew knowledge (Liedtka, 1998; 2001). The meta-narrative is the strategic thinking contribution to all artifacts or products, which include the strategies, campaign plans, operations orders, and judgments that establish and maintain competitive advantage. It integrates fugitive ideas discarded in the past with emergent understanding of how contextual systems operate. The meta-narrative frames availability of context based opportunities and vulnerability to threats. It presents a marked path to the future that builds from conceptual thoughts to normative expectations (Goldman, 2008; Goldman & Casey, 2010). The meta-narrative is the strategic thinking genome. The meta-narrative builds from the three strategic thinking profile narratives.

The future-present profile narrative enables extending future goals. It is a narrative of the most important issues to build "trust" or "credibility" (Denning, 2005; Mullen, 2009). The strategic narrative is an account of who we are—really. It presents the context of "our fundamental views about the world" and shows that we grasp all the stories of our audience (Denning, 2005, pp. 92, 96). It proves that we "know the context within which our actions will be received and understood" (Mullen, 2009, p. 3). The strategic narrative draws attention to building, strengthening, and maintaining relationships. The quality check of a strategic narrative is that observers find no gap between our "published account" and our "behavior account" (Mullen, 2009). In a competitive environment, the future profile or strategic narrative brings understanding of what holds systems together and in balance. The strategic narrative describes an intention that informs constructed beliefs and interpretive judgments in the present profile.

The future-past profile or problem narrative represents insight into "how environmental inertia can be leveraged to ensure the desired conditions are achieved" (U.S. Department of the Army, 2010, para. 3-52). The problem frame narrative is a "word picture" of the interaction of opportunities and strengths against threats and weaknesses that supports a conclusion. The visualization informs insight into knowledge requiring elaboration as well as to knowledge that no longer fits the "unlearning" requirement. The quality check is that the visualization and collaborative story about the future reflect realities from the viewpoints of leaders, governments, and populations within the contextual setting. The problem narrative describes an unbiased account from a "home team" perspective.

The past-present profile narrative or concept narrative connects critical factors about contextual opportunities and threats to organizational strengths and weaknesses. The concept explains

approaches to enable or apply available constructive, destructive, and information capabilities as power to achieve or maintain competitive advantage. The concept narrative describes themes, messages, and effects to relevant observers whose perceptions, attitudes, beliefs, and behaviors contribute to the collaborative story in the future profile. The concept narrative is an orchestrated logic that conveys specialized content to specific audiences—internal planners and external observers. The quality check is consistency between the guidance to planners and expectations emerging from facilitated discourse. The concept narrative is a combined account of what needs to happen as well as what to expect in regard to applying military power in an ethical approach to ensure competitive advantage.

Conclusions on Strategic Thinking Doodles

Professional literature frames strategic thinking to encompass a wide range of activities; all tend toward a future temporal orientation. Professional military education tends to view strategic thinking as a level of activity associated with an outcome, a strategy. The definitional goal often seems to focus on rendering a cognitive process into a normative procedure. While all are instructive in understanding various components that combine as strategic thinking, the genome doodle follows an approach attributed to Dwight Eisenhower: when you cannot solve a problem, enlarge it.

A common thread running through strategic thinking definitions points to an orchestrated effort to chain related events into accounts of reality as it is, as it has been, as it should be, and as it could be in the future. In enlarging the problem, time is a critical consideration as a meta-cognitive phenomenon that grinds the lens individuals and collectives use to think about and understand the world. There exists a positive correlation between an individual's time horizon and the choice important activities (Das, 1987, 1991). Temporal orientation is a distinguishing consideration in organizational design (Miles & Snow, 1978) and in developing approaches to achieve and maintain competitive advantage (Segev, 1989). Our temporal orientation frames whether we believe that time controls us or we control time; strategic thinking is a proactive measure to ensure that we control time.

A second connecting thread in strategic thinking points to learning. In enlarging the problem, epistemology is a critical consideration as a paradigm phenomenon that limits how individuals and organizations develop knowledge, define how to structure problems, decide which problems are worth solving, and choose which solutions are legitimate. Based on paradigm choice, individuals elevate some data over other data sets; follow some techniques while ignoring other methods; and, explain problems in ways that reinforce the paradigm (Kuhn, 1995). Our paradigm choice limits whether we rely more on deductive, inductive, or abductive reasoning. A paradigm shapes a preference to objective facts, constructed beliefs, or collaborative stories. Strategic thinking mandates a coalition of epistemologies combine as cognitive power to discover, refine, apply, and renew knowledge (Liedtka, 1998; 2001).

The final connecting thread in strategic thinking points to narratives that account for a set of events that share relationships arranged within a contextual setting. In enlarging the problem, a composite narrative assembles all stories into a cohesive whole. While relationships may not be always in the cause and effect style, all bring about some effect. Each relationship represents a

story and the various stories combine into a collaborative account that is a narrative. Each narrative presents a unique pattern that holds goodness for different purposes of competitive learning and advantage (Denning, 2005). Given the importance of context and learning, the capacity to discern which pattern best fits a particular requirement points to the narratives as a critical component to master in order to gain all potential benefits from strategic thinking.

The capacity to fill proactively a knowledge void is a defining characteristic of strategic thinking and a necessary skill in competitive learning. The nature of Army concerns and PME design is to operations in a context of uncertainty, complexity, and hazardous competition. As a result, questions often focus attention toward how to do things over questions of strategic thinking into the what and the why. Strategic thinking emphasizes the art and science of refreshing, creating, integrating, and applying knowledge in response to important problems (Boyer, 1990). As the antidote to "Victory Disease," strategic thinking builds on a foundational meta-competency for leveraging temporal orientations, epistemology methods, and narratives across the life cycle of a big idea. For PME, reframing strategic thinking as the cognitive component that balances art and science in purposeful activity to win in a competitive learning environment appears as a new big idea worthy of further development.

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Exploring Strategic Thinking: A Synthesis and Way Ahead

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The U.S. Army is currently engaged in significant deliberation and discourse regarding its strategic thinking capability (e.g., Bethel, Prupas, Ruby, & Smith, 2010; McCauley, 2012; Olson, 2011; Waters, 2011; Wong, 2011; Yingling, 2011). Senior military leaders have recently argued that strategic thinking skills in our military ranks are inadequate, and that personnel with potential to become powerful strategic thinkers are affected by a culture that values short-term tactical success over the characteristics and activities associated with strategic thought (Bethel et al., 2010; Olson, 2011). Meanwhile, the wars in Iraq and Afghanistan have repeatedly demonstrated the need for strategic thinking skills across all levels of the command chain, as decisions and actions of those at all levels can have profound political and strategic consequences.

The challenges the Army faces today are arguably tougher than ever—requiring attention to a range of economic, historical, diplomatic, political, and cultural factors (Mattis, 2009; Salmoni, Hart, McPherson, & Winn, 2010; Schmitt, 2006; USJFCOM, 2010). Though a necessary prerequisite, it is not sufficient for officers to be technically and tactically proficient (Dempsey, 2009; Gurney & Smotherman, 2009). Senior military leaders must have strategic thinking capability. Managing the complexity and uncertainty inherent in operational environments requires that military officers have the capability to anticipate and visualize possible future states; to consider the impact of actions on an array of geo-political factors; and to conceptualize what actions are necessary to shape future states in ways that benefit U.S. interests. Moreover, the same skill sets are critically important within the Army institution itself in order to determine priorities, set requirements, and allocate resources so the organization can adapt and transform to meet future needs.

To make progress toward understanding strategic thinking in the Army, the U.S. Army Research Institute for Behavioral and Social Sciences (ARI) commissioned an effort with the intent to leverage a wide spectrum of perspectives from business, academia, and across the military on the topic of strategic thinking. The goal of the effort was to consider a key overarching question: How can the Army more effectively develop, assess, and retain strategic thinkers? In this final chapter we offer a synthesis of the papers included in this volume. Specifically, we discuss how strategic thinking has been described; the activities and skills commonly associated with strategic thinking; fundamental prerequisites for developing strategic thinking skills; the impact of organizational culture on developing and retaining strategic thinkers; and issues related to assessment of strategic thinkers. Finally, we identify areas where questions remain, and offer suggestions for next steps and future research.

What is Strategic Thinking?

Contributors to this report provide a diverse set of perspectives on strategic thinking, and many note the lack of consistency in how strategic thinking has been defined in the existing literature.

The ambiguity that surrounds the concept of strategic thinking may be due, in part, to the way in which the term has been used interchangeably with other concepts such as critical thinking, design, conceptual planning, creativity and innovation, and long-term visioning. In addition, the ways in which contributors address the strategic thinking construct varies considerably. Some describe strategic thinking as a set of skills and activities (e.g., Cross, Ch. 7[1]), some describe it as a goal-oriented activity (e.g., Van Riper, Ch. 1), and others describe strategic thinking as a broader, meta-level construct—for example, as a "habit of mind," a way of thinking, or a cognitive orientation (e.g., Clark, Ch. 13; Goldman, Ch. 2; Schmidt, Ch. 12).

In our view, the variability and range of definitions of strategic thinking are not necessarily inconsistent or contradictory. In most cases, divergent perspectives appear to reflect a focus on differing aspects of strategic thinking. When some contributors describe strategic thinking, they are focusing on the *precursors or requirements* for strategic thinking (i.e., the individual's background, education, skill sets, and personality characteristics). Others are focusing on the *activities and/or cognitive processes* involved in strategic thinking. And others are emphasizing the *purpose or outcomes* of strategic thinking. Overall, what is clear from the papers in this compilation is that strategic thinking in the military context is a complex and multi-faceted construct that encompasses a wide range of skills, activities, and goals. Furthermore, strategic thinking is consistently viewed as critical for a variety of challenges facing the Army. These challenges include setting priorities and agendas, and allocating resources within the institution itself; building military campaigns and aligning instruments of power to achieve national interests; and anticipating and planning for potential futures resulting from actions taken.

Is a Shared Definition Needed?

Several of the authors in this volume contend that gaining greater clarity regarding the definition of strategic thinking is a critical first step toward enhancing the strategic thinking capability within the Army, and offer their own definitions as a place to start (see Van Riper, Ch. 1 & Goldman, Ch. 2, for examples). But is a single unifying definition of strategic thinking essential in order for the Army to move forward in its goals to develop strategic thinkers? As noted by Duggan: "if you use the wrong definition of strategic thinking, you will find the wrong kind of thinkers and develop them in the wrong kind of thinking" (Ch. 8, p. 144). While there is certainly an element of truth to this statement, it is also possible that the Army could spend years in an attempt to reach agreement on a precise definition of strategic thinking, diverting resources and attention from its aim of actually improving strategic thinking.

Our view is that while a shared definition is a worthy goal and would certainly be valuable, it is not an essential prerequisite for the Army to move forward in its goal to embed strategic thinking skills more deeply among its ranks. What *is* necessary is an understanding of the central elements most commonly associated with strategic thinking in the military context. That is, what are the key components of this multifaceted construct? What are the common precursors, skill sets, characteristics, and activities involved that the Army should strive to cultivate and sustain in its personnel? In the next section, we describe the skills and activities commonly noted across chapters contained in this compilation.

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[1] Citations without year listed refer to previous chapters within this compendium.

Skills and Activities Associated with Strategic Thinking

The multifaceted nature of strategic thinking is reflected in the diversity of cognitive skills and activities authors associate with it. While there is ample variation in the labels and terminology used by report contributors, there is also considerable consistency in underlying constructs. As noted in the chapters within this compilation, strategic thinking encompasses a variety of complex cognitive skills. The central cognitive skills and activities associated with strategic thinking that emerged as common across the papers are described here:

- *Systems Orientation.* Despite the use of different labels to refer to this concept (e.g., *contextual thinking, enterprise understanding, thinking in context*) contributors converge on the central idea that strategic thinking involves thinking holistically and synthetically. This includes consideration of connections and interdependencies, and how decisions and actions affect the system as a whole. In opposition to popular and convenient reductionist approaches to problem solving, rather than reducing problems to their component parts, a systems orientation involves recognition of the complexity and inter-relatedness of problems and the ability to develop narratives to account for those relationships (Bethel, Ch. 3; Clark, Ch. 13; Cross, Ch. 7; Sanders, Ch. 9; Van Riper, Ch. 1; Wong & Gerras, Ch. 4). The holistic, systems orientation in the context of strategic thinking is encapsulated well in the recommendation attributed to Dwight Eisenhower and referenced by Clark, "When you cannot solve a problem, enlarge it" (Ch. 13, p. 241).

- *Qualitative Thinking.* Related to a systems orientation is the ability to think qualitatively and descriptively (Owen, Ch. 10; Schmidt, Ch. 12). Schmidt makes a persuasive argument that the types of problems that are strategic problems are also qualitative problems, and require qualitative approaches to thinking that recognize and appreciate context and the complex interdependence of variables within that context. A qualitative approach to thinking involves sensemaking, interpretation, and recognition of contextual change in order to describe complex non-linear systems and to identify questions that matter. It also involves acceptance of the subjective nature of the qualitative approach and awareness of biases, both personal and institutional (which is linked to metacognitive ability). Importantly, qualitative thinking is markedly distinct from the traditional quantitative/predictive worldview that is so deeply ingrained in military culture.

- *Metacognitive Ability.* involves a capability for self-reflection and awareness of one's own thought processes and associated limitations (e.g., Clark, Ch. 13; Paparone, Ch. 5; Schmidt, Ch. 12; Van Riper, Ch. 1; Vance, Ch. 11). Clark, for example, discusses the importance of being aware of one's own temporal orientation and how it impacts how we understand, think, and make decisions. Other authors (e.g., Sanders, Ch. 9; Van Riper, Ch. 1) refer to Schon's notion of "reflective practice" (Schon, 1987; Schon, 1983) which involves reflecting-in-action for purposes of learning and adapting. Importantly, Sanders also notes the value of reflective practice at the team level, as a way for teams to reflect on their processes and experiences of collective creativity and visioning.

- *Cognitive Flexibility.* entails versatility in one's thinking approach. It encompasses the capacity to recognize when a given cognitive approach is well- or ill-suited to the situation at hand, and the ability to adjust accordingly (Goldman, Ch. 2; Van Riper, Ch. 1; Vance, Ch. 11; Wong and Gerras, Ch. 4). Cognitive flexibility is reflected in Vance's notion of linear vs. non-linear thinking style balance, and also in Van Riper's discussion of analytic, intuitive, and systemic approaches to decision making. Both describe the need to adapt and employ different approaches at different times depending on the nature of the task and problem under consideration. Paparone (Ch. 5) also makes a compelling argument that, as an institution, the Army lacks such versatility. In his view, the Army strictly adheres to a single way of thinking and making sense of the world (i.e., the functionalist paradigm) and fails to foster institutional reflexivity and multi-paradigmatic thinking.

- *Openness to Diverse Perspectives.* is an aspect of strategic thinking that includes willingness to consider input from others, especially others who are "not like you," along with actively seeking such input. Related to the notion of openness to diverse perspectives is the ability to facilitate discussion and discourse with people who hold differing (and diverse) perspectives, and the willingness to consider a range of possible futures (Bethel, Ch. 3; Cross, Ch. 7; Wong & Gerras, Ch. 4). At the heart of this skill is the recognition that strategic thinking is not solely an individual-level activity, but a team and organizational activity as well.

- *Critical Thinking*. Asking hard questions is an inherent aspect of strategic thought. It includes the ability and willingness to identify, question, and test assumptions and to think divergently (Cross, Ch. 7; Goldman, Ch. 2; Van Riper, Ch. 1). We should note that Van Riper expressed some concern with usage of the term *critical thinking*. In his view, it is often associated with prescriptive and analytical activities that are antithetical to the holistic and synthetic nature of strategic thinking. He suggested the use of the phrase "thinking critically" as an alternative to describe what strategic thinkers actually do.

- *Ability to Visualize.* refers to the ability to anticipate and visualize potential future states and mentally simulate (and evaluate) how decisions and actions can shape that future state (Goldman, Ch. 2; Owen, Ch. 10; Sanders, Ch. 9; Wong & Gerras, Ch. 4). Several authors connect visualization to creativity and to non-linear and innovative thinking patterns that foster deliberate shedding of old ways of thinking. Creativity and ability to visualize also support experimentation with new perspectives and unique combinations that allow exploration of alternative futures (Sanders, Ch. 9; Vance, Ch. 11). Sanders makes a strong case for the role of collective creativity in envisioning future states and exploring how those future states can be realized. She also describes the important role of the physical space and materials in promoting creativity and visualization.

- A *Historical Mind.* reflects the ability to use analogical reasoning and to look to past examples to help solve today's problems (Bethel, Ch. 3; Duggan, Ch. 8; Van Riper, Ch. 1; Vance, Ch. 11). As noted by Clark, (Ch. 13) "Strategic thinking draws from the past in order to understand and improve the future" (p. 235). At the same time, the benefits of the historical mind must be balanced by a recognition of the limitations of history. While

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strategic thinking involves learning what we can from history, it must avoid relying too heavily on the past (e.g., Wong & Gerras, Ch. 4; Clark, Ch. 13). For example, "when we rely on understanding the past to deal with the future, we err. A record of past success increases vulnerability to trust in patterns gleaned from salient experiences" (Clark, Ch. 13, p. 231).

Although the above list may not be exhaustive, it does represent a comprehensive set of skills and activities that were described by contributors as relevant to strategic thinking. It is useful for providing a fuller, and more nuanced picture of what people mean when they invoke the term strategic thinking. The set of skills and activities described here should be considered in any strategy geared toward inculcating strategic thinking skills in the Army.

Developing and Retaining Strategic Thinkers

One of the major questions posed by ARI at the outset of this effort was: How can the Army develop and retain strategic thinkers? How can the skills identified earlier be encouraged, developed, nurtured, and supported within the Army? Implicit in this question is an assumption that strategic thinking skills can, in fact, be taught and developed. A fairly consistent theme across the papers is that strategic thinking *can* be developed. It is not an innately determined attribute. Nonetheless, it does appear that some individuals may possess particular characteristics (or come to the Army with particular educational or life experiences) that predispose them to developing strategic thinking skills and abilities more quickly and/or more fully (see Wong & Gerras, Ch. 4, for elaboration on this point).

Prerequisites for Strategic Thinking

In addition to the skills and abilities catalogued in the preceding section, contributors also described a variety of influencing factors that may contribute to an individual's proclivity to develop strategic thinking skills, as well as factors that may inhibit it. Importantly, the authors do not suggest that these elements necessarily *make* someone a strategic thinker; rather, they provide a critical foundation for development of strategic thinking skills. In any forthcoming strategy the Army develops for enhancing strategic thinking skills, it will be vital to consider these foundational elements and the extent to which they can be fostered in the force. Key factors include breadth of education and experience; opportunities to put strategic principles to practice via experiential learning; aspects of character and personality; and organizational culture that supports and reinforces the skills and activities associated with strategic thinking.

Broad Education and Experiences. The knowledge, awareness and critical thinking skills acquired through broadly-focused, liberal arts educational programs were consistently identified as important prerequisites to developing strategic thinking skills. A broad education was identified as important because it has the potential to expand a person's knowledge set over time through exposure to a variety of subjects, theories, perspectives, and paradigms. As Owen described, those with generalist preparation "…can reach across disciplines to communicate and…can bring diverse perspective experts together in coordinated effort. For inventive creativity, the wider the reach of the knowledge base, the more likely will be creative inspiration" (Ch. 10, p. 179). Van Riper (Ch. 1) also described this important foundational

element in depth, describing six fundamental areas that should be at the heart of a broad education for strategic thinkers (e.g., humanities, history, systems thinking, strategic theory, geostrategy and geopolitics, and cultural anthropology.) In addition to the knowledge base itself, a liberal arts education engenders a way of questioning, studying, and learning about the world that has direct relevance to complex problems for which strategic thinking is necessary.

Related to the role that a broad education can play in developing strategic thinking skill is breadth of life experiences. Contributors pointed to the ways in which foreign travel—which exposes people to different cultures, languages, people, fields, and organizations—can expand and deepen how a person thinks (Duggan, Ch. 8; Goldman, Ch. 2; Van Riper, Ch. 1; Wong & Gerras, Ch. 4). In her study of successful strategic thinkers in healthcare, Goldman identified broadening experiences as one of the common foundational experiences possessed by successful healthcare CEOs. As described by Wong and Gerras, broadening experiences can expand a person's frames of reference by exposing him or her to the alternative points of view and diverse perspectives that exist outside of the Army. Such experiences, when paired with opportunities for reflection, enable people to make connections, think analogically, and develop an appreciation for complexity and difference—all important aspects of strategic thinking.

Several authors allude to the role of civilian graduate programs as contributing significantly to broader education and life experiences (e.g., Bethel, Ch. 3; Schmidt, Ch. 12; Van Riper, Ch. 1; Wong & Gerras, Ch. 4). Extending beyond military education programs and attending civilian graduate programs can provide opportunities to expand one's frames of reference. Expansion occurs not just through diverse courses of study, but through interactions with people of diverse backgrounds and different points of view. As noted by Wong & Gerras (Ch. 4):

> Civilian graduate degrees develop frames of reference not only through the actual course content, but also by immersing student officers in environments where professors could be Marxists, fellow students could be pacifists, and neighbors could be anarchists—not the types of people that Army officers typically associate with (p. 73).

At the same time, some authors noted that the general trends in military education are moving in the opposite direction. For example, the number of officers pursuing civilian graduate degrees is declining, and there are some indications that pursuit of such a path (and intellectualism overall) is undervalued by the Army (see Wong & Gerras, Ch. 4). Contributors noted that Army personnel who choose to attend full-time civilian graduate degree programs (particularly doctoral programs) may find their career paths hindered relative to those who do not choose that path.

Opportunities for experiential learning. Along with opportunities for continuous practice, are also important underpinnings for developing strategic thinking skills described consistently by authors (e.g., Casey, Ch. 6; Cross, Ch. 7; Goldman, Ch. 2; Van Riper, Ch. 1). Casey noted that while formal education programs can certainly be influential, it is the informal day-to-day experiences that are most valuable in developing an individual's strategic thinking abilities. Goldman makes the case that programs to develop strategic thinking in the Army should take account of what is known about how people learn—for example, the critical roles that practice, access to feedback, and reflection play in development of advanced skill. Development of

strategic thinking skills requires that individuals experience repeated assignments where they can practice and hone those skills (Bethel, Ch. 3; Casey, Ch. 6; Cross, Ch. 7; Goldman, Ch. 2). A consistent theme that emerged from contributors was the importance of providing those opportunities early in a Soldier's career in order to lay an early foundation, and that experiential opportunities to practice should continue over the course of the person's career assignments. Waiting until individuals have advanced to mid-level officer to begin developing key skills risks missing significant windows of opportunity.

A significant challenge for the Army with respect to experiential learning is that many officers with potential to develop into high-powered strategic thinkers have been occupied with tactical level fighting over the last ten years. This tactical focus on short-term goals has inhibited their ability to reflect, practice, and hone strategic skill sets (Bethel, Ch. 3; Wong & Gerras, Ch. 4). A potential way to increase opportunities for practice is to provide surrogate experiences akin to those described in the chapters by Owen (Ch. 10) and Vance (Ch. 11). Both have offered useful descriptions of experiential learning opportunities targeted toward development of the skills associated with strategic thinking.

Personal Characteristics. In addition to educational and broadening experiences, authors suggested that there are particular personal traits and characteristics that may play an important role in development of strategic thinking skills. Wong and Gerras (Ch. 4), Bethel (Ch. 3), and Cross (Ch. 7) all suggest that there are specific, definable indicators of strong strategic thinking capability. For example, are some people innately open to other perspectives? Do they encourage frank flow and discussion of ideas? Are they willing to express dissent and to put ideas out for scrutiny and accept criticism? Others have posited that strong intellect or general intelligence is another personal characteristic that is a necessary precondition for strategic thinking and should be considered (and assessed) in selection of individuals into the officer corps (e.g.,Van Riper, Ch. 1; Wong & Gerras, Ch. 4).

The challenge the Army faces in this regard is that many of these characteristics are not believed to be pervasive within the Army, in part because they are not typically sought after, encouraged, or rewarded. Wong and Gerras (Ch. 4) provides some interesting data relevant to this point. A survey of 22,000 leaders across the Army in 2010, conducted by the Center for Army Leadership, found that only half of respondents believed that their unit or organization encouraged frank or free flow discussion of ideas. Wong and Gerras also note that assessments of Lieutenant Colonels and Colonels at the U.S. Army War College have shown that Army officers demonstrate less openness than the societal norm. Furthermore, there is a decrease in prevalence of this characteristic as officers progress through the ranks. One interpretation of these data is that openness is not a trait that is generally encouraged, incentivized, and/or given due consideration in current Army performance evaluation and promotion practices. This interpretation is potentially linked to the next prerequisite, organizational culture.

Organizational Culture that Supports and Reinforces Strategic Thinking. Regardless of a person's formal educational background, life experiences, and innate characteristics, it is clear that the socio-cultural context in which one works plays a pivotal role in whether strategic thinking skills are either cultivated or stifled. Developing expertise in strategic thinking requires an organizational culture that encourages, supports, and reinforces those skills (Bethel, Ch. 3;

Casey, Ch. 6; Cross, Ch. 7; Paparone, Ch. 5; Schmidt, Ch. 12; Wong & Gerras, Ch. 4). Casey and Cross describe the important role of artifacts, symbols, and specific organizational practices that send a consistent message that strategic thinking is a valued skill. This includes promotion and reward systems that incentivize the types of behaviors associated with strategic thinking, such as critical thinking, questioning, and ability to invite and synthesize diverse perspectives. It also includes an education system that emphasizes and provides practice in the skills associated with strategic thinking and that provides opportunities for thought and reflection.

Perhaps most importantly, it includes leaders who model strategic thinking and the characteristics associated with it, including encouraging others to question perspectives and assumptions, providing mentorship to others, and sharing stories that illustrate strategic thinking and its value to the organization. The role of leaders emerged as particularly important across the papers. Casey and Cross both provide a variety of specific practices that leaders can foster to model and promote strategic thinking. For example, Casey suggests that leaders reflect on (and articulate) their own thought processes involved in making decisions. Cross suggested that leaders become skilled at "whiteboard meetings" where they promote inclusive dialogue as opposed to imposing their pre-determined strategy via a set of powerpoint slides.

Given the recognition of the important role of organizational culture, it is noteworthy that among our contributors, there was an overwhelming and consistent view that the greatest impediment to the development and retention of strategic thinkers is the Army institution itself.

Cultural Barriers

The authors identify several types of barriers specific to the Army's organizational culture. First, the current Army culture is characterized by existing policies, procedures, and organizational structures that are generally set up to encourage and reward short-term tactical success, action orientation, and decisiveness rather than the types of activities associated with strategic thought (see Bethel, Ch. 3; Schmidt, Ch. 12). As described by Bethel:

> The current benefit/reward system in the United States and in the military emphasizes short term/immediate tactical success and is inherently impatient, unwilling to wait for a strategy to play out and evaluate its long-term success...The current standard of success is focused on battlefield achievement…Adhering to strategy takes discipline and focus and the immediate does not afford the time to see a plan through. (p. 56)

As Schmidt aptly notes:

> Few commanders or political leaders want to be seen as "indecisive." Yet in a real sense strategic thinking requires at least the mindset of someone who is in a sense perpetually unsure about what and why something might happen if one decision is made over another. (p. 227)

The tension between providing the time and resources for strategic thinking, and the need to act decisively, is a critical one to explicitly identify and address in the context of various situational conditions.

In addition to the short-term focus, the hierarchical culture and related cultural norms are often perceived as directly counter to the spirit of inquiry, openness, dissent, and creative thinking that are part of strategic thinking (Cross, Ch. 7). Wong and Gerras note: "Unfortunately, many aspects of the Army culture of self-sacrifice and loyalty…make it more difficult for officers to challenge the views of their superiors and peers" (Ch. 4, p. 72). There is a notable tension between the Army's need for Soldiers who follow directions, comply with orders and act at a moment's notice, and its need for officers (and possibly Soldiers at all levels) who can think critically, reflect productively, and question assumptions to good purpose. How can the Army manage these conflicting goals and create a culture that values both?

There is also a perception that the Army devalues development of intellectual skills, including many of the complex cognitive skills described in this and other chapters. As just one example, Wong and Gerras provide a compelling picture of the seemingly lax intellectual standards to which Army officer candidates are held. There is a concern that individuals with strong intellectual capacity self-select out of the Army because there are insufficient operational assignments that allow them to exercise strategic and critical thinking skills.

Finally, the Professional Military Education system is heavily influenced by a reductionist/ analytic and techno-scientific perspective. It provides no clear career path for strategic thinkers, and scant encouragement for the development and application of a holistic, synthetic, qualitative worldview that is required for strategic thinking about dynamic, complex systems (Paparone, Ch. 5; Schmidt, Ch. 12; Vance, Ch. 11). Schmidt (Ch. 12) eloquently argues that strategic thinking is difficult to inculcate into Army culture precisely because strategic thinking lacks predictive power, and is therefore of little value to those who are expected to "do something and do it now" (p. 223).

> Much of the reason the Army struggles with true strategic thinking and views such thinkers as outsiders in its ranks is because the prerequisites to strategic thinking are antithetical to the Army's dominant professional culture. That culture privileges a techno-scientific quantitative/predictive worldview. Yet strategic thinking requires a fundamentally different worldview, one that is oriented around a qualitative way of thinking about problems. (Schmidt, Ch. 12, p. 220)

This raises an important question: How can the Army, as an institution, convince itself that there is value in the descriptive and qualitative approach to thinking that is necessary for strategic thought?

Identifying and Assessing Strategic Thinkers

As the Army seeks to develop and retain strategic thinkers, important questions surround how those with potential for strategic thinking can be identified, and how strategic thinking ability can be assessed. Assessment is important for a variety of reasons. For example, if the Army can

identify mid-level officers who have the potential for excelling at strategic thinking, it can then "fast track" them by providing targeted education and experience to further develop and hone their skills. As Bethel noted, currently, "strategic thinkers are often discovered via a happy accident. There is no strategy to select those who will guide the long term effectiveness of an individual department, or the overall trajectory of DoD" (Ch. 3, p. 55).

Assessment is also critical from the standpoint of cultural change. Authors have emphasized the importance of building accountability for strategic thinking skills into performance evaluations as a way to inculcate the value of strategic thinking in the Army (e.g., Casey, Ch. 6; Cross, Ch. 7). As some contributors have noted: if it doesn't appear on your evaluation, it doesn't happen. Cross argues that "measuring how well leaders practice strategic thinking, develop strategic thinking among their people, and the quality of their strategic plans will ensure that leaders take strategic thinking seriously and devote appropriate effort to it" (Ch. 7, p. 129).

The Challenges of Assessment

Several authors spoke to the challenges of assessment and raised a variety of questions related to when and how individuals could or should be assessed (e.g., Cross, Ch. 7; Duggan, Ch. 8; Goldman, Ch. 2; Van Riper, Ch. 1; Wong & Gerras, Ch. 4). One of the challenges of assessment is the question of *what*, exactly, the Army should be assessing. This is particularly challenging given the complex and multifaceted nature of the strategic thinking concept described earlier. A related question is *how* should strategic thinking be assessed—through formal, standardized testing? (Bethel, Ch. 3; Van Riper, Ch. 1) Through observation of performance during exercises? (Cross, Ch. 7) Through expert evaluation? (Cross, Ch. 7; Duggan, Ch. 8). And *when* should individuals be assessed? Bethel, in addition to Wong and Gerras, recommend screening for strategic thinking competencies at various points throughout an officer's career. Wong and Gerras offer a concise developmental model that depicts the specific points in an individual's career progression in which screening should occur.

A related challenge is that there is currently no single well-established means of assessing strategic thinking skills—in the Army or elsewhere. Duggan (Ch. 8) argues that assessment is currently done primarily through leaders' observation and use of subjective evaluation criteria: "Who seems curious? Who reads and thinks and asks questions outside their core areas of expertise? Who seeks new experiences for learning rather than thrills? Who solves problems by looking for parallels outside their personal experience?" (p. 145).

Perhaps the most significant challenge of assessment is that the outcomes of strategic thinking may not be known for years, making evaluation of effectiveness and provision of feedback extremely difficult. Even then, it is impossible to disentangle the multitude of variables and their relationships to make any determination of cause and effect (Bethel, Ch. 3; Schmidt, Ch. 12).

Ideas for Assessment

Despite these various challenges, the papers in this report provide some suggestions for ways to begin identifying individuals with the potential for strategic thinking and for assessing strategic thinking skills. Assessment may be feasible through a combination of expert evaluation and

surrogate measures that can be used in conjunction with exercises and other experiential opportunities (see Cross, Ch. 7; Goldman, Ch. 2; Owen, Ch. 10). Any assessment of strategic thinking capacity and/or ability will need to be multifaceted to reflect the multidimensional nature of the construct. It should also be grounded in an understanding of the context within which the strategic thinking occurs (Goldman, Ch. 2). Elements that may be part of a global assessment of strategic thinking capacity or skill set might include:

1. The background factors and innate abilities that are believed to be indicative of strategic thinking skill ability (e.g., breadth of formal education; exposure to other cultures, organizations, paradigms; breadth of assignments and opportunities for experiential learning; general intelligence; openness to diverse perspectives, and courage).

2. The skill sets and activities that are associated with strategic thinking (e.g., systems orientation, cognitive flexibility, metacognitive ability, and so forth).

In some cases, there are existing measures that could be leveraged (e.g., measures of general intelligence and personality traits associated with strategic thinking potential; also see Vance's Linear/Nonlinear Thinking Style Profile Assessment$^{©}$ (LNTSPA) instrument, as an example). In other cases, new measures and techniques will need to be developed to assess the identified prerequisites and the skills and activities associated with strategic thinking. Regardless of whether or not existing measures are used, assessment is clearly an area that warrants additional research.

Where should the Army go from here?

The ideas presented in these experts' papers have yielded a variety of important questions and recommendations for next steps. Overall, it is clear that the Army needs a strategy for inculcating strategic thinking across the institution. While the strategy can (and should) remain fluid and evolving, some potential elements of such a strategy are described in the following recommendations:

➢ *Study and learn from great strategic thinkers*. One of the questions that has emerged from this compendium is: What is it that great strategic thinkers are doing? What is common among them? These questions have been addressed in studies of strategic thinkers in other contexts, such as a study of healthcare CEOs (see Goldman, Ch. 2). But given the unique context of the military, there would be considerable value in conducting a study of powerful strategic thinkers in the military to address questions such as: What are the common formative experiences? What does skilled strategic thinking actually look like in practice? What behaviors and cognitive skills do the best strategic thinkers exhibit? What approaches to strategic thinking do they use? What have they tried that has been less than successful? What can be done to replicate their development with other aspiring leaders? Embedded in this recommendation is the assumption that great strategic thinkers can be identified. Our view is that general consensus could be reached on a set of military leaders who exhibit notable strategic thinking skills.

➢ *Identify best practices from industry and from other services* that may be applied to the Army. The Army is certainly not the first organization to struggle with the challenge of developing strategic thinkers. A study of best practices would entail a close examination of how organizations in the private sector and/or other military organizations (e.g., Special Forces) develop, support, and encourage strategic thinking skills in their personnel. It would provide detailed insight into practices currently employed for teaching strategic thinking, strategies for integrating it into daily activities, and how it is supported through tools, processes, and technology. Clearly, there are certain approaches that may not readily transfer to the Army given its unique culture. But particular practices might be adapted for the Army or adopted by the Army as a means to promote cultural change.

➢ *Identify what currently works well*. While the Army has a variety of hurdles to overcome, there are a number of things the institution is doing remarkably well. The fact that there is attention being directed toward the complex challenge of developing strategic thinkers is a prime indication of this. What is the Army currently doing well that it can build upon? What aspects of the culture support development of the skills associated with strategic thinking? To advance the goal of embedding strategic thinking more deeply in the Army, there is a need to examine what the Army is already doing well, how and why those programs or efforts work, and build upon that.

Education and Support

➢ *Critically examine the PME curriculum.* An examination of the curriculum might be carried out with these questions in mind: Do learning objectives promote the types of activities involved in and/or required for strategic thinking? Are students given ample opportunities to practice different ways of thinking and decision making? Given the important role of a broad education to the development of strategic thinking skills, are there practices the Army might adopt from liberal arts programs to inform PME? One potential outcome of such an examination might include reframing or creating new learning objectives and associated curricula that better reflect the types of skills associated with strategic thinking.

➢ *Provide education in the activities and skills associated with strategic thinking throughout PME.* If there is a shared sense of the central skills and activities associated with strategic thinking, exposure to and experience with these activities should be an integral part of PME. One component that emerged as particularly important, for example, is the need for education and practice in *team* processes that support questioning, reflection, encouragement of discourse and frank discussion of ideas, and openness to diverse perspectives that are part of strategic thinking. Given the criticality of this skill set to the complex cognitive processes the Army is currently trying to promote within its force (e.g., design, strategic thinking, etc.), this should be interwoven throughout PME.

➢ *Provide experiential learning opportunities.* A consistent theme from the papers and discussion is that the Army should identify individuals with strategic thinking potential and provide them with assignments early in their careers that present opportunities to practice and hone strategic thinking skills. To do so requires identifying what those experiences are and where they exist. What sorts of experiences lend themselves to developing the skills

associated with strategic thinking? What are the characteristics of those experiences? Furthermore, a feature needed to maximize experiential learning is the freedom to make decisions (see Goldman, Ch. 2).What opportunities exist in the Army to practice strategic thinking at all levels, along with freedom to act? If limited experiential learning opportunities exist, perhaps surrogate experiences (see Vance, Ch. 11; Owen, Ch. 10, for example) could be integrated to help personnel acquire the needed practice. Owen, for example, provides an interesting team-based project-oriented learning model to foster development of strategic thinking skills.

➢ *Provide broadening experiences.* Given that broadening experiences are commonly viewed as an important precursor to the development of strategic thinking skills, there is value in promoting and fostering experiences that expose personnel to differing worldviews and broaden their frames of reference (Wong & Gerras, Ch. 4). This might include bolstering sponsorship of civilian graduate education (Van Riper, Ch. 1). But it also begs an additional question: What are other ways, besides civilian schooling, that can be used to develop broader frames of reference? Many of our Soldiers are exposed to foreign cultures and diverse perspectives through deployments. Yet exposure alone does not appear to be sufficient, or the Army would be overflowing with strategic thinkers. How can those experiences (and reflection on those experiences) be maximized for development of strategic thinking skills? Further research in this area, or deeper examination of current research, is needed.

➢ *Provide tools and processes to support strategic thinking.* Education is clearly a critical foundational element, but personnel also need process tools to support strategic thinking and strategic conversations such as tools to support listening, inquiry, and group dynamics (see Cross, Ch. 7, for examples). In addition, there is a need for tools to support visualization, illustrating connections, and developing shared mental models (Sanders, Ch. 9; Van Riper, Ch. 1). Enabling leaders and PME instructors to model the value of these tools can help. The use of such tools is particularly important for addressing complex, abstract concepts that do not lend themselves well to standard representational tools, such as maps. This is another potential area for future research.

Assessment

➢ *Hold people accountable* for strategic thinking. An argument made by some of the authors in this report is *you get what you measure*. If the Army wants to embed strategic thinking more broadly across the force, leaders should be held accountable for it as part of their performance evaluations and assessment should be ongoing and continuous throughout one's career. Not only will ongoing assessment serve as a basis for identifying those with significant strategic thinking potential and as a means to evaluate developmental progress and provide training feedback, but it is an organizational practice that will send an important message that this skill set is one that is valued within the institution.

➢ *Create assessment tools and techniques that are multidimensional* to assess the multifaceted nature of strategic thinking. Existing measures of intellect and personality traits associated with strategic thinking potential may be leveraged as one component of a more global

assessment approach. For creation of new measures and techniques, studies might be conducted to capture and document the informal and subjective assessments leaders are currently using to evaluate an individual's potential for (or skill in) strategic thinking. An important element of assessment is to recognize the role of context. Strategic thinking should be considered within the context of the organization in which it is taking place—the command teams, the hierarchy, and the larger national/political context.

Culture

➢ *Critically examine existing organizational structures.* The authors have emphasized the critical role of organizational practices and policies in either encouraging or stifling strategic thinkers through the implicit messages they send about the value of strategic thinking to the institution. Existing organizational systems and processes in addition to PME—such as informal and formal socialization practices used to introduce and orient new personnel, the evaluation processes employed, recognition and promotion criteria—should be examined to determine the extent to which they implicitly undermine and discourage (or promote) the behaviors and skills associated with strategic thinking. Such an evaluation will highlight areas for needed attention and potential change.

➢ *Promote incremental cultural change* through the introduction of specific practices, symbols, and artifacts that illustrate the value of strategic thinking. Some of these practices might include establishing a professional journal on strategic thought in the military, gathering case accounts that exemplify strategic thinking, conducting research in strategic thinking development and making efforts to apply research findings, adjusting incentives and reward structures that foster strategic thinking, and developing tools that support strategic thinking. The process of promoting cultural change will necessitate attention to the variety of factors that have the potential to either facilitate or inhibit cultural change. Owen provides an insightful description of the ways that implementation of change can fail, in addition to ideas that increase the odds that the change will be assimilated, including making the benefits of change known, making progress visible, and minimizing complexity and disruption. Attention to these factors and those provided by experts in organizational change (Kotter, 1996; Rogers, 1995) will be prudent as change is promoted.

➢ *Focus on leaders.* For the Army to achieve its goal of embedding strategic thinking more fully across its force, it is critical that it recognizes the important role of leaders in promoting needed cultural change. Due to their authority, power, and access to others, leaders are catalysts for change within an organization (Casey, Ch. 6). In moving forward, leaders will play an absolutely pivotal role in modeling and promoting strategic thinking through the demonstration of activities and skills—such as reflection, questioning, and elicitation of diverse perspectives—that are associated with strategic thinking. They also serve a crucial role in providing feedback and mentorship to nascent strategic thinkers. As part of the strategy for embedding strategic thinking skills across the Army, it will be important to address questions such as: What supports (including policies, processes, tools) do leaders need to provide mentorship in strategic thinking to others? What are the current barriers and/or resistance points that prevent this mentorship today, or prevent it from being

effective? And how do we convince leaders that strategic thinking is fundamental to the mission and encourage them to foster it on an ongoing basis? (Schmidt, Ch. 12).

➢ *Gather stories*. Given the powerful role of stories in communicating aspects of organizational identity and in illustrating the value of strategic thinking (Casey, Ch. 6; Cross, Ch. 7), a key task for promoting the skill set is to begin gathering and sharing stories of strategic thinking. Does the Army have compelling examples of strategic thinking? And what are the characteristics of a good example? Some of the elements that constitute a worthy example might include those that contain descriptions of team processes and strategies for discourse, key tradeoffs, factors considered, and decisions made. A key consideration noted by Schmidt is the need to convince the Army institution that strategic thinking is worthwhile to its missions. Thus, an additional critical characteristic of stories gathered and shared is that they demonstrate the value of strategic thinking to a broad range of Army missions.

Conclusion

Given the demands facing today's Army and the range of complex challenges it must manage, it is no longer sufficient for strategic thinking skills to reside in a select few leaders. Increasingly, there is a recognized need to embed the skill set required for strategic thinking more broadly across the force and throughout the command chain. Progress toward the goal of expanding the Army's strategic thinking capability will require time, additional reflection, inquiry, discourse, and significant cultural change. The current culture of the Army poses a variety of impediments to the institutionalization of strategic thinking, including institutional structures and practices that undervalue the skills, characteristics, and activities associated with strong strategic thought. Nevertheless, there are specific steps and considerations outlined in this chapter that the Army can take to transform into an institution that more effectively develops, nurtures, and reinforces strategic thinking skills and the people who practice them.

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