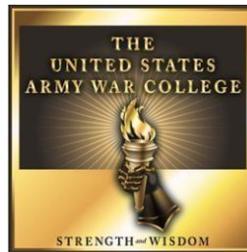# Strategy Research Project

Inspiring Innovation

by

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Inspiring Innovation

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Abstract

The Defense Innovation Initiative and the Army Operating Concept provide a common vision for the future, and they demand innovation. Congressional and DOD leaders as well as Army's CASAL survey of leader effectiveness suggest that there is a dramatic need for improvement in Army leader support for innovation. Despite senior leaders' call to action, leaders can undermine their efforts to support. These conflicts represent lost opportunities to leverage the creativity and expert knowledge within the Army. Individual Army leaders can choose innovation; in fact, they must in order to sustain a competitive advantage against our adversaries. Creativity, critical thinking and collaboration provide the leader tools to cultivate. Leaders can avoid discouraging innovation by not blaming fiscal uncertainty, process or bureaucracy and by mitigating the attention, error and data blindness that interfere with their decision-making. Senior leaders provide a vision for the future of warfare and in doing so articulate the importance of innovation for success. Leaders must inspire creativity and critical thought across their organizations to create value-added solutions to the Army's complex challenges.

Inspiring Innovation

> It's all about innovation, it's all about staying ahead of potential
> adversaries. It's all about questioning our comfortable assumptions and
> asking whether things that have worked in the past for us are going to
> work in the future. And if we say they won't we have better have the
> courage to do something about it.
>
> —Bob Work[1]

Historian Stephen Peter Rosen suggests military innovation during peacetime occurs when leaders articulate a strategy for innovation and a vision for the future character of war and victory.[2] A troop increase in Iraq and Afghanistan[3] is evidence peace is not a particularly familiar state. Even so, Rosen's concept of peacetime innovation has taken root in the Army. It is clear the *Army Operating Concept* provides a vision for the future, and it demands innovation.[4]

Are Army leaders innovative? Ostensibly. Anything short of a resounding yes response means that one of the "basics of an army leader's intellect" is at risk.[5] Occasional emphasis, or power-point deep support will not sustain a culture of innovation. The Center for Army Leadership conducts an *Annual Survey of Army Leadership* (CASAL) on the quality and effectiveness of Army military and civilian leaders.[6] Where innovation is concerned, the results disappoint.

Over the last 6 years, Army civilians give leaders D+ for innovation and active duty military give leaders a C.[7] Being innovative only sometimes is insufficient to meet the challenges of the future operating environment. These poor grades are derived from 2009-2014 CASAL survey data. Leader effectiveness in demonstrating innovation has been rated around 76% effective for military leaders and 67% effective for civilian leaders.[8] For military leaders, out of fifteen attributes innovation is in the bottom two

along with interpersonal tact. The bottom three for civilian leaders are innovation, interpersonal tact and total fitness.[9]

Those who perceive themselves as innovative will suggest that the survey respondents do not know how to recognize innovation. Or perhaps the effectiveness is low because leaders demonstrate other important attributes, like Army values and self-discipline significantly more often. It is possible to rationalize away the uncomfortable idea that Army leaders may not be innovative.

It is harder to ignore the perceptions external to the Army that demand more. The viewpoint of former and current Secretaries of Defense, who recognize a willing capacity for innovation within the force and still call for improvement.[10] Such perspectives remain consistent with the 2002 observations of a culture "stifling" innovation causing entrepreneurial talent to leave the Army.[11] In a July 2015 speech on Defense acquisition, Senator John McCain suggests that "our Defense Department has grown larger but less capable, more complex but less innovative."[12] Army leaders must acknowledge the need for innovation and as Deputy Secretary of Defense Bob Work challenges "have the courage to do something about it."[13]

This paper explores the role of the individual Army organizational leaders in encouraging innovation. Through their actions and attitudes, they can either undermine innovation or inspire it. They can thwart innovation by blaming fiscal uncertainty or process and bureaucracy. They can be blind to opportunities by not being mentally prepared to recognize them. Alternatively, by avoiding these common pitfalls leaders can choose to inspire innovation. Through creativity, critical thought and collaboration

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leaders create opportunities for innovation to occur. They can motivate organizations in a purposeful search for new and useful solutions to the Army's complex problems.

Strategic Environment

The Quadrennial Defense Review published in March 2014 calls for a "culture of innovation and adaptability."[14] This culture drives the development of capabilities, operational concepts and leaders required to be successful in a complex and uncertain future operating environment. The Defense Innovation Initiative started later the same year and seeks to speed innovation across the Department of Defense (DOD).[15] The criticality of innovation to success in the future of warfare is not a new idea in the Army. By the time the Defense Innovation initiative began, the AOC was promulgating innovation and adaptability as foundational to the future force.[16]

In his book, *The Fifth Discipline*, Peter Senge posits that the "only real competitive advantage is learning faster than the competition."[17] Army leaders must make this a reality. The goal of the Defense Innovation Initiative--to retain the U.S. competitive advantage--is unlikely to succeed without leaders that can inspire their organizations beyond today's obstacles. It is clear senior leaders are working to shape an enduring culture of innovation. To further the Army towards an organizational culture that actively seeks and adopts value-added change.[18]

Leaders and Innovation

Despite senior leader call to action, Army organizations do not always encourage decision making that inspires innovation. Environmental conditions, institutional processes, and organizational culture can thwart all but the most determined. Leaders themselves may even inadvertently undermine their own intentions. This represents lost opportunities to leverage the creativity and expert knowledge within the Army.

Leaders regularly make decisions that deliberately or subtly affect their organizational environments, mission success and assumption of risk. They make choices that encourage or discourage the sharing of new ideas and collaboration across organizations. They strive to develop themselves and their subordinates to think critically rather than be critical, and they can demonstrate (or not) the flexibility to recognize the potential of creative ideas. Leaders can choose to create environments that intellectually challenge the status quo and support innovation.

Encouraging innovation does not mean the Army needs a new initiative to recruit inventors. Inventors generate groundbreaking new ideas. When they occur, such moments of brilliance are worth leveraging. For a solution to be innovative, it must be both new and useful. Inventors solve problems without necessarily assessing if they are important problems or if proposed solutions are practical. Innovation requires individuals with knowledge and experience who incorporate and adapt to changing information and think in a different way about what they already know.[19]

Developing Army innovation does not necessarily mean the Army is limited to contract solutions. When resources are available, leveraging industry to produce technical innovation and unconventional ideas is extraordinarily valuable. Procuring the products of innovative thinking is the primary means to achieve the revolutionary technology leaps that the Defense Innovation Initiative demands. Acquiring innovation, however, cannot be the only approach. Acquisition of technology and ideas does not contribute to a culture of innovation within the DNA of the Army.

An "adapt or die" mindset is a characteristic of the operational experiences of Iraq and Afghanistan.[20] Protracted conflict generated bottom-up adaptation inspired, in

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part, by the actions of the enemy. As forces drawdown and resources dwindle, the challenge is to retain an adaptive mindset. The Army has made strategic choices about which lessons to learn and which cultural attributes will best posture it for future success. These choices are evident in the updates to the operating concept, doctrine and learning models of the Army.

The competitive environment of the wars in Iraq and Afghanistan were an incentive for rapid adaptation. Actions of the enemy and success or failure generated both the urgency and demand for new solutions. Creativity in tactics and openness to new capabilities result in immediate operational needs. Inventions, many which are innovations, are the result of such competitive friction.[21] Numerous DOD organizations developed to respond to urgent operational needs with contingency funds allocated to them.[22] This resulted in a distinction between rapid and deliberate acquisition systems.[23] In such an expanding system, there was room for everything--inventions, innovation and legacy concepts.

In a contracting fiscal environment, there is no longer room for everything. Historian Williamson Murray observes that that the military "can rarely replicate in times of peace the actual conditions of war."[24] As forces and funds drawdown and direct interaction with our adversaries becomes less frequent, what will prompt innovation? What will produce the friction necessary for this combat-experienced Army to incorporate new information about the environment and re-think what it knows? Some leaders will demonstrate disciplined initiative and create a competitive environment while dwindling resources will compel others.[25]

Leader support for innovation is critical in commercial and military contexts. In a study of successful leaders in commercial innovation, Hill et al examine the role of the leader as one of shaping the environment in order for innovation to occur rather than setting a vision.[26] On the point of vision setting, there is some divergence to examples from military innovation. Collins found that senior military leaders making doctrinal and organizational innovations during the Iraq war used an initial vision to prompt innovation albeit one without "clarity."[27] Both contexts converge on the importance of leader describing the outcome or goal and allowing teams to think creatively and evolve concepts towards viable solutions. Hill et al describe this as creating a "balance between the need for improvisation and the realities of performance."[28]

Even when leaders choose to support and encourage innovation there may be point at which the team is constrained by individual capacities. Leader development can enhance skills that contribute without a guarantee of results. An innovative force requires the identification and selection of those leaders most capable of sustaining a culture of innovation. This may require investment in selection processes to examine individual capabilities linked to career progression. The Army must seek out and promote those adept at leading innovation.[29]

There is a lack of direct measures for an individual or organizational innovation quotient. Industry also struggles to find reliable metrics for innovation. There are some models, within industry and DOD, however, they have not been broadly applied.[30] Subjective measurements, like the CASAL survey can provide indicators of leader attributes that are associated with innovation and command climate surveys may be a tool for feedback.[31] The suggested questions in the Army's command climate surveys

do not include innovation, creative thinking, critical thinking or collaboration. [32] It is up to

Army leaders to incorporate these attributes themselves in assessing their own

innovation environment.

Extraordinary leaders get credit for successful innovation whereas failure to

innovate is the fault of the resistance of institutions. Jungdahl and McDonald's work on

"Innovation Inhibitors" refocuses the dialog away from the institution as an entity and

instead examines individual actors in key positions within a bureaucracy as the cause

for resistance to innovation.[33] In this context, organizations are subject to internal

tension, a battle between those leaders providing incentives for change and those

discouraging deviations from the status quo.[34] Leader decisions deter or catalyze

innovation.

<div align="center">Undermining Innovation</div>

The first step to successfully incentivizing innovation is to stop undermining it.

Leaders, even those desiring to support innovation, can act in ways that dis-incentivize

the effort. They do this by (1) blaming the environment and (2) being blind to

opportunities.

<u>Blaming the Environment</u>

Blaming the environment is when leaders act as bystanders. They do so by

demonstrating fear of fiscal uncertainty and by succumbing to process pitfalls.

Fear of Fiscal Uncertainty

Leaders undermine opportunities for innovation by succumbing to the fear of

fiscal uncertainty. Fear discourages innovation and prudent risk taking. This may be a

fear of loss of organizational resources, a fear of failure or perceived failure. Taking

actions to avoid risks rather than manage risk may guarantee some success but may

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also be a reaction to uncertain circumstances or the result of short-term thinking. Economics research shows that avoiding loss is a powerful driver of decision-making.[35] The desire to preserve the resource status quo and increase individual power or influence at the expense of the larger organization can result.[36] The potential for a loss of resources can cause leaders to default to known and comfortable choices.

Fear of failure is rooted in both the individual leaders' egos and the concern that an unsuccessful choice may negatively influence reputation or career progression.[37] Processes and procedures exist to create repeatability and minimize risk. When leaders are concerned about absorbing risk or being responsible for a failure following procedure is a way to deflect blame.

Concern about failure, either mission or personal is understandable. Anxiety is a normal reaction to an unknown future, but it hinders positive change. Managing and accepting risk is an area where Army leaders have a distinct advantage over their commercial business counterparts.[38] Army Mission Command doctrine calls for the acceptance of "prudent risk to exploit opportunities" in the face of uncertainty.[39] While the AOC applies, the concept across the operational and institutional force these tenants are more aligned with the profession of arms than a bureaucracy.[40]

An uncertain fiscal environment is the new normal. Decisions rooted in fear fail to recognize the changed environment. This does not mean leaders should forgo the need to shore up resources, nor should they squander limited resources on long shot opportunities but rather strive for a balance. This requires leaders to deliberately question assumptions and consider alternatives in conjunction with status-quo choices.

Process Pitfalls

Leaders can fall prey to process pitfalls that undermine innovation. Even if able to overcome the challenges of fiscal uncertainty, there are process pitfalls that discourage innovative ideas. These are challenges, which at first glance, cannot be associated with a specific individual or circumstance within the environment. Often blamed on the nebulous bureaucracy, process pitfalls require leader examination in order to determine the root cause of what actually is undermining innovation.

Leaders may not be able to sell the idea in order to garner sufficient resources to implement the innovation. This can happen in any number of ways: a fledgling idea may not be mature enough to compete for precious resources, the pitch insufficient, or staff members might unduly influence the importance of ideas based on competition.

If the new idea competes in some perceived way with an existing approach, the incumbent has the advantage.[41] This is a pitfall because the introduction of a new idea also insults the current method or the conventional wisdom. Those proudly protecting the status-quo may view the innovation as an attack rather than an opportunity. This could generate further opposition based on the perception of insult, vice thoughtful evaluation of the merits of a new idea.

Implementing a top-down process review can remove barriers to innovation but may be subsumed by other approaches or be tangential to business as usual. For example, the Training and Doctrine Command (TRADOC) developed the Rapid Infusion Process as a way to integrate new concepts into the organization.[42] It was conducted as a portion of the Army Lessons Learned process before being fully absorbed. This is not to suggest that the existence or absence of the Rapid Infusion Process hinders innovation, in fact its purpose was to encourage it. However, the variability and short-

lived nature suggest what Wilson refers to as a peripheral process that "can be easily reversed."[43] Suggesting peripheral changes prove as temporary as the presence of a champion. This is a situation where an innovator can stumble or lose momentum and support for a new idea by not knowing how to garner support.

While bureaucracies are an extension of the individual leaders within them, process pitfalls make it difficult to determine exactly what or whom is hindering progress. Is it a lack of resources or actually a lack of support? Is there opposition to the specific new idea, or opposition to all new ideas? Is the process evolving, or a way to thwart change? In all cases, the cynic would choose the latter and blame the environment. A leader of innovation must dig deeper to shape the environment.

Blindness to Opportunities

Louis Pasteur, a great innovator, once said, "Chance favors only the prepared mind."[44] Leaders must be attune to their environment and themselves. Any less and they will be blind to opportunities for innovation. Such blindness manifests itself in several ways. Attention-blindness rewards the leader for positive attribute of focusing on a task and then something else in the environment surprises them. Error-blindness reveals the leader capacity to be wrong or oppose new ideas. Data-blindness results when leaders focus on a need for irrefutable proof that an idea will succeed in order to capitalize on opportunity. These approaches stifle innovation by driving solutions towards an incumbent approach without requisite analysis.

Attention Blindness

Cognitive science research on visual attention finds that by selectively attending to specific tasks, people can become blind towards other things in the environment.[45] Based upon the experimental work where individuals focus on one thing on the screen,

such as people passing a basketball, and remain so focused that they miss a significant distractor that passes through their view.[46] This is not to suggest any kind of researched cognitive link between visual attention and innovation but rather consider attention blindness more broadly. The distraction could be an innovative idea. By being fixated on the known task, the potential in what is new goes unnoticed.

Clayton Christensen, in his book *The Innovator's Dilemma*, attributes this type of blindness to good management. How could managing correctly result in missed opportunity? The idea is at first counter-intuitive. However, a simplistic view of good management focuses attention exclusively on assigned missions. Such focus can become myopic and oblivious to changes in the environment. This approach may be good management but it is poor leadership. The Army leadership manual calls for leaders that "expand their frame of reference to fit a situation rather than reducing a situation to fit their preconceptions."[47] Attention-blind leaders, who remain in denial, miss opportunities to innovate and risk losing the competitive advantage.[48]

Error Blindness

Leaders can miss opportunities by being blind to their own potential for error. By being oblivious or unwilling to seek new information or approaches because, it is superfluous. Being open to new ideas requires a willingness to rethink assumptions, and incorporate new information. It requires a leader who can imagine a situation in which they do not have all the answers and are willing to acknowledge this uncertainty. It may mean previous ideas were wrong and they have been doing something that is imperfect. It may also mean the environment has changed. Attributed to arrogance at times or other personality quirks the idea of not recognizing one's own errors, or error-blindness, is from *Being Wrong* by Kathryn Schultz.[49] Leaders who cannot fathom a

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situation where being wrong is a possibility miss opportunities for innovation by not being receptive.

Gerras and Wong, in their examination of *Changing Minds in the Army*, articulate a link between being receptive--demonstrating willingness to re-examine beliefs--and openness.[50] Their study finds that this characteristic is not as prevalent in future Army strategic leaders as the complexity of the strategic environment demands. Collins furthers the analysis, by connecting openness as a positive trait for leaders of innovation.[51]

Leader "receptivity to innovation" presupposes an organization whose members are willing to share ideas for innovation and a leader that is responsive.[52] Leaders must encourage debate and challenge proposed solutions. Consider the example of Eastman Kodak, which not only failed to bridge the market and consumer evolution towards digital photography but also missed the opportunity to act on the ideas from within their team.[53]

Encouraging new ideas through debate and "creative abrasion" is a leadership challenge for innovation in industry and the Army adds the structured dynamic of hierarchical command.[54] However, without openness to dissenting opinions, and an environment amenable to constructive debate a leader's error-blindness can lead to missed opportunities for innovation.

Data Blindness

Leaders can also miss opportunities by relentlessly searching for confirming evidence or data in order to backstop decisions.[55] In the same manner, fear encourages the preservation of the status quo; a leader with an insatiable need for analytical proof can inhibit innovation. Data-blindness is an over-reliance on analytical information in lieu

of professional judgment. Taken, loosely from Cukier and Mayer-Schonburg, who in their book *Big Data* apply the concept to the use of casualty data as a measure of progress in Vietnam.[56] Such decision-making, driven by data from an incorrect metric demonstrate the dangerous pitfall of becoming blind to everything but the numbers.[57] Analytics are a decision-support tool, not a decision maker. The irrefutable evidence provided by data is the crutch that carries the blame should things go poorly.

When an innovative idea begins within an organization, data can supplement or replace demonstrated success. This is the case when information is actually reliable and based on rigorous analysis. At times what leaders lean on, particularly within bureaucracies, is conjecture or agenda-driven information masked as analysis.[58] Truly analytical data can support a decision to further an innovation but requires "informed skeptics" who consider data and are willing to challenge its voracity.[59] Data-blindness results in loss of balance between analytics, professional military judgment and risk.

Inspiring Innovation

In his account of transforming IBM, Louis Gerstner Jr. describes culture and organizational "DNA" as primary drivers of behavior.[60] His assessment is that leaders can shape the environment and incentivize transformation and must "invite the workforce" to transform themselves.[61] Army senior leaders set the conditions by providing a vision of the future that values adaptation and innovation. Leaders must choose to incentivize transformation and transform themselves.

Incentivizing transformation does not prescribe emphasis on management style motivators such as bonuses, award programs, or reserved parking spots.[62] While such extrinsic motivators are useful as reinforcing tools, they are not guarantors of creative thinking and in some circumstances may hinder it or cultivate resentment.[63] In his 1959

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essay on creativity, Isaac Asimov suggests new ideas are not generated on-demand for money but rather as a secondary result of collaboration and sharing of information in an environment designed to encourage creativity.

Inspiring innovation must become an everyday activity for leaders, a choice demonstrated through action. By creating an environment, that generates opportunities through (1) creativity, (2) critical thinking and (3) collaboration, leaders and their teams can produce new and useful solutions to military problems.[64]

Creativity

Generating "novel ideas" is a pre-cursor to determining the usefulness and potential for the idea to add value to the mission or organization.[65] Paraphrasing Teresa Amabile and her collaborators, creativity requires related expertise, creative process, and motivation all applied in concert within a supportive environment.[66] Considered a divergent approach, creative thinking is often unconstrained discovery to help define problems in a concise way and generate options.[67]

There is little literature on the practical application of creative thinking theories in the Army. One approach, proposed by an Australian Army officer, is to encourage creativity in Australian forces using mission command. This was found effective operationally but slow to take hold in institutional situations.[68] In an Army adaptive leader training program, thinking creatively is one of the core attributes of adaptability incorporated into all learning activities.[69] There are also academic applications where a lack of rigid hierarchy aid in the encouragement of divergent thought.[70]

Operational adaption of equipment and techniques demonstrate creativity in real-world situations. The threat of improvised explosive devices in Iraq produced numerous adaptations: Rhino Convoy protection devices, small robots, and company intelligence

support teams to name just a few.[71] These bottom-up solutions provide a glimpse into the creativity available for innovation.

Further review of Amabile's concepts of expertise, creative process and motivation help shape concepts of creative thinking for innovation in the Army.[72] Relevant expertise and understanding of the area in which innovation is required results from education, training and real world experience. Expertise adds value and opportunity for nuanced understanding of the application of a new idea in a specific environment or situation. It is essential for problem solving and individual expertise can be a comfort zone as leaders move away from technical roles into senior leadership positions with broad responsibilities. There is a risk that expertise in a given area can introduce "cognitive entrenchment" or an over-commitment to a specific way of thinking that makes adaptation to new ideas a challenge.[73] Enlightened experts can avoid this by introducing non-experts, working outside their own domains to broaden themselves or seeking the challenge of a dynamic environment to increase creativity.[74]

Creative processes take into account individual tendencies and cognitive approaches as well as other character traits like persistence and enthusiasm.[75] Leaders can capitalize on their own capacity, or that of their team to invent entirely novel ideas or combine and adapt existing ideas. Leaders should avoid the misperception that a capacity for creative thinking must be innate and encourage broad involvement.[76] Some individuals will have more of an aptitude for divergent thinking, being a devils advocate or simultaneously grasping opposing viewpoints and may emerge as leaders within the creative context.[77]

Intrinsic motivation is most effective for encouraging creativity and extrinsic rewards such as monetary compensation provide secondary reinforcement.[78] However, the reverse is not true, extrinsic rewards can diminish creativity. Leaders do not need to wait for individuals to self-generate creativity. Motivation increases with deliberate assignments to thinking creativity with promise of openness and sincere evaluation of ideas. A perception of autonomy is also a powerful motivator. Self-determination about "how" tasks are completed produces increases creativity.[79]

Creative Environment

Some individuals may have more of a tendency for divergent thinking while others may bring expertise, or related knowledge a creative thinking environment is a diverse environment. This includes a diverse approach to thinking and diversity of experience. To achieve this, leaders should seek advisors and team members who are not replicas of themselves.

Offering up new ideas may be uncomfortable for anyone concerned about appearing wrong. An environment encouraging of creativity necessitates a certain amount of trust amongst those involved. Trust that challenging or opposing thoughts are constructive and add to the information available for synthesis.

The positive attributes of such an encouraging environment integrate with the realities of organizational challenges. Research on the impact of downsizing, for example, shows that both the fear of such a significant event, as well as the actual experience can diminish both productivity and creativity with enduring effects.[80] While this study did not investigate downsizing in a military context or the impacts of fiscal uncertainty it is not a significant leap to consider the potential for negative implications

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on creative thinking. The environment must help generate a multitude of creative ideas to support innovation.

Critical Thinking

When the leader and their team cultivate creative ideas, critical thinking is a technique to assess and refine them. Critical thinking is an element of mental agility, and along with innovation, one of the "basics of an Army leader's intellect."[81] It is a deliberate way to deconstruct thinking in order to illuminate the elements of an idea to include assumptions, weaknesses and intellectual merits.[82] Critical thinking is "purposeful, reasoned and goal directed" and linked with a capacity for judgment.[83]

Whereas creative thinking is divergent and potentially uncomfortable, critical thinking is convergent and more structured. Critical thinking provides rigor and focus so that novel ideas can provide the practical value that is foundational to innovation. In comparison to the limited amount of research on creative thinking in the Army, there is a number of perspectives on critical thinking and its role in developing Army leaders.[84]

Richard W. Paul and Linda Elder in *Miniature Guide to Critical Thinking* divide critical thinking into "elements of thought" and "intellectual standards." This work, common in military education, provides a question-based checklist to aid the user in challenging one's own thinking.[85] Paul and Elder's approach is sufficiently generic that it can apply broadly across disciplines. As a result, multiple authors call for the application of context specific information for military problems, in the form of a real world challenge, war-game scenario or an "interpretive paradigm."[86] Each approach adds its own version of a situational frame to increase the utility of the critical thinking approach to Army problems. Gerras extends the discussion beyond Paul and Elder's model to

expand the military concept of critical thinking. He highlights biases, heuristics, fallacies and other errors commonly made by decision makers, and future strategic leaders.[87]

Critical Thinking Environment

Creating an environment embracing and regularly applying critical thinking takes time and discipline. Time is necessary to cultivate critical thinking and understanding as well as teams to build teams that can dispassionately assess concepts with rigor. Discipline is required to apply the models, within context, to organizational problems without eliminating critical thinking to a hasty solution. These are leader responsibilities. Leaders and organizations can struggle with impartiality about their own ideas. To tackle this challenge, the Army has developed Red Team training and Decision Support Red Teams which can aid commanders by providing an outside viewpoint and advanced critical thinkers.[88]

The role of critical thinking in innovation is to evaluate creative ideas to determine if they add value. Critical thinking is a deliberate repeatable process and may be comfortable to a bureaucracy, or at least more comfortable than creative thinking. The concepts of critical thinking are already within the planning and decision-making processes of the Army although working through a checklist does not guarantee critical thought.[89] Critical thinking is the opportunity to test, challenge and refute separate ideas for strengths and weaknesses. Such evaluation is a war-game of ideas. Critical thinking prepares potential innovations and the leaders championing them for implementation. Leader integration of critical thinking as a tool for inspiring innovation must be more than routine process; it must manifest the purposeful evaluation of creative ideas. The results of creative and critical thinking provide potential innovations for implementation to be shared through collaboration within and across organizations.

Collaboration

      Collaboration is an area where the Army has a distinct advantage as compared to industry. The Army is already a team with shared purpose and values. The many sub-cultures and organizational distinctions can limit collaboration to those already thinking in a similar manner. The Army is also part of the DOD team and the whole-of-government team. Depending upon leaders' perspective, the perception of who is part of their organization can influence how teams collaborate and towards what purpose. Collaboration moves past brokering partnerships between organizations to get what one group needs towards the integration of ideas and capabilities for mutual solutions.[90]

      In the 1950 study of continuous-aim firing in the U.S. Navy, Elting E. Morrison describes the "danger of limited identifications" on innovation.[91] Morison describes how the introduction of a technological change in naval gunnery, organizational sub-groups aligned themselves with their own aspects of the problem rather than taking a holistic view of how the change could benefit defense. In doing so, these sub-groups were divisive, rather than collaborative. Morison called for an expanded view of self-identification and proposes identification with an "adaptive process" rather than a functional role. An adaptive process "will enable us to accept fully and easily the best promises of changing circumstances without losing our sense of community or essential integrity."[92] Sixty-six years later, Morrison's observations still apply.

      The Army's total force policy emphasizes unification of Active, National Guard and Reserve Components as one Total Army.[93] This is an example of strategic leadership shifting the identification of sub-groups towards a broader view. Collaboration can bring together diverse perspectives on a challenge or problem. At its most basic level, the Army is culturally and experientially diverse.[94] Collaboration will

make such diversity an asset in creative and critical thinking. Self-identifications, however, have a way of overcoming individual or even team diversity to create unity. Such unity strengthens collaboration and can add risk if too narrowly defined.

Collaboration requires moving past cooperating to meet sub-groups needs and towards common goals. This requires dialogue or "thinking together."[95] Dialogue achieves a transition to a more enlightened approach of shared creation. When organizations or individuals think together, the result in creative thinking might be a longer list of new concepts. In critical thinking, each group may advocate for the merits of their own approaches. This does not necessarily mean compromise or consensus, which can dilute the benefits of the diverse perspectives.[96] Collaboration for innovation demands a more integrated result, where differing solution(s) succeed based upon potential for value, not the origin of the idea.

Once collaboration sensitizes efforts to potential innovations, there may not be a singular focus. Use of a portfolio mindset can allow for a multitude of approaches and ideas to achieve the same goal. While each innovation may have varying levels of risk and resources, these options provide differing paths to the overall purpose. Derived from an industry approach, this type of portfolio synchronizes innovation progress with varying timelines.[97] In the context of collaboration, a portfolio can focus on exploring multiple concepts simultaneously as a means of discovering the value-added innovation(s) for a singular problem.

Collaborative Environment

Leaders can prompt an environment of collaboration that supports innovation. Providing a common goal towards a higher purpose and mission can elevate sub-group identification to create trust. Embracing the diversity of experience and thought of those

involved requires leaders to remain open to divergent perspectives. The leader of innovation will bridge the diverse viewpoints in search of common ground but not necessarily compromising on value.

Encouraging a portfolio of ideas can amplify collaboration by focusing the group on owning the outcome. This holds the potential to open avenues of evaluation that allow for constructive failures.[98] Experimentation is a valuable tool in refining concepts and opening up opportunities for additional collaboration. Piloting an innovation to assess value is as an opportunity to learn. Fear of failure or competition for resources can present hurdles. Pursuing parallel concepts from the portfolio of ideas may be the most prudent approach to innovating and the least desirable from a fiscal efficiency standpoint.

Fueling a competitive environment can generate momentum. A culture of debate and regular competition of ideas in order to purposefully seeks new and useful ways to accomplish the mission. Fostering competition includes being willing to relinquish old ideas to implement a new promising approach. An example is the implementation of the Army Learning Model (ALM) across TRADOC centers and schools.[99] Operationalizing ALM called for change in how the army learns and adapts over time.[100] Implementing ALM is not without challenges and misperceptions but the transformation has generated a competitive dialog about approaches to improving Army learning.[101]

Leaders can generate collective urgency within their organizations through "purposeful impatience" described by Tom Peters in his book *Thriving on Chaos*. By enforcing accountability for innovation, leaders can drive their organizations to collaborate, to find mutual ground, overcome stasis and implement changes. This

means not tolerating excuses but also understanding what is realistic.[102] Leaders striving to generate urgency can also draw inspiration from external sources. War-games, training scenarios, and real-world threats provide a frame from which to define problems and context in which to generate solutions. An environment conducive to collaboration can help overcome barriers and generate momentum for innovation.

<div align="center">Choosing to Innovate</div>

Army leaders must do more than superficial support to innovation. They must seek innovation more than just sometimes. As part of the intellectual foundation of Army leaders, a capacity to inspire innovation is essential. Rather than rationalize away the uncomfortable notion that the Army may not be as innovative as the future environment requires, leaders must transform themselves and their organizations. The perceptions of congressional oversight, DOD leadership and those within the Army suggest that there is more to be done to inspire rather than stifle innovation.

Army leaders can make an innovative culture a reality. It is an everyday choice in how they conduct themselves and influence their organizations. Creativity, critical thinking and collaboration provide the leader tools to cultivate. This requires practice and the knowledge to avoid inadvertently undermining the effort. Leaders can avoid discouraging innovation by not standing on the sidelines. Passive players mired in blaming fiscal uncertainty or process challenges instead of influencing and shaping their environment. Self-development and self-awareness are essential to mitigate the attention, error and data blindness that interfere with decision-making.

This paper calls for individual Army leaders to choose innovation. Senior leaders have provided a vision for the future of warfare and in doing so articulate the importance of innovation for success.[103] Leaders must inspire creativity and critical thought across

their organizations to create value-added solutions to the operational and institutional

challenges facing the Army. Leaders must strive for an A in innovation by unleashing

"the incredible advantage we have in our people."[104]

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