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Adaptability: Preparing for and Coping with Change in a World of Uncertainty

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Executive Summary

This paper emphasizes the importance of adaptability in a security environment characterized by uncertainty, constant change, and the inability to predict where and how the military will be called upon in the future. The paper establishes a foundation by citing the call for adaptability by both military and civilian leaders over a period of several decades. While suggesting examples of where the military has adapted well or been slow to adapt in the past, the paper emphasizes the importance of (1) giving precise definition to the word and (2) developing a greater understanding of exactly what adaptability means and offers in relation to people, organizations, systems, and processes. It contends that the Department of Defense (DOD) would benefit greatly from a well-defined and dedicated effort to analyze a wide range of adaptability-related issues and their relevance to the various functional aspects of DOD. The paper suggests that while DOD has, in fact, shown it can and does adapt, a concerted effort to (1) better understand what it means to be adaptable and (2) enhance adaptable performance across the department has significant potential for saving lives and money and advancing the nation's security interests more effectively in the future. The paper concludes with a proposal for developing and executing a multi-year program of cross-cutting research that has the support and participation of a broad-based community of interest within DOD.

Contents

1. Adaptability in the Department of Defense (DOD)

> *"This is the most adaptable, creative, can-do, amazing organization in the world. … We have adaptability in our DNA here."* [1]
>
> Deputy Secretary of Defense Ashton Carter speaking to military and civilian personnel at Scott Air Force Base, April 16, 2013.

How adaptable is the Department of Defense (DOD)? What does it mean to be adaptable? Why is the subject important? Should DOD manage adaptability?

Of course, one should give Deputy Secretary Ashton Carter some allowance for hyperbole because he was seeking to inspire a large number of people working at all levels of the U.S. Transportation Command (USTRANSCOM) as it was setting off on the difficult task of Afghanistan retrograde. Nonetheless, there is comfort in the belief that DOD is demonstrably more adaptable than other gargantuan organizations, for example:

- The Russian Ministry of Defense, about the largest comparable foreign organization
- The U.S. Department of Health and Human Services (DHS), about the largest U.S. executive department, by outlays[2]
- General Motors, at least before its rescue by the United States Government (USG), when it was the largest industrial company in the United States

Still it is by no means obvious that DOD is adaptable *enough* when one considers the strategic uncertainties it has faced and will face in the future. Measured against that challenge, many serious observers have argued that DOD is insufficiently adaptable, by a considerable margin. In this view, insufficient adaptability costs lives and billions of dollars.

Leaders, from the President of the United States on down, have spoken or written about the importance of adaptability. It is important because, as they all recognize, it is impossible to predict the future; but change is certain. And it is not just change that is important, but the speed of change and the need to respond to the unexpected.

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1 Karen Parrish, "Carter: DOD Will Prevail Against Uncertainty," *American Forces Press Service*, April 17, 2013. Carter's entire speech and question and answer session are available on YouTube video at: http://www.youtube.com/watch?v=bvxW8Fv4QqM.

2 By Office of Management and Budget's (OMB) estimate for FY 2013 outlays, Department of Defense (DOD) Military Programs are about $616B; HHS is about $900B; Treasury is about $490B; VA is about $140B; DOT is about $80B; and DHS is about $60B.

The key question that confronts DOD's leaders is: Recognizing that there is a rapidly changing security environment and that no one can predict exactly what types of situations the military will face in the future, when is it best to continue to "muddle through," and when is it cost effective to invest the time and effort necessary to develop, over an extended period of time, the more adaptable individuals, organizations, systems, and processes that will allow the department more effectively to prepare for and respond to inevitable but unpredictable new challenges and opportunities?

Greater adaptability is certainly not the answer to every problem related to uncertainty. However, since DOD has demonstrated the importance of adaptability in operations, its ability to conduct training that produces more adaptable performance, and the utility of designing adaptability into combat systems, is it possible, or even likely, that DOD would benefit from a purpose-designed effort to manage the enhancement of adaptability as it responds to the challenges and opportunities of the rapidly changing security environment? Can DOD manage adaptability to achieve more desirable outcomes?

While ideas that enhance adaptability are likely to come from below in the organization, only a comprehensive plan driven from the top is likely to produce overall greater adaptability and the synergistic effects that will ultimately be reflected in improved department-wide readiness and performance. This paper outlines the need and the necessary steps to get started on a path towards embracing adaptability as one element of a strategy for coping with uncertainty.

Past adaptability-related research has led the Institute for Analyses (IDA) research team to believe that DOD would benefit from developing a multi-year program of cross-cutting research on the subject. An initial effort to collect and catalog relevant military, academic, and business literature on the subject would proceed in parallel with efforts to develop a dictionary of adaptability-related terms; hypothesize how adaptability differs in relation to individuals, organizations, systems, and processes; and propose specific directions for future research. The development of a community of interest would be integral to this process, with sponsors reviewing the initial efforts and authorizing the further refinement and execution of the research program.

The goal is a DOD prepared to produce, in a more integrated fashion, the capabilities necessary to move to an even higher level in its ability to respond quickly and effectively to operational demands in a world characterized by constant change and uncertainty; ultimately saving thousands of lives and billions of dollars, not to mention more readily advancing the nation's security interests.

2. Adaptability is Important

A. The President Says So

President Barack H. Obama's January 2012 prefatory letter to the Secretary of Defense's statement of priorities for defense in the 21st century observed that the nation is at a "moment of transition"[3] in which the nation will "focus on a broader range of challenges and opportunities."[4] The President wrote that "we will ensure; that our military is agile, flexible, and ready for the full range of contingencies."[5] He also noted that "we must put our fiscal house in order here at home and renew our long-term economic strength." In other words, the President was saying *that DOD must adapt to a changing and uncertain security environment in the context of domestic fiscal and economic challenges.*

B. Military and Civilian Leaders in DOD Say So

Successive Secretaries of Defense, Service Secretaries, Chairmen of the Joint Chiefs of Staff, and Service Chiefs have reiterated the need for adaptability in a variety of forums and contexts and in very direct and specific language. Leaders have discussed the need for adaptability as it relates to strategy, planning, the development of capabilities and combat systems, education, organizational structures, and fiscal and budgetary constraints. The need for adaptability is embedded in Joint Doctrine.

In short, Pentagon leaders have been talking for years about an unpredictable future, the persistence of change, and the need for adaptability in order to deal with uncertainty and respond effectively to change and to the unexpected.[6] They have spoken of the need for adaptability in individuals, units, organizations, and systems. They have written of the need to develop adaptability through education, training, and system design. But what action has DOD actually undertaken to improve adaptability across the department?

C. The Present and Future Security Environments Demand It

The security environment is changing and will continue to change. DOD must continue to adapt as that environment is currently evolving, and the department must be prepared to adapt to

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3 Leon E. Panetta and Barack H. Obama, *Sustaining U.S. Global Leadership Priorities for 21st Century Defense* (Washington, DC: DOD, 2012), prefatory letter by President Obama, January 3, 2013, first paragraph, http://purl.fdlp.gov/GPO/gpo18079.

4 Ibid., fourth paragraph.

5 Ibid., fifth paragraph.

6 Appendix A provides a broad range of examples of senior DOD leaders discussing the need for adaptability.

future changes, threats, and opportunities. In the strategic guidance published in January 2012, Secretary of Defense Leon Panetta wrote that "this country is at a strategic turning point,"[7] and that "the global security environment presents an increasingly complex set of challenges and opportunities to which all elements of U.S. national power must be applied."[8] The guidance acknowledged both the "changing geopolitical environment and our changing fiscal circumstances."[9] It also recognized that DOD leaders "cannot predict how the strategic environment will evolve with absolute certainty"[10] and that there will be "unforeseen demands."[11]

A particular point with regard to the environment, stressed earlier by former Chairman of the Joint Chiefs, Admiral Michael G. Mullen, is that not only must the military be prepared to respond adaptively to change, but the pressure to do so is increasing because the rate of change is increasing.[12] Taking note of the changing security environment, the guidance speaks of U.S. posture evolving and the Joint Force needing to "recalibrate its capabilities."[13] The Secretary summed up the guidance by saying "the Department will both encourage a culture of change and be prudent with its 'seed corn,' balancing reductions necessitated by resource pressures with the imperative to sustain key streams of innovation that may provide long-term payoffs."[14]

Change, uncertainty, and complexity are all part of a dynamic security environment that demands an adaptable DOD…both the department as a whole and the major departments and agencies that individually comprise the department.[15]

D. Becoming More Adaptable Will Reduce Risk

The military seeks to maintain a high degree of readiness in order to be able to respond to a range of threats and scenarios. It measures readiness by assessing the status of personnel, equipment, supplies, and training…the capabilities required for assigned missions and the ability to perform specific tasks to given standards under defined conditions. A high degree of readiness requires making the right resource decisions. A high degree of readiness also implies less risk. In fact, in a world of constant change, ambiguity, complexity, and uncertainty, readiness is very difficult to assess. With regard to personnel, the readiness of individuals, units, and

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7 Panetta and Obama, *Sustaining U.S. Global Leadership*, prefatory letter by Secretary Panetta, January 5, 2012, second paragraph.

8 Panetta and Obama, *Sustaining U.S. Global Leadership*, 1.

9 Ibid.

10 Ibid., 6.

11 Ibid.

12 See Admiral Mullen's comments in Appendix A.

13 Panetta and Obama, *Sustaining U.S. Global Leadership*, 4.

14 Ibid., 8.

15 Appendix B provides additional examples of how the foreseeable security environment demands adaptability.

commander/leader teams (CLT) depends, in part, on the adaptability of each—their ability to respond effectively to change and to surprise. The readiness of equipment depends not just on its ability to perform to design specifications, but on its adaptability—"the potential set of missions (or possible states within a mission space) that can be supported."[16] Supply readiness depends not just on having specific quantities of specified items available to individual units, but having an adaptable supply and logistics system that can provide unanticipated quantities of material to unanticipated locations when they are needed. Training readiness, depending on the training audience, is often more than units performing to task, conditions, and standards or large exercises comprised of pre-scripted events designed to train procedures. Training readiness can also include preparing individuals, units, and CLTs to adapt in real time…to respond effectively to changes in the operational environment and to the unexpected.

Measuring readiness in these broader ways will encourage changes that will make personnel, equipment, supply, and training more adaptable and reduce risk.

E. Becoming More Adaptable Will Save Lives and Money

From a historical perspective, there are numerous examples of how the failure to adapt to change or to unanticipated conditions cost lives and money: Perhaps none is more obvious than World War I, where trench warfare and repeatedly marching ranks of soldiers into the onslaught of modern weapons cost an entire generation of young men. In Vietnam, the U.S. strategy of attrition and graduated response reflected an inability to adapt to the nature of the war and the character of the enemy. In the end, waging war as it did cost the nation the lives of more than 58,000 U.S. soldiers, sailors, and airmen and $738 billion in FY2011 dollars.[17] More recently, in Iraq and Afghanistan, and as attested to by the senior leadership, the United States had little understanding of what it was getting into and was slow to adapt to the realities it found. U.S. participation in the Iraq war dragged on for nearly nine years, and the war in Afghanistan, continuing to cost lives and billions of dollars, is now in its twelfth year.

Appendix C provides comments of the senior U.S. leaders in Iraq and Afghanistan, as well as both historical and more contemporary examples of where the military was too slow to adapt, resulting in protracted conflicts that did not serve U.S. security interests well, the unnecessary loss of lives, and the needless expenditure of large sums of money. The appendix also provides several non-operational examples of where DOD might have benefited from greater adaptability.

The military does, in fact, adapt; but, as is well documented, the rate at which it has done so in the past has sometimes been too slow and costly, both in terms of lives and money. Jim Lacey

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16 Prashant R. Patel and Michael P. Fischerkeller, *Prepare to be Wrong: Assessing and Designing for Adaptability, Flexibility, and Responsiveness*, IDA Document NSD-4932 (Alexandria, VA: Institute for Defense Analyses, June 2013), iii.

17 Stephen Daggett, "Costs of Major U.S. Wars" (Washington, DC: Congressional Research Service, June 29, 2010), 2.

and LCOL Kevin Woods, in an article that argues for institutionalizing enhanced adaptability in DOD, make two important observations based on an historical review:

- The United States has almost always entered conflicts with an inappropriate force structure and doctrine for the situation.
- In recent decades, it has taken an average of three years to adapt U.S. military doctrine and force structure to meet unexpected challenges.[18]

Looking back at the past twelve years in Iraq and Afghanistan may well provide a major opportunity to learn how to adapt more quickly in the future.

[18] Jim Lacey and Kevin Woods, "Adapt or Die," *U.S. Naval Institute Proceedings* 133, no. 8 (August 2007): 18–19.

3. Adaptability is Illusive

Because there is no DOD-approved definition of the word, it is difficult to provide a consensus view of where the military has adapted effectively in the past or where it has been too slow to adapt. Similarly, because of the uncertainty of the security environment and the range and pace of change in the world, it is difficult to assess the degree to which the current security community is adapting or the effectiveness of its efforts to adapt. More fundamentally, there is not a clear understanding of what constitutes adaptable performance, an adaptable organization, an adaptable combat system, or adaptable processes. Thus, it is difficult to pinpoint opportunities to improve adaptability, to measure postulated gaps, or to specify exactly what might enhance adaptability in a given situation. Specifically, DOD lacks recognized metrics for adaptability. However, based on a broad understanding of adaptable performance as it is described in relevant literature, the following suggest several possible examples of where the military has adapted in a timely manner or where it has been too slow to adapt.[19] The IDA research team also provides examples of efforts by various professional disciplines to address the subject of adaptability and suggests that DOD would benefit from a conscious and dedicated effort to enhance adaptability across the department.

A. Successful Adaptations

1. Strategic Recognition of the Modern Battlefield and Defeating the Taliban Network

The change in operational strategy undertaken by General Stanley McChrystal in the battle against insurgents in Iraq and Afghanistan is a superb example of the experience and depth of professional understanding, the imagination, the time and perseverance, and the sheer hard work that may be required to adapt. This example also illustrates how successful adaptation requires the ability to deal with complexity and ambiguity and, especially, the ability to change the way people think. General McChrystal described both the challenge and his adaptive response to it in an article in *Foreign Policy* magazine in 2011.[20]

McChrystal begins by recognizing that not only do the Taliban have the traditional insurgent advantages of living with and having ties to the population, but that they have also leveraged technology in a way that has made them a highly effective network, a community of

[19] This paper suggests several additional examples of success and failure in adaptation, as well as efforts that turned out to be mal-adaptive, in Appendix C.

[20] Stanley A. McChrystal, "Becoming the Enemy: To Win in Afghanistan, We Need to Fight More like the Taliban," *Foreign Policy* (March/April 2011): 66–70.

interest, and not simply a conventional army. This enemy was different from any the United States had previously faced, and it was both difficult and frustrating for the Army to come to terms with this. McChrystal eventually concludes that it will take a network to defeat a network. It will take a network to produce the knowledge, speed, precision, and unity of effort necessary to fight successfully:[21]

> Just getting to the starting line with this type of thinking was not something that came easily or naturally. It began with thorough analysis that did not cling to preconceived notions or an adherence to existing doctrine. It required self-analysis and self-understanding, as well as understanding the enemy. It required an appreciation that the enemy was not a hierarchical organization, but a constellation of fighters that was flexible, able to sustain losses, and capable of both nuanced and sudden changes in tactics. Reacting effectively to the enemy required both information and the ability to process it and act on it rapidly.[22]

In essence, McChrystal had discovered that he needed to build a network that could outperform the enemy's network. Achieving that goal was an iterative process that required extensive learning throughout the development process. Study, experimentation, and adjustment led to the understanding

> …that an effective network involves much more than relaying data. A true network starts with robust communications connectivity, but also leverages physical and cultural proximity, shared purpose, established decision-making processes, personal relationships, and trust. [23]

The challenge was "transforming a traditional military structure into a truly flexible, empowered network."[24] For an effective network, he needed a different way of imagining relationships; a different organizational structure; a different set of resources, particularly command and control (C2) resources; and to breakout from conventional linear thinking. Each group involved had to appreciate that success depended on shared situational awareness—on all information being shared completely throughout the entire network, not simply up and down a chain of command. Accomplishing this took a great deal of time, but ultimately the organization he created developed…a shared consciousness between each level of the counterterrorism teams.

> We started by sharing information: Video streamed by the drones was sent to all the participants—not just the reconnaissance and surveillance analysts controlling them. When an operation was set in motion, information was continuously communicated to and from the combat team, so that intelligence specialists miles away could alert the team on the ground about what they could expect to find of value at the scene and where it might be. Intelligence recovered on the spot … was immediately cycled back through the loop to our intelligence and surveillance

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21 Ibid., 67.

22 Ibid., 68.

23 Ibid., 69.

24 Ibid.

> forces following the results of the raid in real time. The intelligence recovered on one target in, say, Mosul, might allow for another target to be found, fixed upon, and finished in Baghdad, or even Afghanistan.[25]

Commenting in a later interview, McChrystal reflected…

> The network had a tremendous amount of geographical spread. At one point, we were in 27 countries simultaneously. Inside Iraq, we were in 20 and 30 places simultaneously—all connected using modern technology but also personal relationships.
>
> In 2003, in many cases we'd go after someone, we might locate them and capture or kill them, and it would be weeks until we took the intelligence we learned from that and were able to turn it into another operation. Within about two years, we could turn that cycle three times in a night.
>
> In August 2004, in all of Iraq, our task force did 18 raids. And we thought that was breakneck speed. I mean, we really thought we had the pedal to the metal. These were great raids, very precise, a high percentage of success. But as great as those 18 raids were, they couldn't make a dent in the exploding insurgency. Two years later, in August 2006, we were up to 300 raids a month—ten a night.
>
> But then, we had to be able to take all of that and make it mean something—because it's not just about capturing and killing people; it's about synchronizing into the wider theater campaign. And that took us longer. We really didn't mesh completely into the conventional war effort [in Iraq] until 2006, 2007.[26]

Very clearly and contrary to much conventional and unadaptive thinking, McChrystal recognized that what was required to defeat a modern insurgency was not simply performing better at what the military had been doing or providing more time and resources to achieve victory on the bases of existing counter-insurgency doctrine. What was required was recognizing the battlefield had changed and that to win on that battlefield required adapting operations and the mentality of entire organizations to that new battlefield.

It is very useful to review and analyze what McCrystal did that was effective. It would also be very useful to analyze what might have allowed his initiative to be undertaken earlier or what might have allowed it to be developed at a faster pace. An honest overall assessment would also need to address the question of whether an earlier investment in the resources necessary to carry out the initiative would have made a difference and been cost effective.

2. Tactical Doctrine and the Development of the Aircraft Carrier

In World War I, the nations involved failed to adapt to the evolution in weapons systems, resulting in an unimaginable carnage. Following that war, there were contentious struggles

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25 Ibid., 70.

26 "Foreign Affairs Focus: Stanley McChrystal on U.S. Military Strategy," by Gideon Rose, foreignaffairs.com, February 20, 2013. http://www.foreignaffairs.com/discussions/interviews/generation-kill?page=show.

throughout the U.S. military regarding how to adapt to the advent of aviation. The Navy developed the aircraft carrier and operational doctrine for its use. The carrier was essential to winning the war in the Pacific in World War II. Even so, it took the sinking of the battleships at Pearl Harbor to permit the carrier to ascend to the position of a capital ship, something resisted up to that time by naval officers in positions of power and influence.[27]

Interestingly, it was a young officer who provided the original thinking that gave impetus to the effective use of the carrier later on. According to *Sea Power: A Naval History*,

> As early as 1930 Lieutenant Commander Forrest B. Sherman, who was to become U.S. Chief of Naval Operations 20 years later, advocated a fleet formation that anticipated the carrier-centered task force of World War II. The Navy was not yet ready to experiment along such lines, but during the next few years development of the task force principle made Sherman's suggestion feasible.[28]

A professor at the Naval War College recently wrote about the lasting effect of the young officer's creative thinking: "Perhaps the most novel and effective way of organizing naval forces for combat is the U.S. Navy's task force concept, used extensively from 1941 to 1945 and still in use today."[29]

3. Adapting to New Technologies--Navy Nuclear Power

Being able to adapt based on advances in technology offers advantages to those with the necessary imagination. It is not new technology, but adaptive and creative thinking with regard to that technology that is decisive. Atomic and nuclear research in the 1940s led to the possibility of building a true submarine…one that would not have to surface to replenish its propulsion capability. In 1949, then-Commander Eugene Wilkinson presented a schedule to then-Captain Hyman Rickover to put to sea a nuclear powered submarine on 1 January 1955. In a speech in 2005, Vice Admiral Wilkinson noted, "We went later—on the 17th."[30] The nuclear submarine provided a nearly undetectable underwater attack capability and, together with the submarine launched ballistic missile, has provided the nation with a secure strategic nuclear weapons response capability since the 1960s.

4. Other Possible Successes

There are many other examples of the military adapting. A recent study on adaptability by CNA includes nearly forty pages of instances in which the Military Services (hereafter, the

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27 E.B. Potter, ed., *Sea Power: A Naval History* (Prentice Hall: Englewood Cliffs, NJ: 1960), 638–639.

28 Ibid., 638.

29 Milan Vego, "On Military Creativity," *Joint Forces Quarterly* 70 (2013): 87.

30 Matt Schudel, "Eugene P. Wilkinson, commander of first nuclear sub, dies at 94," *Washington Post*, July 17, 2013.

Services) have adapted since the 1980s.[31] This listing very clearly illustrates DOD's adaptability, but it also highlights the need for a clear definition of adaptability and illustrates the point that without such a clear-cut definition "everything becomes an example of adaptability." More importantly, the question remains whether DOD, which has demonstrated its ability to adapt in many diverse situations, would be better prepared to deal with an uncertain future and rapid change if it were able to enhance its ability to adapt, if it were to attempt to manage adaptability.

B. Failures to Adapt

1. Vietnam Strategy

The U.S. strategy of attrition and graduated response failed to recognize the nature of the war being fought or the character of the enemy. The idea that the nation could fight a "limited war" ignored the fact that the other side was engaged in total war. Tom Ricks, in his recent book, *The Generals*, excoriates the Army's leadership and its failure to adapt to the realities of Vietnam.[32] He attributes this failure to a lack of accountability. He writes:

> If the Army is serious about having an officer corps that is adaptive, it needs to try to carry out a major cultural shift that enables it to embrace accountability rather than shun it…accountability is the engine that drives adaptability.[33]

2. Adapting to New Technology—the Navy's Efforts to Take Advantage of New Technology to Reduce Shipboard Manning and Time Spent in the School House

In an effort to increase efficiency and reduce costs by making adaptive use of new technology, the Navy reduced manning, in both numbers and experience level, on its surface ships and shifted much of the training for its surface ship sailors, both officer and enlisted, to computer-based training. The result was a steady decline in the material readiness of the ships and an inability to maintain required standards.[34] The Navy has been forced to reverse course and has begun adding billets to its surface ships. Additional off-ship training is being provided to new officers, but questions about the best way to train both officers and enlisted personnel assigned to ships still remain. In this case, what was intended as an adaptive response to changed conditions was not only ineffective, but was counterproductive.

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31 Sarah A. Stevenson, William D. Brobst, Alan C. Brown, Ninghao Jiang, and Valerie J. Scruggs, *Adaptive Posture Analysis* (Alexandria, VA: CNA, June 2012).

32 Tom Ricks, *The Generals: American Military Command from World War II to Today* (New York: Penguin Press 2012), 252–292.

33 Ibid., 451.

34 Vice Admiral Phillip M. Balisle, *Fleet Review Panel of Surface Force Readiness*, February 26, 2010.

3. Adapting in Real Time to Soldier Needs on the Battlefield

Troops in the field rely on the Services in Washington to provide them the means to wage war. As conditions on the ground evolve or change, new requirements in response to the changes take on special urgency. In 2008, in a speech at the National Defense University, Secretary of Defense Robert M. Gates addressed current shortcomings of the procurement system and process with regard to the ability to respond effectively to warfighter requirements:

> Why did we have to go outside the normal bureaucratic process to develop counter-IED [improvised explosive device] technologies, to build MRAPs [mine-resistant ambush protected], and to quickly expand our ISR [intelligence, surveillance, and reconnaissance] capability? In short, why did we have to bypass existing institutions and procedures to get the capabilities we need to protect our troops and pursue the wars we are in?
>
> Our conventional modernization programs seek a 99 percent solution in years. Stability and counterinsurgency missions—the wars we are in—require 75 percent solutions in months. The challenge is whether in our bureaucracy and in our minds these two different paradigms can be made to coexist.[35]

No better examples can be provided with regard to the failure of the bureaucracy to adapt to meet operational requirements. In the cases discussed, the Secretary ultimately overrode Service reluctance to adapt. However, Secretary Gates emphasized the cost in lives and money resulting from institutional slowness to adapt in support of the troops and exhorted the students he was addressing to act in their future roles as Service leaders to enhance DOD's institutional adaptability:

> In Iraq, we've seen how an army that was basically a smaller version of the Cold War force can over time become an effective instrument of counterinsurgency. But that came at a frightful human, financial, and political cost. For every heroic and resourceful innovation by troops and commanders on the battlefield, there was some institutional shortcoming at the Pentagon they had to overcome. Your task, particularly for those of you going back to the services, is to support the institutional changes necessary so the next set of colonels, captains, and sergeants will not have to be quite so heroic or quite so resourceful.[36]

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[35] Secretary of Defense Robert Gates (speech, National Defense University, Washington, DC, September 29, 2008).

[36] Ibid.

4. Grasping the Concept of Adaptability

A. Defining the Word

DOD would be well-served by a generally accepted definition that makes clear what it means to adapt and what characterizes an adaptable individual, organization, process, or system. DOD is much more likely to develop enhanced adaptability in people, organizations, processes, and systems if it is well understood what the word adaptable means and how the definition applies in each case.

While DOD has not published a definition of adaptability, various studies conducted on behalf of DOD have offered possible definitions.[37] That is important because achieving adaptability depends on meeting specific criteria depending on the context in which the word is being used. An adaptable individual can be characterized in a certain way and an adaptable combat system can be characterized in another way. Adaptability might be considered an attribute or it might be considered a meta-skill. It is also important that the word not simply be used interchangeably with other terms such as flexibility, agility, resilience, robustness, responsiveness, and innovativeness; in which case, the word means everything and nothing.

IDA has attempted, in a number of research efforts, to contribute structure to the concept of adaptability. The Office of the Secretary of Defense for Personnel and Readiness (OSD (P&R)) has sponsored IDA research related to adapting to asymmetric threats and developing an adaptability training strategy that resulted in a working definition of adaptability as a meta-skill. The C2 Programs and Policy Directorate in Acquisition, Technology, and Logistics (AT&L) continues to sponsor IDA research to develop the concept of C2 agility. This analysis defines adaptability as one aspect of agility. More recently, IDA research on the design of weapons systems provided a definition of adaptability useful in assessing that characteristic in a given system.

What is meant by adaptability remains open to debate. There are several recent examples of attempts to define adaptability. In 2002, Personnel Decisions Research Institutes, Inc. in a study for the Army Research Institute (ARI), reviewed a number of definitions of adaptability contained in academic literature and summarized them with its own definition. The *Defense Science Board 2010 Summer Study on Enhancing Adaptability of U.S. Military Forces* defined adaptability, but the definition has not been officially adopted or publicized. A study conducted in 2012 by CNA discusses what it means to be adaptive as defined by the Office of the Deputy Assistant Secretary of Defense (Readiness).

[37] See Appendix D for specific definitions.

B. Efforts to Study Adaptability

Adaptability has been the subject of research for many years, in many countries, and in a variety of venues. Perhaps most well-known is Charles Darwin's theory of evolution by means of natural selection. In essence, this theory describes the way biological populations adapt in order to survive. [38]

But the importance of adaptability to survival in a military environment is reflected in the title of an article discussing the slowness with which the U.S. military has traditionally adapted at the beginning of wars—*Adapt or Die*.[39]

Academics in a number of fields have addressed barriers to adapting, as well as incentives to adapt. With regard to government, a natural reluctance by all agencies to adapt in real time—to acknowledge that change has created a situation whereby today is not a linear extension of yesterday—is discussed in Charles Lindblom's 1959 article, "The Science of 'Muddling Through," which describes the tendency of decision-makers "to overlook excellent policies for no other reason than that they are not suggested by the chain of successive policy steps leading up to the present."[40]

The following short paragraphs provide a very small sampling of more recent research concerning adaptability;

Academics in a number of universities have focused their studies on the subject of adaptability. One example is the work of Professor Stephen Zaccaro at George Mason University who has studied and written extensively on leader adaptability. Zaccaro has been a significant contributor to research on adaptability and leader development by the Army Research Institute for the Behavioral and Social Sciences.

As an example of the Army's earlier interest in the adaptability research, Personnel Decisions Research Institute (now PDRI) prepared a review of adaptability literature for ARI in 2002.[41]

Within the Pentagon, the *Defense Science Board 2010 Summer Study on Enhancing Adaptability of U.S. Military Forces* specifically recognized the power of culture and made recommendations based on its judgment that DOD "can achieve greater adaptability across the

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38 Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (London: John Murray, 1859).

39 Lacey and Woods, "Adapt or Die."

40 Charles E. Lindblom, "The Science of 'Muddling Through,'" *Public Administration Review* 19, no. 2 (Spring 1959): 87–88.

41 Susan S. White and David W. Dorsey, "Review of Adaptability Literature" (Arlington, VA: Personnel Decisions Research Institutes, Inc., April 1, 2002).

enterprise—moving beyond the cultural, organizational, and regulatory barriers that exist."[42] The board identified key elements of a strategy to promote adaptability within DOD. Certainly, this study could contribute to any future efforts to conduct analysis of the subject of adaptability.

Non-university educational institutions, such as the Center for Creative Leadership and Partners at Cambridge Leadership Associates, have also focused on the subject of adaptability in their leadership development programs.

Probably the greatest amount of writing on the subject of adaptability, however, is focused on business. Adapting is just as essential to survival in business as on the battlefield. Many businesses do not survive over time because they fail to adapt to changing business conditions. In fact, as Lacey and Woods point out in their excellent article, of the original firms in the Dow Jones Industrial Average, only General Electric has adapted and still exists.[43]

Outside the United States, Dr. Anne-Marie Grisogono, Research Leader for Complex Adaptive Systems at Australia's Defence Science and Technology Organisation (DSTO), has studied and written extensively on adaptability and decision-making in complexity.[44] Her work has been instrumental in the Australian Army's development of the concept of an "adaptive stance" and its adoption of "Adaptive Campaigning—Army's Future Land Operating Concept."[45]

Dr. Grisogono's research on adaptability was inspired and influenced by the writings of German professor, Dr. Dietrich Dorner. His book, *The Logic of Failure,*[46] explores why certain tendencies in human patterns of thought lead to failure when dealing with complexity. Dr. Grisogono has built on this to develop the idea that it is possible to exploit the power of adaptation to solve complex problems.

LtGen Sir John Kiszely, the former Director of the Defence Academy of the United Kingdom, has addressed both the need to institutionalize adaptability and the long time horizon that leaders must maintain, particularly with regard to education, in their efforts to develop adaptability.[47]

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42 Defense Science Board, *2010 Summer Study on Enhancing Adaptability of U.S. Military Forces*, introductory memorandum from the Chairman (Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)), January 2011).

43 Lacey and Woods, "Adapt or Die," 17–18.

44 Dr. Anne-Marie Grisogono, "Exploiting Adaptation," presentation to Operational Adaptation Conference, Edinburgh, UK, June 24, 2010.

45 *Adaptive Campaigning: the Land Force Response to Complex Warfighting*, Future Land Warfare Branch, Australian Army Headquarters, Canberra, December, 2007. *Army's Future Land Operating Concept*, Director Future Land Warfare and Strategy, Australian Army Headquarters, Canberra, September 2009.

46 Dietrich Dorner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York, Metropolitan Books, 1996).

47 John Kiszely, "Post-Modern Challenges for the Modern Warriors," *The Shrivenham Papers-Number 5*, Defence Academy of the United Kingdom, December 2007.

OSD (P&R) has sponsored IDA research that has (1) provided a working definition of adaptability; (2) demonstrated the relevance and importance of developing more adaptable individuals, leader teams, and organizations; and (3) shown through experiments with military personnel that adaptability can be measured and that training can produce more adaptable individuals.[48]

Based on more than thirty years of study related to education and training, IDA's Dr. J. Dexter Fletcher emphasizes the importance of cognitive readiness, a key component of adaptability in individuals.[49]

Very recently, two IDA researchers, Drs. Prashant Patel and Michael Fischerkeller, authored a paper that recognizes the unpredictable nature of future demands on DOD and recommends that the design of weapons systems include the development of three attributes, including adaptability, "to hedge against the likelihood of being wrong about the future."[50]

In 2012, CNA conducted a study to help the Office of the Deputy Assistant Secretary of Defense (Readiness) (ODASD (Readiness)) "build the organizational construct necessary to develop and maintain an adaptive force."[51] The study analysis "examined the Mission Readiness Adaptive Cycle (MRAC) that ODASD (Readiness) has proposed for the adaptive force, as well as the adaptability model defined by the Australian Defense Science and Technology Organisation (DSTO)." [52]

Today, despite the stated importance of adaptability and the wide range of studies addressing the subject of adaptability, DOD has not attempted to assemble a broadly applicable body of knowledge on the subject. Without taking this first important step, DOD remains at a large disadvantage with respect to any effort to foster adaptability in its various functional areas.

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48 John C. F. Tillson, Waldo D. Freeman, William R. Burns, John E. Michel, Jack A. LeCuyer, Robert H. Scales, and D. Robert Worley. *Learning to Adapt to Asymmetric Threats*, IDA Document D-3114 (Alexandria, VA: Institute for Defense Analyses, August 2005); Waldo D., Freeman, William R. Burns, Jr. *Developing an Adaptability Training Strategy and Policy for the Department of Defense (DOD)*, IDA Paper P-4591 (Alexandria, VA: Institute for Defense Analyses, August 2010).

49 John Dexter Fletcher, *Cognitive Readiness: Preparing for the Unexpected*, IDA Document D-3061(Alexandria, VA: Institute for Defense Analyses, September 2004).

50 Patel and Fischerkeller, *Prepare to be Wrong*, iii.

51 Sarah A. Stevenson, William D. Brobst, Alan C. Brown, Ninghao Jiang, Valerie J. Scruggs. *Adaptive Posture Analysis* (Alexandria, VA: CNA, June 2012), 8.

52 Ibid., 1.

5. A Conscious and Dedicated Effort is Required to Enhance Adaptability

A. An Important Initiative

Adaptability is important to the military. Leaders have regularly emphasized and reiterated this. Failing to adapt or being slow to adapt costs lives and money. The IDA research team stipulates up front that the military is, indeed, adaptable. But does it need to be more adaptable, and can it become more adaptable? Can or should adaptability be managed? If adaptability is an important attribute or capability when considering future uncertainty, where might devoting resources to enhancing adaptability be cost effective? The research suggests that undertaking a long range disciplined study of adaptability could result in identifying where enhanced adaptability would improve the capability and readiness of leaders, combat systems, organizational structures, and administrative processes, thereby making of DOD a more effective organization and the military better prepared to carry out its assigned missions.

B. Tough Questions to Answer

A flag officer reviewing the draft of an earlier IDA paper on the subject of developing more adaptable leaders in the Navy asked perfectly valid and important questions:

- Where is the evidence that doing something differently will produce adaptive leaders?
- Where is the gap?
- What metric will you use to tell if the gap has been filled?[53]

These same questions could be applied not just to leadership development, but to organizational structures, combat systems, and DOD processes. And answers to these, as well as other relevant questions, will come only from a disciplined and sustained effort to analyze the concept of adaptability.

C. Much Time, but Low Cost and Great Value

As the concept of adaptability is better understood, DOD leadership will be better prepared and have more opportunity to take actions designed to increase adaptability across various DOD domains. This paper does not envision this as a short term undertaking or one that ultimately can be achieved in a few easy steps. Rather, it will be an iterative process in which learning and action continually inform each other.

[53] RADM Jamie Barnett, Director of Naval Education and Training, e-mail, May 25, 2006.

The value of committing to such a process cannot be measured precisely, but the promise is that lives and dollars will be saved. Saying this another way, failing to pursue initiatives to improve the adaptable performance of DOD will, at some point, result in the needless loss of life and unaffordable expenditure of resources. The good news is that the cost of carrying out an analytic plan to begin the process of increasing adaptability is very small compared to the costs of investing in technology designed to increase military capability in other ways. Adaptability can and should be viewed as an essential military capability. Beginning the work of increasing this capability will not require a lot of money, but it will require time, leadership, commitment, and hard work in the form of intellectual activity.

D. Sustaining the Initiative

Developing and sustaining a long-range research program that affects all major areas of DOD will not happen without the commitment and dedication of a coalition of leadership that shares a vision of what might be possible. Ensuring the necessary leadership commitment over an extended period of time will itself require a special effort. The IDA research team proposes establishing and growing a community of interest as the best means to accomplish this. The normal turn-over in leadership positions will threaten any initiative. A community of interest can serve to enhance support for the initiative and bridge the inevitable transition of individual leaders. Managing such a community of interest will be an essential element in sustaining the initiative.

6. Suggestions for the Way Ahead

The first and most important suggestion is that a coalition of DOD leaders sponsor and engage in a multi-year effort to study the concept of adaptability in a coordinated and rigorous way. The ultimate goal would be the implementation of policies and practices that increase the adaptability of DOD leadership (military and civilian), organizational structures (including military force structure), systems, and processes.

A. Initial Effort

The IDA research team proposes that one or more research organizations initially be asked to accomplish three things:

- Collect relevant literature on the subject of adaptability from all sources and catalogue it in a manner that will allow it to be accessed readily for future research.
- Establish a working taxonomy of adaptability-related terms and proposed definitions for adaptability as it applies to individuals, organizations, systems, and processes.
- Develop a proposal for a multi-year program of cross-cutting research. This will require determining areas for research and the resources to be assigned to each. Examples of potential adaptability-related research topics and questions are listed in Appendix E. This list constitutes only an incomplete and unstructured list of possible research areas that must be associated and organized into a research program that will guide the analysis going forward.

B. Multi-year Research Effort

The research team envisions a full-time research program to support this initiative. A schedule of regular reviews would allow the program to be modified if necessary. More importantly, the reviews would allow all members of the community of interest to take advantage of the research findings as they are developed. Whereas the entire research effort might extend over a period of several years, the research team envisions that research findings and hypotheses developed in conjunction with the research would lead to initiatives by members of the community of interest as they seek to adapt to changes in the security environment and changes made necessary by budgetary constraints. In particular, the research program could specifically identify studies with potential near-term impact.

C. Building a Community of Interest

As discussed above, this ambitious project will succeed only if it is supported by a community of interest composed of leaders who recognize the desirability of enhancing the department's adaptability and are committed to remaining engaged in a long-term effort to develop more adaptable individuals, organizations, systems, and processes throughout DOD.

The nucleus of the community of interest will be those leaders who take on initial sponsorship of the research effort. The community will grow as the research effort expands and as researchers engage with additional leaders in DOD who recognize that they, too, have a stake in making various aspect of their organizations more adaptable.

Remarkable synergies derive from the development of a community of interest. People discover that there are others they did not know who are dealing with similar issues and who are willing to share ideas and perspectives that will advance their own work. Discussions within the community produce new ideas and challenge existing ideas in ways that do not happen when people remain within a small, homogeneous work group. The fact that the community is developing new ideas and making progress in solving old problems becomes known to other leaders who are themselves drawn into the community. The open and free discussion of new ideas by such a community would provide an ideal catalyst for the development of adaptability initiatives.

7. Conclusion

Adaptability is important, but the concept is elusive. Because failing to adapt in a timely or effective way costs lives and money and has a negative effect on efforts to attain U.S. security goals, fostering greater adaptability throughout DOD should be a leadership imperative. DOD leaders can serve the department, and the nation, in an invaluable manner by committing to a conscious and dedicated effort to increase the adaptability of individuals, organizations, systems, and processes. Such an effort should begin with the creation and execution of a multi-year program of cross-cutting research. Military leaders readily refer to the need to be adaptable and the need to adapt in the face of an uncertain future. At the same time, there is clearly a lack of specificity in these references. What is it, exactly, that makes an individual, a system, a process, or an organization adaptable? How do they adapt, and how are they made more adaptable?

There have been and continue to be studies, both in the academic world and within the military, of the subject of adaptability. Various people and groups have offered definitions of the word and described what is required to be adaptable. However, DOD has not yet put forth its own definition, so it continues to be understood to have a variety of meanings within the department. Likewise, the department does not have a long term and integrated plan for enhancing adaptability, where doing so would increase its readiness to respond to both the predictable and unpredictable challenges and opportunities that are unfolding today and that will continue to emerge. Without a definition or plans that address adaptable performance specifically, DOD is left in the position of being unable to assess whether or to what degree it is adapting to a rapidly changing world or is prepared to adapt in the future.

In a letter to the Chairman of the Army Science Board, Secretary of the Army John M. McHugh asked, "While culture cannot change overnight, particularly in an organization as large as the Army, are there steps than can be taken to at least get the process of change underway to develop an innovation culture?" [54] One might ask the same question with regard to adaptability. There is no reason to believe that DOD can fully appreciate how it can enhance its adaptable culture or effect changes to accomplish that end in a short period of time. Becoming more adaptable, both for individuals and organizations, is a slow and evolving process. But like Secretary McHugh, should other DOD leaders be asking if there are steps that can be taken to get an effort underway to increase DOD's ability to adapt in a timely and effective manner to changes and surprises?

[54] Honorable John M. McHugh, Secretary of the Army, letter to Mr. George Singley, March 25, 2013.

The IDA research team thinks there could be a very large return on investment if DOD were to undertake a long-term analysis of what constitutes adaptability, the requirements for becoming more adaptable, where efforts to achieve greater adaptability would be cost effective, and what sorts of plans would need to be implemented to increase the adaptive performance of the department.

To reiterate: The key question that confronts DOD leaders is: Recognizing that there is a rapidly changing security environment and that no one can predict exactly what types of situations the military will face in the future, when is it best to continue to "muddle through," and when is it cost effective to invest the time and effort necessary to develop, over an extended period of time, the more adaptable individuals, organizations, systems, and processes that will allow the department more effectively to prepare for and respond to inevitable but unpredictable new challenges and opportunities? Is it possible, or even likely, that DOD would benefit from a purpose-designed effort to manage the enhancement of adaptability as it works to respond to the challenges and opportunities of the rapidly changing security environment? Can DOD manage adaptability to achieve more desirable outcomes?

Appendix A
Senior Department of Defense (DOD) Leaders Discuss the Need for Adaptability

DOD leaders have themselves, time and again, written or spoken of the need for adaptability and an adaptable military. Frequently, such assertions are tied to the idea that the United States faces not just a challenging future, but an uncertain and unpredictable future.

Secretary of Defense Robert M. Gates, in an often quoted speech, observed,

> We can't know with absolute certainty what the future of warfare will hold, but we do know it will be exceedingly complex, unpredictable, and—as they say in the staff colleges—"unstructured… when it comes to predicting the nature and location of our next military engagements, since Vietnam, our record has been perfect. We have never once gotten it right, from the Mayaguez to Grenada, Panama, Somalia, the Balkans, Haiti, Kuwait, Iraq, and more—we had no idea a year before any of these missions that we would be so engaged.[1]

One of Secretary Gates' predecessors, Harold Brown, addressed this issue of uncertainty and highlighted the need for adaptability in an article he wrote while serving as Secretary of the Air Force.

> Uncertainty is necessarily the lot of the planner, since he deals with the future. Uncertainty can never be completely removed. However, it can be compensated for, and to do so is a continuing responsibility of those who plan military forces. Primarily this can be done by insuring, in so far as we can, that future weapons and forces will be adaptable to the right range of defense needs or, as defense planners often put it, by insuring flexibility.[2]

The views of these two Secretaries are reflected in Joint Doctrine.

> The strategic security environment is characterized by uncertainty, complexity, rapid change, and persistent conflict. This environment is fluid, with continually changing alliances, partnerships, and new national and transnational threats constantly appearing and disappearing. While it is impossible to predict precisely how challenges will emerge and what form they might take, we can expect that

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1 Secretary of Defense Robert M. Gates (speech, U.S. Military Academy, West Point, NY, February 25, 2011).

2 Secretary of the Air Force Harold Brown, "Planning Our Military Forces," *Foreign Affairs* (January 1967): 277–290.

> uncertainty, ambiguity, and surprise will dominate the course of regional and global events.[3]

The current Chairman of the Joint Chiefs (CJCS), General Martin E. Dempsey, told this year's graduates of the National Defense University:

> You re-enter organizations at a time of turmoil, when they're working hard to adapt to uncertainty and rapidly changing geopolitical, budgetary and cultural landscapes.[4]

General Dempsey, in his white paper on Joint Education, specifically addressed the need for adaptive leaders and operational adaptability in order to cope with the uncertain and rapidly changing environment:

> As we continue to develop our future leaders, I expressly desire that joint education:
>
> Prepare the leaders of Joint Force 2020 to be adaptive, innovative, critical thinking leaders capable of operating in complex and unstructured environments.[5]

The former Chairman, Admiral Michael G. Mullen, was equally concerned about the need for adaptability. Meeting with the members of the new U.S. Africa Command, he offered the following views:

> "We're living in a world that's got to adapt to change, be more flexible," he said. "Individuals need to be, units in the military need to be, and I think our government structures need to be as well. We can be very, very slow and, in that regard, unresponsive."
>
> "I do worry," Mullen said. "In a time of change, you worry about heading in one direction and by the time you get there, it's time to change [again]."[6]

Note that his concern for adaptability applied to individuals, units, and government structures.

Earlier, as Chief of Naval Operations (CNO), Admiral Mullen had expressed a similar concern for the need for adaptability:

> I think adapting not just to change, but to the speed of change, is critical.[7]

His CNO guidance for the same year clearly stated his number one priority was to:

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3 Joint Chiefs of Staff, *Doctrine for the Armed Forces of the United States*, Joint Publication 1 (Washington, DC: Joint Chiefs of Staff, March 25, 2013), I-10.

4 General Martin E. Dempsey "JCS Speech" (speech, Ft. McNair, Washington, DC, June 13, 2013). http://www.jcs.mil/speech.aspx?id=1774.

5 General Martin E. Dempsey, "Joint Education White Paper," (CJCS, July 16, 2012, 5).

6 Charlie Coon, "Mullen: Flexibility Crucial As World Changes Quickly," *Mideast Stars and Stripes*, June 28, 2008.

7 Admiral Michael G. Mullen, "Remarks to Current Strategy Forum" (Newport, RI: Naval War College, June 14, 2006).

> Sustain combat readiness…with the right combat capabilities—access, speed, agility, *adaptability*, persistence, awareness and lethality—for the right cost.[8]
>
> Admiral Mullen was not alone in that year in calling for adaptability. The Quadrennial Defense Review (QDR) that was published in 2006 stated: "New joint training initiatives should help insure that the Total Force is capable of *adapting* to emerging challenges…"[9]

Recently, the CNO and the Commandant of the Marine Corps clearly expressed the idea that adaptability is necessary.

> As naval service chiefs, we are fully committed to the changes necessary to adapt to the emerging fiscal and security environment.[10]

Also recently, the Secretary of the Army requested that the Army Science Board conduct a study aimed at creating an innovative culture. He specified that the study should, among other things:

> Investigate enablers that should be considered in developing an adaptive Institutional Army driven by continual innovation.[11]

In discussing its mission in the world of technology, the Defense Advanced Research Projects Agency (DARPA) discusses the uncertainties of a changing world and the need for adaptable systems and solutions. First, it describes the existing and foreseeable security environment in terms of:

> the complex set of real and potential security challenges our Nation faces … this shifting, un-predictable national security environment demands a wide range of capabilities for the future and the agility to both anticipate and respond to whatever comes.[12]

Note the use of the word "agility" where others might have used the word "adaptability." But then, in fact, the DARPA mission description does go on to describe the critical need for adaptability.

> Adaptable systems and solutions. Our military engagements of the last 20 years, with a few exceptions, have been fought with systems developed largely for Cold War scenarios. Our Warfighters have adapted for the realities on the ground. Today when we consider future engagements, we can more readily imagine a host of diverse environments and adversaries. In an uncertain world, adaptability is critical. We won't always know exactly what we will need for tomorrow's battle,

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8 Admiral Michael G. Mullen, *CNO Guidance for 2006: Meeting the Challenge of a New Era* (Washington, DC: Department of the Navy, October 2005).

9 Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: DOD, February 6, 2006), 5.

10 Admiral Jonathan W. Greenert and General James F. Amos, "A New Naval Era," *U.S. Naval Institute Proceedings* 139, 6/1 (June 2013): 16–20.

11 Honorable John M. McHugh, Secretary of the Army, letter to Mr. George Singley, March 25, 2013.

12 Defense Advanced Research Projects Agency (DARPA), *Driving Technological Surprise: DARPA's Mission in a Changing World* (Arlington, VA: DARPA, April 2013). 3.

and our adversaries will change their tactics and technologies over time and in the field. So systems that can be readily upgraded and can adapt in real time to changing surroundings and conditions will play an important role.[13]

[13] Ibid., 4.

Appendix B
The Security Environment Demands Adaptability

The appendix lists various aspects of the security environment that are indicative of its constantly changing nature. Each item suggests the need to respond effectively to the ongoing change. The IDA research team has posited, based on a number of definitions of the word, that responding effectively to change is the essence of adaptability.

- A very obvious aspect of the environment and one discussed every day throughout all parts of the Pentagon are the building budgetary pressures. Simultaneously, the department must reduce its force structure, acquisitions, and training, while maintaining readiness and preparing for the unknown. All this while the costs of people and combat systems are rising.
- Directly related to budgetary pressures affecting the size of the force are ongoing debates as to how the force mix between the Active Component (AC) and the Reserve Component (RC) should be adjusted to adapt to both lower budgets and a changing security environment.
- The complexity of the security environment no longer permits focusing on a limited number of threats or opportunities or relying on a fixed set of plans, but requires leadership thinking, organizational structures, processes of various types, and combat systems that are all adaptable and capable of responding to the changes and interactions of the complex environment.
- Emerging technologies have and will continue to demand adaptability. Existing and potential foes will use new and often inexpensive technology to off-set the superior power of conventional forces. The United States will be required to adapt to blunt the use of such asymmetrical weapons.
- Thinking enemies with very limited conventional military capability adapt their strategies and tactics in order to pose asymmetrical threats to the United States and its friends, and this requires the United States and its allies to adapt in turn.
- Increasingly sophisticated capabilities in the hands of small states and non-state actors requires adapting from a preoccupation with the capabilities of major military powers to an appreciation for the potential of myriad threats.
- A number of observers have argued that the department has maintained Industrial Age organizations, systems, infrastructure, and processes in a Post-Industrial Age

environment, and in that respect, it is poorly positioned to meet either existing or potential challenges or to leverage current or future opportunities.[1]

- The immediate availability of information to everyone in the Information Age creates greater pressures to respond to events quickly, the need to adapt quickly to changes as they develop within the security environment. The pressure to adapt is borne by senior leaders and the "strategic corporal" alike.
- The rate at which change is occurring in the security environment and in society as a whole creates increased pressure to adapt to the emerging changes.
- The United States maintains a highly capable all volunteer force but does so without having made the systemic changes that its authors said would be necessary to sustain it[2] and without having determined how to keep that force connected to the larger society it serves.
- The potential for a Black Swan[3] event—a catastrophic event outside the realm of regular expectations, where nothing in the past can convincingly point to the real possibility it will occur—argues for adapting thinking and capabilities in preparation for recovering from the consequences of those events that will not be prevented.
- Recognition that many of the security challenges the nation faces require not just a military, but a whole of government response requires that many government departments and agencies, along with DOD, adapt to new working relationships and new methods of funding and coordinating operations.

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1 Gordon Adams, "It Ain't About the Hardware: Will the Wars of the Future be Won by Management Consultants?" *ForeignPolicy.com*, June 5, 2013. http://www.foreignpolicy.com/articles/2013/06/05/it_aint_about_the_hardware?wp_login_redirect=0.

2 President's Commission on an All-Volunteer Armed Force, *Report of the President's Commission on an All-Volunteer Armed Force* (Washington, DC: U.S. Government Printing Office, February 1970).

3 Nassim Nicholas Taleb, *The Black Swan: the Impact of the Highly Improbable* (New York: Random House, 2010).

Appendix C
Historical Examples of the Military Successfully Adapting, Being Slow to Adapt, or Mal-Adapting

Where the Military Has Shown It Can Adapt in an Effective and Timely Manner

Strategy—Advance across the Central Pacific and Island Hopping in the Pacific during World War II

The advent of the aircraft carrier opened the possibility that the advance on Japan could be accelerated by an advance across the Central Pacific, rather than simply by a slow Army advance from the Southwest Pacific, dependent upon land-based air support. The Navy anticipated this possible adaptation by ordering twenty-two new fleet carriers just before and after the United States entered the war.[1] As one naval history noted:

> The Central Pacific drive was unique in the history of warfare. Nothing in the past gave any sure clue as to how armed forces could advance in great leaps across an ocean studded with hostile island air bases. Carrying out the new offensive required new methods of training, new techniques of combat, support, supply, and maintenance, and a whole arsenal of weapons. Yet when the drive began in the autumn of 1943, less than two years after the attack on Pearl Harbor, the means were at hand. That was perhaps the most remarkable achievement of World War II.[2]

The decision to bypass Japanese-fortified islands was just as important as the idea of a thrust across the expanse of the Central Pacific. The same naval history recorded that after the costly battle for Tarawa, V Amphibious Corps Commander Major General Holland Smith, U.S. Fifth Fleet Commander Vice Admiral Raymond Spruance, and Amphibious Force Commander Rear Admiral Richmond Kelly Turner

> …favored a two-step operation: Maloelap and Wotje to be captured first and developed into American bases to support a later assault on Kwajalein. To their surprise and consternation, Nimitz proposed instead that Maloelap and Wotje be by-passed and that the forthcoming assault be carried out against Kwajalein alone. Spruance, Turner, and Smith argued strongly against Nimitz' proposal, pointing out that Kwajalein in American hands would be subject to air attack from Japanese bases at Maloelap, Wotje, Mili, and Jaluit…The decision to go directly

1 E.B. Potter, ed., *Sea Power: A Naval History* (Prentice Hall: Englewood Cliffs, NJ: 1960), 736.

2 Ibid., 737.

> at the heart of the Marshalls took the Japanese as much by surprise as it did Nimitz' commanders.[3]

Admiral Nimitz' decision to initiate island hopping reflected the imagination, creative thinking, and willingness to take a risk indicative of more adaptable thinking and was vindicated by the success of the subsequent operations. Naval historian E. B. Potter wrote:

> It was clear now that fleet surface and air capabilities in the Central Pacific had reached a state where they could support invasions far beyond the reach of land-based air…On Admiral Nimitz' recommendation, the Joint Chiefs in March 1944 named the next invasion target for the Fifth Fleet. This entailed nothing less than a breathtaking thousand-mile leap to the Marianas.[4]

Operationally Responsive Space Program

In support of the 2001 Quadrennial Defense Review (QDR) goals, the Secretary of Defense sought to enhance space capabilities and contend with the anti-satellite threat. He accomplished this through his Office of Force Transformation, using commercial technology and new launch companies. In other words, the Department of Defense (DOD) obtained a new operational capability in support of the new defense strategy through an adaptive acquisition model. An investigation of this program suggests that the capability was developed ten to fifteen years earlier than it otherwise would have been because of the existence of the Office of Force Transformation.[5]

Employment of Open-architecture Weapon Systems

The increasing use of software-based open-architecture allows weapons systems to be adapted quickly as relatively cheap technologies make it possible for threats to change rapidly. In this case, adaptability applies to both the weapons systems and the acquisition system. This was recently highlighted in a memo written by Under Secretary of Defense for Acquisition, Technology, and Logistics (AT&L) Frank Kendall:

> We must improve the department's early planning for obtaining technology through an open business model concept with emphasis on having open, modular system architectures that can be supported through multiple competitive alternatives.[6]

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3 Ibid., 749.

4 Ibid., 756.

5 Jason A. Dechant, "Catalyzing Change in Complex Organizations: The Department of Defense Office of Force Transformation: A Summary of Research and Findings" (briefing, Institute for Defense Analyses, Alexandria, VA., May 21, 2013).

6 INSIDEDEFENSE.COM, "Open Systems Seen As Crucial To U.S. Anti-Access Warfare Efforts," Public Articles, Vol. 29, No. 21. Accessed at: http://insidedefense.com/201305222435844/Inside-Defense-General/Public-Articles/open-systems-seen-as-crucial-to-us-anti-access-warfare-efforts/menu-id-926.html.

Logistics—Withdrawal from Afghanistan

Redeploying equipment belonging to the International Security Assistance Force (ISAF) from Afghanistan poses unique challenges not experienced in previous conflicts, including the initial loss of one of the primary routes by which equipment was introduced into theater. AS COL David Banian wrote,

> Afghanistan is landlocked, has primitive road networks, severely challenging terrain consisting of high mountains, and its weather is extreme. None of the neighboring countries allow easy access or are willing to serve as an ISB [intermediate staging base], which decreases flexibility and increases cost, complexity, and risk to meeting time constraints. In addition, ISAF contains forces from 42 countries, all doing their own retrogrades, and that will require additional de-confliction and synchronization during the operation. Due to the geopolitical situation, the primary retrograde mode is by air to nearby regional transportation hubs, and then transfer to a ship to bring it to the United States—a process called *multimodal*. Multimodal air shipments cost roughly six times more than moving equipment on the ground through Pakistan.[7]

The United States has begun meeting this challenge through a whole of government approach in which:

> The Department of State and Department of Defense consistently worked together to gain access through multiple countries to open the Northern Distribution Network and re-open the Pakistan ground line of communication.[8]

Additional adaptation has included revised command and control arrangements and the creation of several retrograde enabling organizations.[9]

Where the Military Has Been Slow to Adapt

The Navy and Continuous-Aim Fire

One type of creative thinking that was often resisted in the past was that of the technical advance that did not originate within the Navy's own technical or engineering commands. This was the case with the development of continuous-aim fire in the U.S. Navy at the beginning of the 20th century. A good account of this episode was provided in a lecture originally given by Elting E. Morison at the California Institute of Technology in February of 1950.[10] William S. Sims, a junior officer, attempted to introduce this very significant improvement to naval gunfire. While serving on the China Station, Sims had become familiar with the technology and

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7 COL David Banian, *From Hard to Harder: Iraq Retrograde Lessons for Afghanistan*, IDA Paper NS P-5007 (Alexandria, VA: Institute for Defense Analyses, June 2013), 13.

8 Ibid., iv.

9 Ibid.

10 Elting E. Morison, *Men, Machines, and Modern Times* (Cambridge, MA: The M.I.T. Press, 1966), 17–44.

procedures developed in the British Royal Navy by Admiral Sir Percy Scott. Yet despite the demonstrated and well-documented effectiveness of the new procedures, the Navy's senior leadership in Washington, particularly the Chief of the Bureau of Ordnance, responded to Sims' ideas by first ignoring them, secondly with faulty arguments against them, and finally with *ad hominem* attacks. Undeterred, Sims sent his ideas in a letter to President Theodore Roosevelt. The president brought Sims to Washington to be the Inspector of Target Practice, a position he held for the six remaining years of Roosevelt's administration. In that time, he was able to effect the change that he could not bring about by working within the Navy bureaucracy.

Submarine Warfare of World War I

According to naval historians Henry H. Adams and Ellery H. Clark, Jr., the Allied Navies were initially no more adaptive in their thinking than the armies: "Until mid-1917, no Allied commander in a position of responsibility could see a means of averting defeat through submarine warfare attacks on allied commerce. Then with the institution of convoy, losses to U-boats fell steadily while sinkings of U-boats mounted rapidly."[11]

Iraq and Afghanistan

In 2003, the United States invaded Iraq and shortly after declared victory. What followed can best be described as a debacle. In December 2011, the United States withdrew; conflict within the country continues today. The United States went into Afghanistan in 2001, achieved initial successes in weakening Al-Qaida and deposing the Taliban, and then shifted its attention to Iraq. Today, the war in Afghanistan continues, with little domestic agreement on what the goals are or whether the military is pursuing a viable strategy. In both countries, the United States had little understanding of what it was getting into and was slow to adapt to the realities it found. In a recent speech in London, General David Petraeus observed:

> In Iraq, for example, it is clear that we came up short on a number of critical issues, and spent a number of very tough years before recognising what needed to be done.[12]

Similarly, General Stanley McChrystal, in remarks to the Council on Foreign Relations regarding U.S. and NATO experience in Afghanistan, related how the country had gone into the war with insufficient knowledge and failed to adapt sufficiently over a ten year period:

> The U.S. began the war in Afghanistan with a "frighteningly simplistic" view of the country and even 10 years later lacks knowledge that could help bring the conflict to a successful end. "We didn't know enough and we still don't know enough," he said. "Most of us—me included—had a very superficial

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11 E.B. Potter, ed., *Sea Power: A Naval History* (Englewood Cliffs, NJ: Prentice Hall, 1960), 475.

12 David Petraeus, "We Must Be Coldly Realistic Over The Use Of Force," *London Daily Telegraph*, June 11, 2013, 21. Extract from a speech to the Royal United Services Institute.

> understanding of the situation and history, and we had a frighteningly simplistic view of recent history, the last 50 years."[13]

In short, the most senior leaders of the military actually responsible for conducting the nation's recent wars acknowledged that they were unprepared and slow to adapt. More generally, the military, as a whole, had not adapted to the changing threats prior to the wars and was slow to adapt once the wars began.

Operational Energy

Writing in an opinion editorial in 2011, a retired Army general and logistician described how the failure to adapt to environmental conditions and transportation challenges in Iraq and Afghanistan had produced an excessive requirement for fuel, resulting in unnecessary loss of life and the unnecessary expenditure of billions of dollars.

> …in the last nine years some 1,000 Americans have been killed on fuel-related missions in Iraq and Afghanistan.
>
> As the military's senior logistician in Iraq for 15 months in 2006 and 2007, I tracked the tremendous amounts of fuel needed to power the generators providing electricity for air-conditioning and other essential uses in shelters hastily constructed of canvas, plywood and sheet metal. Today our troops in Afghanistan are furiously building more of the same. Nine years into that war, they are living more or less as Alexander the Great's men did 23 centuries ago—in often dangerous and always inefficient tents and shacks.
>
> For many in the military, improving the situation isn't a priority. "To hell with efficiency, effectiveness is all I care about," a finger-wagging superior once told me in Iraq. But keeping our bases and units supplied with fuel endangers not just the lives of many soldiers manning the tanker convoys, it also drains $24 billion a year from the Pentagon budget. The solution: a Defense Department policy requiring all structures in the combat zone be energy-efficient.
>
> In 2007, an Army study found that spraying foam insulation on the exterior of inefficient structures would reduce their energy requirements by over 80 percent and improve the quality of life for the troops living in them. Accordingly, we obtained the necessary safety, fire and disposal certifications and began a $95 million effort in Iraq; a study last year confirmed this initiative was saving about $1 billion a year and taking more than 11,000 fuel trucks off the road.
>
> Yet, despite three years of quantitative proof that insulated structures in extreme climates tremendously reduce fuel requirements, there has been little effort to broaden the scope of the initiative.[14]

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[13] Robert Burns, Associated Press, *Ex-Commander: US Started Afghan War Lacking Info*, Yahoo.com, October 6, 2011.

[14] Steven M. Anderson, "Save Energy, Save Our Troops," *New York Times*, January 13, 2011, A29.

In a later briefing, the general attributed the failure to adapt to, among other reasons, "leaders not accountable for energy use, leaders not responsible for energy use, competing priorities and workload, and leaders not incentivized to cut energy use."[15]

Adapting the Culture

Certainly, recent events and upheaval within the military with regard to sexual assault are stark evidence of the leadership's slowness in adapting to the ongoing addition of women in the ranks over the past several decades. The Chairman of the Joint Chiefs of Staff admitted as much in a recent Congressional hearing when he stated: "I took my eye off the ball in the commands I had."[16] Both the Chief of Staff of the Army and the Chief of Staff of the Air Force have said that sexual assault is their number one priority.[17] Women have been integrated into the ranks and have shown they can perform every bit as well as the men, but the leadership failed to recognize the need to deal with the consequences of having men and women living and working together in close quarters for extended periods of time in the operational environment. They neither anticipated nor responded to the changes and challenges resulting from the wide-scale introduction of women into the ranks.

Adapting Management—Creating a Compensation and Retirement System Commensurate with the Requirements of an All-volunteer Force.

In 1973, the United States. moved to create an all-volunteer military. In doing so, it followed the recommendations of the President's Commission on an All-Volunteer Armed Force. The commission's final report recommended fundamental changes to the military compensation and retirement system, which the committee felt would be necessary to sustain an all-volunteer force.[18] Despite the subsequent endorsement of the basic elements of those recommendations by succeeding Quadrennial Reviews of Military Compensation, those recommendations have yet to be acted upon. The result is a personnel system with rapidly increasing costs which many observers consider unsustainable. That is, of course, subject to debate. And while one can rightly point to political reasons for the current situation, one can also ask whether a greater capacity for adaptability within DOD might have led to needed changes earlier on.

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15 Steven Anderson, "The Case for Policy to REQUIRE Energy Efficiency in Military Operational Theaters (Hint: Saves Blood and $Billions)" (Army REF Energy Conference, Phoenix, AZ, February 10, 2012).

16 Jennifer Steinhauer, "Joint Chiefs' Answers On Sex Crimes Dismay Senators," *New York Times,* June 5, 2013, A-12.

17 Senate Armed Services Committee, *Oversight hearing to Receive Testimony on Pending Legislation Regarding Sexual Assaults in the Military,* June 4, 2013 and Robert Burns and Lolita C. Baldor, Associated Press, *Hagel Orders Review of Sex-Abuse Prevention*, Yahoo.com, May 17, 2013.

18 President's Commission on an All-Volunteer Armed Force, *Report of the President's Commission on an All-Volunteer Armed Force* (Washington, DC: U.S. Government Printing Office, February 1970), 49–67.

Where the Services Have Attempted to Adapt but the Result Has Been Mal-adaptation

Army Future Combat System (FCS)

In 1999 the Army faced criticism for being a cold war force ill-suited to the challenges of the day and the 21st century which were thought to require a lighter, more rapidly deployable force. Gen. Eric Ken Shinseki, then Army Chief of Staff and attempting to lead an effort to transform the Army, faced considerable cultural resistance to change of the magnitude some thought was needed. In response, he often said "If you dislike change, you're going to dislike irrelevance even more."[19] The Army's response to the perceived transformation challenge was the Future Combat System (FCS). The FCS concept was an effort to drive change in order to adapt to changed circumstances, thereby keeping the Army relevant in a murky future operating environment. Although a well-intentioned effort to adapt, the result fell short.

The FCS program was intended

> to transform all of the Army's divisions into a lighter and more modular but interconnected force that could—outsmart and outmaneuver heavier forces on the battlefield. The goal was to deploy a brigade in four days, a division in five days, and five divisions in 30 days. At these rates, the FCS Brigade Combat Team (BCT) would be sixty percent more strategically deployable than current heavy BCTs.[20]

The total program cost was to be over $300 billion. According to a 2012 Rand report,

> The Future Combat Systems (FCS) was the largest and most ambitious planned acquisition program in the Army's history. It called for fielding not just one system but an entire suite of systems, all organized into a brigade structure that was envisioned to operate under an entirely new (but not yet fully developed) doctrine while integrated by a wireless network. The scope and reach of the program were remarkable and for a number of years defined the modernization effort of the Army. [However] in 2009 the FCS program was cancelled. Although some of its components have been transferred to other programs, FCS is widely regarded as a failure.[21]

The Rand report cited above lists forty-seven lessons, or mistakes, that contributed to this failure.[22] These include relying on wargames to validate concepts, unspecified assumptions,

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19 Quoted in Mackubin Thomas Owens, "Marines Turned Soldiers," *National Review Online*, December 10, 2001.

20 Hans Ulrich Kaeser, The Future Combat System: What Future Can the Army Afford? working draft, Center for Strategic and International Studies (CSIS), February 5, 2009, 1.

21 Christopher G. Pernin, et al., *Lessons from the Army's Future Combat Systems Program*, Rand Arroyo Center, 2012, xvii.

22 Ibid, xvii–xxix.

weak analysis, concepts that became assertions of capability and feasibility, and failure to rigorously connect the concept developers with the technical and acquisition communities.

In his 2009 testimony before the U.S. Senate Committee on Armed Services, Subcommittee on Airland, Paul Francis, managing director of acquisition and sourcing management at the U.S. Government Accountability Office (GAO), said the biggest problem with FCS was that it was too ambitious and "not executable within reasonable technical, engineering, time, or financial resources. The program was immature when it began, never measuring up to DOD's own standards for technology and design."[23]

In short, the FCS program began as an ill-defined concept based on unstated or even unrecognized assumptions, not only about the operating environment, but also about what would work operationally and what was technically feasible. And it remained so for ten years. But since the concept was top driven, it quickly became dogma or group think, and all evidence to the contrary, including red teaming and external criticism or questioning about technology availability time lines, was ignored. Within the Army a "can do" spirit prevailed even among the doubters, of whom there were many. The result was $30 billion mostly wasted and ten years of misdirected research and development. While FCS initially resulted from an effort in creative thinking, it was never subjected to true critical thinking that would have exposed its shortcomings, which were mostly obvious. Hope, unfortunately, trumped sound analysis and good judgment.

Littoral Combat Ship

With the end of the cold war, the Navy found itself with no peer blue-water competitors. However, the challenges it envisioned for the years ahead did include conflicts in the world's littorals. Swarming small craft, mines, and diesel submarines were perceived threats. Several ship types were proposed to counter these threats before the Navy committed to the littoral combat ship (LCS). In July 2013, the GAO reported to the Congress on the success of the Navy in its efforts to adapt to these perceived threats. GAO described the LCS as

> a program framed by a revolutionary approach to shipbuilding acquisition and naval operations. The LCS consists of the ship—called a seaframe—and mission modules, which, when integrated with the seaframe and supplemented with aviation support, provide mission capability…These modules are intended to give the Navy flexibility to change equipment in the field to meet different mission needs and incorporate new technology to address emerging threats.[24]

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23 *Issues to be Considered for Army's Modernization of Combat Systems: Testimony before the Subcommittee on Airland*, Committee on Armed Services, U.S. Senate Defense Acquisitions, GAO-09-793T (June 16, 2009) (statement of Paul L. Francis, Managing Director Acquisition and Sourcing Management), 4.

24 *Navy Shipbuilding: Significant Investments in the Littoral Combat Ship Continue Amid Substantial Unknowns About Capabilities, Use, and Cost: Testimony before the Subcommittee on Seapower and Projection Forces*, Committee on Armed Services, House of Representatives, GAO-13-738T (July 25, 2013) (statement of Paul L. Francis, Managing Director Acquisition and Sourcing Management), 1.

With the LCS, the Navy has attempted not only to provide an adaptive capability, but also to do so with an adaptive acquisition strategy. According to GAO,

> this evolutionary acquisition strategy, which delivers improving levels of capability over several increments, offers warfighters improved capability as it is available. However, the requirements for the increments have not yet been defined, and the increments will provide performance below the Navy's minimum needs for years to come… Internal Navy studies and wargames have also raised concerns with the overall effectiveness of each mission package based on inherent seaframe or mission module limitations. Significant questions remain about the LCS program and its underlying business case, even as seaframe and mission package procurements continue. Elements of the LCS business case—including its cost and its anticipated capabilities—have degraded over time.[25]

GAO offered the following assessment of the LCS's current capabilities:

> Current LCS weapon systems are under-performing and offer little chance of survival in a combat scenario.
>
> Not to be employed outside a benign, low-threat environment unless escorted by a multi-mission combatant providing credible anti-air, anti-surface, and anti-submarine protection.[26]

GAO concludes that the Navy

> still does not know how well the ships will perform their missions, how well its unique crewing and maintenance concepts will work, or how much it will cost to equip and support the ship.[27]

Nonetheless, GAO does not fault the Navy for the development problems to overcome:

> At issue, rather, is the misalignment of the program's progress with acquisition decisions, and with key decisions being made well before requisite knowledge is available.[28]

The bottom line here appears to be that the ship the Navy is delivering does not have the adaptive capability originally intended, and the acquisition process has itself not been adaptable in the way necessary to support successful production of a new combat system.

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[25] Ibid., 3–4.

[26] Ibid., 5.

[27] Ibid., 6.

[28] Ibid., 7.

Appendix D
Defining Adaptability

The Office of the Secretary of Defense for Personnel and Readiness (OSD (P&R)) has sponsored Institute for Defense Analyses' (IDA) studies related to adapting to asymmetric threats and developing an adaptability training strategy that have provided a working definition of adaptability as a meta-skill:

> Adaptability is the operable capacity to bring about an effective response to an altered situation.[1]

The Command and Control (C2) Programs and Policy Directorate in the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) continues to sponsor IDA work to develop the concept of C2 agility. This analysis has posited that to respond to potential or manifest stresses or to seize opportunities requires, among other things, adaptation. This research uses a definition of adaptability as one aspect of agility:

> Adaptability
>
> *Change in Circumstances:* A mission challenge that an entity, by its very nature or by its established organization or processes, is ill structured to undertake.
>
> Adaptation permits an entity to change itself, that is, to change its organization, processes, and/or structure to become better suited to the challenge.[2]

IDA research focused on the design of weapons systems provided a definition of adaptability useful in assessing that characteristic in a given system.

> Adaptability: A measure of the potential set of missions (or possible states within a mission space) than can be supported.[3]

In 2002, Personnel Decisions Research Institutes, Inc. in a study for the Army Research Institute, provided a number of definitions of adaptability gathered from academic literature and summarized them with the following definition:

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1 Waldo D. Freeman and William R. Burns, Jr., *Developing an Adaptability Training Strategy and Policy for the Department of Defense (DOD)*, IDA Paper P-4591 (Alexandria, VA: Institute for Defense Analyses, August 2010), 7.

2 David S. Alberts, *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors* (Washington, DC: Department of Defense (DOD) Command and Control Research Program, September 2011), 218.

3 Prashant R. Patel and Michael P. Fischerkeller, Prepare to be Wrong: Assessing and Designing for Adaptability, Flexibility, and Responsiveness, IDA Document NSD-4932 (Alexandria, VA: Institute for Defense Analyses, June 2013), iii.

> Adaptability is an effective change in response to an altered situation.[4]

The Defense Science Board *2010 Summer Study on Enhancing Adaptability of U.S. Military Forces* also offered a useful definition of adaptability, but it has not been officially adopted or publicized.

> Adaptability is the ability and willingness to anticipate the need for change, to prepare for that change, and to implement changes in a timely and effective manner in response to the surrounding environment.[5]

In 2012, CNA conducted a study to help the Office of the Deputy Assistant Secretary of Defense (Readiness) (ODASD (Readiness)) "build the organizational construct necessary to develop and maintain an adaptive force."[6] The study analysis "examined the Mission Readiness Adaptive Cycle (MRAC) that ODASD (Readiness) has proposed for the adaptive force, as well as the adaptability model defined by the Australian Defense Science and Technology Office (DSTO) [*sic*]." [7] This study used the definition for being adaptive provided by ODASD (Readiness):

> The persistent ability of an individual or unit to constantly sense its environment for change and to agilely respond to actual or anticipated changes in the environment in a way that improves its operating effectiveness or survival in that environment.[8]

Authors of an article on the necessity to adapt addressed the confusion that can exist in discussing what is and is not adaptation:

> Adaptation is not innovation (even though adaptation can be innovative). Adaptation is what you do with all your innovations after they have worked their way into your doctrine and force structure, so that they can best be employed in the environment that you face.
>
> Adaptation is also not transformation. It is how to make the best use of whatever processes, systems, and structures continuous transformation produces… Adaptation is the process by which we take ongoing transformation initiatives and put them to good practical use in a real situation.[9]

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4 Susan White and David Dorsey, *Review of Adaptability Literature and Products* (Arlington, VA: Personnel Decisions Research Institutes, Inc., April 1, 2002).

5 Report of the Defense Science Board *2010 Summer Study on Enhancing Adaptability of U.S. Military Forces* (Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)), January 2011), 1.

6 Sarah A. Stevenson, William D. Brobst, Alan C. Brown, Ninghao Jiang, Valerie J. Scruggs, *Adaptive Posture Analysis* (Alexandria, VA:CNA, June 2012), 8.

7 Ibid., 1.

8 Ibid., 9.

9 Jim Lacey and Kevin Woods, "Adapt or Die," *U.S. Naval Institute Proceedings* 133, no. 8 (August 2007): 19–20.

Appendix E
Adaptability-Related Issues Suggesting Possible Areas of Research

The Environment

- Identifying the challenges posed by uncertainty and the pace of change as they apply to various DOD functions and activities
- Characterizing uncertainty and describing how it is regarded in relation to adversaries, capabilities, and operational and fiscal environments
- Understanding complexity and how dealing with complexity relates to adaptability
- Responding to surprise
- Identifying specific demands for adaptability
- Identifying barriers or obstacles to adaptability

Defining and Characterizing Adaptability

- Defining adaptability, including how the definition applies to various entities: individuals, organizations, systems, and processes
- Identifying the attributes and skills associated with adaptability
- Relating "adapting to unexpected or unpredictable occurrences" to "adapting to the necessity of doing business in new ways"

Lessons Learned

- Examining efforts to achieve adaptability in the business world
- Examining efforts to achieve adaptability in the medical and other professional contexts
- Examining business failures resulting from failures to adapt
- Identifying what contributed to effective adaptation by the military in specific situations in the past
- Identifying why adaptation did or did not take place as needed
- Assessing cases where the military was slow to adapt or failed to adapt in the past
- Identifying factors that led to more rapid or more successful adaptation

- Examining adaptation in the context of the Iraq and Afghanistan wars. Where was there successful adaptation and where was there a failure to adapt or to adapt rapidly enough? Where did the military adapt, but might have adapted more effectively? For example, in its use of new Intelligence, Surveillance, and Reconnaissance (ISR) capabilities.
- Examining the request for forces (RFF) procedures used in Iraq and Afghanistan with a view towards determining how and why the process adapted or failed to adapt and how it might be adapted in the future to provide a better product down range
- Identifying and examining instances of strategic military adaptation or failure to adapt
- Identifying and examining instances of operational military adaptation or failure to adapt
- Identifying and examining instances of tactical military adaptation or failure to adapt
- Examining the military's past adaptation to the end of a war or to a budgetary draw-down

Managing and Facilitating Adaptability

- Identifying mechanisms for adaptability
- Identifying enablers of adaptability
- Identifying ways to reward adaptive performance
- Identifying ways to overcome barriers and obstacles to adaptability
- Assessing the role of leadership in fostering adaptability
- Identifying incentives for more adaptable individual, unit, or team performance
- Identifying incentives for the development of more adaptable systems, processes, organizations, and force structures
- Assessing the political and bureaucratic support needed to foster greater adaptability
- Examining the role of accountability
- Assessing organizational tolerance for failure
- Examining the relationship between risk assessment and adaptability
- Examining adaptability as a factor in cost and benefit analysis
- Examining how DOD might manage specific functions differently if it were committed to developing greater adaptability
- Exploring possible ways to prepare in advance to adapt to future changes
- Examining how organization and communications facilitate the recognition of and response to evolving demands for adaptation

Identifying Specific Analytic Challenges with Regard to How Adaptability Affects Various DOD Functions, including:

- Strategic and Force planning
- Acquisition
- Programming and budgeting
- Manpower
- personnel
- Training
- Education
- Communications, Information, and Command and Control
- Readiness
- Management

Barriers to Adaptability

- Examining historical examples of how group think inhibited adaptive action
- Exploring possible antidotes to group think
- Examining historical situations where a positive "can do" attitude resulted in persisting in actions that precluded an effective response to a changed situation
- Examining historical situations where the role of vested interests prevented necessary adaptation. Determine what actions might have been successful in countering the vested interests.
- Conducting case studies to identify situations in which bureaucratic inertia prevented necessary adaptation
- Examining aspects of human nature that resist adapting when adapting would be beneficial
- Examining the relationship of introvert (reflective) leaders and extrovert (action-oriented) leaders to adaptive response to change

Developing Individual Adaptability

- Defining or characterizing what makes individuals more adaptable
- Identifying the attributes and skills associated with individual adaptability
- Determining aptitude for adaptability

- Identifying levels of adaptability
- Determining what contributes to making individuals more adaptable
- Assessing the role of education in developing adaptability
- Assessing the role of training in developing adaptability
- Relating career patterns to adaptability

Education and Adaptability

- Developing critical thinking
- Dealing with ambiguity
- Dealing with complexity
- Dealing with uncertainty

Metrics—Measuring Adaptability

- Determining appropriate metrics for measuring adaptability
- Measuring adaptability and improvement in adaptability
- Measuring the attributes and skills associated with adaptability
- Measuring gaps in adaptability

Developing Organizational Adaptability

- Characterizing organizational adaptability
- Measuring adaptability and improvement in adaptability
- Identifying what contributes to developing more adaptable organizations
- Determining the role of leadership
- Assessing the impact of organizational structure

Developing Adaptable Processes

- Characterizing adaptable processes
- Measuring adaptability and improvement in adaptability
- Identifying examples of processes that proved adaptable
- Identifying what contributes to developing more adaptable processes

Developing Adaptable Systems

- Characterizing adaptable systems
- Identifying what contributes to developing more adaptable systems
- Measuring system adaptability

Developing an Adaptable Culture

- Characterizing an adaptable culture
- Identifying what contributes to developing a culture of greater adaptability
- Identifying the steps necessary to develop a more adaptable culture

Adaptability as a Factor in Decision-making

- Assessing the relationship of adaptability and cost effectiveness
- Assessing the relationship of adaptability and risk

Appendix F
References

Adams, Gordon. "It Ain't About the Hardware: Will the Wars of the Future be Won by Management Consultants?" *ForeignPolicy.com*, June 5, 2013. http://www.foreignpolicy.com/articles/2013/06/05/it_aint_about_the_hardware?wp_login_redirect=0.

Alberts, David S. *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors*. Washington, DC: Department of Defense (DOD) Command and Control Research Program, September 2011.

Anderson, Steven M. "Save Energy, Save Our Troops." *New York Times*, January 13, 2011, A29.

———. "The Case for Policy to REQUIRE Energy Efficiency in Military Operational Theaters (Hint: Saves Blood and $Billions)." ARMY REF Energy Conference. February 10, 2012.

Banian, COL David. *From Hard to Harder: Iraq Retrograde Lessons for Afghanistan*. IDA Paper NS P-5007. Alexandria, VA: Institute for Defense Analyses, June 2013.

Brown, Secretary of the Air Force Harold. "Planning Our Military Forces." *Foreign Affairs* (January 1967): 277–290.

Burns, Robert and Lolita C. Baldor. "Hagel Orders Review of Sex-Abuse Prevention." Associated Press, Yahoo.com, May 17, 2013.

Coon, Charlie. "Mullen: Flexibility Crucial As World Changes Quickly." *Mideast Stars and Stripes*, June 28, 2008.

Daggett, Stephen. *Costs of Major U.S. Wars*. Washington, DC: Congressional Research Service, June 29, 2010.

Darwin, Charles. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. London: John Murray, 1859.

Dechant, Jason A. "Catalyzing Change in Complex Organizations: The Department of Defense Office of Force Transformation: A Summary of Research and Findings." Briefing delivered at the Institute for Defense Analyses, Alexandria, VA, May 21, 2013.

Defense Advanced Research Projects Agency (DARPA). *Driving Technological Surprise: DARPA's Mission in a Changing World*. Arlington, VA: DARPA, April 2013.

Defense Science Board. *2010 Summer Study on Enhancing Adaptability of U.S. Military Forces*. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)), January 2011.

Dempsey, General Martin E. *JCS Speech.* Delivered at Ft. McNair, Washington, DC, June 13, 2013. http://www.jcs.mil/speech.aspx?id=1774.

Dempsey, General Martin E., Chairman, Joint Chiefs of Staff. "Joint Education White Paper." July 16, 2012. http://cole.fuqua.duke.edu/Joint%20Education%20White%20Paper.pdf.

Department of Defense. *Quadrennial Defense Review Report*. Washington, DC: DOD, February 6, 2006, 5. http://www.defense.gov/qdr/report/report20060203.pdf.

Director Future Land Warfare and Strategy. *Army's Future Land Operating Concept*. Canberra: Australian Army Headquarters, September 2009.

Dorner, Dietrich. *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*. New York: Metropolitan Books, 1996.

Francis, Paul L. *Issues to be Considered for Army's Modernization of Combat Systems: Testimony before the Subcommittee on Airland*. Committee on Armed Services, U.S. Senate. GAO-09-793. Washington, DC: Government Accountability Office, June 16, 2009.

———. *Navy Shipbuilding: Significant Investments in the Littoral Combat Ship Continue Amid Substantial Unknowns About Capabilities, Use, and Cost: Testimony before the Subcommittee on Seapower and Projection Forces*. Committee on Armed Services, House of Representatives. GAO-13-738T. Washington, DC: Government Accountability Office, July 25, 2013.

Fletcher, John Dexter. *Cognitive Readiness: Preparing for the Unexpected*. IDA Document D-3061. Alexandria, VA: Institute for Defense Analyses, September 2004.

Freeman, Waldo D., and William R. Burns, Jr. *Developing an Adaptability Training Strategy and Policy for the Department of Defense (DOD)*. IDA Paper P-4591. Alexandria, VA: Institute for Defense Analyses, August 2010.

Future Land Warfare Branch. *Adaptive Campaigning: the Land Force Response to Complex Warfighting*. Canberra: Australian Army Headquarters, December, 2007.

Gates, Secretary of Defense Robert M. Speech delivered at West Point, NY: U.S. Military Academy, February 25, 2011.

Greenert, Admiral Jonathan W., and General James F. Amos. "A New Naval Era." *U.S. Naval Institute Proceedings* 139, 6/1 (June 2013): 16–20.

Grisogono, Anne-Marie. "Exploiting Adaptation." Presentation to Operational Adaptation Conference, Edinburgh, UK, June 24, 2010.

INSIDEDEFENSE.COM. "Open Systems Seen As Crucial To U.S. Anti-Access Warfare Efforts," *Public Articles* 29, no. 21. http://insidedefense.com/201305222435844/Inside-Defense-General/Public-Articles/open-systems-seen-as-crucial-to-us-anti-access-warfare-efforts/menu-id-926.html.

Joint Publication 1. *Doctrine for the Armed Forces of the United States*. Washington, DC: Joint Chiefs of Staff, March 25, 2013.

Kaeser, Hans Ulrich. "The Future Combat System: What Future Can the Army Afford?" Working draft. Washington, DC: Center for Strategic and International Studies (CSIS), February 5, 2009.

Kiszely, John. "Post-Modern Challenges for the Modern Warriors." *The Shrivenham Papers* 5 (December 2007): 1–28.

Lacey, Jim and Kevin Woods. “Adapt or Die.” *U.S. Naval Institute Proceedings* 133, no. 8 (August 2007): 16–20.

Lindblom, Charles E. “The Science of ‘Muddling Through.” *Public Administration Review* 19, no. 2 (Spring 1959): 87–88.

McChrystal, Stanley A. “Becoming the Enemy: To Win in Afghanistan, We Need to Fight More like the Taliban.” *Foreign Policy*, no. 185 (March/April 2011): 66–70.

McHugh, Honorable John M., Secretary of the Army. Letter to Mr. George Singley, March 25, 2013.

Morison, Elting E. *Men, Machines, and Modern Times*. Cambridge, MA: The M.I.T. Press, 1966.

Mullen, Admiral Michael G. *CNO Guidance for 2006: Meeting the Challenge of a New Era*. Washington, DC: Department of the Navy, October 2005.

———. “Remarks to Current Strategy Forum.” Newport, RI: Naval War College, June 14, 2006.

Owens, Mackubin Thomas. “Marines Turned Soldiers.” *National Review Online*. December 10, 2001.

Panetta, Leon E., and Barack H. Obama. *Sustaining U.S. Global Leadership Priorities for 21st Century Defense*. Washington, DC: DOD, 2012. http://purl.fdlp.gov/GPO/gpo18079.

Parrish, Karen. “Carter: DOD Will Prevail Against Uncertainty.” *American Forces Press Service*. Washington, DC, April 17, 2013.

Patel, Prashant R. and Michael P. Fischerkeller. *Prepare to be Wrong: Assessing and Designing for Adaptability, Flexibility, and Responsiveness*. IDA Document NSD-4932. Alexandria, VA: Institute for Defense Analyses, June 2013.

Pernin, Christopher G., Elliot Axelband, Jeffrey A. Drezner, Brian B. Dille, John Gordon IV, Bruce J. Held, K. Scott McMahon, et al. *Lessons from the Army’s Future Combat Systems Program*. Santa Monica, CA: Rand Arroyo Center, 2012.

Petraeus, David. “We Must Be Coldly Realistic Over The Use Of Force.” *London Daily Telegraph*, June 11, 2013, 21.

Potter, E.B. ed. *Sea Power: A Naval History*. Englewood Cliffs, NJ: Prentice Hall, 1960.

Ricks, Tom. *The Generals: American Military Command from World War II to Today*. New York: Penguin Press, 2012.

Schudel, Matt. “Eugene P. Wilkinson, Commander of First Nuclear Sub, Dies at 94.” *Washington Post*, July 17, 2013.

Senate Armed Services Committee. Oversight Hearing to Receive Testimony on Pending Legislation Regarding Sexual Assaults in the Military, June 4, 2013.

Steinhauer, Jennifer. “Joint Chiefs’ Answers On Sex Crimes Dismay Senators.” *New York Times*, June 5, 2013, A-12.

Stevenson, Sarah A., William D. Brobst, Alan C. Brown, Ninghao Jiang, and Valerie J. Scruggs. *Adaptive Posture Analysis*. Alexandria, VA: CNA, June 2012.

Taleb, Nassim Nicholas. *The Black Swan: the Impact of the Highly Improbable*. New York: Random House, 2010.

Tillson, John C. F., Waldo D. Freeman, William R. Burns, John E. Michel, Jack A. LeCuyer, Robert H. Scales, and D. Robert Worley. *Learning to Adapt to Asymmetric Threats*. IDA Document D-3114. Alexandria, VA: Institute for Defense Analyses, August 2005.

Vego, Milan. "On Military Creativity." *Joint Forces Quarterly* 70 (2013): 83–90.

White Susan S., and David W. Dorsey. "Review of Adaptability Literature." Arlington, VA: Personnel Decisions Research Institutes, Inc., April 1, 2002.

President's Commission on an All-Volunteer Armed Force. *Report of the President's Commission on an All-Volunteer Armed Force*. Washington, DC: U.S. Government Printing Office, February 1970.

Appendix G
Abbreviations

AC	Active Component
ARI	Army Research Institute
AT&L	Acquisition, Technology, and Logistics
C2	Command and Control
CLT	Commander/Leader Team
CNO	Chief of Naval Operations
DARPA	Defense Advanced Research Projects Agency
DHS	Department of Homeland Security
DOD	Department of Defense
DOT	U.S. Department of Transportation
DSTO	Defence Science and Technology Organisation
FCS	Future Combat System
FY	Fiscal Year
GAO	Government Accountability Office
HHS	Health and Human Services
IDA	Institute for Defense Analyses
IED	improvised explosive device
ISAF	International Security Assistance Force
ISR	Intelligence, Surveillance, and Reconnaissance
LCS	littoral combat ship
MRAC	Mission Readiness Adaptive Cycle
MRAP	Mine-Resistant Ambush Protected
ODASD	Office of the Deputy Assistant Secretary of Defense
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
P&R	Personnel and Readiness
R&D	research and development
RC	Reserve Component
USTRANSCOM	U. S. Transportation Command
USG	United States Government
VA	U.S. Department of Veterans Affairs

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14. ABSTRACT

This paper emphasizes the importance of adaptability in a security environment characterized by uncertainty, constant change, and the inability to predict where and how the military will be called upon in the future. While suggesting examples of where the military has adapted well or been slow to adapt, the paper emphasizes the importance of (1) giving precise definition to the word and (2) developing greater understanding of exactly what adaptability means and offers in relation to people, organizations, systems, and processes. It contends that the Department of Defense (DOD) would benefit greatly from a well-defined and dedicated effort to analyze a wide range of adaptability-related issues and their relevance to the various functional aspects of the department. The paper suggests that while DOD has, in fact, shown it can and does adapt, a concerted effort to (1) better understand what it means to be adaptable and (2) enhance adaptable performance across the department has significant potential for saving lives and money and advancing the nation's security interests more effectively. The paper concludes with a proposal for development and execution of a multi-year program of cross-cutting research that has the support and participation of a broad-based community of interest within DOD.

15. SUBJECT TERMS

Adaptability. Uncertainty. Change. Ambiguity. Unpredictability

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