



EXCERPT FROM THE PROCEEDINGS

OF THE
TENTH ANNUAL ACQUISITION
RESEARCH SYMPOSIUM
ACQUISITION MANAGEMENT

**Defense Acquisition and the Case of the Joint
Capabilities Technology Demonstration Office:
Ad Hoc Problem Solving as a Mechanism for
Adaptive Change**

**Kathryn Aten and John T. Dillard
Naval Postgraduate School**

Published April 1, 2013

Approved for public release; distribution is unlimited.
Prepared for the Naval Postgraduate School, Monterey, CA 93943.

Disclaimer: The views represented in this report are those of the authors and do not reflect the official policy position of the Navy, the Department of Defense, or the federal government.



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 APR 2013	2. REPORT TYPE		3. DATES COVERED 00-00-2013 to 00-00-2013		
4. TITLE AND SUBTITLE Defense Acquisition and the Case of the Joint Capabilities Technology Demonstration Office: Ad Hoc Problem Solving as a Mechanism for Adaptive Change			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School, Graduate School of Business and Public Policy, Monterey, CA, 93943			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT This report describes the preliminary analysis and findings of our study exploring what drives successful organizational adaptation in the context of technology transition and acquisition within the Department of Defense (DoD). It is based on our initial collection and analysis of archival and interview data. We began this study seeking to understand what influences the successful transition of commercial off-the-shelf (COTS) technologies to the warfighter focusing on the Joint Capabilities Technology Demonstration (JCTD) office as a successful case study. In the course of our investigation, we noted shifts in organization structure, goals and business processes of the JCTD in response to changing needs of warfighters in Iraq and Afghanistan. Further exploration indicated that these shift were not unique to the JCTD but were one example of many adaptive solutions to changing needs faced by the DoD acquisition community. This led us to focus our research on better understanding what drives successful organizational adaptation. Our preliminary analysis suggests that ad hoc problem solving may be an undervalued yet broadly practiced skill set within the DoD, which may support adaptive responses to change by the acquisition community. We are currently collecting additional data, which we will use to further explicate our findings.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 27	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The research presented in this report was supported by the Acquisition Research Program of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

To request defense acquisition research, to become a research sponsor, or to print additional copies of reports, please contact any of the staff listed on the Acquisition Research Program website (www.acquisitionresearch.net).



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Preface & Acknowledgements

Welcome to our Tenth Annual Acquisition Research Symposium! We regret that this year it will be a “paper only” event. The double whammy of sequestration and a continuing resolution, with the attendant restrictions on travel and conferences, created too much uncertainty to properly stage the event. We will miss the dialogue with our acquisition colleagues and the opportunity for all our researchers to present their work. However, we intend to simulate the symposium as best we can, and these *Proceedings* present an opportunity for the papers to be published just as if they had been delivered. In any case, we will have a rich store of papers to draw from for next year’s event scheduled for May 14–15, 2014!

Despite these temporary setbacks, our Acquisition Research Program (ARP) here at the Naval Postgraduate School (NPS) continues at a normal pace. Since the ARP’s founding in 2003, over 1,200 original research reports have been added to the acquisition body of knowledge. We continue to add to that library, located online at www.acquisitionresearch.net, at a rate of roughly 140 reports per year. This activity has engaged researchers at over 70 universities and other institutions, greatly enhancing the diversity of thought brought to bear on the business activities of the DoD.

We generate this level of activity in three ways. First, we solicit research topics from academia and other institutions through an annual Broad Agency Announcement, sponsored by the USD(AT&L). Second, we issue an annual internal call for proposals to seek NPS faculty research supporting the interests of our program sponsors. Finally, we serve as a “broker” to market specific research topics identified by our sponsors to NPS graduate students. This three-pronged approach provides for a rich and broad diversity of scholarly rigor mixed with a good blend of practitioner experience in the field of acquisition. We are grateful to those of you who have contributed to our research program in the past and encourage your future participation.

Unfortunately, what will be missing this year is the active participation and networking that has been the hallmark of previous symposia. By purposely limiting attendance to 350 people, we encourage just that. This forum remains unique in its effort to bring scholars and practitioners together around acquisition research that is both relevant in application and rigorous in method. It provides the opportunity to interact with many top DoD acquisition officials and acquisition researchers. We encourage dialogue both in the formal panel sessions and in the many opportunities we make available at meals, breaks, and the day-ending socials. Many of our researchers use these occasions to establish new teaming arrangements for future research work. Despite the fact that we will not be gathered together to reap the above-listed benefits, the ARP will endeavor to stimulate this dialogue through various means throughout the year as we interact with our researchers and DoD officials.

Affordability remains a major focus in the DoD acquisition world and will no doubt get even more attention as the sequestration outcomes unfold. It is a central tenet of the DoD’s Better Buying Power initiatives, which continue to evolve as the DoD finds which of them work and which do not. This suggests that research with a focus on affordability will be of great interest to the DoD leadership in the year to come. Whether you’re a practitioner or scholar, we invite you to participate in that research.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the ARP:



- Office of the Under Secretary of Defense (Acquisition, Technology, & Logistics)
- Director, Acquisition Career Management, ASN (RD&A)
- Program Executive Officer, SHIPS
- Commander, Naval Sea Systems Command
- Program Executive Officer, Integrated Warfare Systems
- Army Contracting Command, U.S. Army Materiel Command
- Office of the Assistant Secretary of the Air Force (Acquisition)
- Office of the Assistant Secretary of the Army (Acquisition, Logistics, & Technology)
- Deputy Director, Acquisition Career Management, U.S. Army
- Office of Procurement and Assistance Management Headquarters, Department of Energy
- Director, Defense Security Cooperation Agency
- Deputy Assistant Secretary of the Navy, Research, Development, Test, & Evaluation
- Program Executive Officer, Tactical Aircraft
- Director, Office of Small Business Programs, Department of the Navy
- Director, Office of Acquisition Resources and Analysis (ARA)
- Deputy Assistant Secretary of the Navy, Acquisition & Procurement
- Director of Open Architecture, DASN (RDT&E)
- Program Executive Officer, Littoral Combat Ships

James B. Greene Jr.
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD
Associate Professor



Acquisition Management

Naval Ship Maintenance: An Analysis of the Dutch Shipbuilding Industry Using the Knowledge Value Added, Systems Dynamics, and Integrated Risk Management Methodologies

David N. Ford, Thomas J. Housel, and Johnathan C. Mun
Naval Postgraduate School

Time as an Independent Variable: A Tool to Drive Cost Out of and Efficiency Into Major Acquisition Programs

J. David Patterson
National Defense Business Institute, University of Tennessee

The Impact of Globalization on the U.S. Defense Industry

Jacques S. Gansler and William Lucyshyn
University of Maryland

Bottleneck Analysis on the DoD Pre-Milestone B Acquisition Processes

Danielle Worger and Teresa Wu, *Arizona State University*
Eugene Rex Jalao, *Arizona State University and University of the Philippines*
Christopher Auger, Lars Baldus, Brian Yoshimoto, J. Robert Wirthlin, and John Colombi, *The Air Force Institute of Technology*

Software Acquisition Patterns of Failure and How to Recognize Them

Lisa Brownsword, Cecilia Albert, Patrick Place, and David Carney
Carnegie Mellon University

Fewer Mistakes on the First Day: Architectural Strategies and Their Impacts on Acquisition Outcomes

Linda McCabe and Anthony Wicht
Massachusetts Institute of Technology

The Joint Program Dilemma: Analyzing the Pervasive Role That Social Dilemmas Play in Undermining Acquisition Success

Andrew P. Moore, William E. Novak, Julie B. Cohen, Jay D. Marchetti, and Matthew L. Collins
Software Engineering Institute, Carnegie Mellon University

Acquisition Risks in a World of Joint Capabilities: A Study of Interdependency Complexity



Mary Maureen Brown
University of North Carolina Charlotte

Leveraging Structural Characteristics of Interdependent Networks to Model Non-Linear Cascading Risks

Anita Raja, Mohammad Rashedul Hasan, and Shalini Rajanna
University of North Carolina at Charlotte
Ansaf Salieb-Aoussi, *Columbia University, Center for Computational Learning Systems*

Lexical Link Analysis Application: Improving Web Service to Acquisition Visibility Portal

Ying Zhao, Shelley Gallup, and Douglas MacKinnon
Naval Postgraduate School

Capturing Creative Program Management Best Practices

Brandon Keller and J. Robert Wirthlin
Air Force Institute of Technology

The RITE Approach to Agile Acquisition

Timothy Boyce, Iva Sherman, and Nicholas Roussel
Space and Naval Warfare Systems Center Pacific

Challenge-Based Acquisition: Stimulating Innovative Solutions Faster and Cheaper by Asking the Right Questions

Richard Weatherly, Virginia Wydler, Matthew D. Way, Scott Anderson, and Michael Arendt
MITRE Corporation

Defense Acquisition and the Case of the Joint Capabilities Technology Demonstration Office: Ad Hoc Problem Solving as a Mechanism for Adaptive Change

Kathryn Aten and John T. Dillard
Naval Postgraduate School

A Comparative Assessment of the Navy's Future Naval Capabilities (FNC) Process and Joint Staff Capability Gap Assessment Process as Related to Pacific Command's (PACOM) Integrated Priority List Submission

Jaime Frittman, Sibel McGee, and John Yuhas, *Analytic Services, Inc.*
Ansaf Salieb-Aoussi, *Columbia University*

Enabling Design for Affordability: An Epoch-Era Analysis Approach

Michael A. Schaffner, Marcus Wu Shihong, Adam M. Ross, and Donna H. Rhodes
Massachusetts Institute of Technology



Measuring Dynamic Knowledge and Performance at the Tactical Edges of Organizations: Assessing Acquisition Workforce Quality

Mark E. Nissen
Naval Postgraduate School

Outcome-Focused Market Intelligence: Extracting Better Value and Effectiveness From Strategic Sourcing

Timothy G. Hawkins, *Naval Postgraduate School*
Michael E. Knipper, *771 Enterprise Sourcing Squadron USAF*
Timothy S. Reed, *Beyond Optimal Strategic Solutions*



Defense Acquisition and the Case of the Joint Capabilities Technology Demonstration Office: Ad Hoc Problem Solving as a Mechanism for Adaptive Change

Kathryn Aten—Aten is an assistant professor in the Graduate School of Business and Public Policy at the Naval Postgraduate School in Monterey, CA, where she teaches business policy and strategy. She earned her PhD in management at the University of Oregon where she taught undergraduate and graduate courses in management, business policy and strategy, entrepreneurship, and technology and innovation. Her research explores the processes and mechanisms that shape the emergence and adoption of technologies and is grounded in her experience working for innovative companies including Apple Inc., Patagonia, and International Game Technology. Her research has been published in management journals and several edited books. [kjaten@nps.edu]

John T. Dillard—Dillard (U.S. Army, Ret.) managed major weapons and communications programs for most of his 26-year career in the military, including development efforts for the Javelin Anti-Tank missile and Army Tactical Missile System (ATACMS). He now serves as a senior lecturer and the Acquisition Academic Area Chairman for the Graduate School of Business and Public Policy at the U.S. Naval Postgraduate School in Monterey, CA. His research interests include defense acquisition policy, organizational design and control, and evolutionary system development. His works have been published by the *Project Management Journal*, *Acquisition Review Journal*, *International Public Management Journal*, the *National Academy of Sciences*, and in two edited books on defense program management. [jtdillar@nps.edu]

Abstract

This report describes the preliminary analysis and findings of our study exploring what drives successful organizational adaptation in the context of technology transition and acquisition within the Department of Defense (DoD). It is based on our initial collection and analysis of archival and interview data. We began this study seeking to understand what influences the successful transition of commercial off-the-shelf (COTS) technologies to the warfighter, focusing on the Joint Capabilities Technology Demonstration (JCTD) office as a successful case study. In the course of our investigation, we noted shifts in organization structure, goals, and business processes of the JCTD in response to changing needs of warfighters in Iraq and Afghanistan. Further exploration indicated that these shifts were not unique to the JCTD, but were one example of many adaptive solutions to changing needs faced by the DoD acquisition community. This led us to focus our research on better understanding what drives successful organizational adaptation. Our preliminary analysis suggests that ad hoc problem solving may be an undervalued yet broadly practiced skill set within the DoD, which may support adaptive responses to change by the acquisition community. We are currently collecting additional data, which we will use to further explicate our findings.

Introduction

Defense acquisition is a key technical and business function, vital to the success of the U.S. military. However, it is also the focus of seemingly constant critique and reform. Most recently, the rapidly changing global environment and tactics of adversaries have highlighted gaps in the organization's business process capability, intensifying the calls for process reform. It is widely recognized that DoD acquisition must become more nimble and flexible to more rapidly deploy materiel solutions to new and emerging problems and that doing so will require changes in organization structure, culture, and processes. What is less clear is how to gain the most value from investment in change efforts, which can have substantial direct and indirect cost implications. This question is the focus of this report of the preliminary conclusions based on an ongoing qualitative study.



We began this study seeking to understand what influences the successful transition of commercial off-the-shelf (COTS) technologies to the warfighter, focusing on the Joint Capabilities Technology Demonstration (JCTD) office as a successful case study. In the course of our investigation, we noted shifts in organization structure, goals, and business processes of the JCTD office resulting from responses to the wars in Iraq and Afghanistan. Further exploration indicated that these shifts were not unique to the JCTD office but that the shifts we observed were one example of many adaptive solutions to changing needs faced by the DoD acquisition community. In order to better understand technology transition in the current context and in accordance with a grounded research approach, we adapted our analysis plan to focus on what drives successful adaptation (Howard-Grenville, Golden-Biddle, Irwin, & Mao, 2011; Corbin & Strauss, 2008; Lofland, Snow, Anderson & Lofland, 2006). This report is based on our initial collection and analysis of archival and interview data. We are continuing to collect data through interviews and document searches, following a process of theoretical sampling (Locke, 2001; Clarke, 2005) selecting subjects and documents to elaborate on the concepts reported here.

Since 2001 and 2003, respectively, U.S. engagements in Afghanistan and Iraq have highlighted gaps in certain capabilities: U.S. warfighters were not always equipped for the unique challenges they faced under unanticipated scenarios. This was evidenced by casualties incurred and the submission of more than 7,000 urgent need statements (Gansler, 2009). As these conflicts ensued, more than 20 organizations and a variety of business process changes emerged to meet warfighter needs. This situation, and the responses to it, are the focus of the widely cited “Gansler report” (2009), which forms a context for this study. The Gansler report stated, “The essence of the problem is the need to field militarily useful solutions faster,” and “the reality is that the Department is not geared to acquire and field capabilities in a rapidly shifting threat environment” (2009, p. viii). The Gansler report concluded that the ad hoc organizations and effective processes that emerged to meet the unanticipated needs of U.S. forces in Iraq and Afghanistan should be consolidated, codified, and institutionalized. This conclusion is frequently interpreted as criticism of the extant acquisition process and used to justify further expansion of ad hoc solutions (see, for example, *Warfighter Support: DoD’s Urgent Needs Processes Need a More Comprehensive Approach and Evaluation for Potential Consolidation*, GAO, 2011).

In accordance with what is formally termed an “entrepreneurial mindset” (Haynie, Shepherd, Mosakowski, & Earley, 2010), we reframe this interpretation and seek to contribute to positive changes in U.S. defense acquisition through an analysis based on it. Specifically, we explore the implications to DoD acquisition from “standing up more than 20 ad hoc offices, agencies, task forces, funds, and other organizations to respond and fulfill these diverse needs” (Gansler, 2009) and the problem-solving these entities engaged in to emerge as an exemplary case of organizational adaptation to unexpected changes. When conducting qualitative case studies, researchers should “go for extreme situations, critical incidents and social dramas ... where the progress is transparently observable” (Pettigrew, 1990, p. 275). Given the tremendous size and bureaucratic nature of the DoD, the vital role of acquisition on the organization’s outcomes, and the sudden and unpredictable external change presented by the September 2001 attacks and subsequent U.S. engagements in Afghanistan and Iraq, we view the acquisition community’s response as an extreme case, justifying focused, qualitative exploration.

Furthermore, we argue that reframing the Gansler report (2009), to view the response as an exemplary, *positive* case, highlights a heretofore under-appreciated skill set, at which the DoD may excel. Based on our reframing and research on organizational routines, dynamic capabilities, learning, and change, we examine the cost and benefits of



investments in this skill set and other business capabilities. Management scholars use the term *capability* to refer to a high-level, patterned and repetitious routine that confers a set of decision options for producing outputs (Winter, 2003, p. 991). In this report, we will use the term *organizational capability* to distinguish this concept from the concept of a military capability, which is perhaps more familiar to our audience.

This report proceeds as follows. First, we ground the study by describing the organizational context of DoD acquisition and the events that resulted in recognition of the need for rapid fielding. Next, we analyze and reframe the 2009 Gansler report. Then, we describe the case of the JCTD and our methods for analyzing it. We explore the potential costs and benefit implications of different approaches to securing adaptive business responses. We conclude by summarizing our preliminary analysis and describing the next steps in our ongoing study.

Defense Acquisition and the Shock of September 2001

Acquisition is big business. Each year, the DoD spends over \$100 billion for research, development, procurement, and support of weapon systems. Acquisition is also a rule-intensive business. In addition to myriad laws governing federal acquisition in the U.S., a plethora of regulations specify how to accomplish the planning, review, execution, and oversight of defense acquisition programs, large and small, sole-source and competitive, military and commercial. Due in some part to the large size and many rules associated with defense acquisition, the organizations responsible for these activities tend to be large and rule-intensive themselves, reflecting the kinds of centralized, formalized, specialized, and oversight-intensive forms corresponding to the classic “machine bureaucracy” from organization theory. The problem is, this classic organizational structure is well known to be exceptionally poor at responding to change. In the context of military transformation, such a problem should be clear and compelling. But which superior organizational approaches are available to acquisition leaders and policymakers? What evidence supports claims of superiority for one organizational approach versus another? Questions such as these are difficult to answer through most research methods employed to study organizations (e.g., case studies, surveys, etc.).

Defense acquisition has been characterized by frequent and extensive critique and reform over the past 50 years leading at least one author to argue that “the only constant in the military’s acquisition system is the continuous reform” (Rasche, 2011). However, driven by the changing demands of warfighters, the commercial rate of technological development, and defense budget constraints, the nature and speed of change in the acquisition system has intensified over the past decade. “Today’s adversaries are changing their tactics, techniques, and procedures at an accelerated pace, heightening the need for U.S. forces to respond rapidly to new threats” (Gansler, 2009). We briefly summarize key reformation events of the past two decades below.

In 1993, then Vice President Al Gore’s *Creating a Government that Works Better and Costs Less: The Gore Report on Reinventing Government* sought to reduce government waste and inefficiency, calling upon the DoD acquisition community to simplify procurement, eliminate regulatory burden, and rely to a greater degree on the commercial marketplace. The Clinton administration was oriented toward “reinventing government” by improving government processes, including procurement. Secretary of Defense Leslie Aspin voiced his concerns that acquisition program costs and schedule problems would threaten the ability of the military Services to continue to acquire the newest technologies that had performed so well during the Persian Gulf War. Aspin proposed a “resource strategy” to allow the DoD to afford the best technology in a times of austerity.



Shortly thereafter, Secretary of Defense William Perry released the memo “A Mandate for Change,” which called for a cultural change within the DoD, shifting the DoD’s focus from the acquisition process to its outcome in the field and asserting that the major obstacles to positive change were internal. Acquisition reform continued under the leadership of Secretary of Defense William Cohen, who, in a 1997, expressed the importance of continuing to reform the way the DoD did business, demanding that the department must be “lean, agile, and focused as our warfighters.” The report’s main assertion was that overhead and support activities be reduced and reallocated to warfighters in light of new threats and constrained budgets. In 2000, “The Road Ahead: Accelerating the Transformation of the Department of Defense Acquisition and Logistics Processes and Practices” detailed the Revolution in Business Affairs (RBA), which called for best practices from the private sector to be implemented in a Revolution in Military Affairs (RMA). The report argued that

the Department continues to rely on acquisition processes, organizations and infrastructure largely developed in the years following World War II [and] continues to face a limited investment budget, and squeezed by increased operations and support costs from aging weapons systems. (Gansler, 2000)

On September 10, 2001, Secretary of Defense Donald Rumsfeld gave a speech in which he expressed his determination to save the Pentagon from itself. The Secretary claimed that the Pentagon bureaucracy was the “serious threat” to national security, but he clarified, saying, “Not the people, the processes. Not the civilians, but the systems. Not the men and women in uniform, but the uniformity of thought and action that we too often impose on them.” Rumsfeld’s vision for reform included commercial outsourcing of functions not directly related to warfighting to save money, streamlining the system development process to match the private sector’s, and retaining a quality workforce within the military forces and acquisition community. Immediately after Rumsfeld’s call, the events of September 11th occurred, along with the subsequent wars in Iraq and Afghanistan. These soon highlighted gaps in the DoD’s ability to rapidly deploy solutions to its warfighters facing their new scenarios and problems.

In both Afghanistan and Iraq, the rapid adaptation of enemy capabilities highlighted the need for rapid response by the acquisition community. The use of improvised explosive devices (IEDs) in Iraq is a frequently cited example of enemy forces exploiting “capability gaps in the technology, systems, and equipment used by U.S. forces” (GAO, 2011). Combatant commands submitted more than 7,000 statements for urgent solutions, resulting in the eventual creation of “over 20 ad hoc offices, agencies, task forces, funds and other organizations to meet warfighter needs” (Gansler, 2009).

The Gansler Report

In 2009, the Defense Science Board’s Task Force on the Fulfillment of Urgent Operational Needs published a report known widely as the Gansler report, which analyzed the DoD’s rapid acquisition process. The core finding of the report was that major institutional changes needed to be made to the existing DoD acquisition process. The report asserted that “rapid” is counter to the current acquisition workforce culture and that the current ad-hoc system is not sustainable and will not create a permanent solution. Furthermore, the report cited institutional barriers (people, funding, and processes) as powerful inhibitors to successful rapid acquisition within the DoD. Thus, the report argued that not all DoD needs can be met by the same acquisition process and that the DoD must create and codify a separate “rapid” process.



According to the Gansler report (2009), although field commanders were resourceful in acquiring local solutions, the enemy's new tactics exploited the DoD's inability to rapidly field new capabilities. The Gansler report did recognize the efforts of the acquisition community, stating, for example, "It is hard to criticize the industrious nature of those in the Department who have made something happen when urgent needs have been presented" (Gansler, 2009, p. 9). However, its overall perspective and its interpretation in subsequent citations is a largely critical call for reform: "These approaches do not offer a long-term solution" (Gansler, 2009, p. 9). In particular, the report highlighted the ad hoc, work-around nature of the solutions, noting that "numerous rapid reaction programs and organizations have been established in recent years to respond to combatant commander needs—processes that work within and around the traditional system to get solutions into the field" (Gansler, 2009, p. 6), and citing a lack of institutional changes to organize, formalize, and codify the ad hoc approaches as evidence of continued failure.

By and large, the Gansler report (2009) represented the breadth of criticisms of the DoD rapid acquisition process and its ad hoc entities since their emergence shortly after the invasion of Iraq. More recent assessments offer similar criticisms. The GAO's (2011) report to congressional committees in 2011 titled *Warfighter Support: DoD's Urgent Needs Processes Need a More Comprehensive Approach and Evaluation for Potential Consolidation* identified at least 31 separate entities that manage urgent acquisition needs. The report claimed that the numerous points through which a warfighter may submit a request for an urgent need is an example of redundancy and inter-agency overlap. The GAO (2011) asserted that the DoD does not have a comprehensive policy for how urgent needs are to be addressed, lacks visibility over the full range of its urgent needs efforts, has no senior-level focal point to lead the department's efforts to fulfill urgent needs, and has not evaluated opportunities for consolidation, resulting in unnecessary costs. The GAO (2011) ultimately attributed the need for the many ad hoc processes that currently exist to a failure of the DoD to predict change in the external environment, saying, "The department had not anticipated the accelerated pace of change in enemy tactics and techniques that ultimately heightened the need for a rapid response to new threats in Afghanistan and Iraq."

The conclusions and tone of these reports appear critical of the so-called ad hoc solutions. For example, the Gansler report noted, "While these programs have produced significant successes, their ad-hoc, one of a kind nature has created a different set of problems. They rely on learning on the job with little emphasis on support training and sustainment" (Gansler, 2009, p. 6). Perhaps unsurprisingly, given the bureaucratic nature and culture of the DoD, the reports call for centralization, formalization, and codification to correct the problem presented to the DoD organization by the ad hoc organizations and processes. Indeed, we have previously suggested that the DoD has a propensity or preference toward such centralization, to its own detriment (Dillard, 2005). Given the current nature and culture of the DoD, the survival of rapid or urgent fielding capabilities may indeed depend on some form of the solutions recommended in these reports. However, we argue it is important to note that in framing ad hoc responses as a problem and then offering a solution, these reports fail to address the institutional and cultural environment, which they argue cannot sustain innovation. Of perhaps greater concern, it is possible that enacting the recommendations of the reports without full consideration of the value of the ad hoc problem solving that occurred and the costs associated with building a "dynamic capability," the DoD may eventually lose a valuable source of business process and organizational innovation and adaptation and/or may overinvest in a costly organizational solution, when a less costly alternative may suffice.



Research Context: Framing Rapid Fielding

We situate this study in a reframing of the widely cited Gansler report of 2009. Our reframing is conducted in the spirit of the accepted wisdom that creative solutions often require “thinking out of the box” or “lateral thinking” (De Bono, 1967), which we equate more formally with adopting an entrepreneurial mindset—described below—and guided by a research approach based on frame analysis. We undertake this exploration not to argue against specific recommendations of the Gansler report, but rather because we believe that a problem of such persistence and consequence deserves considered reflection from multiple perspectives.

Research Framework

An entrepreneurial mindset is the ability to “think differently,” to sense, act, and mobilize under uncertain conditions (Haynie et al., 2010). Adaptive thinking hinges on “the ability to be dynamic, flexible, and self-regulating in one’s cognitions” (Haynie et al., 2010, p. 218) and is of fundamental importance to entrepreneurs or others facing uncertain task environments. Adaptive thinking is dependent on metacognitive processes—thinking about thinking—which enable individuals to think beyond existing heuristics and knowledge structures in order to be adaptable. A metacognitive strategy refers to the mental framework formulated by an individual, through which to evaluate multiple, alternative responses to processing a task. Researchers have demonstrated that employing a metacognitive strategy can improve the outcome of problem solving by helping individuals avoid using a flawed approach for addressing a problem (Staw & Boettger, 1990; Haynie et al., 2010).

Drawing on these arguments, Haynie et al. (2010) argued that successful entrepreneurs will be those that formulate a metacognitive strategy to generate alternative approaches to thinking about how to accomplish tasks in ambiguous environments. In other words, entrepreneurs who succeed will be those who can develop multiple, alternative ways of thinking about a problem. We approached this research in this spirit, seeking an alternative strategy for thinking about the problem of acquisition reform in order to evaluate possible responses.

A metacognitive strategy requires metacognitive awareness, that is, awareness concerning one’s own thinking. We thus undertook an examination of the logic, assumptions, and links between these and the conclusions presented in the Gansler report. Our examination followed the norms and precepts of frame analysis as developed in organization research (Benford & Snow, 2000; Creed, Langstraat, & Scully, 2002).

Frames are “action-oriented sets of beliefs and meanings that inspire and legitimate that activities and campaigns” created through conversations and written communication that connect events and experiences (Benford & Snow, 2000). Core framing tasks include diagnostic framing, the identification of problems and causes; and prognostic framing, the articulation of a proposed solution. Institutional solutions to problems result when recurring or widespread problems are theorized, or described in general terms, and agreed upon, pointing to a particular solution (Suchman, 1995). Following Creed et al. (2002), we developed a signature matrix to sort the idea elements found in the Gansler report into categories that support the functions of interpretation, argumentation, punctuation, elaboration, and motivation. This allowed us to discern key elements of the frame and consider alternatives.

The Framing of the Gansler Report

The Gansler report (2009) depicted the response to the unanticipated needs of warfighters in Afghanistan and Iraq as evidence that the DoD cannot respond to changing needs. The report framed the emergence of many organizations and the lack systematic,



codified processes as evidence of failure, and problems, which must be corrected. In particular, the report highlighted the lack of sustainable funding for ad hoc processes as a problem for which the solution is codification, centralization, and formalization. Although this is a logical solution to the problem as framed in the report, an alternate frame might suggest other possible solutions.

In the Gansler report, the large number of requests to meet urgent needs, and the highly visible problem of IEDs, are used to support the assertion that the DoD “lacks the ability to rapidly field new capabilities” (2009). The text of the report includes the phrase “in a systematic and effective way,” linking the assertion of failure and a lack of systematic processes to ineffectiveness. This depiction is further linked to an overall presentation of the problem or the diagnostic frame; the lack of systematic processes makes the current solution unsustainable, and as the problem is the lack of systematic processes, the solution is therefore the creation of a systematic, codified process in a formal, centralized organization. The latest update of the Joint Capabilities Integration and Development instruction, CJCSI 3170.01H (2012), already reflects some implementation of this recommendation.

Although some successful outcomes result from ad hoc organizations and business processes, recognition of achievements are followed by critiques of the processes that achieved them. Variation is presented as redundant and costly. Ad hoc problem solving is not systematic or codified (and linked to ineffective and unsustainable). Workarounds, although recognized as necessary, are depicted as “disjointed” (linked to unsystematic and ineffective). For example,

Over the past five years there have been many success stories and lessons Learned. ... However, in the larger picture, the DoD has not made major, institutional changes in budgeting and acquisition essential to posture itself for the ongoing hybrid warfare reality. DoD is not systematically prepared to anticipate and respond to urgent and dynamically changing needs that will be a permanent part of 21st century operations.

When progress is noted, it (progress) refers to codification, as in this example:

The Joint Staff, COCOMs, and the Services have all codified in directives new processes to identify urgent needs and provide rapid responses. Recent progress includes a detailed urgent needs process memorandum circulated by the Secretary of the Navy in March 2009.

The arguments of the report support the recommendation to restructure the organization and to create a codified, systematic process for rapid fielding. This recommendation is consistent with the bureaucratic nature and culture of the DoD and with past routines for codifying, reorganizing, and centralizing. However, a reframing of the problem allows a deeper consideration of factors mentioned but not emphasized in the report and illuminates heretofore underemphasized or overlooked implications of the report’s recommendations.

An Alternate Perspective

We explored the question “What is the most cost effective means of achieving the dynamic and adaptive business capabilities DoD seems to require?” We began by reframing the Gansler report. A summary of our analysis and reframing is shown in Table 1. In our reframing, we considered the establishment of 20 (and eventually more than 30) organizational entities over a period of a few years and their development of associated



business models and processes to be *an amazing adaptive response* to an external shock by a bureaucratic organization, which would be expected to be hampered by severe inertia.

Table 1. Framing of the Gansler Report

Focal event	<i>Warfighters in Afghanistan and Iraq have unanticipated equipment needs</i>		
	Gansler Frame	Representative Quote	Alternate Frame
Depiction	DoD has not responded/cannot respond.	DoD lacks the ability to rapidly field new capabilities to the warfighter (<i>in a systematic and effective way</i>).	Acquisition community responded.
Punctuation: What is the problem?	Current rapid fielding process is unsustainable.	The essence of the problem is the need to field militarily useful solutions faster. Current approaches to implement rapid responses to urgent needs are not sustainable.	Adapting (business organization) to changing environment. Current process is an example of a valuable, periodically utilized skill-set.
Elaboration: What factors contribute?	Variation is redundant and costly.	The procedures these organizations have developed ... vary across the DoD ... definitions and regulations that apply to the processes vary [and words] ... are sometimes used in conflicting and overlapping ways.	Variation is a necessary component of change.
	Ad hoc problem solving is problematic.	Their ad hoc, one-of-a-kind nature has created a different set of problems. They rely on learning on the job with little emphasis on support, training, and sustainment.	Ad hoc problem solving is a “low cost” skill set.
	Workarounds contradict the institution.	All also utilize workarounds ... to sidestep traditional acquisition and fielding process, but these are generally disjointed.	Workarounds allow creativity within a bureaucracy.
	Formalization, codification, and consolidation result in sustainability.	DoD needs to codify and institutionalize “rapid” acquisition processes and practices.	Codification is costly. The full value lies in the knowledge gained through the process, gaining full value requires collaboration.
Motivation: What action should be taken?	Undertake structural reforms to institutionalize a specific solution.	The Secretary of Defense should establish a new agency.	Evaluate costs/benefits of ad hoc solutions and seek solutions that retain diverse skill sets.

Our perspective is not without precedent, even within the DoD. In a 2011 report, *Lessons Learned From Rapid Acquisition: Better, Faster, Cheaper?*, Colonel Robert A. Rasch examined the impacts of wartime acquisition initiatives on the DoD acquisition systems. Rasch framed the continual reform of DoD acquisition as a possible indicator of positive adaptive change. Perhaps best known is the large scale and rapid acquisition of at least 7,000 Mine Resistant Ambush Protected (MRAP) vehicles in just over two years. The need for MRAP vehicles was initially articulated, in February of 2005 by Marines who needed protection from IEDs, RPGs, and small-arms fire. The need was met through a variety of ad hoc solutions involving innovative adaptations to standard processes for



establishing requirements, evaluating progress, and contracting. This instance is cited as an exemplary outcome in GAO reports (GAO, 2009).

Viewing this response above as a successful solution suggests a reconsideration of the definition of the problem. The Gansler report (2009) is clearly focused on the immediate need for rapid fielding, as tasked, and our reframing should not be viewed as a criticism of those efforts. However, when given the luxury of reflective consideration afforded a research project (as opposed to the task specific demands facing a decisively engaged military force), the context of the organization, past attempts at reform and an environment characterized by unpredictable events, suggest a broader and persistent need for business adaptability. We reframe the problem in terms of this broader need: The DoD must adapt its business model and processes to meet unpredictable demands from the external environment. This need is recognized in the Gansler report:

The global landscape has changed the national security environment, demanding the ability to rapidly access and field capabilities from any source. Agile adversaries are taking advantage of important, globally available technologies by rapidly creating and fielding highly effective weapons. Moreover, the nation faces a vast range of potential contingencies around the world. ... This set of circumstances calls for rapid adaptation on the part of the United States as well—*adaptation of tactics, techniques, and procedures* [emphasis added] as well as the ability to field new [warfighting] capabilities on a timeframe unfamiliar to the bureaucratic processes that dominate acquisition in the Department of Defense today. (2009, p. 3)

However, the overriding focal problem highlighted by the framing of the Gansler report is the need for a rapid fielding capability. Reframing the problem as we have done suggests a reconsideration of the role and value of variation, ad hoc problem solving, and codification. The Gansler report frames these factors as contributors to the problem. In our reframing, we considered the role of variation as precursor to change, workarounds as a mechanism for allowing creativity within a bureaucracy, and the benefits of codification as deriving from the process of articulation and clarification as much as (or even more than) from written output. Our reframing suggests a need to evaluate the costs and benefits of ad hoc problem solving versus codified business capabilities and to seek overall solutions that most efficiently support the business adaptability in an unpredictable environment.

Research Approach and Methods

We began our study of the JCTD case with the question of what best influences the successful transition of commercial-off-the-shelf (COTS) technologies to the warfighter. During our initial investigation, we noted shifts in organization structure, goals, and business processes of the JCTD office in response to the wars in Iraq and Afghanistan. In accordance with a grounded research approach (Howard-Grenville et al., 2011; Corbin & Strauss, 2008; Lofland et al., 2006), we adapted our analysis plan to focus on how the organization was adapting to change. This report is based on our initial collection and analysis of archival and interview data. The organization is once again adapting as the need for rapid fielding in Afghanistan and Iraq diminish, and our analysis to this point must thus be considered preliminary. We are continuing to collect data through interviews and document searches, following a process of theoretical sampling (Locke, 2001; Clarke, 2005).

We began this study with a review of literature related to the JCTD office and the evolution of defense acquisition processes. We also conducted a round of exploratory interviews with subject matter experts in the JCTD office. These were informal, unstructured interviews, designed to familiarize us with the history, operations, and evolution of the office.



We encouraged experts to elaborate on these topics and took detailed notes. In the course of the initial data collection, we noted an apparent and deliberate shift had occurred in the mission of the JCTD office in recent years, from demonstrating advanced militarily useful concepts with promising technologies towards rapid fielding of materiel and the importance of ad hoc problem solving.

We collected additional data from two sources: a “snowballing” Google search and the Internet Archive (Nardon & Aten, 2008; Aten, 2010). On Google, we searched for all pages and documents with JCTD or ACTD and the word *technology* in the title from the year 2000 to the present and saved each as a PDF, yielding more than 2,000 pages. We then followed links to identify additional pages and documents, yielding an initial 247 saved PDFs. We scanned all of the documents and excluded documents such as glossary pages, descriptions of acronyms, and descriptions and press releases related to particular JCTDs. This yielded a dataset that included presentation slides, JCTD announcements and policies, and descriptions of the organization.

Next, we collected data from the Internet Archive (2009), “a non-profit organization that was founded to build an Internet library, with the purpose of offering permanent access for researchers, historians, and scholars to historical collections that exist in digital format.” The Internet Archive is searchable by URL with a search resulting in a list of hyperlinks to web pages for the specified URL, by date, that are included in the archive. Thus, one can view web pages of an organization as they existed for a particular year in the past. The archive for the ACTD and JCTD was intact, with multiple instances captured every year from 2001 to the present. We reviewed one web page per year, adding instances as necessary when we noted major changes to ensure that we did not miss relevant documents. On each page, we followed links and printed PDF files of web pages and documents related to the evolution of the JCTD office. We selected pages and documents available from links titled introduction, guidelines, Q&A, links, organization, and what’s new. Our saved documents included conference presentation slides, management briefings, procedures and guidelines, organization charts, and the text of speeches. We did not save specific JCTD project descriptions, glossary pages, or point of contact information pages.

We organized all of the documents by year and imported them into an Nvivo qualitative data analysis software project. We used Nvivo to code the data into broad categories suggested by our previous analysis: organization structure, business model (mission/goals, value proposition, measures), technology characteristics (maturity level, use, customer), and process characteristics (requirements, steps). We then generated reports allowing us to view examples from the broad categories across time.

Research Setting: The Joint Capabilities Technology Demonstration Office

The JCTD program began in 1994 as the Advanced Concepts Technology Demonstration (ACTD), with the aim of more rapid prototyping and fielding of technology for the DoD by demonstrating and assessing the of the military utility of a technology. Over the 18 years since its inception, the overall mission of the program has remained unchanged.

History and Purpose

In the late 1980s, the President’s Blue Ribbon Commission on Defense, also known as the Packard Commission, was charged by Executive Order 12526, in which President Reagan asked the commission to conduct a defense management study focusing on the budget process, the procurement of systems, the legislative oversight, and intra-government organizational arrangements in regard to defense. Among other things, the report indicated a high need for prototyping. The report stated that



a high priority should be given to building and testing prototype systems and subsystems before proceeding with full-scale development. This early phase of R&D should employ extensive informal competition and use streamlined procurement processes. It should demonstrate that the new technology under test can substantially improve military capability, and should as well provide a basis for making realistic cost estimates prior to a full scale development decision. This increased emphasis on prototyping should allow us to “fly and know how much it will cost before we buy.”

The Packard Commission report, as well as several other Defense Science Board reports, led to the establishment of the ACTD. ACTDs are user-oriented and of a large enough scope to establish military utility. During the ACTD, the users (the warfighters) determine whether they will begin acquisition of the new technology. The ACTDs/JCTDs serve the Combatant Commands (COCOM) by fulfilling capability gaps the Services may not view as mission-critical but that the COCOMs are nonetheless requesting.

In 2006, the ACTD became the JCTD. Although the core staff and office remained the same, the name change brought with it a change in focus; there was a shift to emphasizing the fulfillment of capabilities and an added emphasis on transitioning new technologies to the field for sustained use. Despite some changes in management, name, and participation of various agencies, the organizational structure of the ACTD/JCTD has remained fairly constant. An ACTD/JCTD is jointly sponsored and managed by a supporting user (the military) and the technology developer. Approval of ACTD/JCTDs is given by the Deputy Under Secretary for Advanced Systems and Concepts (DUSD [AS&C]). The ACTD/JCTD program maintains a significant cross-service, cross-agency involvement with a heavy focus on joint operations and COCOM participation. In September 2009, the DoD established the Office of the Deputy Assistant Secretary of Defense for Rapid Fielding (ODASD[RF]). Sometime shortly after its establishment, the ODASD(RF) was designated as the overseeing agency of the JCTD program.

Although the personnel and management remained the same, the JCTD program claims to be implementing a new and enhanced business process to better meet the DoD's transformational goal of becoming capabilities based. JCTDs focus directly on the COCOM's most critical warfighter needs and proved a faster, more agile and integrated joint response to emerging asymmetrical threats. JCTDs emphasize increased upfront transition planning, provision for a higher level of OSD funding during the first two years, and bridge funding from Budget Activity Four for those projects that demonstrate compelling joint military utility. In the move from ACTD to JCTD the program eliminated several of the review processes, such as the so-called Breakfast Club, and limited the involvement of the Joint Chiefs. The program was redirected to focus more on capabilities and transitioning the new capabilities but also on rapid fielding; the ACTD program saw a 50–60% transition rate, as the JCTD program is seeing an 80–90% transition rate.

Technology

An important part of considering candidates to become an ACTD/JCTD is the technology readiness level (TRL). “Technology maturity is a measure of the degree to which proposed critical technologies meet program objectives; and, is a principal element of program risk.” The DoD Component Science and Technology (S&T) Executive directs the technology readiness levels and determines the level of maturity of a given system.

There are nine TRL levels, each representing a major step forward in the development process of the system. ACTDs/JCTDs are largely previously proven technologies that will, by and large, have a TRL of 7, 8, or 9. A system that is ranked with a



TRL 7 has demonstrated “an actual system prototype in an operational environment.” TRL 8 is assigned to technology that “has been proven to work in its final form and under expected conditions.” In almost all cases, this TRL represents the end of true system development. TRL 9 is assigned to technology “in its final form” and that has been proven through successful mission operations.

There are several characteristics for which ACTD candidates are chosen: affordability, interoperability, sustainability, and potential for evolution. The affordability of a new capability was viewed from the perspective of the total ownership cost, to see whether the cost of the capability throughout its life cycle would hinder its eventual inclusion into the regular acquisition process. The new technology or capability was required to be interoperable because of the importance of implementing the technology in future operations. The new systems remain in the field, so sustainability was a crucial aspect. Finally, systems and capabilities were evaluated based on their potential to be updated as the situation or threat evolved.

The TRL of ACTDs fluctuated depending on the type of system and the level of risk that managers and oversight organizations were willing to take. In the period before 2003, projects were much larger and assumed more risk in term of the readiness of the technologies (Global Hawk and Predator). The Defense Advanced Research Projects Agency (DARPA) was once one of the largest contributors to the funding of ACTDs; however, eventually DARPA’s involvement in the program waned, and so too did the large and risky nature of many ACTDs.

As the ACTD transitioned to the JCTD and as time went on, the program became more focused on picking “the low hanging fruit” in the sense that ACTDs became more focused on smaller projects that assumed less risk. This has also been attributed to the increased focus of rapid fielding that was generated by the wars in Iraq and Afghanistan. Figure 1 shows the relatively steady decline in the average estimated costs of the ACTD/JCTD projects by year for the last 10 years. The decline in costs coupled with the decline in the average length is evidence that lends itself to the notion that the program was, as one official put it, focused on “getting something out the door as quickly as possible.”

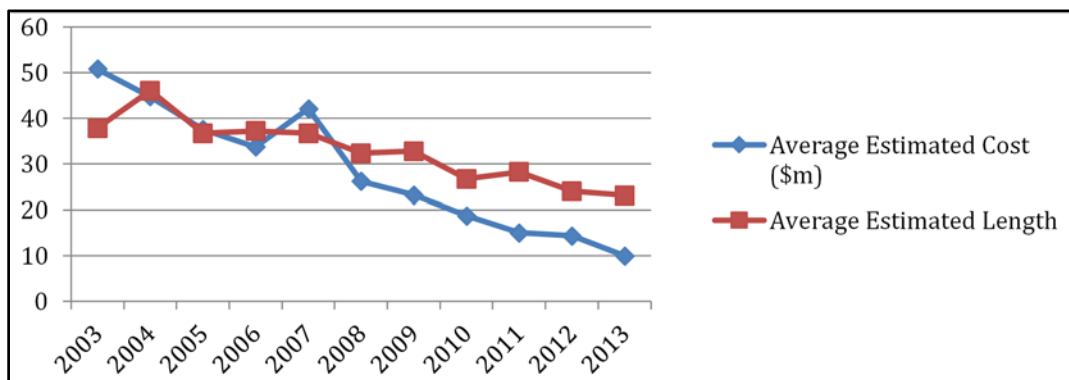


Figure 1. Average Estimated Costs of the ACTD/JCTD Projects by Year for the Last 10 Years

More recently (in last few months) and after a change in management, the JCTD has encountered criticism for its increasing aversion to risk, which was generally coming from senior leadership of the program. Also, the need for rapid fielding has been lessened by the ending of the Iraq War and the winding-down of operations in Afghanistan. Now, there is an emerging desire to shift the JCTD back to its original style of bigger, better and riskier and to adapt once more.



Dynamic Capabilities and Ad Hoc Problem Solving: Pathways to Adaptability

Although the political environment is not perfectly analogous to the business environment, some useful comparisons can be made. The shocks of 9/11 and enemy innovations suggest the acquisition community is facing, and will continue to face, a turbulent environment. Studies of organizations operating in turbulent environments have focused on understanding the role of routines in change and adaptation. Scholars have argued that dynamic capabilities, or the ability to systematically change existing organizational routines are a key to success (Teece, 2007). However, Winter (2003) argued that the costs of creating dynamic capabilities may not be justifiable in turbulent environments. Winter's (2003) argument, along with a recent discussion of anticipated consequences in such environments (Selsky et al., 2007), suggests that ad hoc problem solving may be an effective solution for adapting to change. We discuss these ideas below.

Understanding organizational adaption and change is a key focus of organizations scholars. Organizational routines provide one avenue for exploring how organizations change their capabilities. Organizational routines are the basic components of organizational behavior and are a crucial to understanding how organizational capabilities are accumulated, transferred, and applied (Becker, Lazaric, Nelson, & Winter, 2005). Thus, organizational routines provide a useful starting point for an exploration of the pathways to organizational adaptability. The discussion below draws largely from Winter's (2003) "Understanding Dynamic Capabilities."

An organizational routine is highly patterned, repetitious behavior that is learned, founded at least in part in tacit knowledge and directed toward specific objectives. Thus, behaviors to run a particular production line to produce a particular product constitute a routine. Organizational improvisation is not a routine because it is dynamic, one of kind, and conscious rather than patterned, repetitions, and tacit behavior. An organizational capability is a high-level routine that confers upon an organization's management a set of decision options for producing a particular type of output.

Recent research on strategy in rapidly changing environments has focused on dynamic capabilities (Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000). Despite the name, dynamic organizational capabilities are based on routines and patterned, repetitious behavior. The dynamic refers to the focus of the routine. Ordinary organizational capabilities are operational capabilities. Those organizational capabilities that provide value exhibit technical and environmental fit, allowing an organization to "make a living" by performing a particular function well and also by allowing an organization to succeed within a particular environment, respectively. Dynamic capabilities are organizational capabilities that extend, modify, or create ordinary capabilities, helping organizations shape and adapt to the environment, achieving evolutionary fitness. Dynamic capabilities involve sensing and shaping opportunities and threats, seizing opportunities, and maintaining competitiveness by combining, enhancing, protecting, and reconfiguring tangible and intangible assets. Zollo and Winter (2002) defined a dynamic capability as "a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (p. 340). Examples of dynamic capabilities include systematic methods for changing operating routines and organizational capabilities for process research development, restructuring and re-engineering, and post-firm acquisition integration.

According to Zollo and Winter (2002), dynamic capabilities are created through three learning mechanisms: experience accumulation, knowledge articulation, and knowledge codification, as shown in Figure 2 Knowledge articulation occurs when individuals express their opinions and beliefs, challenge each other's viewpoints, and engage in constructive



confrontations. Knowledge articulation is a deliberate process through which groups and individuals seek to understand what works and what does not to complete a particular organizational task. Organizational and individual competence is enhanced when implicit knowledge is articulated through discussion, debriefing sessions, and assessments of past performance. These processes serve to improve individuals' understanding of the causal mechanisms that link actions to outcomes. Articulation requires significant effort but can produce improved understanding of changes in links between action and performance. Articulation can thus result in adaption of existing routines.

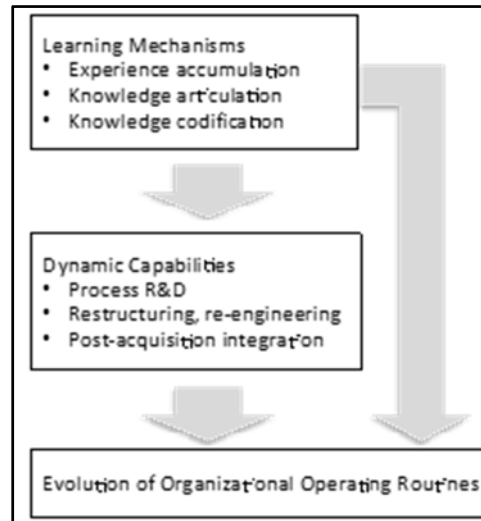


Figure 2. Learning, Dynamic Capabilities, and Operating Routines
(Zollo & Winter, 2002)

Knowledge codification, occurs when articulated understandings are captured in writing, as in, for example, manuals, decision support systems, or project management software. Knowledge codification requires greater effort than articulation. Codification is challenging because it can be difficult to ensure that codified guidance is adequate, and also that such guidance is implemented and followed. The additional effort means that codification may be costly. Costs include the time, resources and attention invested in the development of task-specific tools, as well as the indirect costs of a possible increase in organizational inertia (because the now-codified routine is applied regularly, making change more difficult) or the inappropriate application of a codified routine.

The development of dynamic capabilities is costly. Investments include financial, temporal, and cognitive resources that are directed toward improving understanding of action-performance linkages. The level of investment can be considered along a continuum. It will be lowest when a firm relies on the accumulation of experience in a semiautomatic fashion and more costly when the firm relies on knowledge articulation and even more so for codification. Dynamic capabilities require specialized personnel, committed to change roles, and, to be economically worthwhile, an opportunity to be exercised.

According to some scholars, organizations operating in rapidly changing business environments require dynamic organizational capabilities, which can be “harnessed to continuously create, extend, upgrade, protect and keep relevant the enterprise’s unique asset base” (Teece, 2007, p. 1319). However, although dynamic capabilities have attracted attention, they are not the only means of organizational adaptation and change. Firms can also adapt and change through ad hoc or one-time problem solving. Ad hoc problem solving is not repetitious and highly patterned. It typically occurs in response to unpredictable events

in the environment. Whereas the development and maintenance of dynamic capabilities requires ongoing specialized investments in personal and attention, the costs of ad hoc problem solving disappear when there is no problem to solve. The costs of ad hoc problem solving are largely opportunity costs associated with the attention given the problem. If the problem is no longer presented, attention shifts and costs are relieved. Thus, so-called routine capabilities, augmented when needed with ad hoc problem solving, may be the more cost effective response to achieving organization adaptation (Winter, 2003).

The responses of the acquisition community to the change in warfighters' needs, exemplified in this study through the case of the JCTD office, can be considered a successful example of ad hoc problem solving. The reaction of the community; creating organizations and processes to fill a particular need from existing organizations, budgets, and processes; learning on the job; and forging one-time solutions are all examples of ad hoc problem solving, creative innovation to a particular problem.

As discussed previously, such problem solving may be more cost effective than creating a dynamic capability. This is particularly true when an environment is ambiguous and unpredictable or competitors are likely to copy one's success. The long-term response to the need for rapid fielding during the conflicts in Iraq and Afghanistan should take into account the "success" of this problem-solving approach. An evolutionary approach to organizational change would suggest that the variation of organizations and processes be subject to environmental selection, whereby only those exhibiting fit with the environment are likely to survive. Thus, if in fact rapid fielding remains a paramount need, we would expect the creativity that fostered the organizations that met that need to find a way to continue to meet it. History suggests that those within the DoD are adept at doing this. Alternatively, however, if rapid fielding is not required, the costs of developing this "dynamic capability" may be misplaced.

DoD acquisition has exhibited a long history of resistance to change. Given the bureaucratic make-up of the DoD and the size of the organization, this is not surprising. Further, bureaucratic processes are appropriate in some situations (particularly those involving great risk) and may be a necessity for the DoD. However, as many have noted, DoD organization structure and processes were well adapted to the post-WWII–Cold War era, and since 2001 that stable environment no longer exists. Thus, many DoD routine capabilities may have technical fit—they fit well with a particular function, such as the acquisition of large, complicated weapons systems to meet the needs of many players when time and money are abundant—but may not fit with the new environment. The question then becomes, what is the best way to adapt to the new environment.

One must be somewhat cautious in making direct comparisons between the competitive business environment—where success is generally defined as earning greater financial returns than one's rival—and the multifaceted environment facing the DoD acquisition community. The discussion above suggests that ad hoc problem solving should not be discounted out of hand and without consideration. Such solutions allow the DoD to adapt in low cost manner without attempting to change the overall bureaucracy. Although developing dynamic organizational capabilities may be possible, doing so is clearly costly and difficult, as exemplified by the many failed attempts with the DoD and in industry. An alternate perspective on ad hoc problem solving suggests that these solutions should be rewarded, and perhaps structural changes should be designed to allow such solutions to emerge and dissipate as needed, rather than automatically seeking codification, centralization, and formalization. This is particularly salient if one considers that the environment may continue to change. The organizations and processes that have emerged and evolved to exhibit technical and environmental fit for the environment following the



September 2001 attacks may not fit the environment of the future. Ad hoc problem solving is a low-cost alternative for allowing adaptability within the large bureaucracy.

Implementing Change—An Additional Consideration

As noted above, this research suggests that reforms should consider how to take advantage of the ad hoc problem solving skills of the DoD acquisition community. Furthermore, the discussion suggests that, when codification of learning is undertaken, then much of the value of such efforts lies in the process, rather than in the end. Capturing this value requires a collaborative, “safe” environment that facilitates knowledge sharing. The acquisition community can be viewed as a system, composed of many different types of actors and organizations, operating in an uncertain environment subject to shocks and subsequent turbulence. Although, some competition within systems is beneficial, a long history of research documents the deleterious effects of competitive environments on knowledge sharing at the individual level and of price wars and “hyper-competition” on industry profitability at the systems level. Policymakers should be aware of the potential consequences of such negative competition and structure reforms to minimize its likelihood.

Scholars argue that in business landscapes characterized by great turbulence, traditional competitive actions may not lead to an advantage but may rather result in further turbulence. For example, organizations relying on dynamic capabilities to “turn themselves into moving targets” moving faster, changing more quickly to avoid being “leapfrogged” by competitors, may increase field level turbulence (Delapierre & Mytelka, 1998, p. 78; Selksy et al. 2007, p. 79). Selksy et al. (2007) argued that success in turbulent environments hinges on collaborative endeavors to develop new field level processes, adaptive skills, and capabilities. Selsky et al. (2007) illustrated these dynamics referencing a pair of studies of hospitals in hyper-turbulent environments. In response to changes in federal Medicare reimbursement programs, the states of California and Minnesota each made major reforms to their healthcare systems, resulting in a turbulent business environment. However, the healthcare industries in the two states experienced different outcomes.

In 1982, California adopted a managed competition program in healthcare, creating incentives for providers to compete on price for government care for indigent citizens. At the same time, the federal government changed Medicare reimbursement procedures. Together, these events resulted in unanticipated turbulence in the business landscape of the state’s hospitals.

California’s hospitals reacted immediately, over one six-week period during the study, two hospitals merged, one was acquired, and seven out of 30 hospitals experienced CEO succession. The hospitals entered mergers, alliances, and partnerships between hospitals, physicians, and insurance plans. These actions challenged traditional rules of competition within the industry, understandings about the domain and identity of hospitals, and the traditional boundaries between players in the healthcare field. For example, insurers became deliverers of care through investments in managed care organizations, hospitals became providers of care through offsite clinics, invading the traditional domain of doctors, and physicians took on new risks for the cost and quality of the services they offered by signing preferred or exclusive provide contracts.

In response, the hospitals formed integrated networks seeking access to new markets, economies of scope and scale, and complements to their distinctive competencies. However, as the environmental turbulence continued to increase, the hospitals reacted with hyper-competitive moves actively disrupting previous competitive norms and each other’s competitive advantages. For example, preferred provider networks linked groups of physicians to particular provider hospitals and health plans. This restricted other hospitals’



access to these physicians and spawned a bidding war. Medical staffs that had taken hospitals years to develop were decimated. Overtime, the competitive actions ceased to provide advantage and success and became only a requirement for survival. Smaller players were marginalized as larger, stronger organizations consolidated their control over resources. The region's healthcare system continues to suffer from "huge systemic flaws: Rampant inflation, large numbers of uninsured, uneven and hard to measure quality and uncertain funding" (Rauber, 2005; Selsky, 2007).

In response to the federal changes, Minnesota reconfigured its healthcare industry a decade later. Healthcare providers responded initially in a manner similar to those in California. However, in contrast to California's hospital executives, those in Minnesota viewed themselves as the architects of a new organizational model. Minnesota's executives constructed collaborative networks yielding "win" solutions for many players in the field. While vigorous competition continued, executives were able to anticipate some of the negative effects of their individual competitive actions in the extended field and to create a model of competition that partially controlled for those effects.

In the end, the process of industry restructuring in California generated negative externalities, whereas industry transformation in Minnesota retained negative feedback brakes and avoided some of these effects. As illustrated by these examples, hyper-competition in a turbulent environment can result in unanticipated negative effects. In California, failures to develop sustainable, collective strategies "echo in the form of failed alliances, labor problems and uncertain financial health" (Selsky, 2007), whereas the collaborative efforts of hospitals in Minnesota contributed to a more successful, field-level change.

If successful adaptation in a turbulent environment is best achieved through collaborative effort, it is imperative that such collaboration between field players be fostered. Although comparisons between a competitive business environment and a public agency are not absolute, they can be enlightening. In the field of defense acquisition, there are many players. As in the hospital examples above, an environmental change resulted in a redefinition of the domain and roles, the emergence of new entities and partnerships, and the creation of new processes. If changes to the system lead to "hyper-competitive" behavior among the new players in the acquisition field now facing restructuring and/or between the new and traditional players, unanticipated negative outcomes can be expected.

This suggests that if substantial reorganization and or codification of emergent processes is undertaken, the DoD should consider how to foster collaboration between the newly formed organizations to develop roles and patterns of interaction viewed as "wins" for multiple players in the field. Structural reform should be complemented by efforts to solicit and incorporate inputs from new and traditional field players with a view toward crafting a field solution. Achieving "the hope that, over time, the DoD acquisition community will understand the benefits of the rapid approach—and the countercultural stigma will dissolve" (Gansler, 2009, p. 26) may require active intervention to change perceptions, and at the very least, a thoughtful consideration of how to avoid worsening the problem when making structural changes.

Conclusion

This report describes the preliminary analysis and findings of our study exploring what drives successful organizational adaptation in the context of technology transition and acquisition within the DoD. It is based on our initial collection and analysis of archival and interview data. Our preliminary analysis suggests that ad hoc problem solving may be an undervalued yet broadly practiced skill set within the DoD. We are currently conducting a



second round of targeted interviews designed to illuminate how those in the JCTD office used ad hoc problem solving and organizational routines to field technology solutions. We will use the data to further explore how ad hoc problem solving may be used to support adaptive responses within the DoD acquisition community and to explicate criteria for determining when to rely on ad hoc problem solving versus when to invest in creating dynamic organizational capabilities.

References

- Becker, M. C., Lazaric, N., Nelson, R. R., & Winter, S. G. (2005). Applying organizational routines in understanding organizational change. *Industrial and Corporate Change*, 14(5), 775–791.
- Benford, R. D., & Snow, D. A. (2000). Framing processes and social movements: An overview and assessment. *Annual Review of Sociology*, 611–639.
- Clarke, A. (2005). *Situational analysis: Grounded theory after the postmodern turn*. Thousand Oaks, CA: SAGE Publications.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Los Angeles, CA: SAGE Publications.
- Creed, W., Langstraat, J., & Scully, M. (2002). A picture of the frame: Frame analysis as technique and as politics. *Organizational Research Methods*, 5(1), 34.
- De Bono, E. (1967). *The use of lateral thinking*. London, England: Jonathan Cape.
- Delapierre, M., & Mytelka, L. (1998). Blurring boundaries: New inter-firm relationships and the emergence of networked, knowledge-based oligopolies. In *The changing boundaries of the firm*. London, England: Routledge Press.
- Dillard, J. T. (2005). *Toward centralized control of defense acquisition programs*.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10–11), 1105–1121.
- Gansler, J. (2009). *Fulfillment of urgent operational needs* (Report of the Defense Science Board).
- GAO. (2011). *Warfighter support: DOD's urgent needs processes need a more comprehensive approach and evaluation for potential consolidation* (GAO-11-273). Washington, DC: Author.
- Haynie, J. M., Shepherd, D., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217–229.
- Howard-Grenville, J., Golden-Biddle, K., Irwin, J., & Mao, J. (2011). Liminality as cultural process for cultural change. *Organization Science*, 22(2), 522–539.
- Locke, K. D. (2001). *Grounded theory in management research*. Thousand Oaks, CA: SAGE Publications.
- Lofland, J., Snow, D., Anderson, L., & Lofland, L. (2006). *Analyzing social settings: A guide to qualitative observation and analysis*. Belmont, CA: Wadsworth/Thomson Learning.
- Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organization Science*.
- Rasche, R. A. (2011). *Lessons learned from rapid acquisition: Better, faster, cheaper?* [Strategy Research Project for U.S. Army War College].
- Selsky, J. W., Goes, J., & Babüroğlu, O. N. (2007). Contrasting perspectives of strategy making: Applications in “hyper” environments. *Organization Studies*, 28(1), 71–94.
- Staw, B. M., & Boettger, R. D. (1990). Task revision: A neglected form of work performance. *Academy of Management Journal*, 534–559.



- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571–610.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991–995.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339–351.

Acknowledgments

The material is based on work supported by the Naval Postgraduate School Acquisition Research Program. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the Naval Postgraduate School.





ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL
555 DYER ROAD, INGERSOLL HALL
MONTEREY, CA 93943

www.acquisitionresearch.net