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

1 October 2013

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NAVAL POSTGRADUATE SCHOOL

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Abstract

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Keywords: JCTD, ad hoc problem solving, organizational adaptions, DoD acquistion

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

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 (Corbin & Strauss, 2008; Howard-Grenville, Golden-Biddle, Irwin, & Mao, 2011; 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 (Clarke, 2005; Locke, 2001) 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…The reality is that the Department is not geared to acquire and field capabilities in a rapidly shifting threat environment" (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, Government Accountability Office [GAO], 2011).

In accord 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 upon 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, p.3) 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, 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 such an extreme case, justifying focused qualitative exploration.

Furthermore, we argue that reframing the Gansler report, 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 use the term *organizational capability* to

distinguish this concept from the concept of a *military capability*, 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 Department of Defense (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 that 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 policy-makers? 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 and surveys).

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. We briefly summarize key reformational 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 focused on 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 such as 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 (Fox, 2011).

Shortly thereafter, Secretary of Defense, William Perry released the memo *A Mandate for Change*, (1994) 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 report, expressed the importance of continuing to reform the way the DoD did business such that the department would be as agile, lean and focused as our warfighters (Cohen, 1997). Cohens's report asserted that overhead and support activities must be reduced and reallocated to warfighters, in light of new threats and constrained budgets (Cohen, 1997). 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 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, constrained by a relatively stable top-line budget, and squeezed by increased operations and support costs from aging weapons systems" (Gansler, 2000, p. 2).

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, 2001, p. 1). 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 11 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, p. 4). 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 p. vii).

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 need 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 argues that not all DoD needs can be met by the same acquisition process and the DoD must create and codify a separate "rapid" process.

According to the Gansler report, although field commanders were resourceful in acquiring local solutions, the enemy's new tactics exploited the DoD's inability to rapidly field new capabilities (Gansler, 2009). 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" (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" (p. 6) and cited 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 represents 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 offered similar criticisms. The Government Accountability Office's (GAO) report to congressional committees in 2011, *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 interagency overlap. The GAO 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 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 that "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" (GAO, 2011, p. 9).

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 called 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 DoD has a propensity or preference toward such centralization and 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 may overinvest in a costly organizational solution, when a less costly alternative might 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 to 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" (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 to avoid using a flawed approach for addressing a problem (Haynie et al., 2010; Staw & Boettger, 1990).

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 sets of beliefs and meanings that inspire and legitimate activities (Benford & Snow, 2000). Frames are created through conversations and written communication, which 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, Langstraat, and Scully (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 depicted the response to the unanticipated needs of warfighters in Afghanistan and Iraq as evidence that the the DoD cannot respond to changing needs. The report framed the emergence of many organizations and the lack of 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 were used to support the assertion that the DoD does not have ability to rapidly field new capabilities. 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 since 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 System (CJCSI 3170.01H; Chairman of the Joint Chiefs of Staff, 2012) already reflects some implementation of this recommendation.

While recognizing some successful outcomes resulting from ad hoc organizations and business processes, recognition of achievements was followed by critiques of the processes that achieved them. Variation was presented as redundant and costly. Ad hoc problem solving is not systematic or codified (and linked to ineffective and unsustainable). Workarounds, while 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 (Gansler, 2009, p. viii),

When progress is noted, it (progress) refers to codification, as in the following 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 (Gansler, 2009, p. 3).

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 the 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	Warfighters in Afghanistan and Iraq have unanticipated equipment needs		
	Gansler Frame	**Representative Quote**	**Alternate Frame**
Depiction	DoD has not/cannot respond.	DoD lacks the ability to rapidly field new capabilities to the warfighter *(in a systematic and effective way) (p. 1).*	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 (p. viii). Current approaches to implement rapid responses to urgent needs are not sustainable (p. 10).	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 (p. 22).	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 (p. 19).	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 (p. 40).	Workarounds allow creativity within a bureaucracy.
	Formalization, codification, consolidation result in sustainability.	DoD needs to codify and institutionalize "rapid" acquisition processes and practices (p. 37).	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 (p. 46).	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. Rasche examined the impacts of wartime acquisition initiatives on the DoD acquisition systems. Rasche 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 a GAO report (GAO, 2011).

Viewing this response above as a successful solution, suggests a reconsideration of the definition of the problem. The Gansler report 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 Department of Defense must adapt its business model and processes to meet unpredictable demands from the external environment. This need is recognized in the Gansler report (underline added):

> 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—<u>adaptation of tactics, techniques, and procedures</u> 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. (Ganlser, 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 framed 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

The purpose of this study was to explore what influences the successful transition of 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, (Corbin & Strauss, 2008; Howard-Grenville et al., 2011; 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 collection and analysis of archival and interview data. The organization is once again adapting as the need for rapid fielding in Afghanistan and Iraqi diminish and our analysis to this point must thus be considered preliminary.

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. From these interviews and documents and summaries provided by the JCTD office, we developed summaries of several JCTD projects. A list of the projects we disscussed is included in Appendix A: JCTD Projects. In the course of the initial data collection, we noted an apparent and deliberate shift had occurred in the focus of the JCTD office in recent years: longer term higher risk projects to a narrower focus on rapidly delivering capability to the warfighter to meet urgent needs resulting from the Iraq and Afghanistan. We conducted five additional structured interviews to explore the role of ad hoc problem solving. These interviews were recorded and transcribed.

We collected additional data from two sources, a snowballing Google search and the Internet Archive (Aten, 2010; Nardon & Aten, 2008). 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. 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 which included presentation slides, JCTD announcements and policies, and descriptions of the organization.

Next, we collected data from the Internet Archive, "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" (Internet Archive, March 30, 2009). 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. These searches yielded a total of 59 documents for coding as shown in Appendix B, Table 1: Overall Summary of Analysis.

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. These reports are included in Appendix B.

Research Setting: The JCTD Office

The Joint Capabilities Technology Demonstration (JCTD) program began in 1995 as the Advanced Concepts Technology Demonstration (ACTD) Program, with the aim of more rapid prototyping and fielding of technology for the Department of Defense (DOD) by demonstrating and assessing the military utility of emerging technologies. 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 Predsident Reagan in Executive Order 12,526 to conduct a defense management study focusing on the budget process, the procurement of systems, the legislative oversight, and intragovernment organizational arrangements in regard to defense (Packard, 1986). Among other things, the report indicated a high need for prototyping. The Packard Commison 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' (1986, p. xxv).

The Packard Commission report, and other Defense Science Board reports, led to the establishment of the ACTD Program. From the beginning, ACTDs were user-oriented and designed to demonstrate military utility in line with the Packard Commission report that suggested the DoD adopt a try before you buy strategy for emerging technologies. In addition, there was a heavy focus on joint operations and combatant commands (COCOM) involvement. These characteristics remain today. The COCOMs remain a primary customer of the JCTD and identify capability gaps not being adequately addressed by the Services but viewed as mission-critical by the COCOMs.

In response to the wars in Iraq and Afghanistan the ACTD Program became the JCTD Program in 2006 and implemented a new business process to better focus on the Combatant Commanders' most critical warfighter needs and to accelerated the identification and execution of JCTD projects to meet emerging asymmetrical threats. JCTDs also emphasize increased upfront transition planning and early technology spirals. The increased focus on the rapid delivery of capabilities to the warfighter saw transition rates increased from 60% to 70% to over 80%.

Final approval of JCTDs is given by the Under Secretary of Defense for Acquisition, Technology and Logistics who sends the proposed JCTD projects to Congress. By law the Department has to wait 45 days once Congress is notified before it can initiate a JCTD. In September 2009, the DOD established the Office of the Deputy Assistant Secretary of Defense for Rapid Fielding (ODASD [RF]) who is the overseeing agency of the JCTD program.

Technology

An important part of considering candidates to become JCTD is the technology readiness level (TRL). Technology maturity is a principal element of program risk and refers to the degree to which proposed critical technologies meet program objectives. 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. JCTDs are primarily focused on technologies with a TRL of 5, 6 or 7. 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 tended to be much larger and assumed more risk in terms of the readiness of the technologies, as in the cases of the Global Hawk and Predator JCTDs). During the early years of the Program the Defense Advanced Research Projects Agency (DARPA) was a significant contributor 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. The wars in Iraq and Afghanistan and the initiation of JCTDs, to replace ACTDs in 2006, accelerated this trend.

The transition to the JCTD Program and the increased focus on meeting urgent operational needs of the DoDs warfighters in Iraq and Afghanistan resulted in a program that was risk adverse and focused on smaller projects that could quickly deliver capability to the warfighter. 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 which supports the notion that the program was, as one official interviewed by the authors put it, focused on "getting something out the door as quickly as possible."
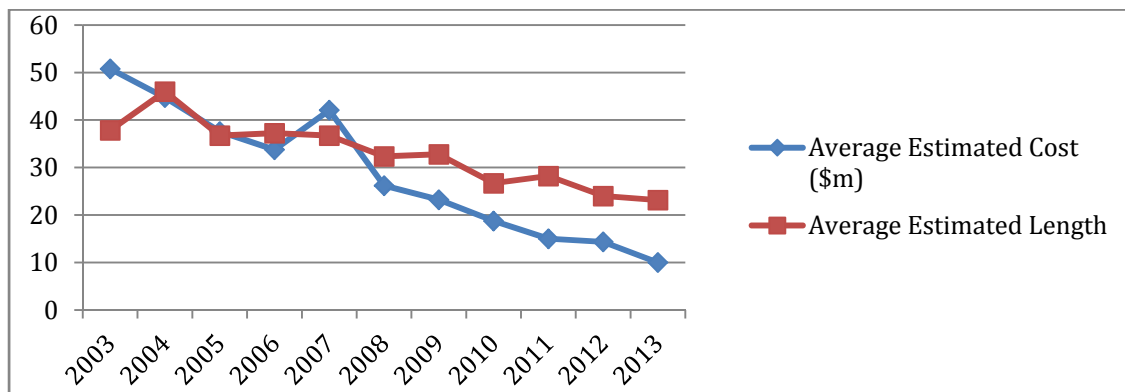
Figure 1.   Average Estimated Costs of JCTD Projects

More recently (in the last few years) the JCTD has encountered criticism for its increasing aversion to risk. 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 Program back to once again focus on the larger projects addressing the strategic priorities of the DoD. This will lead to larger more risky projects that have a bigger potential payoff. The JCTD Program is adapting 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, 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, Goes, & Babüroğlu, 2007), suggested 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 organization 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, repetitious 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 (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen,1997). 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 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 does and does not work 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.
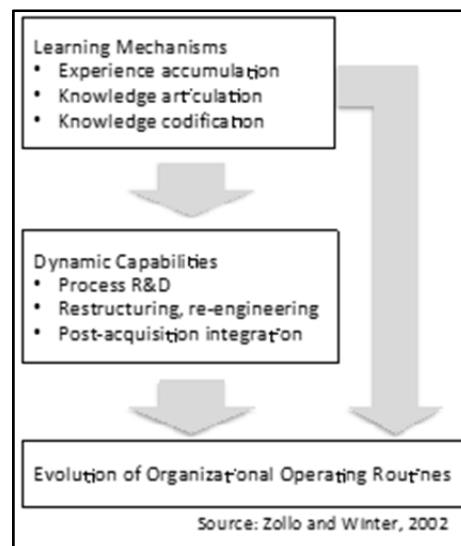
Figure 2.   Learning Dynamic Capabilities and Operating Routines
(Zollo & Winter, 2002)

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 assure 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 towards 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 personnel 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 community reacted by drawing on existing organizations, budgets, and processes to create new organizations and processes to fill a particular need, learned on the job, and forged one-time solutions. These actions are examples of ad hoc problem solving, bringing creative innovation to a particular problem.

As discussed above, 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 which 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, 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. Policy-makers 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 advantage but may rather result in further turbulence. For example, organizations relying on dynamic capabilities to turn themselves into moving targets by moving faster and changing more quickly to avoid being leapfrogged by competitors, may increase field level turbulence (Selksky et al. 2007). 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 provider 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, spawning a bidding war. Medical staffs that had taken hospitals years to develop were decimated. Over time, 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. As noted in a report by Cris Rauber for the San Franciso Business Times in 2005, 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" (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, labour problems and uncertain financial health" (Selsky, Goes, and Baburoglu, 2007, p. 85), 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 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. What we found most noteworthy in our interviews and observations was that entrepreneurial-type organizational shifts can indeed occur within a large mechanistic bureaucracy like the DoD. It makes us ponder whether the vastness of the organization—its mere size—actually lends to pockets of organizational departure from what is codified in regulations, instructions, and so on. Moreover, we feel our strongest conclusion was perhaps not apparent to many others while it was occurring—that the JCTD Office moved away from investments based upon highest capability payoff towards those based upon nearer-term delivery and user needs, using technology maturity and urgency as determining metrics. That the office could maneuver into this space was not from directives, but independently and from real-world warfare scenarios in Operation Iraqi Freedom and Operation Enduring Freedom. The shift was from asking, "What is in the realm of future possible technological applications?" to "How can emerging technologies rapidly be fielded to satisfy current needs?" The DoD formally established the Office of the

Assistant Secretary of Defense for Rapid Fielding (ODASD[RF]) in 2009—fully six to eight years beyond these combat operations.

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Appendix A: Text Analysis and Summary

This appendix contains reports summarizing the coding and analysis of the database of documents containing the term *ACTD* or *JCTD*. Both terms were searched on Google and also using the Internet Archive in order to include documents available on a given year, that have since been removed. This appendix contains the table and reports listed with a brief description below.

Table 2: Overall Summary of Analysis—Documents and Codes by Year

This report shows the total number of documents retrieved (59), by year, and the number of times segments of text referring to each of four categories (business model, organization structure, process characteristics, technology characteristics) were identified. This report also shows the number of documents, by year, in which text referring to each of the four categories was identified, and the total number of segments of text coded (1,307).

Report 1: Project Summary

This report shows the title and source of each document (ACTD Google search, JCTD Google search, Internet Archive [WayBack]).

Report 2: Source Summary

This report shows the total number of words, paragraphs, and segments coded in each document.

Table 2.   Overall Summary of Analysis

Year	# Doc	Bususiness Model		Org. Structure		Process Characteristics		Technology Characteristics	
		# doc coded	# segment	# doc coded	# segment	# doc coded	# segment	# doc coded	# segment
2001	5	0	0	0	0	1	7	0	0
2002	2	1	94	2	189	2	189	1	94
2003	2	0	0	1	22	1	22	1	22
2004	9	0	0	1	3	1	3	0	0
2005	3	0	0	0	0	0	0	0	0
2006	6	1	15	1	3	2	5	1	3
2007	4	1	20	1	20	1	20	0	0
2008	9	1	9	0	0	1	9	0	0
2009	4	0	0	0	0	2	19	0	0
2010	4	1	86	1	86	2	128	0	0
2011	4	1	51	1	51	1	51	0	0
2012	5	1	39	3	81	3	81	0	0
2013	2	0	0	1	4	0	0	0	0
Totals	59	7	314	12	459	17	534	3	119
Total # Segments Coded									1307

Report 1: Project Summary

ACTD Google Documents

Internals\\ACTD Google\\2001_I.E.1
Internals\\ACTD Google\\2002_Collins
Internals\\ACTD Google\\2002_JointTheaterLogistics
Internals\\ACTD Google\\2003_ACTD_Critical Incident Response Conference
Internals\\ACTD Google\\2004_ACTD & Urban Technology Office Pathfinder ACTD
Internals\\ACTD Google\\2004_Advanced Concept Technology Demostrations (ACTD)
Website_AcquisitionCommunityConnection
Internals\\ACTD Google\\2004_Coalition Theatre Logistics (CTL) Advanced Concept Technology Demonstration
(ACTD) Architecture Overview - GetTRDoc
Internals\\ACTD Google\\2004_JointPrecisionAirdropSystemPPT
Internals\\ACTD Google\\2005_Coalition Theatre Logistics (CTL) Advanced Concept Technology Demonstrator
(ACTD) Web Services Documentation - GetTRDoc
Internals\\ACTD Google\\2005_JAHUMSACTDCasestudy
Internals\\ACTD Google\\2006_JCTDDoc
Internals\\ACTD Google\\2006_Joint Precision Airdrop System Advanced Concept Technology Demonstration
(JPADS ACTD)
Internals\\ACTD Google\\2006_JTCD Technology Demos Announced
Internals\\ACTD Google\\2006_peterson
Internals\\ACTD Google\\2007_ACTD & Urban Technology Office Small Unmanned Aerial Vehicles (SUAVs)

JCTD Google Documents

Internals\\JCTD Google\\09Dec_FITEJCTD_Ang
Internals\\JCTD Google\\2006_DoD Announces ACTD, JCTD Projects
Internals\\JCTD Google\\2006_GetTRDoc-1
Internals\\JCTD Google\\2007_04455284
Internals\\JCTD Google\\2007_65781I_1
Internals\\JCTD Google\\2007johnKubricky
Internals\\JCTD Google\\2008_Information_Dwyer
Internals\\JCTD Google\\2008_IRISJCTDoview_110808
Internals\\JCTD Google\\2008_Space09_SzajnfarberWeigel
Internals\\JCTD Google\\2009_10.%20PACOM%20Conf_Brief%2019%20March%2010%20N832
Internals\\JCTD Google\\2009_AIAA09_SzajnfarberJCTD_MIT
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Internals\\JCTD Google\\2009_Press Releases_ AeroVironment Receives Order for Third Global Observer
Aircraft under JCTD Program - AeroVironment, Inc
Internals\\JCTD Google\\2009_TISC White Paper-FINAL (12-2-09)-1
Internals\\JCTD Google\\2010_0603648D8Z_PB_2011
Internals\\JCTD Google\\2010_C3E_new-format_16FMar2010_A%5b1%5d
Internals\\JCTD Google\\2010_PEOPLE JCTD EUCOM Brief 061610
Internals\\JCTD Google\\2010_SPIDERS JCTD microgrid baseline will be up to 10 megawatts -
FierceGovernmentIT
Internals\\JCTD Google\\2011_0603648D8Z_3_PB_2012
Internals\\JCTD Google\\2011_Global Observer JCTD
Internals\\JCTD Google\\2011_Joint STARS Successfully Supports JSuW JCTD
Internals\\JCTD Google\\2011_News From USJFCOM_ FITE JCTD concludes, begins transitioning
Internals\\JCTD Google\\2012_20507_PEAK_JCTD_Comms_User_Manual
Internals\\JCTD Google\\2012_CNB Briefing Template - Sep 2012
Internals\\JCTD Google\\2012_CS_JCTD_Unity_Demo_ST_CONF_27Jun2012_V2 0
Internals\\JCTD Google\\2012_JCTD Transition Desk Reference

Internals\\JCTD Google\\2012_RDAJCTD_03132012
Internals\\JCTD Google\\2013_Joint Capability Technology Demonstration (JCTD) - 0603648D8Z_3_PB_2013
Internals\\JCTD Google\\2013_PEOPLE%20JCTD%20Telecon%20Mtng%20Minutes%20042710

Internet Archive (Wayback) Documents

Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Charter for Oversight Groups
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Implementation Directives
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Information Warfare
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Transition
Internals\\WayBack\\Guidelines\\2001_ACTD Guidelines_ Formulation, Selection and Initiation
Internals\\WayBack\\Guidelines\\2001_ACTD Guidelines_ Information Warfare
Internals\\WayBack\\Guidelines\\2001_ACTD Guidelines_ Transition
Internals\\WayBack\\Guidelines\\2001_Guidelines for ACTD Management Plans
Internals\\WayBack\\Guidelines\\2003_Mngr'sGuidetoTechTransition
Internals\\WayBack\\Guidelines\\2004_Advanced Concept Technology Demonstrations (ACTD)
Internals\\WayBack\\Guidelines\\2004_Advanced Concept Technology Demonstrations (ACTD)_Implementation Directives
Internals\\WayBack\\Guidelines\\2004_DoD 5000 Series Resource Center
Internals\\WayBack\\Guidelines\\2004_JCIDS_JointCheifs
Internals\\WayBack\\Guidelines\\2004Advanced Concept Technology Demonstrations (ACTD)_ManagementPlans
Internals\\WayBack\\Guidelines\\2005_tra_deskbook
Internals\\WayBack\\Guidelines\\2006_JCTD_Web_Site
Internals\\WayBack\\Guidelines\\2008_JCTD POG Master
Internals\\WayBack\\Guidelines\\2008_JCTD POG Narrative Description v 1.0
Internals\\WayBack\\Guidelines\\2008_Joint Capability Technology Demonstrations (JCTD) Guidelines
Internals\\WayBack\\Guidelines\\2008_Joint Capability Technology Demonstrations (JCTD) Joint Electronic Warfare Center Red Team
Internals\\WayBack\\Guidelines\\2008_MRL Background 040429
Internals\\WayBack\\Guidelines\\2008_POG Quick Start Instructions
Internals\\WayBack\\Guidelines\\JCIDSManual

Report 2: Source Summary

Report 3: Source Summary

JCTD Evolution

Total Words in Source	Total Paragraphs in Source	Number of Nodes Coding Source	Coded Percentage of Source	Number of Text References	Number of Audio Video References	Number of Image References
PDF						
Internals\\ACTD Google\\2001_I.E.1						
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Internals\\ACTD Google\\2002_Collins						
2162	94	3	1.0000	3	0	282
Internals\\ACTD Google\\2002_JointTheaterLogistics						
20511	1280	5	1.0000	5	0	465
Internals\\ACTD Google\\2003_ACTD_Critical Incident Response Conference						
1909	410	4	1.0000	4	0	84
Internals\\ACTD Google\\2004_ACTD & Urban Technology Office Pathfinder ACTD						
260	10	1	1.0000	1	0	1
Internals\\ACTD Google\\2004_Advanced Concept Technology Demostrations (ACTD) Website_AcquisitionCommunityConnection						
796	31	2	1.0000	2	0	4
Internals\\ACTD Google\\2004_Coalition Theatre Logistics (CTL) Advanced Concept Technology Demonstration (ACTD) Architecture Overview – GetTRDoc						
986	34	1	1.0000	1	0	34
Internals\\ACTD Google\\2004_JointPrecisionAirdropSystemPPT						
2334	280	1	1.0000	1	0	41
Internals\\ACTD Google\\2005_Coalition Theatre Logistics (CTL) Advanced Concept Technology Demonstrator (ACTD) Web Services Documentation – GetTRDoc						
145	6	1	1.0000	1	0	6

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5136	173	1	1.0000	1	0	10
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777	22	1	1.0000	1	0	2
Internals\\ACTD Google\\2006_Joint Precision Airdrop System Advanced Concept Technology Demonstration (JPADS ACTD)						
428	12	1	1.0000	1	0	1
Internals\\ACTD Google\\2006_JTCD Technology Demos Announced						
276	9	1	1.0000	1	0	1
Internals\\ACTD Google\\2006_peterson						
1910	196	1	1.0000	1	0	14
Internals\\ACTD Google\\2007_ACTD & Urban Technology Office Small Unmanned Aerial Vehicles (SUAVs)						
768	16	1	1.0000	1	0	2
Internals\\JCTD Google\\09Dec_FITEJCTD_Ang						
187	33	1	1.0000	1	0	5
Internals\\JCTD Google\\2006_DoD Announces ACTD, JCTD Projects						
591	23	2	1.0000	2	0	4
Internals\\JCTD Google\\2006_GetTRDoc-1						
1435	63	1	1.0000	1	0	5
Internals\\JCTD Google\\2007_04455284						
3127	107	1	1.0000	1	0	6
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1387	64	1	1.0000	1	0	5

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2061	204	4	1.0000	4	0	76
Internals\\JCTD Google\\2008_Information_Dwyer						
1022	59	1	1.0000	1	0	3
Internals\\JCTD Google\\2008_IRISJCTDoview_110808						
648	55	1	1.0000	1	0	7
Internals\\JCTD Google\\2008_Space09_SzajnfarberWeigel						
6055	104	3	1.0000	3	0	24
Internals\\JCTD Google\\2009_10_%20PACOM%20Conf_Brief%2019%20March%2010%20N832						
1560	123	1	1.0000	1	0	14
Internals\\JCTD Google\\2009_AIAA09_SzajnfarberJCTD_MIT						
634	75	2	1.0000	2	0	24
Internals\\JCTD Google\\2009_GetTRDoc						
1631	147	1	1.0000	1	0	21
Internals\\JCTD Google\\2009_Press Releases_ AeroVironment Receives Order for Third Global Observer Aircraft under JCTD Program - AeroVironment, Inc						
937	18	1	1.0000	1	0	2
Internals\\JCTD Google\\2009_TISC White Paper-FINAL (12-2-09)-1						
1002	37	1	1.0000	1	0	2
Internals\\JCTD Google\\2010_0603648D8Z_PB_2011						
33724	1413	3	1.0000	3	0	255
Internals\\JCTD Google\\2010_C3E_new-format_16FMar2010_A%5b1%5d						
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5268	626	2	1.0000	2	0	82
Internals\\JCTD Google\\2010_SPIDERS JCTD microgrid baseline will be up to 10 megawatts -- FierceGovernmentIT						
305	10	1	1.0000	1	0	1
Internals\\JCTD Google\\2011_0603648D8Z_3_PB_2012						
23515	865	3	1.0000	3	0	150
Internals\\JCTD Google\\2011_Global Observer JCTD						
1168	37	1	1.0000	1	0	4
Internals\\JCTD Google\\2011_Joint STARS Successfully Supports JSuW JCTD						
1160	53	1	1.0000	1	0	3
Internals\\JCTD Google\\2011_News From USJFCOM_ FITE JCTD concludes, begins transitioning						
739	31	1	1.0000	1	0	2
Internals\\JCTD Google\\2012_20507_PEAK_JCTD_Comms_User_Manual						
3214	141	1	1.0000	1	0	32
Internals\\JCTD Google\\2012_CNB Briefing Template -- Sep 2012						
3003	327	2	1.0000	2	0	54
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739	70	1	1.0000	1	0	12
Internals\\JCTD Google\\2012_JCTD Transition Desk Reference						
3476	142	2	1.0000	2	0	26
Internals\\JCTD Google\\2012_RDAJCTD_03132012						
1791	125	1	1.0000	1	0	11

Total Words in Source	Total Paragraphs in Source	Number of Nodes Coding Source	Coded Percentage of Source	Number of Text References	Number of Audio Video References	Number of Image References
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988	38	3	1.0000	3	0	114
Internals\\JCTD Google\\2013_PEOPLE%20JCTD%20Telecon%20Mtng%20Minutes%20042710						
858	30	1	1.0000	1	0	3
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407	10	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Implementation Directives						
508	11	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Information Warfare						
485	19	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\1999_ACTD Guidelines_ Transition						
8651	124	0	0.0000	0	0	0
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Internals\\WayBack\\Guidelines\\2004_Advanced Concept Technology Demonstrations (ACTD)_Implementation Directives						
525	14	0	0.0000	0	0	0
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133	13	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\2004_JCIDS_JointCheifs						
13987	542	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\2004Advanced Concept Technology Demonstrations (ACTD)_ManagementPlans						
4556	64	0	0.0000	0	0	0
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71668	3982	0	0.0000	0	0	0
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3814	432	0	0.0000	0	0	0
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5853	425	0	0.0000	0	0	0
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21505	731	0	0.0000	0	0	0
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848	33	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\2008_Joint Capability Technology Demonstrations (JCTD) Joint Electronic Warfare Center Red Team						
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Internals\\WayBack\\Guidelines\\2008_MRL Background 040429						
588	4	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\2008_POG Quick Start Instructions						
286	14	0	0.0000	0	0	0
Internals\\WayBack\\Guidelines\\JCIDSManual						
24909	989	0	0.0000	0	0	0
Internals\\WayBack\\Introduction\\2001_Introduction to ACTDs						
3725	65	0	0.0000	0	0	0
Internals\\WayBack\\Introduction\\2004_Intro_Advanced Concept Technology Demonstrations (ACTD)						
3921	63	0	0.0000	0	0	0
Internals\\WayBack\\Introduction\\2006_intro_Advanced Concept Technology Demonstrations (ACTD)						
1196	27	0	0.0000	0	0	0
Internals\\WayBack\\Introduction\\2009_JCTD_Card_Deck						
1152	198	0	0.0000	0	0	0
Internals\\WayBack\\Introduction\\2009_Joint Capability Technology Demonstrations _ About JCTD						
273	17	0	0.0000	0	0	0
Internals\\WayBack\\Manager's Conference\\2001_AssessingUtility_SU-Koumb						
1496	235	0	0.0000	0	0	0
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975	104	0	0.0000	0	0	0
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Internals\\WayBack\\Manager's Conference\\2001_Systems Dev_SU-Wasil

| 481 | 52 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2001_Transition_SU-Palad

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Internals\\WayBack\\Manager's Conference\\2011_JCTD_Completion_Closeout

| 651 | 51 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2011_JCTD_Documentation_Requirements

| 652 | 60 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2011_JCTD_Execution_and_Schedule

| 797 | 86 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2011_JCTD_Funding_Process

| 1232 | 116 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2011_JCTD_Selection_and_Approval_Process

| 2829 | 372 | 0 | 0.0000 | 0 | 0 | 0 |

Internals\\WayBack\\Manager's Conference\\2011JCTD_Roles_and_Responsibilities

| 882 | 62 | 0 | 0.0000 | 0 | 0 | 0 |

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Appendix B: JCTD Projects Reviewed

- Large Data (LD)
  This project demonstrated a highly scalable, rapid and secure integrated capability to effectively retrieve, store and share massive amounts of information effectively between users.

- Persistent Ground Surveillance Systems (PGSS)
  This project demonstrated a small aerostat system used to provide persistent surveillance.

- Rapid Reaction Tunnel Detection (R2TD)
  This project demonstrated a family of systems to detect and characterize tunnels.

- Collaborative Online Reconnaissance Provide Operationally Responsive Attack Link (CORPORAL)
  This project demonstrated data sharing across airborne and ground-based systems for collaboration and visibility to higher authorities.

- Commercial Radar Operation Support to SOUTHCOM (CROSS)
  Demonstrated the ability to task commercial radar constellations and receive unclassified imagery data to support operations and contingency planning activities.

- Joint Multi-Mission Electro-Optical System (JMMES)
  This project demonstrated an automated wide-area surveillance capability using advanced sensors in a common turret compatible with a variety of aircraft.

- Counter-Intelligence/Human Intelligence Advanced Modernization Program
  This project demonstrated Intelligence Operations Now (CHAMPION) - Optimized the reporting of timely and actionable Counter-Intelligence (CI) and Human Intelligence data.

- Critical Runway Assessment and Repair (CRATR)
  This project demonstrated the ability to conduct rapid runway damage assessment and repair.

- Joint Medical Distance Support and Evaluation (JMDSE)
  This project demonstrated battlefield casualty care support with precision medical resupply and telemedicine for battlefield reach back.

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