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**AN ANALYSIS OF METHODOLOGIES & BEST PRACTICES FOR RAPIDLY
ACQUIRING TECHNOLOGIES TO MEET URGENT WARFIGHTER NEEDS**

THESIS

Charles David Solomon, Captain, USAF

AFIT/GRD/ENV/08-M11

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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AFIT/GRD/ENV/08-M11

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THESIS

Presented to the Faculty

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In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Research & Development Management

Charles David Solomon, BS

Captain, USAF

March 2008

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Abstract

The rapidly changing global security environment that today's military operates within requires an ever increasing ability to quickly adapt to non-traditional threats. This has forced the U.S. to re-examine the traditional means of equipping its forces to ensure more agile acquisition practices are available to the Science and Technology (S&T) and acquisition communities. While there have been significant efforts to look towards industry for potential solutions to this problem, the heavily bureaucratic and restrictive government environment has made applying commercial lessons learned difficult. In order to effectively implement rapid fielding approaches within the government context, research into organizations facing the same or similar constraints must be conducted. This research focused on interviewing innovative pockets across the Government with proven track records for rapidly fielding new technologies in order to cross-pollinate measures for success. Through the use of various qualitative measures, innovative practices and methodologies were identified that keep these organizations on the cutting edge of rapid product delivery. The recommendations of this research can be broadly applied to organizations chartered with rapidly responding to customer needs.

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Charles David Solomon

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AN ANALYSIS OF METHODOLOGIES & BEST PRACTICES FOR RAPIDLY ACQUIRING TECHNOLOGIES TO MEET URGENT WARFIGHTER NEEDS

I. Introduction

The rapid global proliferation of new technology is placing a strain on the United State's ability to effectively counter emerging and adaptive threats such as those currently being encountered in Afghanistan and Iraq. Unlike the Cold War era, there is no defined enemy or standard tactic used by those who wish to do harm to the United States and the ease with which our enemies have access to new technology is higher than ever before (DSB, Vol IV, 2007). These factors have given our enemies the ability to quickly adapt and develop innovative countermeasures to our defenses such as the improvised explosives devices (IEDs) that have become prevalent over the last several years. Consequently, soldiers in the field are relying more heavily on the acquisition and science and technology (S&T) community to address critical gaps or shortfalls with immediate solutions. As stated in the Defense Acquisition Performance Assessment (DAPA) report:

The Acquisition System must deal with external instability, a changing security environment and challenging national security issues. The Department must be agile -- to an unprecedented degree -- to respond quickly to urgent operational needs from across the entire spectrum of potential conflicts. (Kadish et al., 2006:7)

This shift towards a more innovative and rapid acquisition has forced the U.S. to re-examine the traditional means of equipping its forces to ensure they are acquiring the

very best capabilities as quickly as possible. However, the S&T and acquisition communities have struggled with how to quickly deliver innovative technology within the constraints of the Department of Defense (DoD) acquisition system and overcome traditional obstacles such as the budget process and the inherent bureaucratic nature of the government. To date, there has been little research into how well the government is answering urgent operational needs or what the organization's responding to these requirements are doing differently in order to reduce historically long acquisition cycle times. Therefore, this research will take an exploratory focus towards investigating government organizations with proven track records for rapidly delivering new technologies and towards identifying best practices. Emphasis was placed on those organizations that have experience in answering urgent operational needs or in significantly streamlining the existing acquisition process through innovative measures. Additionally, the Defense Acquisition Performance Assessment Report (2006) and the Defense Science Board Study on 21st Century Technology Vectors were heavily leveraged due to the limited data available on this uniquely government-focused topic.

Background

Historically, the DoD acquisition process has delivered products behind schedule and over budget. Therefore, numerous acquisition reform efforts over the past 30 years have aimed at streamlining the process. The most notable of these efforts was the 1986 President's Blue Ribbon Commission on Defense Management, otherwise known as the Packard Commission. One of the major findings of the commission was that long

development time is the main factor from which all other major acquisition problems stem (Packard, 1986). The report goes on to state the following as part of its findings:

Acquisition problems have been with us for several decades, and are becoming more intractable with the growing adversarial relationship between government and the defense industry, and the increasing tendency of Congress to legislate management solutions. In frustration, many have come to accept the ten-to-fifteen year acquisition cycle as normal, or even inevitable.

We believe that it is possible to cut this cycle in half. This will require radical reform of the acquisition organization and procedures. It will require concerted action by the Executive Branch and Congress, and full support of the defense industry. Specifically, we recommend that the administration and the Congress join forces to implement the following changes in the defense acquisition system. (Packard, 1986:15)

In an effort to implement the Packard Commission's findings, many transformational programs were initiated across DoD during the 1980s and 1990s to reverse what many perceived to be as a growing gap in the department's ability to remain on the cutting edge of technological development and procurement. With multiple initiatives aimed at adopting commercial best practices and lessons learned such as Total Quality Management, Business Process Reengineering, and Continuous Process Improvement, the Air Force invested heavily in adopting the practices and methodologies that had been making large commercial firms very profitable. While some of these techniques had marginal success and raised awareness for further reform, the Air Force continued to see cost overruns and schedule delays on the majority of their major weapon system programs well into the 21st century (Kadish et al., 2006). Figure 1 summarizes some of the major acquisition reform efforts since the Packard Commission.

Samples of Past Acquisition Reforms
<p>Packard Commission - 1985</p> <ul style="list-style-type: none"> • Followed 131 separate investigations of 45 of the Department's 100 top contractors • Focused on Defense Management issues, evaluated Department's acquisition system, organization and decision-making as well as Congressional oversight
<p>Defense Reorganization Act - 1986</p> <ul style="list-style-type: none"> • Established the Service Acquisition Executive and consolidated acquisition decision-making in the hands of civilian leadership • Codified many of the Packard Commission recommendations
<p>Section 800 Report - 1993</p> <ul style="list-style-type: none"> • Reviewed existing legislation and recommended repeal or amendments • Focused on streamlining and simplifying acquisition laws
<p>National Performance Review - 1993</p> <ul style="list-style-type: none"> • Vice President Gore initiative in light of the end of the Cold War • Promoted using commercial standards for more acquisition programs
<p>Federal Acquisition Streamlining Act - 1994</p> <ul style="list-style-type: none"> • Consolidated and simplified hundreds of laws into unified procurement code
<p>SecDef Perry Memo - 1994</p> <ul style="list-style-type: none"> • Addressed shrinking industrial base • Commercial technologies are outpacing DoD sponsored efforts
<p>Defense Reform initiative - 1997</p> <ul style="list-style-type: none"> • Consolidation of industry and erosion of core capabilities addressed • Need to recover interest in DoD requirements by commercial sector
<p>The Road Ahead - 1999</p> <ul style="list-style-type: none"> • Addressed the slowness of logistics to meet sustainment needs • Requirement to integrate civil-military industrial base
<p>Rumsfeld's Challenge - 2001</p> <ul style="list-style-type: none"> • Bureaucratic inertia stopping crucial initiatives, excess infrastructure • Planning, Programming, and Budgeting system outdated • Technology moving faster than DoD, that is deploying outdated technology

Figure 1. Past Acquisition Reform Efforts (Kadish et al., 2006)

While some of these initiatives had limited success, the overall result of these recommendations and corrective actions was minimal towards reducing acquisition costs and speeding the time to deliver capability to the field. The results of development cycle times in each of the Services' largest programs over the last decade are summarized in Table 1 and point to an average program length of 11.5 years. As stated by then Under Secretary of Defense for Acquisitions and Technology, Paul Kaminski, in his testimony before the Senate in 1995:

The Department of Defense cannot afford a 15-year acquisition cycle time when the comparable commercial turnover is every 3 to 4 years. The issue is not only cost. The lives of our soldiers, sailors, marines, and airmen may depend upon shortened acquisition cycle times as well. In a global market, everyone, including our potential adversaries, will gain increasing access to the same commercial technology base. The military advantage goes to the nation who has the best cycle time to capture technologies that are commercially available; incorporate them in weapon systems; and get them fielded first. (Kaminski, 1995: 2)

Table 1. Development Cycle Times Over the last Decade (DSB Vol IV, 2007: 61)

Program	End Item	Commodity	Services	IOC/FUE	Time to IOC	
					Months	Years
AWACS RSIP (E-3)	RSIP MOD	Transport/Aircraft	Air Force	Dec 2006	168	14.0
F-22A	F-22 Raptor	C3I	Air Force	Dec 2005	174	14.5
MH-60R	Multi-Mission Helicopter	Helicopter	Navy	Dec 2005	149	12.4
MIDS	MIDS-LVT	C3I	DOD	Sep 2003	117	9.8
SM 2 (BLKS I-IV)	SM-2 BLK IV	Missile	Navy	Aug 1999	156	13.0
JSTARS	JSTARS	Transport Aircraft	Air Force	Dec 1997	147	12.3
FMTV	FMTV	Transport Vehicle	Army	Jan 1996	104	8.7
NESP	NAVY EHF SATCO PROGRAM	Satellite	Navy	Apr 1994	147	12.3
NAVSTAR GPS	NAVSTAR GPS User Equip	Satellite	Air Force	Mar 1993	165	13.8
DDG 51	DDG 51 Program	Ship	Navy	Feb 1993	110	9.2
LHD 1	LHD	Ship	Navy	Nov 1990	100	8.3
NAVSTAR	NAVSTAR GPS Satellite	Satellite	Air Force	Apr 1990	130	10.8

Recent military actions in Afghanistan and Iraq have further reinforced the need for a more agile government acquisition system. In response, the fiscal year 2002 (FY02) Defense Planning Guidance (DPG) mandated that each military service develop rapid acquisition programs to meet the increasing demands arriving from the battlefield (HQ USAF, 2005a). The resulting programs, and the respective organizations overseeing them, are shown in Figure 2. As part of a larger acquisition transformation initiative,

these programs sought to meet urgent wartime needs by shortening overall cycle times to a matter of months versus years.

It is important to note that not all rapid acquisition processes were structured to meet the same urgent needs. Current literature makes a distinction between those processes that address shortfalls of *existing* capability and those that attempt to solve problems where existing technology or capabilities *do not exist*. The latter processes address problems where minor technology integration must take place in order for breakthrough solutions to be identified and implemented, as noted by the Defense Science Board:

The products from rapid acquisition programs tend to be simple purchases or integrations of existing technologies never intended to result from any significant technology development. They continue to be predominantly integration projects as opposed to development projects and almost exclusively use technologies at Technology Readiness Level (TRL) 6 or higher. The main challenge they face is the integration of technologies (components, software, subsystems) to produce new and improved capabilities. (DSB, 2007: 12)

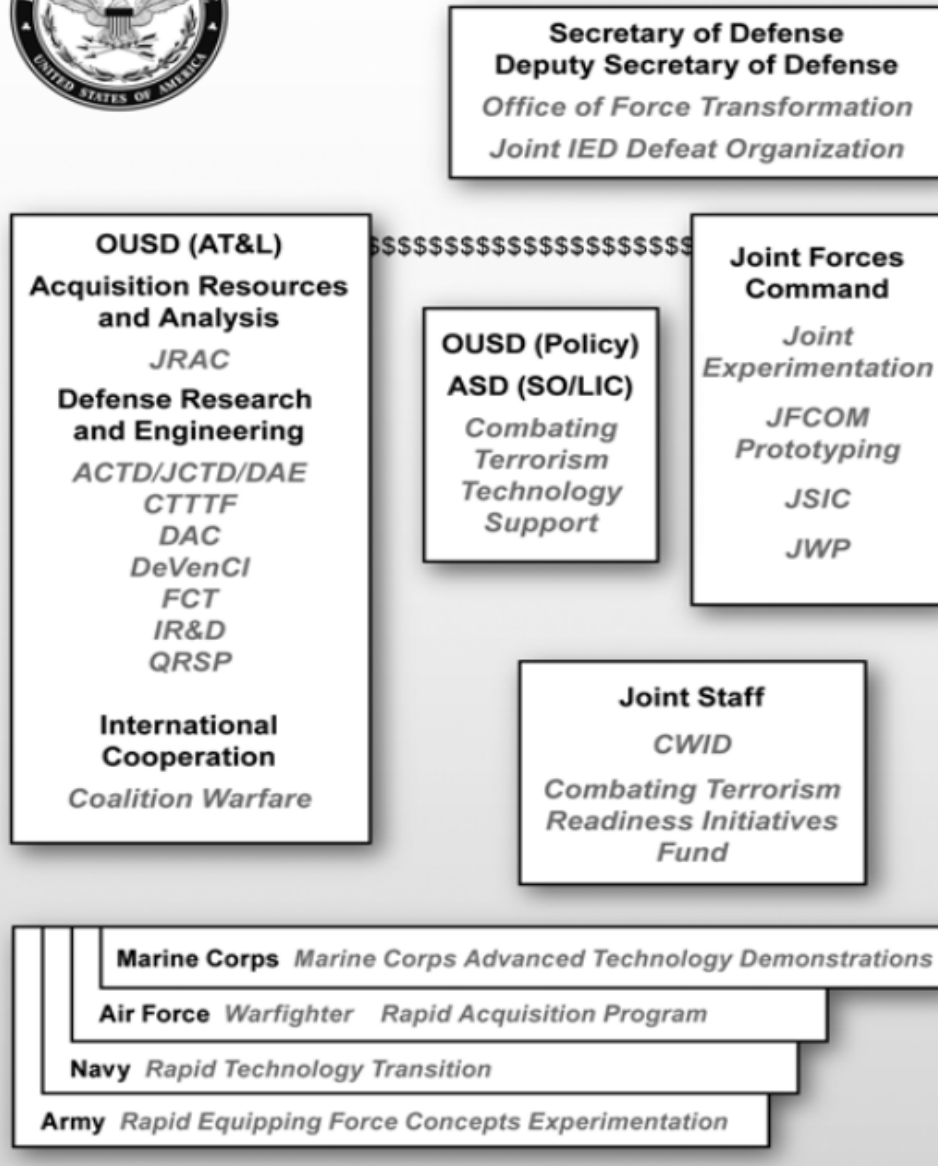


Figure 2. DoD Rapid Acquisition Programs (DSB Vol IV, 2007)

The problem of addressing urgent needs depends on many factors but can be broken down into the ability to quickly conceive and develop creative solutions as well as quickly usher those ideas into a working prototype through established procurement processes. In order to achieve the compressed cycle times required by many urgent needs, the use of innovative rapid development and rapid acquisition techniques must be applied. Surprisingly, there are no standard definitions for these methodologies in the course material used by the DoD's primary acquisition training organization (Defense Acquisition University). For the purposes of this research, rapid development is defined as the process for quickly identifying, refining, and producing new products or technical solutions. Techniques for achieving rapid development range from novel approaches to harnessing and maturing new ideas to ways in which rudimentary prototypes can be quickly constructed in order to refine early design concepts. These processes culminate in the delivery of a working prototype that can be used for further concept refinement and evaluation by the warfighter or direct insertion into the battlefield.

Similarly, rapid acquisition is defined as the process for acquiring a needed capability or service through the use of streamlined procurement measures. Techniques such as increased contractor and government interaction in the proposal development process to the use of non-traditional contract vehicles are examples of rapid acquisition practices. Rapid acquisition processes are essentially the mechanisms that enable breakthrough ideas to evolve into tangible products. Simply implementing portions of each process in isolation will not ensure the ability to quickly respond to urgent requirements and could result in even greater inefficiencies. To solve this problem,

innovative measures and theory must be applied to examine alternatives for streamlining existing organizational processes and striking a balance between advanced development and acquisition practices. For the purposes of this research, the term rapid reaction processes/programs will be used as a general term describing both rapid development and rapid acquisition practices.

Along with the growing pains associated with implementing new processes, the DoD also struggled with how to integrate them into the existing acquisition framework and address the historical deficiencies illustrated in Figure 3 including a two year funding gap, absence of a method for finding and encouraging disruptive technology, and many disparate attempts to insert new technologies rapidly.

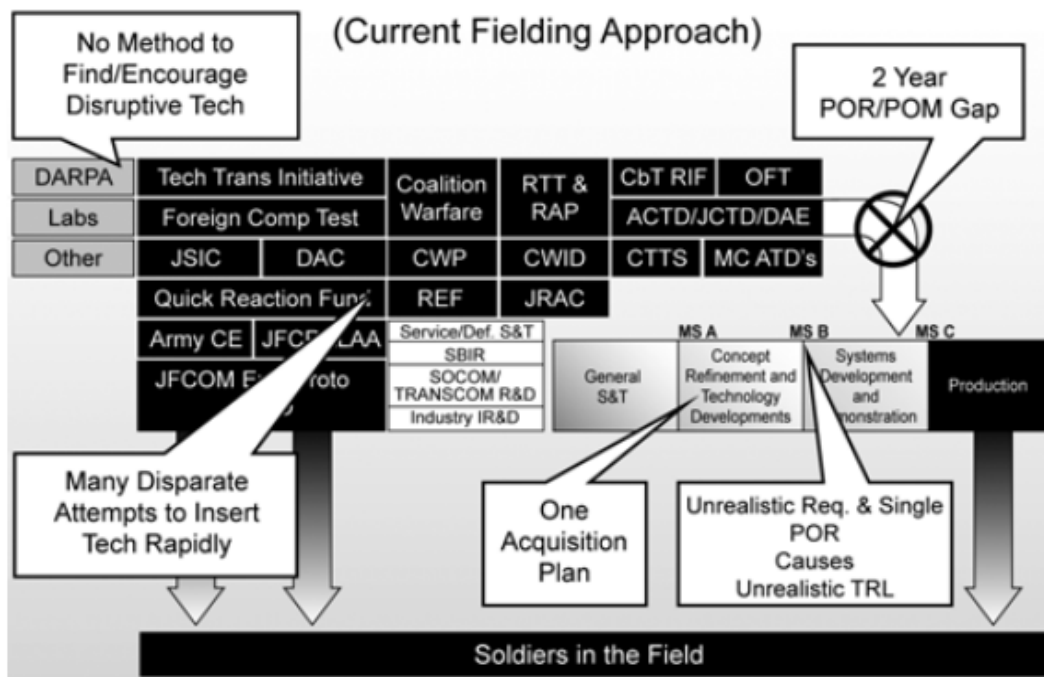


Figure 3. Current Fielding Approach (DSB Vol IV, 2007)

As part of a series of transformational studies aimed at addressing these deficiencies, the Defense Science Board (DSB) initiated an effort to investigate ways in which the U.S. could strengthen its ability to respond to emerging threats in the 21st century (DSB Vol I, 2007). In a series of recommendations, six cross-cutting enablers were identified that present areas where future enhancements could reduce the time it takes to field new and innovative technologies. The areas include human resources, systems engineering, budgets, technology reach, industrial base, and incentives (DSB Vol IV, 2007). Addressing these enablers is an important part of an overall process and rapid reaction strategy that must be developed by those organizations at the forefront of technical innovation and implementation.

Recognized as the primary science and technology (S&T) organization of the Air Force, the Air Force Research Laboratory (AFRL) is central to the discussion of rapidly fielding innovative technologies. Chartered with the discovery, development, and integration of revolutionary and cutting-edge technologies, AFRL is comprised of over 9,500 personnel in 14 geographically separated sites (Shahady, 2007). A new approach being implemented at AFRL, titled Innovative Solutions to Urgent Needs (iSUN), could be the answer to meeting the S&T community's challenge of how to deliver innovative technology to the battlefield quickly and affordably. By implementing a phased approach, iSUN, or Core Process Three (CP3) as it is commonly referred to, aims at providing an organizational framework and process that can deliver breakthrough results in record time (6-9 months). Its focus is on fostering innovative technical solutions by integrating existing technologies in new ways. The first phase of CP3 is focused heavily

on investigating innovative measures being employed by private industry to solicit, compile, and mature novel ideas that could result in solutions to urgent needs. While this will enable AFRL to tap into a world wide network of talented scientist and engineers, additional study needs to be done on how organizational and process innovations within the government are aiding a given organization's ability to rapidly respond to warfighter needs.

Problem Statement and Objective

One reason the multitude of acquisition reform initiatives of the last two decades have had limited success has been the difficulty in applying commercial best practices to the defense environment where a high level of bureaucracy, funding instability, leadership turn-over, and changes in requirements lead to unstable environments for many programs (Chew, 1997). In order to effectively implement innovative rapid reaction approaches within the government context, research into organizations facing the same or similar constraints must be conducted. The objective of this research will be to analyze innovative processes within various pockets of the government where rapid reaction programs or acquisition streamlining efforts have been successfully demonstrated in order to cross-pollinate proven techniques that address the DSB's cross-cutting enablers and could be directly applied to the science and technology (S&T) community. To date, there has been very little research on the topic of meeting urgent warfighter needs through rapid reaction processes. The goal of this thesis is to identify a list of best practices and methodologies that could be applied at government

organizations involved in answering urgent needs/requirements in order to refine rapid reaction processes and facilitate even faster response times.

Research Questions

This research aims to investigate if there are methodologies or best practices that can be implemented at AFRL in order to improve their rapid response time to urgent warfighter needs. In order to answer this primary research question, the six critical enablers identified in the DSB study will be used to focus interview questions in areas that are perceived to have the greatest impact in reducing the time it takes to field new and innovative capabilities. Emphasis will be placed on drawing comparisons between the techniques used by various government organizations as well as documenting practices that can readily be adopted by AFRL in order to refine existing rapid reaction processes. In addition to answering the primary research question, the following questions will be used to focus this research and identify potential gaps or areas for follow on investigation:

1. Is the government succeeding in rapidly delivering new capabilities?
2. Are there institutional barriers that limit the effectiveness of rapid reaction approaches?
3. What are the road blocks to reducing the rapid reaction cycle time?
4. Is there a well defined and documented strategy for meeting urgent needs being implemented across the government (inside and outside of the DoD) that leverages all of the current rapid reaction processes?

Methodology

This research will leverage the results of the 2007 DSB study that highlighted six critical enablers to addressing the deficiencies in the current rapid fielding approach embraced by DoD. Informal interviews will be conducted at various organizations within the government where rapid reaction programs/processes have been successfully demonstrated (e.g., U.S. Special Forces Command, Army Rapid Equipping Force) to see if there are innovative processes or themes that could be applied across AFRL and specifically to CP3. Where possible, phone interviews will be conducted and all data will be transcribed. Qualitative analysis measures will be used to interpret interview material and draw conclusions.

Summary

This chapter introduced the historical problems inherent with the DoD procurement environment and introduced the relatively new rapid reaction processes for meeting urgent warfighter needs. The importance of maintaining a balanced focus on both rapid development and acquisition techniques was discussed along with the importance of innovation to implementing a robust rapid reaction strategy. Additionally, the six critical enablers identified in the DSB study were introduced and a methodology of how those will help focus the interview questions in areas of the government where rapid reaction processes have been achieved was also discussed. Chapter 2 will present a summary of the relevant literature related to the topics discussed in Chapter 1 and will serve as a foundation to describe the detailed research methodology to be presented in Chapter 3.

II. Literature Review

This chapter will synthesize the current literature on the topics addressed in Chapter 1. The purpose is to give the reader a more in-depth understanding of the areas discussed in this research and provide them with a solid foundation of knowledge that can be used to objectively analyze the findings and recommendations discussed in the following chapters.

Innovation Defined

Throughout history, innovation has proven to be an integral part of improving efficiency, growth, performance, and quality across many organizations and areas of study ranging from economics to biotechnology (Fagerberg, 2003). Similarly, innovation has taken on a wide range of definitions depending on the audience. Burgelman, Christensen, and Wheelwright (2004:2) describe innovations as, “the outcome of the *innovation process*, which can be defined as the combined activities leading to new, marketable products and services and/or new production and delivery systems.” Similarly, an on-line reference center for the New Zealand Government defines innovation as:

The creation, development and implementation of a new product, process or service, with the aim of improving efficiency, effectiveness or competitive advantage. Innovation may apply to products, services, manufacturing processes, managerial processes or the design of an organization. It is most often viewed at a product or process level, where product innovation satisfies a customer's needs and process innovation improves efficiency and effectiveness. (The Digital Strategy, 2007:1)

A common theme in these definitions is that innovation is the combination of multiple activities resulting in a new, more efficient item or process. It is important to note that *innovation* is quite different than *invention*. Often confused with one another, invention is the creation of a new ideas and innovation is the application or commercialization of those new ideas (Porter, 1990). Furthermore, innovation can be categorized in several ways and is often referred to according to its “type” as described in Table 2.

Table 2. Types of Innovation (Burgelman et al., 2004; Wikipedia, 2007)

<i>Innovation Type</i>	<i>Description</i>
Incremental	Adaptation, refinement, and enhancement of existing products and services and/or production and delivery systems
Breakthrough, Disruptive, or Radical	Involves entirely new product and service categories and/or production and delivery systems; radical innovation involves considerable change in basic methods and technologies
Technical	Involves the use of new technologies to create new products or services
Product	Involves the introduction of a new good or service that is new or substantially improved
Process	Involves the implementation of a new or significantly improved production or delivery method
Organizational	Involves the creation or alteration of business structures, practices, and models, and may therefore include process, marketing and business model innovation

Current literature often identifies incremental and breakthrough/radical innovation as two broad categories with technical, product, process, and organizational used to further define the aspects of a particular innovation process. Understanding each of these innovation types and the distinctions between them is crucial to any organization wishing to successfully implement and manage an innovation process; particularly those heavily involved in new or advanced technologies (Burgelman et al., 2004). Because of the technical nature of most government projects and the bureaucratic nature of the

government itself, a blend of all of these innovation types are required to improve efficiency. However, before an innovation process can be successfully implemented, an assessment of the government's capacity to change must be analyzed.

Innovation and Change in the Government Context

For many organizations, understanding and implementing innovative practices can be difficult. Different organizational environments influence the innovation process in various ways making innovation difficult to accurately define and implement. Christensen and Overdorf have postulated that three critical factors influence an organization's capacity to change: resources, processes, and values (Burgelman et al., 2004). Each of these factors are analyzed from a government perspective in the following paragraphs.

Having access to abundant, high-quality resources increases an organization's ability to change and accept innovation (Christensen & Overdorf, 2000). Resources in the government context include the many civilian and military members themselves, infrastructure, money, equipment, and the cutting-edge technology developed at its research facilities. In recent years, the Air Force has struggled with how to properly balance resources. With aging aircraft, declining budgets, and a large number of the science and technology (S&T) and acquisition communities now eligible for retirement, the Air Force is faced with making tough resource decisions that could impact its ability to change and remain innovative.

The second factor influencing an organization's capacity to change is its processes. Christensen and Overdorf (2000:542) define processes as:

Patterns of interaction, coordination, communication, and decision making employees use to transform resources into products and services of greater worth...some processes are formal, in the sense that they are explicitly defined and documented. Others are informal: they are routines or ways of working that evolve over time.

The Government is no stranger to processes. Almost every action is defined by statute or regulation, and the adherence to established processes are often mandated. As previously described, the Department of Defense (DoD) has struggled with how to revamp many of its acquisition processes. These problems are not unique to the DoD and the difficulty changing established processes can be seen across the Government. For innovation and change to occur, the Government must be willing to challenge established processes and procedures in order to break through self-inflicted barriers to progress. This realization is becoming a reality in the Air Force as emphasis is being placed on a new strategy to eliminate all non value-added tasks and processes aimed at saving time and money while accomplishing the mission more effectively. Titled Smart Operations for the 21st Century (AFSO21), the Air Force has taken process change seriously and has given the issue the top-level emphasis and support needed by upper management in order for radical change such as this to occur (Gilbert, 2007). As part of AFSO21, a focused investigation into streamlining DoD acquisitions is also taking place that holds the promise of drastically reducing the time it takes to field new weapon systems and capabilities

The third factor affecting an organization's capacity to change is values. As stated by Christensen and Overdorf (2000:542), an organization's values are "the standards by which employees set priorities that enable them to judge whether or an order is attractive or unattractive, whether a customer is important or less important, whether an idea for a new product is attractive or marginal, and so on." The Government, and the Air Force specifically, place a very high emphasis on values. Every organization has the same end goal, which is to support the warfighter. At the Air Force Research Laboratories (AFRL), their values are specifically portrayed through their mission statement: "leading the discovery, development and integration of affordable warfighting technologies for America's aerospace forces" (AFRL, 2007). While values are clearly depicted and emphasized in the government environment, adhering to them can become difficult in such a large organization. Christensen and Overdorf (2000:542) assert that, "the larger and more complex a company becomes, the more important it is for senior managers to train employees throughout the organization to make independent decisions about priorities that are consistent with the strategic direction and the business model of the company." The Air Force, and the Government as a whole, must continue to emphasize the objectives and values that are driving decisions at the strategic level and ensure that the message makes it way down to every employee charged with implementing change. Figure 4 depicts an example of how this construct might look in the DoD.

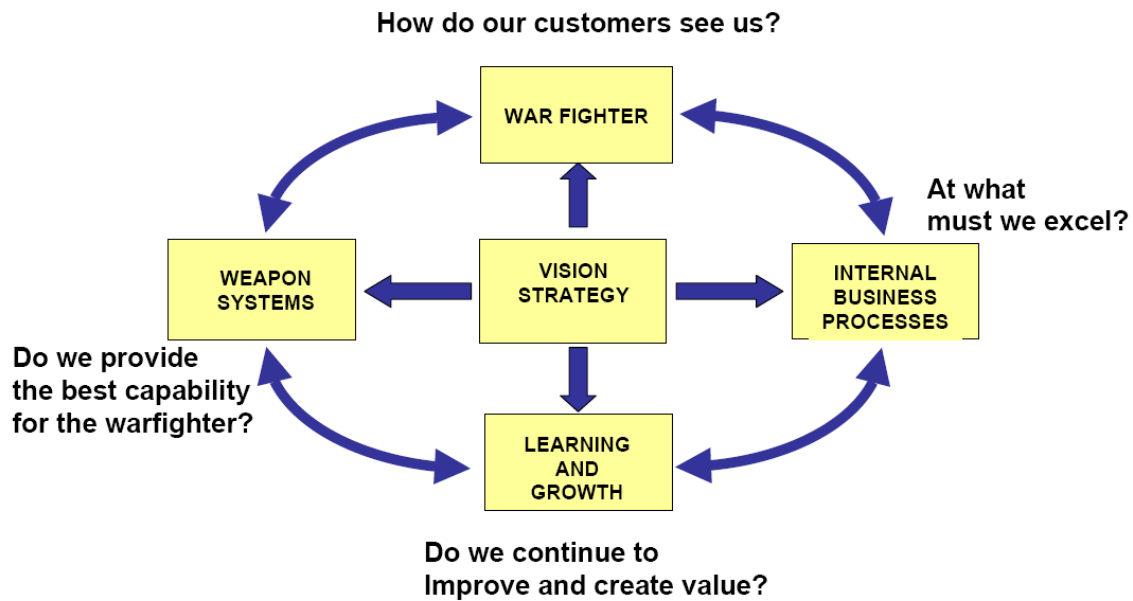


Figure 4. Balanced Scorecard Approach (Christle, 2005)

These three factors (resources, processes, and values) for assessing openness to change can also be indicators of an overall level of organizational innovation. According to Ulwick (2005:3-4), organizational innovation happens when “a company discovers inefficiencies in a business operation and works to address those inefficiencies through creative solutions...often requiring companies to rethink their value chains and reconstruct them in ways that cut costs and waste.” As previously indicated, the government has recognized inefficiencies in the way in which it procures and develops new warfighting capabilities. However, after 128 studies addressing the acquisition system, no significant improvements have been made to the time or manner in which new technologies are delivered to the warfighter (Christle, 2005). This indicates a low level of organizational innovation within the government context. Part of the reason for this

stagnation lies in the Government's organizational culture. As Christensen and Overdorf (2000:544) have stated:

The factors that define an organization's capabilities evolve over time – they start in resources; then move to visible, articulated processes and values; and migrate finally to culture. As long as the organization continues to face the sorts of problems that its processes and values were designed to address, managing the organization can be straightforward. But because those factors also define what an organization cannot do, they constitute disabilities when the problems facing the company change fundamentally.

Since the Vietnam War, the Government procurement community has faced a rather predictable threat. However, with the recent engagements in Iraq and Afghanistan, the U.S. is facing an enemy that has mastered the art of adaptation and can quickly leverage technology to exploit weaknesses in U.S. defenses. This new threat is forcing the United States to re-examine its traditional acquisition and development processes in order to remain effective.

Areas For Improvement

As part of a study commissioned in the summer of 2006, the Defense Science Board (DSB) was chartered to investigate the United States' and more specifically the DoD's effectiveness at meeting emerging threats for the 21st century. As part of this effort, an emphasis was placed on the increasing need for more rapid and agile response programs to counter atypical threats and critical shortages on the battlefield. In addition to defining multiple areas for improvement, the DSB recommended a series of cross-

cutting enablers that will be critical to the United States' ability to effectively change the way in which it delivers war-winning capability to the field.

The first enabler is human resources. As numerous studies affirm, there is a growing decline in the number of U.S. students who are majoring in the science and mathematic fields as compared to other leading countries such as China (DSB Vol IV, 2007). As these numbers diminish, the pool of talented and qualified engineers and scientists who are available for government employment is also shrinking. According to the DSB (Vol IV, 2007:54):

DoD is among the most vulnerable institutions to the impending shortage of highly trained engineers and scientists. The DoD civilian acquisition corps is particularly vulnerable due to an aging workforce, outsourcing of research, and non-competitive pay. There is little career development or education (as opposed to training) available for civil servants. The situation for the military acquisition workforce is much the same and, in fact, has deteriorated from a previous time...there are three specific skill sets that the panel believes are in critically short supply in the DoD acquisition corps. One is system engineering...the second is biological science...and the third is a broad subset of social sciences that deals with organized human behaviors.

As with successful companies in industry, the DoD needs to investigate what practices or processes can be strengthened to ensure the right talent is being recruited in Government S&T and acquisition communities. In the end, talented individuals who possess the right background and knowledge for a job will be the main factors that affect innovation and change and not the actual processes themselves (Ward, 2006).

The second enabler is systems engineering. The DSB defines systems engineering as “the process responsible for managing trade-offs necessary to develop and field a system that is affordable, is sustainable, is delivered on schedule, satisfies user

needs, and minimizes risk” (DSB Vol IV, 2007: 57). The current state of systems engineering in the DoD is summarized by the DSB (Vol IV, 2007:60) as:

The DoD system engineering workforce has deteriorated in capability. It is too small, not adequately empowered for the task at hand, and too often uses processes and procedures that have not been validated as shortcuts to compensate for the lack of resources to accomplish systems engineering tasks.

This specific field of engineering covers an end-to-end look across a program; it is intended to fill gaps and address cross-cutting issues critical to meeting program objectives. In the government context, system engineers are those who have a deep technical knowledge of both the system itself and the intended concept of operations; they can analyze all portions of a system to ensure the components are interoperable and will function as planned.

The third enabler is budget, which refers to funding flexibility and adequate fiscal plans for the out-years (DSB Vol IV, 2007). Both factors must be present for a program or project to achieve initial schedule and cost goals. In today’s environment of shrinking defense budgets, the DoD is faced with the difficult challenge of how to properly fund all of the needs of the services while fighting a major war. Because many current programs have priority over appropriated funding, urgent needs and emerging technologies are often difficult to fund and end up competing for survival against major programs of record (DSB Vol IV, 2007). As the name implies, urgent needs are those that arise quickly and properly budgeting for them is difficult. The DSB (Vol IV, 2007:14) describes the problems with the current Programming, Planning, Budgeting, and Execution (PPBE) system by stating:

Over the years, allegiance to service goals were institutionalized by the PPBE process that vested decision-making for force structure with the respective military services. The PPBE process leaves little room for exploitation of unanticipated technical discoveries or unanticipated urgent operational needs. As a result, virtually every rapid acquisition program is either funded or survives on supplemental funding to the defense budget.

A balanced solution must be identified where existing priorities can be funded and non-traditional accounts can be used to fund those needs that have yet to materialize.

The fourth enabler is technology reach. This term refers to the amount of technology investment that is being made within the United States (DSB Vol IV, 2007). As technologies continue to advance even quicker than before, many commercial firms have recognized the importance of technology in achieving profitability and long-term viability in a quickly changing global marketplace (Burgelman et al., 2004). Similarly, the United States has demonstrated the overwhelming effect technology can have in winning wars through the rapid defeat of Iraqi forces in the early phases of Operation Desert Storm. Yet, the United States Government is losing the once prominent position it held as the leading innovator and developer of cutting-edge technology as depicted in its percentage of S&T investments in Figure 5. Additionally, the DSB points out that the focus of DoD investment in S&T has shifted from research to development and asserts that, “if the DoD wants to be a leader in using technology; it needs to become very adept at finding and using globally available resources, whether funded by industry of academia or DoD or other government agencies...the department needs to become very efficient *prospectors*” (DSB Vol IV, 2007: 66).

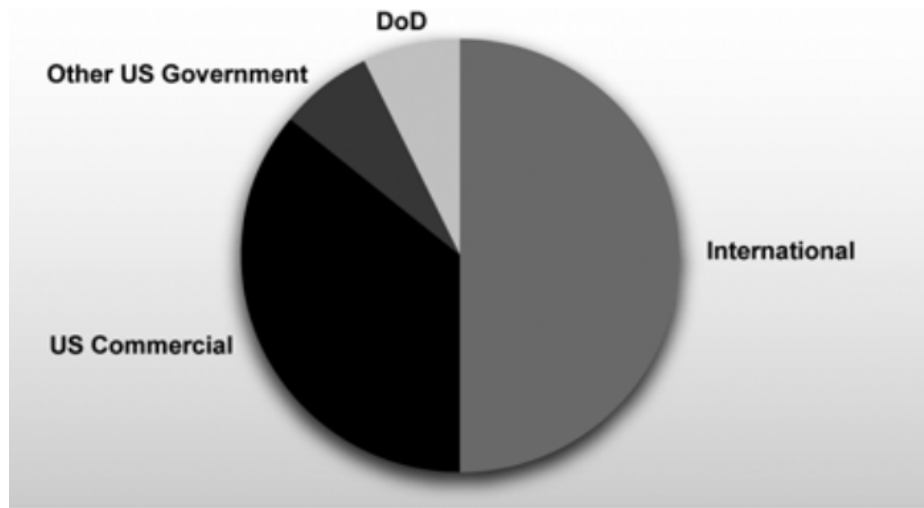


Figure 5. S&T Investments (DSB Vol IV, 2007)

The fifth enabler is the industrial base. As seen in numerous articles over the past decade, the defense industrial base has been deteriorating to the point where there are only a handful of large contractors soliciting bids on government proposals. Through mergers and acquisitions, major contractors have eliminated lower tier competitors in order to try and gain a more competitive stance in the marketplace. The result of these mergers has been the reduction of innovative ideas that often come from smaller businesses and fewer competitors for major government contracts (DSB Vol IV, 2007). In order to maintain an agile response capability, the Government must ensure a healthy and competitive industrial base where multiple options exist to provide new products or services.

The sixth and last critical enabler is incentives. As part of a larger equation, incentives are the motivator for industry to address the deficiencies of the current

acquisition and development system while aligning them with desired outcomes (DSB Vol IV, 2007). As asserted by the DSB (Vol IV, 2007:78):

The “clock-speed” of technology transition needs to more closely match that of technology innovation and the cycle times of new and emerging multilateral threats on the current global battlefield. This necessarily requires that the supporting processes, policies, and culture of DoD’s technology transition and acquisition processes be transformed. A culture that values innovation, speed, agility, and prudent risk-taking must be created. But this evolution will take not just mindset and policy changes; it requires incentives.

Incentives can take many forms and the government must be innovative in identifying new ways to encourage out-of-the-box type thinking with industry partners while still adhering to statutory procurement requirements. In addition to traditional motivators such as profit, promotion, and recognition, the Government must analyze other motivational factors that will encourage all of the stakeholders in the rapid reaction process to become as efficient as possible. As seen recently in the commercial sector and the Ansari X Prize, incentives have been used very successfully by organizations wishing to solve difficult problems such as the privatization of space flight (Wessel, 2007). However, utilizing incentives in the Government context is often more difficult where constraints limit the number of options available at the Government’s disposal. Questions that the DSB (Vol IV, 2007:79) reflected on with respect to rapid reaction incentives are:

1. How can the department create the proper incentives so that industry will want to embrace the new approach?
2. Why should the acquisition professionals get behind the process?

3. What will be the benefit to the operational user who is, in the final analysis, the customer?

While the DSB made initial recommendations on how to address this enabler as well as the five other areas, further examination into each enabler must be completed. A more detailed description of each enabler, the current issues or problems in that area, and the initial DBS recommendations are summarized in Appendix A.

Guidelines for Rapid Reaction Programs

In order to explore each critical enabler further and gain a better understanding of the current state of rapid reaction programs across the government, this research sought to first examine the existing guidelines on rapid reaction processes. Because of the relatively recent emergence of these programs, there is very little implementation guidance available to the S&T and acquisition communities. The existing Federal Acquisition Regulations (FAR) and the more specific DoD Directive 5000.1, DoD Instruction 5000.2, and Defense Acquisition Guidebook are focused on the traditional acquisition process and do not address the rapid timeframes and unique circumstances driving urgent operational needs.

Recognizing this gap in addition to the lack of a joint urgent request process, the Joint Rapid Acquisition Cell (JRAC) was created in September 2004. Chartered with removing traditional institutional barriers that prohibit timely and effective warfighter support, the JRAC reports directly to the Secretary of Defense through the Deputy Under Secretary of Defense for Acquisition Technology and Logistics and acts as an

overarching entity to facilitate the assessment and validation of Combatant Commander (COCOM) Joint Urgent Operational Needs (JUONs) and Immediate Warfighter Needs (IWNs) (Buhrkuhl, 2006). A JUON is a requirement that if unmet poses significant risk of loss of life or mission accomplishment. Similarly, an IWN is a JUON that can only be satisfied through a material or logistics solution and must be addressed within 120 days or less (Process For Meeting, 2005). Once a JUON arrives at the JRAC, the goal is to have resolution on a course of action within 48 hours and a capability delivered to the field in less than 120 days (Buhrkuhl, 2006). Figure 6 depicts the current JUON and IWN routing process. In contrast to the various service-unique rapid acquisition approaches, the JRAC does not provide funding to the various JUONs; instead it acts as a facilitator to acquire the needed funding by working closely with Congress or the Under Secretary of Defense (USD) Comptroller (Buhrkuhl, 2006).

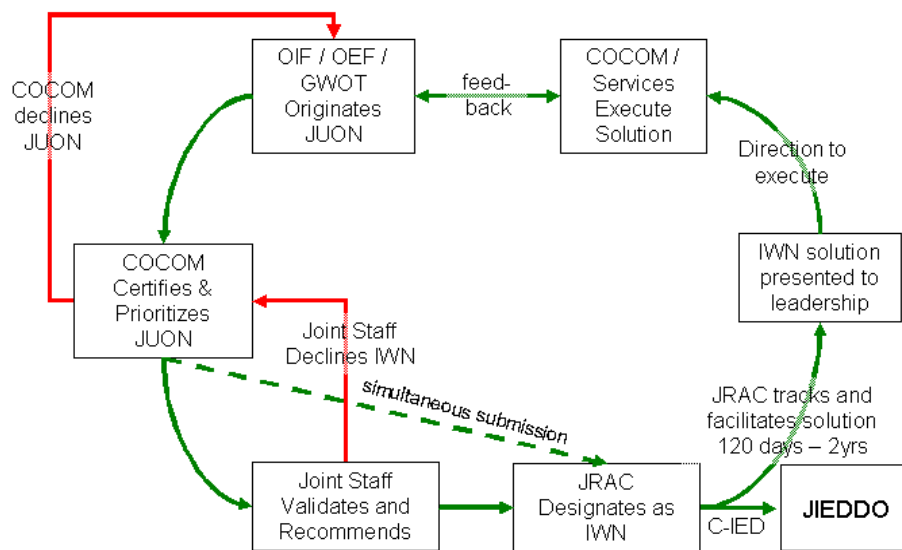


Figure 6. CJCSI 3470.01 Process Flow (Joint Rapid, 2006)

Shortly after the establishment of the JRAC, the Joint Chiefs of Staff issued Chairman, Joint Chiefs of Staff Instruction (CJCSI) 3470.01, “Rapid Resourcing of Joint Urgent Operational Needs (JUONS),” to facilitate the assessment and routing of JUONs. Its purpose as described in CJCSI 3470.01 is to:

Establish policy and procedures to facilitate assessment, validation, sourcing, resourcing (in accordance with DOD 7000.14-R, “DOD Financial Management Regulations (FMRs)”) and fielding of operationally driven urgent, execution-year combatant commander needs. Generally, these needs can be considered as life- or combat-mission-threatening needs, based on unforeseen military requirements that must be resolved in days, weeks, or months. This process is not intended to replace the Joint Capabilities and Development System (JCIDS) process but rather to accelerate the process of fielding of readily available systems to satisfy joint urgent wartime needs. (CJCS, 2005: 1)

The process begins once a JUON is identified, approved, and prioritized by the COCOM and forwarded to the Joint Chiefs of Staff (JCS) and JRAC for review through secure electronic networks. Upon receipt, the JUON is reviewed by a JCS working group and validated as an urgent need if it cannot be satisfied within the current processes (Joint Rapid, 2006).

In addition to helping approve JUONs and IWNs, the JRAC was also named as the administrating body assisting the Secretary of Defense (SECDEF) in executing the recently approved Rapid Acquisition Authority (RAA). Established as part of Section 811 of the Ronald W. Regan National Defense authorization Act for FY05, RAA gives the SECDEF the authority to reallocate up to \$100M to meet urgent capability shortages that have resulted in wartime casualties (U.S. Congress, 2005). RAA gives the SECDEF the ability to rapidly procure the needed equipment or capability by using “colorless”

money and bypassing many regulatory requirements except those that would incur criminal punishment, thus providing another avenue to rapidly respond to urgent needs (U.S. Congress, 2005).

In addition to joint guidance to meet urgent needs, there is also Air Force specific guidance that exists through portions of Air Force Instruction 10-601, *Capabilities-Based Requirements Development*, Attachment 3 July 2004, and AFI-63-114, *Rapid Response Process*, 29 July 2005 (HQ AFMC, 2007). Additionally, Air Force Material Command (AFMC) is in the process of creating an AFMC Instruction (AFMCI 63-114) that will outline the command's process for routing and processing Urgent Operational Needs (UON). A top-level depiction of the current Air Force warfighter UON process is depicted in Figure 7.

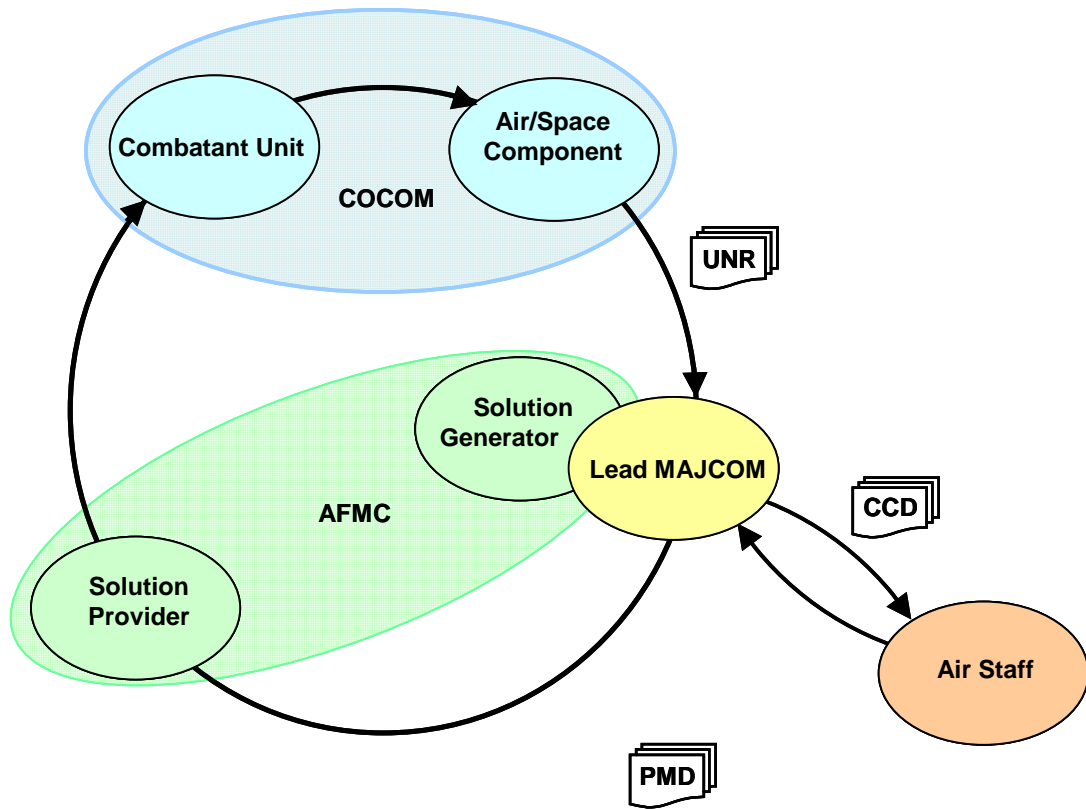


Figure 7. USAF UON Process (HQ AFMC, 2007)

Furthermore, the routing process for soliciting materiel solutions within AFMC is depicted in Figure 8.

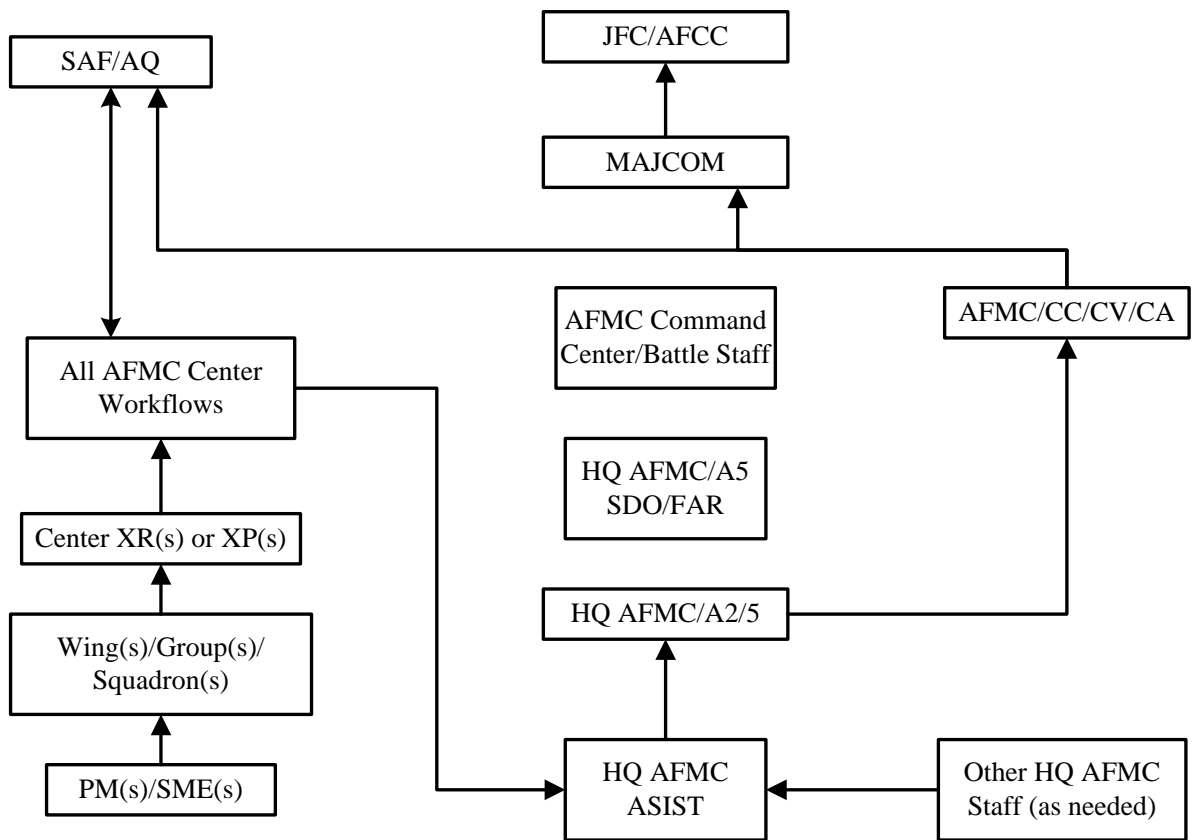


Figure 8. AFMC Materiel Solution Coordination Process (HQ AFMC, 2007)

It is important to note that all of these avenues to address urgent needs are meant to supplement, not circumvent, the traditional acquisition processes. Additionally, the guidelines described above primarily address urgent needs where existing technology or capabilities exist and can readily be acquired to fill immediate gaps. For those problems that require minor integration or the innovative assimilation of existing technology in new ways, no guidance exists beyond the individual service-unique processes to address

these needs. While all of these processes are aimed at delivering innovative solutions to the field as quickly as possible, there is no standard routing process being followed, nor is there any organization looking across the entire Government to ensure all urgent needs are being addressed.

Road Blocks to Rapid Reaction Programs

Given the strides made towards improving the acquisition system and delivering capabilities quicker, current literature asserts that there are still a number of roadblocks that prevent truly radical change from happening in the time and manner in which we deliver new and advanced capability to the warfighter. In addition to the issues surrounding the six critical enabler areas, some roadblocks exist simply because of the bureaucratic nature of the U.S. government, while others lie in the fact that the DoD is still maturing their processes to quickly address a rapidly changing global security environment. Addressing each of the factors outlined below is necessary when considering improvements to current rapid reaction processes.

Lack of Centralized Guidance and Oversight

As previously mentioned, there is no central agency or body charged with consolidating the multiple rapid reaction and quick development projects happening at multiple levels within each service and across the entire DoD. This lack of central governance has led to duplicative and misunderstood processes that ultimately cost additional time and money. One of the recent recommendations of the Defense Science Board (DSB) to combat this growing problem is the initiation of a “Rapid Fielding Organization,” or (RFO), whose charter would be to maintain an institutional focus and

level of authority towards consolidating all urgent warfighter needs and quick reaction programs as well as coordinating an overall investment strategy (DSB Vol IV, 2007). By focusing across the DoD, this entity could assist in identifying gaps and overlaps in order to better focus the resources of the acquisition and technical communities. Similarities among programs could be leveraged in order to streamline and combine different processes and reporting chains to realize even greater efficiencies. In addition to providing overarching guidance, this office could also assist the various Service Acquisition Executives (SAEs) and the Joint Chiefs of Staff (JCS) in prioritizing requirements and bridging the gap to the S&T community.

Rapid Proliferation of New Technology

The rapid pace of technology innovation and its accessibility across the globe are quickly expanding, thereby making it vital that the U.S. decrease its time to develop and deliver new capabilities even further. As seen in Iraq and Afghanistan, our adversaries are quickly gaining access to the global technology base and acquiring the means to quickly develop new threats and countermeasures for our systems (DSB Vol III, 2007). Their ability to rapidly implement simple, low-cost yet innovative solutions places the traditional U.S. acquisition and S&T communities at a distinct disadvantage when forced to live within the constraints of the current rapid reaction processes. “Recent reporting has also brought to light the United States’ deficiencies in getting innovative solutions to our warfighters rapidly enough to adjust to the changing tactics and techniques of our enemies” (Buhrkuhl, 2006:28).

Lack of feedback and lessons learned

Because many of the methods being used to rapidly field new technologies are still being refined, it is important to get immediate feedback from the using command as well as the managers empowered with executing rapid reaction programs. However, as many rapid reaction technologies are fielded, they often become absorbed into the operational unit or are left behind as one-of-a kind devices intended to fill an immediate gap (DSB Vol IV, 2007). This reality leaves the S&T community with little information on how their technologies were used, how well they performed, and what improvements must be addressed before transitioning a capability over to the traditional acquisition community. Additionally, little evidence exists that lessons learned from one rapid reaction project are being passed to other organizations as a result of multiple ad hoc processes (DSB Vol IV, 2007). If the government is serious about improving rapid reaction cycle times, valuable information learned from real-world deployments and demonstrations as well as lessons learned from the business process point of view must be shared with every organization chartered with addressing urgent needs.

Current Rapid Reaction Processes

As previously discussed, many programs are being developed to address urgent needs. This research will briefly describe several of the Air Force specific rapid reaction processes ranging from those that quickly identify money and rely on existing technologies to those that address problems where existing technologies do not exist. A similar theme in all of these programs is that solutions are delivered in a matter of months versus years, with goals often being shorter than 120 days.

Rapid Response Process (RRP)

Focusing on those processes that use existing technologies, the Air Force identified the need to have a program that could address shortages of existing capabilities in the field. The response was Air Force Instruction (AFI) 63-114, “Rapid Response Process (RRP).” As described in AFI 63-114:

The purpose of this AFI is to establish a Rapid Response Process (RRP) to accelerate the fielding of critical systems to meet theater-specific wartime needs. The instruction provides the warfighter with a means of obtaining a limited number of needed systems/capabilities in a combat theater during an ongoing conflict or crisis situation to address a critical capability gap/shortfall that could result in “loss of life” and/or prevent mission accomplishment. The RRP does not replace normal acquisition procedures, but rather speeds up the process of fielding systems/capabilities to satisfy wartime needs. (DAF, 2005: 1)

For a requirement to be addressed under this program, it must be a time-sensitive shortfall that could result in the loss of life or mission accomplishment, technologically feasible with minimal research, development, test, and evaluation (RDT&E), affordable, supportable, and sustainable within the existing support infrastructure, and solutions must be fielded in time to impact current operations; typically within 60 days from approval by the Rapid Reaction Process Council (RRPC) or Chief of Staff of the Air Force (CSAF) (DAF, 2005). The RRP program provides COCOMs and Major Commands (MAJCOMS) the necessary vehicle to address capability gaps or shortfalls of existing capability that would otherwise be unmet through the typical acquisition process (DAF, 2005; HQ USAF, 2005b). Because this process is much quicker than the typical acquisition cycle, there is not enough time to generate the formal Joint Capabilities

Integration Development System (JCIDS) documentation that would normally be completed under the existing DoD 5000.2 guidance. As a result, requirements and capability gaps are captured in what is called a Combat Capability Document (CCD).

Submitted by the MAJCOMs, the CCD is described in AFI 63-114 as:

One of several courses of action available to the lead MAJCOM for responding to a warfighter's urgent need request. It is an operational requirements document used by the Air Force in lieu of an Initial Capabilities Document (ICD), Capability Development Document (CDD), and Capability Production Document (CPD) to support fielding an interim solution to a warfighter's urgent capability needs. The Lead MAJCOM will evaluate the deficiency to determine if it can be addressed by a non-materiel solution. The Lead MAJCOM has four possible courses of action: 1). Approve requirement and execute within existing program authority; 2). Approve requirement (MAJCOM funded) and submit a CCD to CSAF and info AF/XOR/FMB/AQX to assist with reprogramming of MAJCOM's existing funds; 3). Approve requirement (not funded) and submit to CSAF for assistance with finding funds to satisfy requirement (Option to be rarely used); or 4). Notify originator that urgent need is non-executable as a CCD. The RRP is used only in those instances (alternatives 2 or 3) where the CCD is forwarded to the CSAF for assistance. (DAF, 2005: 3)

Because of the high level of visibility and support, RRP projects are approved in under 20 days as depicted in the RRP process shown in Figure 9.

Once a Program Management Directive (PMD) has been issued, the lead MAJCOM must identify the appropriate funding from within its portfolio and initiate program execution through the designated authority. After completion, the MAJCOM and COCOMs will determine if future follow-on efforts are required to incorporate the RRP program into the formal acquisition and PPBE process.

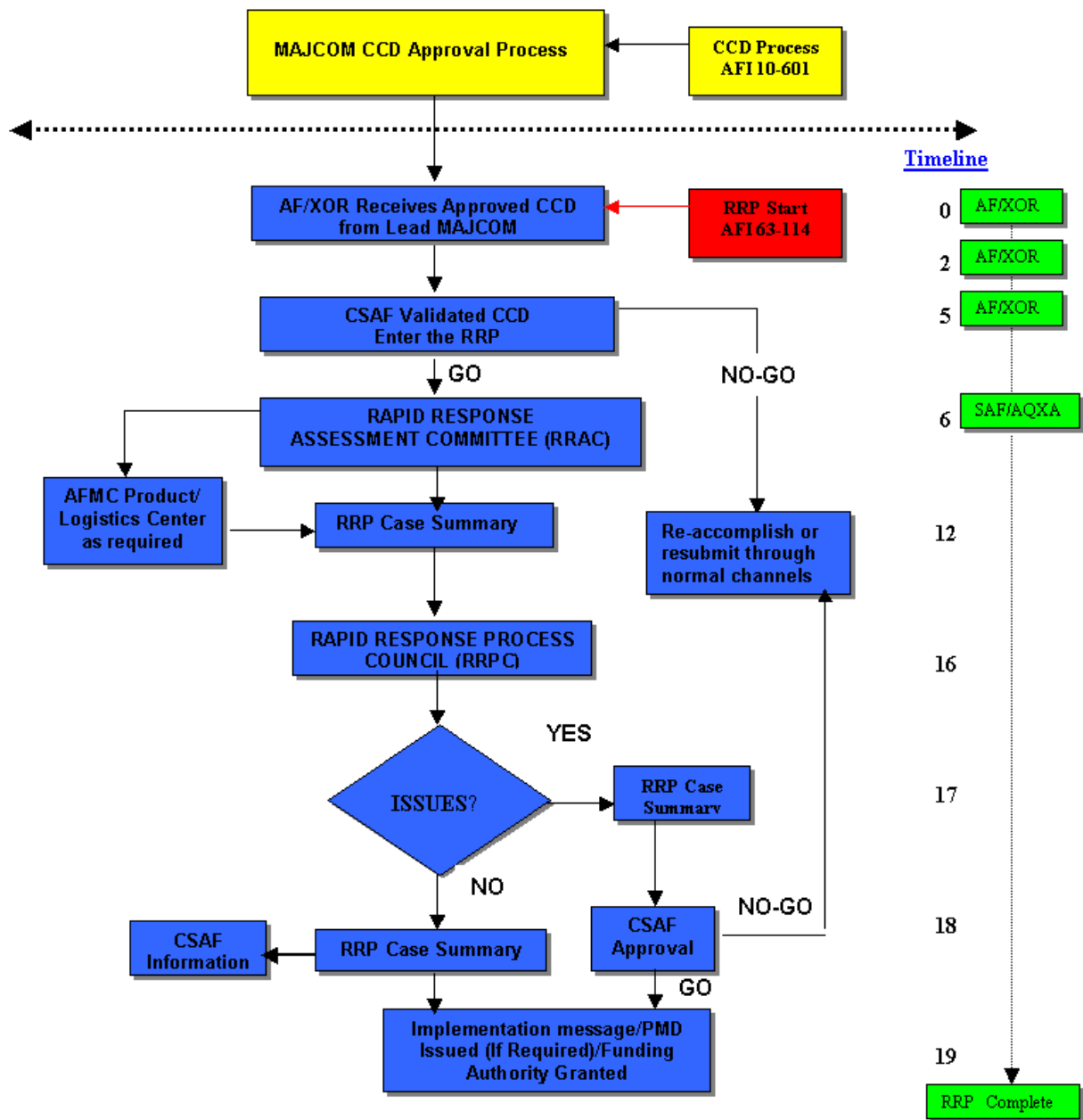


Figure 9. Rapid Response Process & Timeline (DAF, 2005)

Warfighter Rapid Acquisition Program (WRAP)

While the Air Force has established processes to quickly acquire *existing* products and technology to meet urgent needs, not all solutions can be achieved through using existing technology. Similar in process flow to the RRP program, the Warfighter Rapid Acquisition Program (WRAP) is a separate and distinct Air Force process aimed at accelerating development of critical technologies through the allocation of current-year research and development funding for situations where the normal Program Objective Memorandum (POM) budgeting process of 18-24 months would be too long (HQ USAF, 2005b). Since its inception in 2002, the WRAP program has seen a great deal of support and success. With an annual funding allotment of \$30M, the WRAP program is helping to provide critical assistance to programs the Air Force will execute, versus those programs still in concept exploration (HQ USAF, 2005b). Programs wishing to acquire WRAP funding must follow the process and associated timeline referenced in Figure 10 before receiving Chief of Staff of the Air Force (CSAF) approval to proceed.

It is important to note that the WRAP and RRP processes are just two of a growing number of Service unique rapid acquisition approaches aimed at supplementing, not circumventing, the traditional acquisition process (DAF, 2005). In many cases, the capabilities that are funded via these rapid acquisition approaches often transition into a traditional acquisition program where additional functionality, manufacturing, and supportability considerations are addressed.

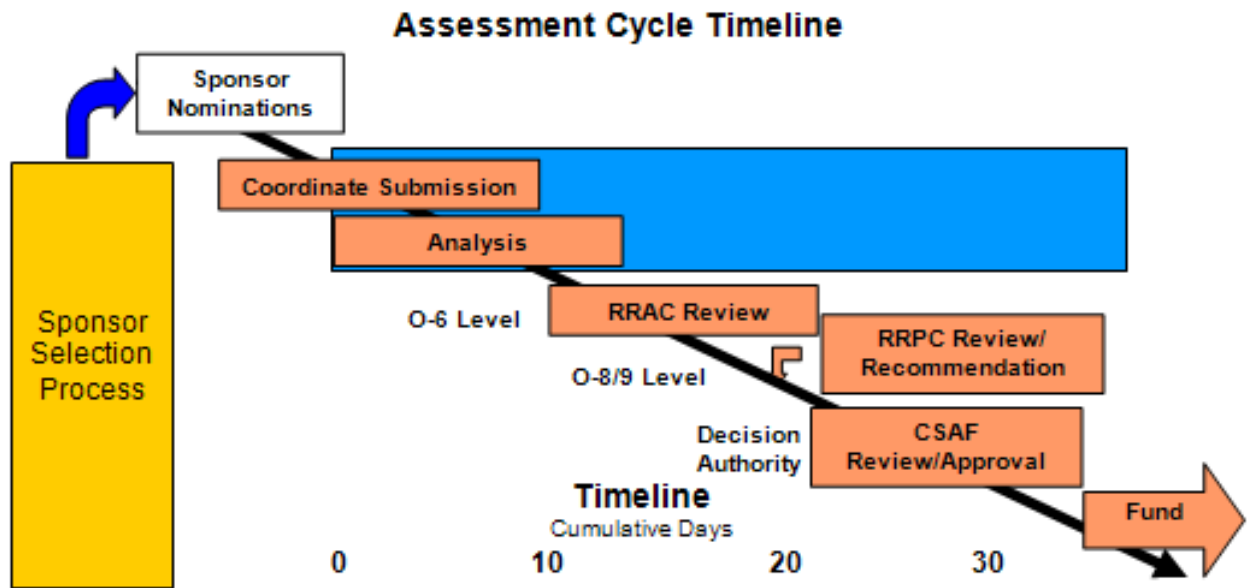


Figure 10. WRAP Assessment Cycle Timeline (HQ USAF, 2005b)

Core Process 3

Realizing the need for a more science and technology focused effort to address problems where the needed technology does not readily exist, the Air Force Research Laboratory (AFRL) has implemented a quick reaction processes called Innovative Solutions to Urgent Needs (iSUN), or as it is often called, Core Process 3 (CP3). As part of a larger effort to reduce the time to develop and deliver technical solutions to meet urgent needs, CP3 focuses on bringing the needed talent to solve a problem to the table quickly while offering breakthrough solutions in 6-9 months. Figure 11 displays the differences between CP3 and the other core processes currently in use at AFRL. Core Process One (CP1) focuses on new methods and approaches to transforming the battlefield through specialized basic research while Core Process Two (CP2) focuses on

maturing key technologies in order to accelerate technology transition and lower acquisition program risk (An Overview, 2005:1).

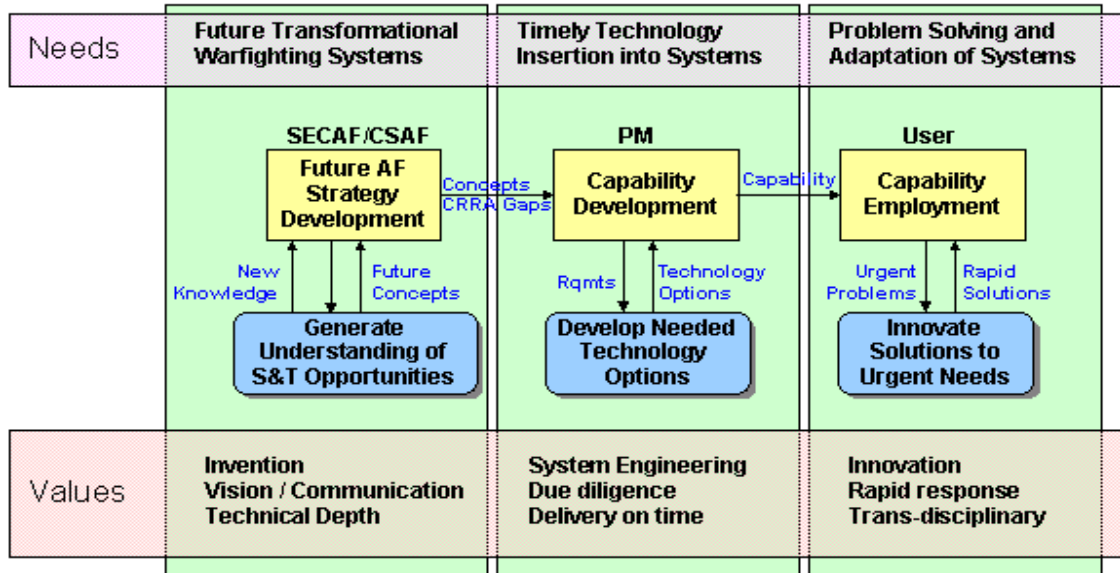


Figure 11. AFRL Core Processes (Das, 2006)

Recognizing that successful rapid development cannot occur alone, the CP3 process has been given a mandate by upper management to leverage both internal and external knowledge as well as strategic partnerships in order to bring the best technology and ideas to the table (An Overview, 2005). For a requirement to be categorized as a CP3 initiative it must be short in duration, focused on clear and urgent operational needs, and involve an innovative solution that does not utilize long-term investments or off-the-shelf systems (An Overview, 2005).

Requirements are first identified to AFRL directly from the various MAJCOMS and combatant commanders. As seen with many failed acquisition programs throughout

history, understanding the user's requirements is paramount to a successful acquisition program no matter how large or small the effort. Careful time is placed in the early portion of the CP3 process to ensure a detailed understanding of both the urgent needs and the requirements/constraints the user identifies as critical to maintaining an advantage on the battlefield. Through the use of heavy user involvement and a close working relationship with AFRL, the early phase of the CP3 process is focused on ensuring the requirements are well understood and identifiable. Figure 12 depicts each phase and associated timeline of the current CP3 Rapid Reaction Process beginning with the user request.

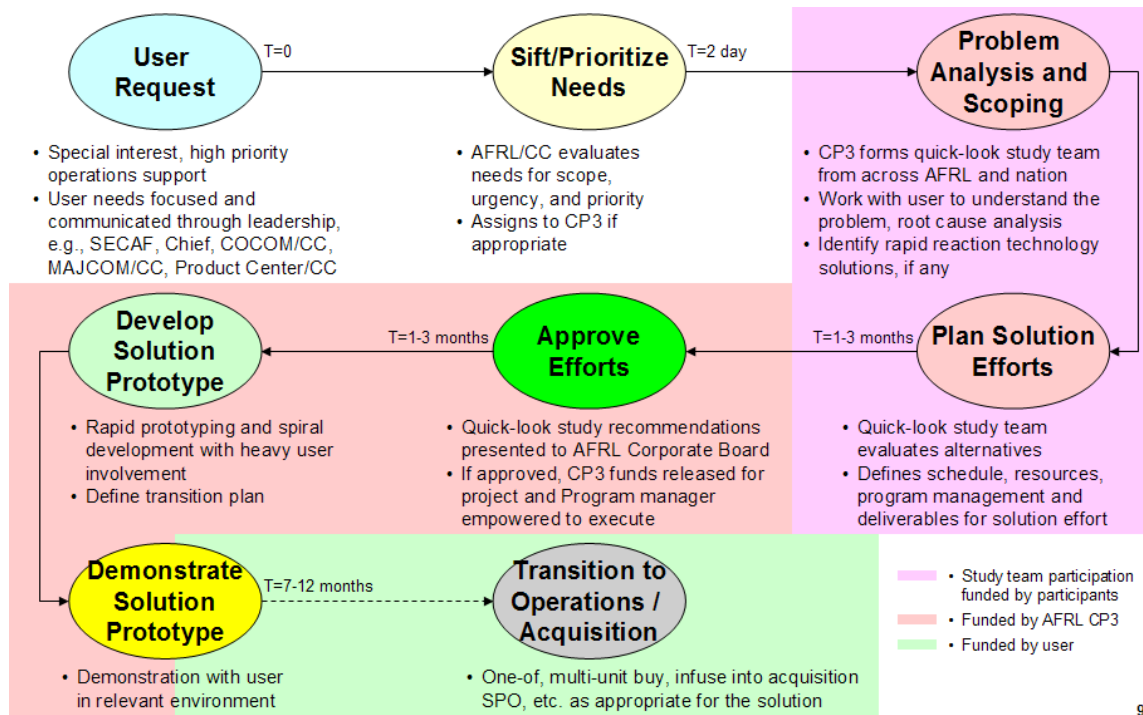


Figure 12. Current CP3 Process (Stallard, 2007)

Once an urgent request arrives from the user community, categorizing and reviewing incoming requirements is accomplished via the Rapid Reaction Team (RRT), and more specifically the Core Team, whose charter is to bring the CP3 process to life and to act as an overarching entity coordinating the various activities and participants within the CP3 process. Core Team members are identified quickly from across AFRL and represent senior area experts across a wide field of studies. Their main task is to ensure the requirements have been well understood before assimilating the extended RRT, soliciting potential solutions, and securing the needed funding to move forward in the iSUN process. The Core Team also serves as the catalyst for assimilating project details used by the AFRL Corporate Board in order to gain approval and funding for new programs (An Overview, 2005).

After a good understanding of the requirements is gained, the Core Team presses forward in constructing the remainder of the Rapid Reaction Team by gathering the required expertise from across academia, industry, and other agencies through the use of what AFRL calls its “Innovation Network” (iNet). As depicted in Figure 13, the iNet forms the basic organizational structure that enables AFRL to pull technical expertise from across the country, provide feedback to upper management, and produce innovative technology solutions for the warfighter.



Figure 13. AFRL iNet Concept (Stallard, 2007)

Often times, this network is maintained through informal working relationships or personal contacts across various areas of innovative research. Individuals and organizations are called upon to join the RRT and participate in identifying and developing rapid solutions that will ultimately go the AFRL Corporate Board and the user for approval. This ability of AFRL to quickly draw on national and globally recognized experts from many different fields is something that sets aside CP3 as an innovative approach to rapidly delivering solutions and building teams. As depicted in Figure 14, the RRT is comprised of a small Core Team of senior AFRL staff and various Innovation Nodes (iNodes) comprised of various external industry partners that manage the solutions teams and pull together the needed expertise from across the globe to tackle a given problem.

• **iNodes**

- Small organizational units
- Each with its own competencies
- Each selected to address a class of user needs
- Created and dissolved based on evolving user needs, performance, etc...

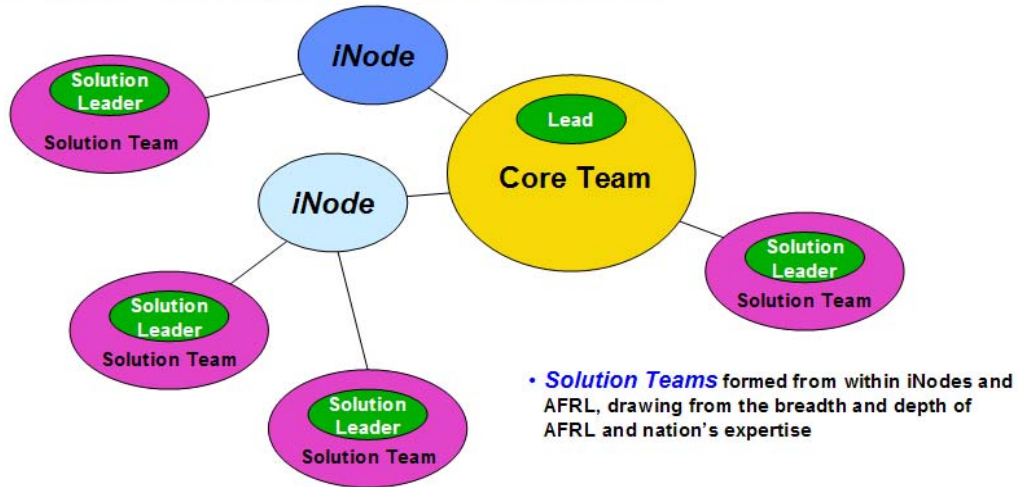


Figure 14. RRT Organization (Stallard, 2007)

These iNodes serve as a central body that assists in providing resources and the needed expertise to the solution teams in order to devise solutions to iSUN problems. These solution teams form the working level of the iNet and are comprised of AFRL, industry, and academic experts including user representatives and acquisition experts as required (An Overview, 2005). The leaders of the solution teams are empowered to operate as efficiently as possible and are encouraged to employ innovative management and collaboration techniques. The flexibility given to the solution team leader in gathering the needed expertise provides the ability to pull individuals out of their home organizations for a period of time and return them when their experience is no longer needed. Through the guidance of the core team and contributing solution teams, CP3 projects culminate in a real-world demonstration where the end user can evaluate the

technologies' effectiveness in a relevant environment similar to what might be seen on the battlefield (An Overview, 2005). Based on the effectiveness of the system or component, the user can then choose to accept the capability as delivered by AFRL, or they can push to further refine the concept through a follow-on acquisition program.

Still in its infancy, CP3 has already produced significant results. As part one of a two-phased program, Phase 1 (Planning and Designing) has demonstrated AFRL's ability to leverage strategic partnerships, both with industry and other Government agencies, as well as their ability to pull the necessary talent needed to tackle iSUN projects from across their organization. Currently, AFRL has an Indefinite Delivery/Indefinite Quantity (IDIQ) contract with two industry partners as iNode contributors. Once an urgent requirement is approved and validated, the Core Team will send out requests to these two iNode partners for potential technology solutions. Future phases of the CP3 effort will look to expand this area of the RRT to include a much larger base of industry and academic partners, thus expanding its ability to reach out to the needed expertise quickly.

Phase two of the program (Process Piloting) is aimed at taking several pilot efforts and walking them through the current CP3 process as well as investigating how industry leaders in innovation manage rapid prototyping/development. This research aims to complement that investigation and deliver a set of methodologies and best practices that AFRL can consider for implementation in future CP3 process refinement efforts. Additionally, AFRL has contracted an industry team to identify commercial best

practices associated with technology transition in order to facilitate their ability to transition technology and speed rapid development.

Summary

This chapter summarized current literature on the topics of innovation, the government environment, rapid reaction guidelines, and current rapid reaction programs. In addition to providing the reader with a more in-depth understanding of these areas, several gaps in the research were addressed as well as roadblocks to successful implementation. Chapter III will explain the methodology to be employed in this research and chapter IV will provide an over view of significant findings.

III. Methodology

This chapter will outline the methodologies employed during the course of this research in greater detail. A background in qualitative research methods will be given in addition to the specific data analysis techniques that were used in conducting this research. Additionally, a brief description on data validity and reliability will be presented as well as ways in which this researcher sought to ensure accurate data was captured. Because there is little literature on how to apply rapid reaction programs within the government science and technology (S&T) context and specifically at the Air Force Research Laboratories (AFRL), this section will also be used to familiarize the reader with specific interview questions, explain how these questions will aid in answering the overall research and investigative questions, and provide a description of how the interview subjects were chosen.

Qualitative Research Method

The term *methodology* and *methods* refer to “a way of thinking about and studying social realities” as well as a “set of procedures and techniques for gathering and analyzing data” (Strauss & Corbin, 1998:3). In the context of qualitative data, this information has historically taken the form of words rather than the hard numbers seen in quantitative research (Miles & Huberman, 1994). Because of this, many researchers view qualitative analysis as an art form and one that is far more diverse than other forms of data analysis (Patton, 2002). However, this fuzzy interpretation can often make it difficult to assimilate and interpret qualitative data. Traditional issues inherent with

qualitative research include the labor-intensiveness of the data collection effort, frequent data overload, researcher bias, time demands of processing and coding the data, adequacy of the sample, generalizability of the findings, credibility and quality of the conclusions, and their overall utility (Miles & Huberman, 1994). Miles (1979:591) further asserts:

The most serious and central difficulty in the use of qualitative data is that methods of analysis are not well formulated. For quantitative data, there are clear conventions that the researcher can use. But the analyst faced with a bank of qualitative data has very few guidelines for protection against self-delusion, let alone the presentation of unreliable or invalid conclusions to scientific or policy-making audiences.

In order to develop a sound research design, careful up-front consideration must be given to how traditional issue areas will be addressed. Additionally, it is also important to understand the various qualitative data collection methods currently in use. A top-level depiction of the qualitative research methodology used in this research is captured in Figure 15.

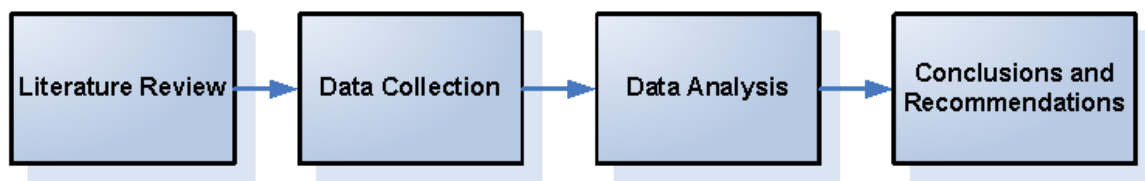


Figure 15. Qualitative Research Methodology

Qualitative research is built on the following types of data collection methods: in-depth open-ended interviews, direct observation, and written documents (Patton, 2002).

Open-ended interviews attempt to gain a more detailed description of the area of study

through the use of focused interview questions that allow the interviewee to respond in the manner they see fit (McNamara, 1997). Additionally, direct observation involves first-hand experience with a particular topic and written documentation refers to any literature on a given subject.

Because the area of study surrounding rapid reaction projects in the government is relatively new, an extensive literature review revealed very little material on the subject other than guidance on how to route urgent needs through the approval chain within the DoD and the Air Force as well as several broad studies that included some discussion on meeting emerging threats and rapid reaction processes. The majority of existing literature focused on rapid product development in the commercial sector where different environmental constraints and incentives make comparing the two areas difficult. Additionally, the nature of many rapid reaction projects makes them classified, so obtaining details on success stories proved to be difficult as well. Without having the value of witnessing a rapid reaction project under execution, this research focused on collecting data through the use of standardized open-ended interviews with subject matter experts (SMEs) from organizations with a track record of rapidly prototyping or fielding innovative technologies and/or applying innovative acquisition practices towards streamlining the government acquisition cycle.

The initial process of selecting organizations to interview began with the literature review and two particular studies that addressed the topic of urgent needs. Those studies were the Defense Acquisition Performance Assessment (DAPA) report and the Defense Science Board Study on 21st Century Technology Vectors. In addition, the researcher

had previous knowledge of several other organizations that have done streamlined acquisition efforts and included them as well. The targeted group of interview participants were those organizations who have participated in answering urgent needs and/or in significantly streamlining the government acquisition process. Potential interviewees were contacted via phone and email and asked if they would be willing to participate in this research. In most cases, the list of interview questions was provided to the interviewee ahead of time in order to give them time to develop responses and familiarize them with the researcher's intended area of focus. All interviews were digitally recorded to aid in data retention and transcription with permission of the interviewee and each was explained that no personal or identifying information would be revealed without their permission. Each participant was asked the same set of interview questions unless time constraints cut the interview short. Instances where a participant was not asked every question is annotated in the results section of this research. As a way of ensuring as large a sample size as possible, each interview participant was also asked for a recommendation of a similar organization and/or interviewee that would be worth investigating as part of this research. Additionally, members of the Air Force research laboratories core process three team were asked for a potential list of organizations as well. The result of this technique was a list of thirteen organizations. Twelve were contacted and a total of ten interviews were conducted across nine different organizations. A summary of all organizations that were interviewed is captured below in Table 3.

Table 3. Organizations Interviewed

Air Force:

Big Safari Program Office
Rapid Capabilities Office (SAF/RCO)

Navy:

Office Of Naval Research (ONR)
Naval Innovation Laboratory (Nall)

Army:

Rapid Equipping Force (REF)
Telemedicine and Advanced Technology Research Center (TATRC)

USSOCOM:

Program Executive Office for Fixed Wing (PEO/FW)

Other Government Agency (OGA):

Defense Advanced Research Projects Agency (DARPA)
National Geospatial-Intelligence Agency (NGA) - Innovision Directorate

Data assimilated for this research effort sought to answer the primary research question of:

Are there innovative methodologies/best practices being implemented within various levels of the Government where rapid reaction projects have been successfully demonstrated that could be cross-pollinated to the DoD S&T community, and specifically AFRL, in order to refine the current processes to address urgent warfighter needs and reduce the time it takes to field new technologies?

Additionally, gaps in the existing literature pointed toward the need for further research in the particular areas of innovative organizational and process management. As a result, the initial investigative questions were used in conjunction with the six-critical enablers previously identified to develop a list of interview questions and highlight potential gaps for areas of future study. The resulting set of interview questions are

displayed in table 4. Additionally, permission for exemption from human experimentation requirements (32 CFR 219, DoDD 3216.2, and AFI 40-402) was also sought and granted by the AFRL/Wright Site Internal Review Board (IRB) and is attached in Appendix C.

Table 4. Interview Questions

Area/Enabler	Question
General / Overarching	<p>1.) What role does innovation play in your organization's ability to rapidly field new technologies/capabilities?</p> <p>2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?</p> <p>3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?</p> <p>4.) What is your average time from concept to working prototype?</p> <p>5.) What are the main roadblocks to quickly delivering capability?</p> <p>6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?</p>
Human Resources	<p>7.) What process does your organization use to identify and recruit highly qualified personnel and are there certain traits that you look for?</p> <p>8.) What measures are used to train and retain personnel within your organization?</p> <p>9.) What type of background do most of your rapid reaction project leads have (i.e. technical, program management, etc.)?</p> <p>10.) What is the optimal team size for a rapid reaction project?</p> <p>11.) Are there a group of subject matter experts (SMEs) you can tap into as required – i.e. a "quick-pull" knowledge capability?</p> <p>12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?</p>
Systems Engineering	<p>13.) What role does systems engineering play in your organization's process for rapidly delivering capability?</p> <p>14.) Do you have a chief engineer as part of your rapid reaction teams?</p> <p>15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?</p> <p>16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?</p>
Budget	<p>17.) Are funds readily available to your organization to pursue new ideas?</p> <p>18.) What process do you use to obtain funding for your rapid reaction projects?</p> <p>19.) What process/method do you use to establish a cost estimate for your rapid reaction projects?</p>
Technology Reach	<p>20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?</p> <p>21.) What process do you use to collaborate with organizations across Government, Academia, and Industry?</p> <p>22.) What process do you use to encourage foreign or non-traditional DoD /Government contractors to solicit ideas?</p>
Industrial Base	<p>23.) What process do you use to solicit proposals for rapid reaction solutions to industry?</p> <p>24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?</p> <p>25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?</p> <p>26.) How long are offerors given to respond to a request for proposal?</p>
Incentives	<p>27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?</p> <p>28.) What innovative contractual incentives have you had success with?</p> <p>29.) How much autonomy do employees at your organization have to help new ideas flourish?</p>

Data Analysis Technique

The data analysis method employed in this research followed Miles and Huberman's (1994) interactive data analysis model depicted in Figure 16. This model was chosen because of its iterative nature and its applicability to large volumes of data such as transcribed interviews. In this model, data analysis is further broken down into three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification (Miles & Huberman, 1994). For the purposes of this research, all interviews were transcribed and the answers were broken down into key phrases (data reduction) and assimilated in order to more clearly analyze all the responses (data display). All transcribed interviews are attached to this document as Appendix E. In addition to this technique, other practices such as pattern, theme, and content analysis (drawing/verification) were used to categorize data and formulate conclusions (Patton, 2002).

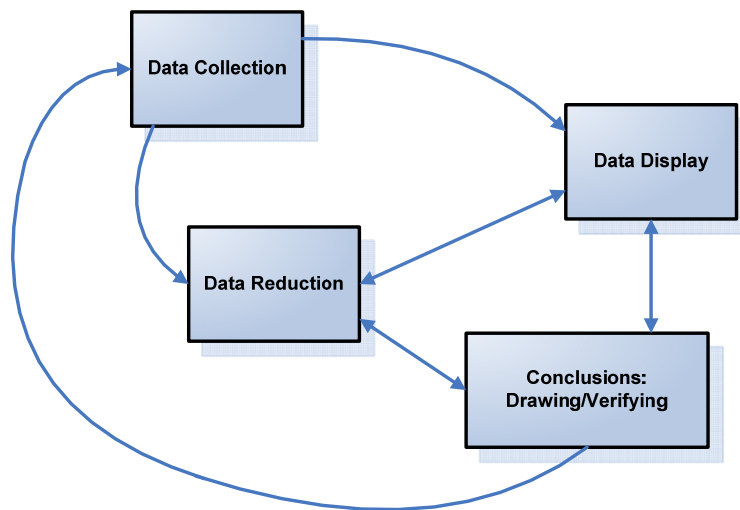


Figure 16. Components of Data Analysis: Interactive Model (Miles & Huberman, 1994)

Ensuring Validity and Reliability

In addressing methods used to validate qualitative analysis, attention is often given to potential biases a researcher could bring to a project. In the case of this thesis, the researcher did have prior government acquisitions experience, but did not have any prior experience with rapid reaction programs. Any potential biases that might have been included introduced into the interview instrument were eliminated after a peer review and committee review of the intended interview questions. Additionally, the issue of validity associated with qualitative research often refers to the instrument being used and how well that instrument measures what it is intended to measure (Patton, 2002). Validity is also associated with the reliability of the individual giving the information as well and his/her familiarity with the topic. In the case of this study, the instrument being used is the standardized open-ended interview. In order to assure research validity and reliability, subject matter experts from AFRL's CP3 Core Team were consulted on areas where they felt innovation had been demonstrated as well as possible interviewees on the topic of innovation and rapid reaction processes. Additionally, the potential list of interview questions were also reviewed by rapid reaction SMEs and AFIT faculty to ensure no researcher biases were introduced. No constraints were placed on the interviewee selection other than being part of a government organization (both inside and outside DoD) that has had experience with addressing rapid reaction type projects and/or implementing innovative acquisition practices to reduce the traditional government acquisition cycle time. It is important to note that the majority of these interviews were conducted with senior individuals within these organizations ranging from mid level

officers to senior executive service members. Additionally, each interviewee was also asked to identify other locations where rapid reaction projects had been demonstrated in order to broaden the research base and number of subjects participating in this research.

Summary

This chapter summarized the various aspects of qualitative analysis used in the course of this research. It also provided the reader with a foundation of qualitative research knowledge and outlined the process used to assimilate and analyze data. In addition, a description of how each interview participant was selected was discussed as well as ways in which the researcher sought to capture valid and reliable data. Chapter IV will provide a detailed analysis and explanation of the results of this research

IV. Data Analysis

Overview

The purpose of this chapter is to document and analyze the qualitative data gathered during the interview portion of this research. As previously discussed, the interview questions were grouped according to six specific enablers, or areas, identified by the Defense Science Board (DSB) Study of 21st Century Technology Vectors (2007) as well as a general, overarching section. Each question was separately analyzed and a high-level summary of the responses was presented. In addition to summarizing key responses, each section (six critical enablers/areas) of interview questions was analyzed to uncover common themes or patterns that helped answer the overall investigative questions for the research. In order to provide a more in-depth view into the interview participant's responses, a complete transcription of each interview is included as Appendix E.

Results and Analysis

This section will introduce each interview question and provide a brief explanation of why that question was used in the interview instrument or what it was intended to measure. At the end of each area/enabler, a summary of the major themes that were observed will be summarized and a table will be provided to provide further detail into the responses for that particular section.

General/Overarching Questions

(GQ-1) What role does innovation play in your organization's ability to rapidly field new technologies/capabilities?

The purpose of this question was to gauge how government organizations involved in rapidly responding to urgent needs view innovation. The overall feeling from the responses to this question is that innovation is a very important when trying to quickly deliver a new capability or item. All ten participants responded positively to this question, indicating that innovation was a critical factor in their ability to rapidly meet customer needs. Three of ten participants explicitly stated that innovation plays a significant role in their organization or that it was at the core of how they operate. One participant stated it was their number one goal in meeting warfighter requirements and one participant stated that innovation enabled their organization to navigate through the typical government bureaucracy. Only one participant stated that while innovation does play a role in their organization's ability to rapidly respond to customer needs, it is not practiced as often as one might think. Additionally, two of ten participants did not explain the degree to which innovation plays a role in their organization, but described its importance to their organizational processes and applications. An item of note is that all the participants felt innovation was important, but some had different opinions of what the term "field" meant in relation to their organization's mission. Where appropriate, the researcher clarified the term "field" to mean successful initial delivery of a prototype or solution to the end customer vice a solution or product that has been given all the typical life cycle considerations such as reliability, maintainability, and supportability.

(GQ-2) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?

This question aimed to investigate what organizations are doing differently that enable their employees to consistently deliver new and creative solutions to difficult problems. The responses to this particular question can be divided into three general categories of processes/practices, work environment, and people. When examining the processes or practices that were used, one participant cited the use of a flexible contract vehicle called a Broad Agency Announcement (BAA) that allows for competition and gives the potential offerors more flexibility to develop their own statement of work and technical approach. BAAs are described in more detail in FAR 6.102, “ Use of Competitive Procedures,” and FAR 35.016, “ Broad Agency Announcements” (DARPA, 2004). Another practice that was cited was the use of brainstorming. Four out of ten participants cited group brainstorming sessions that involved a very diverse variety of expertise. Two participants also cited frequent and detailed feedback from their customers on what they needed and what could make their lives better. One participant said there was no process or practice used to encourage out-of-the-box type thinking other than awards and praise. Lastly, one participant cited the key driver for innovation in their organization was execution year funding or funding that was readily available for use.

The second category of work environment dealt more with how the office was oriented to encourage creativity. One participant cited their key driver was the actual working environment and layout of their office. In this example, a private company

called Applied Minds was consulted and the result was that employees were placed within close proximity of one another, natural lighting was installed, and cubicle walls were removed.

When analyzing the people within an organization and how they can affect creativity and innovative thinking, one participant cited that high turnover rates within their organization helped support innovation by constantly bringing in new people and ideas, reducing career agendas, and making employees feel like they had to do the best they could in the limited time they were there. Lastly, one participant cited that it simply came down to hiring the right people that could think out-of-the-box, while another one cited leadership as the main catalyst for fostering innovative thinking.

(GQ-3) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?

This question aimed to investigate whether or not those organizations who are responding to urgent needs have a defined process or methodology for consistently achieving success. The responses to this question can be divided into the broad categories of organizational structure, customer interaction, and process definition. In looking at organizational structure, one organization cited a “skunk works-like” unit called Swampworks, while another cited an organizational charter. This charter enforced the use of a short, narrow chain of command, early and prominent warfighter involvement, a small integrated team operating in the same location, high DoD and industrial precedence ratings that rank requirements according to mission importance and urgency of need, funding stability, and waivers and deviations to encumbering practices,

procedures, policies, directives, or regulations. Similarly, one participant also cited frequent user involvement and feedback as well as the use of iterative development. One organization also highlighted the use of a combat mission needs statement and the fact that they were in close proximity to the other key players. Another participant described getting an early look at the requirement in order to get a baseline technical approach nailed down as soon as possible as their process, while one other participant simply cited speed. Lastly, one participant cited that there was no checklist and that they had no standard process.

(GQ-4) What is your average time from concept to working prototype?

The purpose of this question was to determine the average time it takes a given organization to respond to an urgent need. The intent was to find out if organizations use similar timelines and to compare what is considered a “rapid response” across multiple government entities. The range in responses can partly be attributed to the difference in individual projects as well as the type of organization itself. Almost all of the participants said it depends on the project or technology and cited multiple examples. However, six of ten participants gave a timeframe ranging from 6 months to a year. Two organizations cited examples of projects with timelines ranging from 48 hours to less than 3 months. One participant said there was no average timeline and a different participant simply stated weeks to months. Lastly, one organization cited that it is only limited internally to a performer’s ability to do the work, but cited a typical 3-5 year timeframe for most projects.

(GQ-5) What are the main roadblocks to quickly delivering capability?

The purpose of this question was to see what the main obstacles to quickly responding to customer needs were within the government rapid reaction community. Responses for this question had a significant range. Almost all participants cited different or multiple roadblocks with the exception of available funding, bureaucracy, and the contracting process; each of those categories were cited twice and also appeared throughout the literature review and the numerous studies on acquisition reform. Other roadblocks that were mentioned only once from the ten participants include: transition funding, the, “not invented here” mentality, lack of formal documented requirements, antiquated baseline architectures that were not designed for change, constrained environment, operational force participation in development and testing, security, and “cold war” type policies and regulations.

(GQ-6) What would you cite as one of your organization’s best practices/methodologies for rapidly responding to customer needs?

The purpose of this question was to aid in developing a common list of best practices being implemented across the rapid reaction community. Three out of ten participants responded to this question by citing their intense interaction with the customer as their best practice. This interaction was seen in multiple ways including daily telephone conversations and immediate feedback from local customer representatives. Similarly, one participant stated their best practice was to have personnel embedded with forward units, which provided direct contact with their customer and immediate feedback into the rapid reaction process. Two participants also cited having

the right people in place with the tenacity and the attitude to never give up. The remaining participants cited different practices including: funding agility (the ability to start a program as quickly as you can kill it), a core business sense (don't think of these as long term projects), and getting as early a look at the urgent need as possible (initiate a team that does nothing but evaluate early urgent needs; before they arrive at the organization).

Human Resources (HR)

(HRQ-6) What process does your organization use to identify and recruit highly qualified personnel and are there certain traits you look for?

The purpose of this question was to investigate how organizations find, recruit, and retain the “right” person to lead a rapid reaction project and what qualities or characteristics do they consider to be most important in that individual. In answering how they recruit personnel, two of the ten participants responded by saying they recruit people through word-of-mouth. Similarly, two other participants responded by saying they recruit through their social network (people they either know or have worked with in the past), while one participant said they simply “cherry-pick” the experienced people they need. One participant stated that people come to them based on the organization's reputation (having the latitude to propose and sell creative ideas), while another said they conduct a broad sweep of academia, the specific community, and the service or agency itself. One participant also said they recruit people from who they sponsor to do the work. For example, if a government agency sponsors a Federally Funded Research and

Development Center (FFRDC) such as the Air Force Research Laboratories (AFRL) to conduct a given project, then they would recruit the talent they needed from within AFRL.

In answering the second half of this question regarding traits, the participant's answers were easily divided into three broad areas: the type of experience or background the individual had, the character or work ethic they possessed, and their professional certifications. Six of the ten participants said they look for either operators (people with operational experience) or program managers. One participant said they have a significant amount of systems engineering talent at their organization, while another said they look for material developers, contracting, and budget personnel. One participant stated that their organization looks for more senior individuals. Two participants also stated that their organization looks for individuals with diverse backgrounds. In terms of character or work ethic, a combination of the following adjectives was used by six of the ten participants that were interviewed: self-starter, motivated, follow through, tenacity, aggressiveness, creative, innovative, and a strong work ethic. Lastly, the certifications that two organizations specifically mentioned that they look for when hiring a new individual include: a level two or, preferably, a level three Defense Acquisition Workforce Improvement Act (DAWIA) certification; specifically in program management. Only two participants had either no response or couldn't specify what qualities or traits they look for in an individual.

(HRQ-8) What measures are used to train and retain personnel within your organization?

The purpose of this question was to see if rapid reaction personnel receive different training or incentives that could impact their effectiveness to rapidly respond to customer needs. Responses to this question varied quite a bit and no common technique was observed. When looking at training, two out of the ten participants said they use standard acquisition classes and certifications and specifically cited Defense Acquisition University (DAU). Two other participants said they don't have any formal training program and that employees are expected to bring the experience they need from previous positions, while two others referenced hands-on learning and on-the-job training (OJT). The remaining participants each cited one or more methods used for training that were unique and included: orientations, symposiums, conferences, various educational programs, and mentoring programs.

When looking at retaining personnel, four out of ten participants did not provide a response for this portion of the question. Additionally, one participant simply stated that they did not have as much leeway in retaining personnel as they would like. The five remaining participants each cited a different method or practice for retaining personnel including: traditional methods, providing their employees the leeway to think freely and do their job, enforcing why their employees are there (i.e., they are doing something important to the nation, their service's mission, and saving lives), and providing the time and opportunities for professional and personal growth.

(HRQ-9) What type of background do most of your rapid reaction project leads have (technical, program management, etc.)?

This question aimed to explore what kind of background and experience rapid reaction personnel had coming into a given organization. The hope was that a common level of experience or background would be observed that enabled rapid reaction project leads to be more innovative and successful at reducing the time it takes to deliver a new technology or capability. The overall feel of the responses to this question indicate that both technical and program management experience/background are needed in a rapid reaction environment. When analyzing similar responses from seven of the participants, two cited a strictly technical background, two cited a mostly technical background with some program management, two cited a mix of technical, program management, and operational backgrounds, and one cited a predominantly program management background with a mix of systems engineering. The three remaining participants did not provide a response for this question due to time constraints of the interview.

(HRQ-10) What is the optimum team size for a rapid reaction project?

The purpose of this question was to see how large or small rapid reaction teams are across various organizations and agencies within the government. The responses to this question indicate that rapid reaction teams tend to be very small. Two participants said the optimal team size was four to five people, while two others said it could be as small as one person. One participant said it depends on the project and urgency of the need, but the smaller the team, the better. Similarly, two participants said that the optimal size was no more than fifteen people depending on the project. One participant said the optimal size was three to five people, one said four to seven people, and another said four to six people. Lastly, one participant said this question did not apply to their

organization because everything was different for every project and one participant did not provide a response for this question due to time constraints of the interview.

(HRQ-11) Are there a group of subject matter experts (SMEs) that you can quickly tap into as required – i.e. “quick-pull” knowledge capability?

The purpose of this question was to investigate the level of expertise present within the rapid reaction organizations that were interviewed. One participant did not provide a response for this question due to time constraints of the interview. The remaining nine participants all said they had access to SMEs and some cited specific places they acquire expertise. The following is a break-out of their responses: four participants referenced their own organization or enterprise, three participants referenced contractors, one participant referenced the various service program offices, one referenced federally funded research and development centers (FFRDCs), and one referenced the Office of the Secretary of Defense (OSD), Defense Advanced Research Projects Agency (DARPA), technical support working group (TSWG), and various “skunk works” type organizations.

(HRQ-12) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?

This question aimed to investigate how long rapid reaction leads stay in a given organization and to measure the rate of personnel turnover. One participant did not provide a response for this question due to time constraints of the interview. Eight out of ten participants said that their rapid project leads do see a project through to the end with one specifically citing an average tenure of three to four years. One participant said it

depends on the individual project and another said that their rapid project leads do not see a project through to the end.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed: there are multiple methods to recruit creative and talented personnel, there are certain personality traits that many rapid reaction project leads share, the majority of rapid reaction project leads have either a technical and or program management background and education, the optimal team size is very small, and there is no standard training process being implemented at these organizations. A summary of the themes in the human resources section is captured in Table 4.

Table 4. Human Resource Themes

Human Resources (Q7-Q12)			
Themes	# of Responses	% of Participants	# of Participants
There are multiple methods to recruit talented and creative people, but word of mouth/social networks are the most utilized methods in the rapid reaction community	5	50%	10
Many rapid reaction project leads share common personality traits - Self-starters, creative, innovative, motivated, tenacity, aggressiveness, strong work ethic and follow-through	6	60%	10
The majority of rapid reaction project leads have a mix of technical and/or program management experience and education	7	100%	7
The optimal team size is very small on rapid projects (4 – 5 people)	5	55%	9
Training programs are ad hoc - Traditional Acquisition Classes/DAU - On-the-Job Training (OJT) - Reliance on prior experience	2 2 2	20% 20% 20%	10 10 10

Systems Engineering (SE):

(SEQ-13) What role does systems engineering play in your organization's process for rapidly delivering capability?

The purpose of this question was to investigate the level of emphasis, if any, placed on systems engineering in organizations that are looking to quickly deliver solutions to their customers. Five out of the ten participants cited that systems engineering plays a reduced role in their organization's ability to rapidly respond to urgent needs. The reason given behind some of these responses was a reliance on the

contractor to perform the systems engineering piece and the speed at which they are trying to get an 80% solution to their customer. Three participants said that systems engineering played a significant role in their organization's ability to rapidly respond to urgent needs, but one of these participants said that it was a more non-traditional systems engineering approach than what is seen on most major programs. None of these participants elaborated on exactly how systems engineering was used differently in their organization. One participant said they were cognizant of systems engineering because it was vital to ensuring a successful transition to the customer or service acquisition program office. In contrast, one participant said that the systems engineering equivalent at their organization played a more process oriented role and was seen as more of a roadblock than an accelerant for rapid reaction projects.

(SEQ-14) Do you have a chief engineer as part of your rapid reaction teams?

This question aimed to determine if system engineering expertise is sought after on rapid reaction teams and if systems engineering efforts, where present, are being championed by a specific individual. Four out of the ten participants said they did not have a chief engineer on their rapid reaction teams. In contrast, three participants said that they did have a chief engineer, but one of these participants said the position was more of a senior systems architect. One participant said that about half of their projects had a chief engineer, but also stated that there wasn't a project lead at their organization that did not have an advanced degree in engineering or wasn't Defense Acquisition Workforce Improvement Act (DAWIA) level three certified. Lastly, one participant said

they had a “chief engineer” position, but that the billet was vacant. One participant did not provide a response for this question due to time constraints of the interview.

(SEQ-15) How much freedom and authority is the system engineer given to make trades concerning system performance?

The purpose of this question was to gauge the level of autonomy of the system engineer across organizations that have this position on their rapid reaction team. Two participants did not provide a response for this question due to time constraints of the interview. Additionally, two other participants could not answer this question either because it did not apply to their organization or because of the way the question was stated. Four out of ten participants said that the system engineer is given significant or considerable authority to make trades concerning system performance. One of these four participants caveated their response by saying that the system engineer’s authority existed as long as the proposed trades did not change the scope of the requirement or need. A separate participant responded by saying that all trades were decided by team decision, while another participant said that the system engineer did not have much authority to make trades at all.

(SEQ-16) How do you receive initial customer requirements and are changes permitted after arrival to your organization?

The purpose of this question was to determine how each organization receives their urgent requirements to determine if a shared process for disseminating and accepting requirements is being followed across the government. Additionally, this question sought to find out if organizations involved with rapidly responding to customer

needs experience, or allow, changes in customer requirements once they begin a project. The overall feel to the responses to this question was that no common requirements process exists. In looking specifically at how requirements arrive at a particular organization, one participant did not address this area in their response. Five out of ten participants cited various means of obtaining requirements including: conferences, visiting the users, users coming directly to them, and formal need statements. Three participants stated that their requirements come strictly from interaction with their user; one of these three participants said they try to work directly with the individual who created or documented the original need. One participant said that their requirements are based off internally developed criteria that are derived from perceived gaps in operational capabilities. Lastly, one participant said that they receive their requirements from a Rapid Reaction Development Council (RRDC) and capture them in a shared database.

In analyzing the later part of this question related to requirements changes, six of the ten participants did not address this specific portion of the question in their response. Two participants said that their organization initiates a rapid reaction project with a clear understanding that things will change. One of these participants said that they explain to their customer up front that there will be things that are wrong with every solution, but that if they want a capability quickly that any changes must be made at a later time. One participant simply stated that changes were permitted, while another participant said that changes were not permitted and could be considered unfunded requirements.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed various levels of emphasis are being placed on system engineering and there is no standard process being utilized for receiving urgent customer needs/requirements. A summary of the themes in the systems engineering section is captured in Table 5.

Table 5. System Engineering Themes

Systems Engineering (Q13 – Q16)			
Themes	# of Responses	% of Participants	# of Participants
The level of emphasis placed on systems engineering varies across rapid reaction projects and organizations			
- Plays a reduced role	5	50%	10
- Plays a significant role	3	30%	10
There is no standard method for receiving urgent customer requirements/needs			
- Obtained through various methods including: conferences, visiting customers, customers coming to organization, and formal need statements	5	50%	10
- Direct interaction with customer only	3	30%	10
- Other	2	20%	10

Budget (B):

(BQ-17) Are funds readily available to your organization to pursue new ideas?

This question aimed to find out how many rapid reaction organizations have the funding flexibility to initiate a project as soon as possible. Three out of the ten

participants said that they did have funds readily available, but one of these organizations said the key to quickly using them was having the right authorizations in place from the start of a project. Additionally, one of these participants said that while these funds were available, they were a very small amount (\$200M). In contrast, three out of the ten participants said that funds were not readily available, with one participant citing this problem as a significant factor in being able to address urgent needs. One of these participants said that while funds weren't readily available to the rapid reaction team, they were readily available within the parent organization or agency. The last four participants did not directly answer the question. Two of these participants said that they get their money through the Program Objectives Memorandum (POM) process. One participant said that they are funded by the actual requirement. Similarly, another participant said that they cannot take on a project unless they have the money and that most of their projects come with associated funding.

(BQ-18) What process do you use to obtain funding for your rapid reaction projects?

The purpose of this question was to determine if a standardized process, such as the Planning, Programming, Budgeting, and Execution (PPBE) process, is being followed to obtain the funding for rapid reaction projects. In some cases, participants cited multiple ways they obtain funding in answering this question. Four participants said they obtain funding internally to their organization or enterprise. One of these three participants stated that they use reprogramming and realignment to obtain the needed funding, while another stated that they conduct an investment balance review. One of the four participants also cited the use of an internal margin fund and trade-offs between

various programs. Three out of the ten participants said that they obtain their funding through the traditional PPBE/POM process. One participant also said they look for funding from external sources, while another participant said they obtain funding through the use of ad hoc processes. Lastly, one participant said they get a budget, but did not specify how.

(BQ-19) What process/method do you use to establish cost estimates for rapid reaction projects?

This question aimed to find out how organizations addressing urgent needs estimate the overall costs of a rapid reaction project when, often times, there is no similar project or capability for comparison in terms of schedule and technical complexity. However, six participants did not provide a response for this question due to time constraints of the interview. The four participants that did respond cited multiples ways of obtaining cost estimates including: internal program office estimates, Office of the Secretary of Defense (OSD) and Air Force Cost Analysis Improvement Group (CAIG) estimates, prior experience, data from similar systems, empirical data, and relative estimates of merit.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed that only a third of the organizations interviewed had funding readily available and that some organizations still use the traditional budgeting process to obtain the needed funding for their rapid reaction projects. A summary of the themes in the budget section are captured in Table 6.

Table 6. Budget Themes

Budget (Q17 – Q19)			
Themes	# of Responses	% of Participants	# of Participants
Funding is not always readily available to answer urgent needs			
- Funds are readily available	3	30%	10
- Funds are not readily available	3	30%	10
Funding is primarily obtained internally to the organization or via the formal PPBE/POM process			
- Obtained internally	4	40%	10
- Formal PPBE/POM process	3	30%	10

Technology Reach (TR):

(TRQ-20) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?

The purpose of this question was to investigate various ways in which organizations addressing rapid reaction projects learn about new technologies and capabilities that might be suitable for their application. Several participants cited multiple ways of gathering information in responding to this question, but none appeared to have a succinct process. Two organizations said they gather information by having the right people working in their organization who are in touch with what is going on within industry. Two participants stated that they attend science and technology forums, while one other said they use cross-walks where information is shared among interested parties. Two participants cited the use of Broad Agency Announcements (BAA), while another

said they use non-traditional requests for information (RFIs) to industry. One participant said they go to Federally Funded Research and Development Centers (FFRDCs). Three participants said they rely on surveying industry, academia, and the government or by canvassing every available resource. Lastly, one participant said they rely on word-of-mouth recommendations about new technologies.

(TRQ-21) What process do you use to collaborate with organizations across the government, academia, and industry?

The purpose of this question was to see if a shared collaboration tool or mechanism was being used across the government to collaborate on rapid reaction projects. Two out of the ten participants said that they either go to visit other organizations or that these organizations seek them out. Two participants also said they socialize issues internally and then determine who to call. Two participants cited that they use networking and various forms of outreach with people they know across the spectrum of organizations. One participant cited multiple ways of collaborating including: forums, formal meetings, conferences, and symposia. Another participant cited the use of a product line review meeting with parties they feel would be interested in a given technology or project from multiple organizations. Lastly, one participant collaborated through the use of liaisons, while another participant stated that they leverage the service program offices. The overall feel of the responses to this question indicate that no standard communication process or tool is being utilized.

(TRQ-22) What process is used to encourage foreign or non-traditional DoD/government contractors to solicit ideas?

This question was posed to determine what means, if any, were being used to encourage non-traditional or foreign contractors to submit ideas or technologies to aid in solving urgent needs. Five participants did not provide a response for this question due to time constraints of the interview. Two participants cited the use of a global outreach type program through existing contacts and networks. One of these participants said they have associates all over the world looking to find the next best idea or innovation, while the other participant cited that they have actually brought in a foreign liaison to work in their organization. One participant cited the use of both public meetings and BAAs. One participant said they do not encourage non-traditional or foreign participation. Lastly, one participant said they did not have a formal process in place.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed that there is no standard method being used to gather information about technologies that might be useful in responding to urgent needs. Additionally, no standard method appears to exist in how various organizations involved in rapid reaction projects communicate with one another across academia, industry, and the government. A summary of the themes in this section are captured in Table 7.

Table 7. Technology Reach Themes

Technology Reach (Q20-Q22)			
Themes	# of Responses	% of Participants	# of Participants
Various methods are used to gather information about existing technologies			
- Surveying industry, academia, and government	3	30%	10
- Attending science and technology forums	2	20%	10
- Broad Agency Announcements (BAA)	2	20%	10
- Knowledgeable personnel within the organization	2	20%	10
No standard method is used to collaborate with similar organizations across academia, industry, and the government			
- Face-to-face visits	2	20%	10
- Networking and/or outreach	2	20%	10
- Other (meetings, conferences, symposiums, liaisons)	6	60%	10

Industrial Base (IB):

(IBQ-23) What process do you use to solicit proposals for rapid reaction solutions to industry?

The purpose of this question was to determine what methods are being used to contact industry and communicate the government's needs or requirements. Five out of the ten participants cited the use of a Broad Agency Announcement (BAA). Two participants stated that they follow the traditional federal acquisition regulation (FAR) rules through the use of requests for proposals (RFPs). Another participant said they use Basic Ordering Agreements (BOAs) to present problems to potential offerors. Lastly, two participants said they do not have a formal process and usually just pick up the phone and call the contractor directly to request a proposal.

(IBQ-24) What process, if any, is used to maintain a relationship with previous contractors who have done good work for your organization in the past?

The purpose of this question was to determine if specific measures were being taken to remain in contact with contractors who have done good work for an organization in the past. Because of the short timelines associated with addressing urgent needs, having the ability to quickly identify contractors who could offer potential solutions is important. One participant did not provide a response for this question due to time constraints of the interview. Three participants cited that no formal process to maintain communication with prior contractors exists in their organization. Two participants said that they keep in contact through informal emails and one said that they actually keep previous contractors on a mailing list for future conferences and workshops. One participant said that they keep a relationship with previous contractors alive through the use of the BOA, which can last from two to three years. One participant also said they maintain a relationship through the use of small studies. Lastly, one participant said that they maintain relationships through word-of-mouth, while another participant said that they never let contractors go and continue to keep working with them.

(IBQ-25) Do you limit your search for potential offerors to traditional DoD and government contractors?

This question was posed to determine a given organization's willingness to go to non-traditional sources in order to get new ideas and solutions to urgent problems. Two participants did not provide a response for this question due to time constraints of the interview. The remaining eight participants all stated that they do not limit their search

for potential offerors to traditional DoD and government contractors. The feeling from the responses to this question is that limiting a search of potential contractors in any way might limit the number of innovative ideas to solve a particular problem. Additionally, small businesses might have more organizational flexibility or agility than larger corporations, so excluding them could limit the ability to quickly respond to a need as fast as possible.

(IBQ-26) How long are offerors given to respond to a request for proposal?

The purpose of this question was to determine how long each organization allows for this portion of the early contracting process. One participant did not provide a response for this question due to time constraints of the interview. Four out of nine participants said that the time given to offerors to respond to a request for proposal (RFP) depends but also gave general timeframes including: 1 month, 3-10 days, 90 days, and one said they have used an undefinitized contract action (UCA) in order to get work started immediately. Two participants stated the average time given to their offerors is one month, but one of these participants stated that this timeframe was given with the understanding that the normal level of detail seen in a larger proposal would not be present on the more rapid projects. One participant responded by stating that they provide a couple of weeks. Lastly, two participants said they do not have a standard timeframe.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed a shift away from traditional means of soliciting proposals

from industry such as the request for proposal (RFP). Additionally, it appears that various methods exist to maintain relationships with contractors and that potential offerors are not limited to traditional DoD/government contractors. Lastly, while the average timeframe cited by most participants to receive an initial proposal from the contractor is 30 days or less, the actual time depends on the project and its urgency. A summary of the themes in this section are captured in Table 8.

Table 8. Industrial Base Themes

Industrial Base (Q23-Q26)			
Themes	# of Responses	% of Participants	# of Participants
Non-traditional methods for soliciting proposals to industry are utilized over standard methods such as the Request for Proposal (RFP)			
- Broad Agency Announcement (BAA)	5	50%	10
- Pick up telephone and call contractor	2	20%	10
- Basic Ordering Agreement (BOA)	1	10%	10
Relationships with previous contractors are maintained through various methods			
- Other (studies, word-of-mouth, continue to keep working with core group of contractors)	3	30%	10
- Informal emails or mailing lists	2	20%	10
- Basic Ordering Agreements (BOA)	1	10%	10
Potential contractors are not limited to traditional DoD/government contractors	9	100%	9
The average time to receive the initial contractor proposal depends on the project and its urgency, but can be as little as 30 days or less			
- No specified time; depends	4	44%	9
- 30 days or less	4	44%	9

Incentives (I):

(IQ-27) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?

This question was posed to determine if anything was being done to reward employees in the government environment for reducing project timelines. Four of ten participants said they do not provide specific incentives to their personnel, and if they do, it is just reminding them of the urgency and importance of what they are doing. Three participants said that they use traditional methods for rewarding a good job such as praise, time-off, and quarterly awards. One participant said that they provide incentives to transition the technology to the customer or program office by identifying a transition partner early. This individual would work with the rapid reaction team to ensure that a given technology could transition into the operational force structure or to a formal acquisition program office with minor delays. One participant also said they provide incentives to their employees through increased flexibility and authority to get the job done without a lot of supervision. Lastly, one participant said they were not sure if any incentives were provided to their personnel to encourage reduced cycle times.

(IQ-28) With which innovative contractual incentives have you had success?

The purpose of this question was to determine if there are innovative contractual incentives in use that help these organizations succeed in rapidly responding to urgent customer needs. Four out of ten participants stated that they have not had success with identifying or using any innovative contractual incentives. One participant out of this group stated that this was partially driven by the fact that their group of contractors

understand that if they don't meet the specified time and performance deadlines, then the project will stop or be killed. The remaining six participants each had a different response that included: a Dash-six Justification and Approval (Dash-6 J&A), Cost-Plus Award Fee (CPAF) contracts, grants, Cost-Plus Fixed Fee (CPFF) contract for small business, Firm Fixed Price (FFP) contracts, event-driven Contract Line Item Numbers (CLINs), an employee incentive fee where the individual doing the work gets the incentive vice the company as a whole, and pre-positioning of an agile contract vehicle or acquisition strategy.

(IQ-29) How much autonomy do employees have to help new ideas flourish?

The purpose of this question was to measure how much leeway is given to personnel in these organizations to encourage the progression of new ideas. One participant did not provide a response for this question due to time constraints of the interview. Another participant said that their organization encouraged new ideas and forward thinking by encouraging employees to question everything, but that they were limited in some ways by the "process." The remaining eight participants said that their employees have a significant amount of autonomy, but did not elaborate on how that was demonstrated.

Summary

The major themes and patterns uncovered in analyzing the responses in this section of questions revealed that very few, if any, innovative incentives are being offered to employees in the government context. Additionally, there appears to be a variety of organizations that are involved in rapid reaction projects that have had success

with non-traditional, or innovative, contractual incentives. Lastly, there was an overwhelming sense that employees working in the rapid reaction environment are given a great deal of autonomy to help new ideas flourish. One participant cited an example of this by describing how employees are able to “sell” a new idea to leadership and, if approved, initiate a new program. A summary of the themes in this section are captured in Table 9.

Table 9. Incentives Themes

Incentives (Q27-Q29)			
Themes	# of Responses	% of Participants	# of Participants
Few innovative methods for motivating employees exist in the government			
- Remind personnel of urgency and importance of what they are doing	3	30%	10
- Traditional methods such as time off, praise, and awards	4	40%	10
- Increased flexibility and authority	1	10%	10
Some rapid reaction organizations have had success with various innovative contractual incentives	6	60%	10
Employees working in organizations doing rapid reaction projects have a significant amount of autonomy to help new ideas flourish	8	88%	9

Summary

This chapter summarized the responses given for each question and displayed themes that were observed by the researcher. Interview participant’s responses were broken down into similar phrases and words in order to uncover high-level themes and patterns across multiple questions within a section. The general themes will aid in

answering each of the investigative or overarching questions of this research and in identifying overarching conclusions, while the more specific themes identified in the six critical enablers/areas will be useful in identifying specific recommendations for organizations looking to refine their ability to rapidly respond to urgent needs. Chapter V will present a series of conclusions based on these results as well as recommendations and limitations of this research.

V. Conclusions and Recommendations

Overview

This chapter will summarize the conclusions reached in this research as a result of the literature review, interview process, and data analysis effort. The data and themes captured in Chapters II and IV helped in answering the overarching investigative questions and to formulate best practices and methodologies that answer the primary research question. This research effort also sought to identify specific measures or practices the Air Force Research Laboratory (AFRL) could consider in order to refine their current approach to rapidly responding to urgent needs. In addition to these specific recommendations, this chapter will also describe research limitations and areas for future study.

Results

The data obtained through the literature review and interview process aided in drawing a number of conclusions and formulating several best practices that will help those government organizations answering urgent needs to operate more effectively. This section is divided into an overarching set of conclusions that specifically address the researcher's main investigative questions followed by a series of best practices, or more specific conclusions, that were observed across the ten interviews.

Conclusions

The literature review and interview portions of this study provided the information to address the first investigative question: *Is the government succeeding in rapidly delivering new capabilities?* While no specific interview question addressed this topic, there was evidence to suggest that the government is succeeding at acquiring things more rapidly than it has in the past. As stated in the literature review, the government has seen development times average 10 to 12 years over the last few decades despite numerous efforts to streamline the acquisitions process. Within each set of interview questions (HRQ-7 – IQ-29), innovative and creative measures were identified that enable the organizations involved in rapidly responding to urgent needs to beat historical acquisition cycle times and deliver new technologies and capabilities in a matter of weeks or months. While this reduction in cycle time varied depending on the actual need or requirement, 60% of those organizations interviewed are delivering new products and capabilities within six months to a year after receiving the initial urgent request; some are actually delivering capabilities in a little as two weeks. Part of this reduction in cycle time can be attributed to the small size and relatively low level of complexity of most rapid reaction projects, but these organizations must still struggle with how to overcome the historical roadblocks identified in the literature review.

While this data shows positive signs that the government is succeeding at delivering capability quickly, there is still more room for improvement as organizations addressing urgent needs mature and the mindset towards more rapid acquisition and development continues to evolve across every level of government procurement. One area for improvement highlighted by the literature review is ensuring that a standard

method for disseminating, classifying, and tracking urgent needs is implemented across the government. While there is very top level guidance on how to route needs through the services, many of the organizations responding to urgent needs still receive them through various methods as seen in the responses to (SEQ-16). Tracking what is being done across the services and various other government agencies becomes difficult and increased communication/coordination could help strengthen the government's ability to rapidly respond to urgent needs even further.

The next investigative question addressed road blocks and specifically stated: *What are the road blocks to reducing the rapid reaction cycle time?* General interview question five (GQ-5) and numerous government studies included in the literature review addressed this investigative question directly, with available budget, bureaucracy, and the contracting process cited as the most significant roadblocks. These factors appeared in multiple forms throughout the interview questions, but the availability of funds and the traditional Planning, Programming, Budgeting, and Execution (PPBE) process were factors that were specifically cited as problems in the responses to questions (BQ-17) and (BQ-18). Only 30% of the participants who were interviewed said that funding was readily available to their organization to pursue new ideas and 70% of the participants said they must obtain funding via the Planning, Programming, Budgeting, and Execution (PPBE)/Program Objectives Memorandum (POM) process either directly or through their organization. Several participants compared the way the government currently apportions money to a "cold war" mentality, or way of doing business, and suggested that measures needed to be taken in order to streamline the process. Bureaucracy was cited as a roadblock primarily within the context of the multiple levels of review and approval

that are typically seen in government acquisitions. Participants cited that while they might be able to quickly derive a solution to a problem, they aren't always able to quickly deliver a solution because of the politics and bureaucracy inherently involved in processes such as the budgeting process. Additionally, a number of participants cited that no matter how quickly they could deliver a solution to a problem, that there are steps that must be followed in the contracting process that add additional time to answer urgent needs. No specific areas of the contracting process were mentioned for improvement, but 60% of those participants interviewed said they use flexible contract vehicles such as the Broad Agency Announcement (BAA) or Basic Ordering Agreement (BOA) in order to start contractors working as quickly as possible.

The next investigative question aimed to answer whether or not barriers existed within the government environment that prohibited the effectiveness of rapid reaction approaches. The question was specifically stated as: *Are there institutional barriers that limit the effectiveness of rapid reaction approaches?* After reviewing the data obtained during the interview process, there are signs that institutional barriers such as the formalized bureaucracy and budget process do exist. However, the organizations who were interviewed are succeeding at limiting the effects of these barriers primarily because of the personnel they hire and the authority given to them by their leadership. While each of these organizations falls under certain statutory and regulatory laws, they all recognized a shift in the mindset of senior leadership towards changing the way the government currently approaches acquisitions and becoming more agile in meeting emerging and asymmetric threats. This shift in mentality provides each organization with the flexibility and backing needed to overcome hurdles and deliver products faster than

ever before. It was stated that many of the participants are given the leeway to selectively man their organizations with individuals who not only possess the right skill mix and background, but with more senior individuals who have the right professional certifications and experience across the technical and program management career fields (HRQ7 and HRQ9). Of the participants interviewed, 60% said that they look for people with operational or program management experience and all participants said that they look for individuals with a technical and/or program management educational background with at least a level two, if not level three, certification in program management. Having more senior personnel with diverse backgrounds enabled these organizations to operate in the reduced manpower environment with a significantly smaller staff. Per the responses to human resources question number ten (HRQ-10), the typical rapid reaction team was very small, with the average team consisting of four to five people.

In addition to having the right personnel in place, the participants interviewed had an extreme amount of autonomy and support granted to them by their leadership. As seen in the multiple responses from questions (GQ-1), (HRQ-12), (SEQ-15), (IQ-27), and (IQ-29), this autonomy was passed down to the organization's employees and fostered an environment where creativity and innovation were encouraged. These organizations also exhibited very horizontal or flat organizational structures and had very streamlined, or short, chains of command to the most senior leadership within their agency or service. This streamlined reporting chain facilitated faster approval and response times and allowed the participants to operate at a much faster pace than the traditional program office or laboratory.

The final investigative question was: *Is there a well defined and documented strategy for meeting urgent needs being implemented across the government (inside and outside of the DoD) that leverages all of the current rapid reaction processes?* The purpose of this question was to see if a common process or methodology was being employed across the government that enabled organizations addressing urgent needs to operate more efficiently. After reviewing the results of the interviews, it is apparent that there is no standard process being followed. In some cases, the organizations interviewed did not have a process to facilitate rapid responses and relied on the innovativeness of their project leads and the established relationships with their contractors to facilitate faster cycle times. Conversely, other organizations had charters or processes established that allowed their employees to have a better understanding of what the operating principles of the organization were as well as the overall objectives. General question three (GQ3) addressed this topic specifically and each participant had a separate and distinct view of their processes, with responses ranging from nothing at all, to close proximity with all the critical players in the process, significant interaction with the user, speed, and entire sub-organizations dedicated to a “skunk works” mentality for addressing problems. Another theme that emerged from the interview results was that no standard systems engineering approach or focus is being implemented across the organizations that were interviewed. Out of ten participants, 50% said that systems engineering plays a reduced role in their ability to rapidly deliver solutions to their customers. Although 30% of the participants that said systems engineering plays a significant role in their organization’s rapid reaction process, they acknowledged that it was more of a non-traditional role than what is seen on larger, more traditional programs.

Best Practices

In addition to the overarching conclusions mentioned above, a series of best practices were identified from the recurring themes that resulted from the interview portion of this research. These best practices could also be considered more specific conclusions but serve as guidelines for any government organization looking to enhance their ability to rapidly respond to urgent needs.

The first best practice that was observed is that early customer interaction and feedback is essential in a rapid environment. In analyzing the responses to questions (GQ-3, GQ-6, and SEQ-16), communication with the customer was cited multiple times as a significant factor contributing to their ability to rapidly respond to customer needs. In responding to question (GQ-6), 40% of the participants cited intense customer interaction and feedback as their organization's best practice to meeting urgent needs. In addition to gaining a thorough understanding of what is actually needed, frequent interaction with the customer induces timely feedback into the development or acquisition cycle, thereby resulting in a product or capability that better matches what the customer really needs. In order to facilitate more rapid communication between the customer and the rapid reaction organization, two of ten participants interviewed said that they actually have personnel embedded with forward units so that they can gain first-hand feedback regarding the problems and the effectiveness of their proposed solutions.

The second best practice is to establish, nurture, and expand social networks and contacts as much as possible. Because rapid reaction projects represent such a small niche in the overall science and technology (S&T) and acquisition community, establishing robust social networks and contacts across the rapid reaction community

(academia, industry, government, and customers) ensures that new ideas and technologies are being shared as much as possible. From the hiring of new personnel to identifying potential technologies, word-of-mouth communication and simply picking up the telephone proved to be the primary means by which the rapid reaction organizations operate. Of all the participants interviewed, 50% obtain their personnel through word-of-mouth recommendations or social networks. Additionally, 100% of the participants cited face-to-face meetings, networking, and conferences as the primary means they use to collaborate and share information with one another. One of the organizations interviewed even expands their social network to organizations and agencies outside the United States in order to gain insight from the brightest minds and technologies from across the world.

The third best practice is to hire creative and focused individuals with technical and/or program management backgrounds. Of the participants that were interviewed, 100% said that their rapid reaction project leads have a mix of technical and/or program management education and experience. Additionally, two of the participants stated that they try to bring in individuals who have a Level III Defense Acquisition Workforce Improvement Act (DAWIA) certification; specifically program management certifications. Having a strong level of program management experience is vital to rapid reaction projects because of the short nature of the project itself. With timeframes of less than one year, the majority of program leads who start a rapid reaction project see it through to the end. In answering (HRQ-12), 88% of the participants said that their project leads see a project through to completion, i.e., demonstration or transition. If a project lead has only technical experience and no real program management experience,

they might have a more difficult time executing the full phase of the project beyond the early technical portion. All of the participants agreed that hiring the right person can make a significant difference in how fast new products or capabilities can be delivered. Very few of these organizations had formal processes for finding the “right” person for the job and relied on the personal aggressiveness, background, and training of their individual program leads to get the job done. Sixty percent of the participants said that they look for an individual who possesses one or more of the following personality traits: self-starters, creativity, innovativeness, motivation, tenacity, aggressiveness, strong work ethic, and follow through. It was stated multiple times that individuals working in the rapid environment must also have a good understanding of the laws and statutes governing government procurement. This thorough understanding enables a project lead to better understand what leeway they have, if any, in streamlining certain portions of the typical acquisitions process and is valuable in situations where assembling a diverse team is not possible.

The fourth best practice is to develop an overarching acquisition strategy that provides the ability to leverage multiple contract vehicles as well as pre-position critical acquisitions documentation such as justifications and approvals, funding authorizations, and requests for proposals. Sixty percent of the participants cited that they utilized more flexible and non-traditional contract vehicles to quickly start contractors working once a requirement had been received such as the Broad Agency Announcement (BAA) or Basic Ordering Agreement (BOA). Sixty percent of the participants also said that they had success with some form of innovative contractual incentives such as the employee incentive fee. Additionally, one organization stated that it has been very effective at

having certain acquisition documentation already drafted prior to the arrival of a requirement; this approach enabled the organization to “fill in the blanks” and press forward. The way this organization was able to be so successful at pre-positioning certain documentation was the intense communication they had with both their customers and industry counterparts. One organization also stated that getting as early a look at the urgent need as possible also facilitated their ability to not only understand customer requirements, but to quickly start a contractor working as soon as a requirement was formally transmitted to their organization. While none of these organizations stated that they had a formal acquisition strategy in writing, one did have a charter that they use to help document their mission and overall approach.

The fifth best practice is to maintain as small a team as possible. Of the nine participants who responded to (HRQ-10), 55% stated that their average team size was only 4-5 people, but two of these participants said they could be as large as 10 to 15 individuals. Two of the participants also stated that they have seen team sizes as small as one. It is important to note that in order to have team sizes this small, best practice number three must be followed by hiring experienced individuals with the right education, background, and personality for the job. A number of the participants stated that they look to establish diverse teams with a mix of contracting, budget, technical, and program management experience.

The sixth best practice is to constantly encourage creativity and provide autonomy to employees. As seen in the literature review and the responses to (GQ-1), (GQ-2), and (IQ-29), innovation and the ability to think creatively are critical attributes in the rapid reaction environment. When asked what role innovation played in their organization’s

ability to rapidly respond to customer needs, all interview participants said that it was a significant factor. One of the participants said it was their number one goal in helping to meet customer needs as quickly as possible. While each participant had a different opinion of how innovation or creativity was encouraged, one participant said that they consulted a leading commercial company called Applied Minds in order to find specific measures they could implement in order to become more innovative. Their organizational changes included eliminating cubicle walls and fostering a working environment where employees are encouraged to question everything. Along with encouraging creativity and innovation, leadership must also make it understood that failures will happen and are considered acceptable. When working on extremely short timeframes and, in some cases, on new technologies or capabilities, not everything will be perfect. Leadership must accept the fact that there will be failures and that these items or capabilities might not be perfect. A number of participants also said that their organization approaches a problem with the understanding that there are no wrong questions and that every idea is a good one. Part of fostering this environment depends on the level of freedom and responsibility employees are given to get a job done. Eighty eight percent of the participants interviewed on question (IQ-29) said that they feel their employees have a significant amount of autonomy and are given ample room to execute their projects and help new ideas flourish. Similarly, there were several participants that felt their employees were encouraged to question everything; in other words, they were encouraged to speak out when they thought a process, practice, or rule was either unnecessary or prohibiting the effective operation of their organization's mission.

Recommendations

Based on the conclusions and best practices previously identified, several recommendations can be offered specifically targeted to the sponsor (Air Force Research Laboratory (AFRL)). The first recommendation is to establish an entity within AFRL that is solely committed to addressing urgent needs. This does not need to be a separate directorate, but it does need to be an autonomous unit/organization capable of selectively hiring the right personnel and implementing a unique acquisition strategy that might not be accepted in other portions of the research laboratories. This entity should establish a minimum requirement for all project leads to be level three program management certified and it should create a charter that will aid in describing their mission both within the research laboratories and to outside customers and participants in the rapid reaction community. The ability for this entity to request waivers when necessary, obtain funding, and have a direct line of communication to the most senior leadership at AFRL is critical. AFRL should work with senior leadership to develop a separate funding source for rapid reaction projects so that new ideas can be pursued by this entity without the need to tax or take money from other programs across the organization. This entity would also be seen as the process owner for CP3-type efforts. It is this researcher's opinion that a generic core process that is applied across the laboratories is not as efficient as a separate organization that assembles the needed expertise when required. This opinion is reinforced by the fact that none of the participants interviewed had a standard process for addressing urgent needs and were all stand alone organizations that had the autonomy needed to make radical change and innovation a reality. The fact is that rapid reaction

projects are a very small and unique subset of the typical acquisition and S&T programs and require a unique culture, operating environment, and procedures.

The next recommendation is to develop an internal training program within AFRL where rapid reaction leads and team members are given an in-depth exposure to the various laws and statutes governing government procurement (i.e., Title 10, Federal Acquisition Regulations (FAR), etc.). While many technical experts are familiar with the FAR and Title 10, not all have had experience in dealing with situations that require an interpretation or detailed understanding of what those laws actually state. Additionally, today's military is operating within a reduced manpower environment; therefore, the goal of keeping the size of rapid reaction teams small might result in teams with no contracting experience. Several participants stated that they were able to achieve success in such small numbers because their leads had a good understanding of what was allowed and not allowed according to the law. Overall, this kind of training would be beneficial to the S&T rapid reaction lead because it would give them the ability to better understand how to streamline the contracting process, which was one of the significant roadblocks cited by the interview participants.

Another recommendation would be to create a partnership with the Air Force Center for Systems Engineering to investigate 1) the appropriate level of systems engineering at AFRL on rapid reaction type efforts and 2) a tailored systems engineering approach/process to be used when addressing urgent needs in order to facilitate technology transition and enhance operational utility. It was clear from the responses given to SEQ-13 through SEQ-16 that there is no standard emphasis being placed on systems engineering among the organizations that were interviewed. Some viewed

systems engineering as vital to their process for addressing urgent needs while others did not. It is important for AFRL to consider systems engineering and the role it plays in facilitating technology transition, which has been a historical problem for the S&T community. Additionally, systems engineering considerations are also important when answering an urgent need where a solution is either a component of a larger system or part of a larger capability. If system engineering principles are ignored or reduced, the possibility exists of delivering a product or capability that might need to undergo significant rework once transitioned, might not be supportable, or might not meet the needs of the customer.

The last recommendation is to strengthen the social network and contacts with the rapid reaction community (academia, industry, and government). One method of doing this is to establish points of contact at each of the organizations included in this research, as well as any other similar organizations. Having the ability to tap into resources from across the country and across various organizations not only helps bring in subject matter expertise when required, but it also helps in identifying potential technologies or solutions that might not have otherwise been discovered. One thing that became evident after the interview process is that there is room for increased coordination among government agencies and organizations. All of the interview participants stated that they try to coordinate as much as possible with experts across academia, industry, and other government agencies; however, there was no standard way of doing so. Methods of collaboration included face-to-face visits, broad solicitations, forums, meetings, symposium, social networks, and word-of-mouth recommendations. One way to increase the social network at AFRL would be to establish a central database in which promising

technologies are cataloged along with a web-based portal, which could be used to disseminate needs to industry as well as collaborate with members from all areas of the rapid reaction community. One participant cited the use of a similar database with positive results and said that it also assisted in letting other rapid reaction partners know what projects and technologies they were interested in. Another way to increase the collaboration network at AFRL would be to host a quarterly rapid reaction themed symposium in which all of AFRL's rapid reaction partners are invited to share their ideas and issues with the larger community. This symposium would not be limited to DoD only partners and would include outside agencies as well.

Limitations of Research

There were several limitations that were observed throughout this research project. While conducting the literature review and the initial process of identifying interview participants, the small size of the rapid reaction community became very clear. There are only 10 to 15 organizations that are currently addressing urgent needs, and even fewer who are meeting those needs in the 6 to 9 month timeframe. Additionally, these organizations span multiple services and agencies across the government; each has its own security protocols and concerns, which makes collaboration difficult. Some of the original organizations that were on the list of potential interviewees were not interviewed due to security constraints or the availability of the identified point of contact.

Another limitation of this study was that not all of the organizations interviewed fall under the same set of procurement rules and regulations. Some of the organizations

operate under specific waivers and authorizations that enable a more streamlined approach to be taken when addressing urgent needs. However, the common factor among all of the interview participants is that they are all operating within a government procurement environment and must all deal with the historical roadblocks identified in the literature review.

The last limitation observed was that the nature of most urgent requirements makes them classified. This made comparing actual projects difficult and made it hard to obtain interviews with some of the intended participants. Additionally, the lack of rapid reaction project data forced the researcher to compare project timeframes with more traditional/larger procurement efforts.

Areas for Future Research

One area of future research should focus on addressing ways to improve the budget and contracting process in the context of a rapid reaction environment. Case studies of specific rapid reaction projects could also be documented and compared in order to better understand how various organizations approach these two road blocks as well as draw comparisons between overall project cycle times. Additionally, investigation into tailoring the traditional view of systems engineering to a more rapid application is necessary. To date, there is no consensus on the amount of systems engineering focus being applied to rapid reaction projects. It largely depends on the organization and the actual need. Lastly, investigation into how to foster more efficient communication among the entire rapid reaction community is needed. This could be accomplished by investigating various forms of web-based collaboration tools as well as

defining an overarching process for routing needs to every organization chartered with responding to urgent needs.

Summary

The purpose of this research effort was to examine areas across the government where rapid reaction problems are being addressed to identify a list of best practices or methodologies that could be applied to the Air Force Research Laboratory (AFRL) and similar organizations looking to reduce the time it takes to respond to urgent customer needs. In doing so, it was noted that the government is making progress towards getting capability to the field more rapidly. However, there is still room for improvement in areas such as streamlining the contracting process and developing an overarching process for disseminating and receiving urgent needs across all agencies and levels of the government. Additionally, several roadblocks were identified that require further attention and research. Factors such as personnel experience and background, availability of funding, technological reach, social networks, and individual autonomy play critical roles in shortening the time it takes to deliver new technologies or capabilities to the user.

Appendix A: Enablers, Issues, & Recommendations (DSB Vol IV, 2007:51-82)

<i>Critical Enablers</i>	<i>Current Issues</i>	<i>DSB Initial Recommendations</i>
Human Resources	Declining number of science and engineering related degrees; aging S&T and acquisition workforce; outsourcing; inexperienced new workforce	1.) Dedicated career development organization for technical workforce 2.) Revision of the existing authorities that provide for rotating industry and government personnel needs 3.) Retool DSMC and DAU to emphasize lessons learned/best practices 4.) Initiate sustained outreach program aimed at attracting highly qualified scientists and engineers
Systems Engineering	Post Col War manpower ceilings; limited Government SE staffing and empowerment; outsourcing function to industry; increased system-of-system complexity	1.) Provide SE the responsibility, authority, and, accountability needed to perform 2.) manage systems-of-systems engineering at the proper level 3.) rebuild the SE workforce 4.) research ways to develop better SE tools 5.) assess SE quality using independent "red teams"
Budget	Lack of funding flexibility; inadequate fiscal plans for the out years	1.) Establish finding (\$3B) in the defense budget for a rapid fielding organization and allow discretionary funds in the execution year 2.) Require budgeting to realistic costs and restore practice of establishing management reserves 3.) Budget RDT&E funding for future spirals through the FYDP 4.) Sustain S&T funding at the 2007 budget level in order to maintain technical superiority
Technology Reach	Declining rate of U.S. investment in R&D as compared globally; shift in U.S. R&D investments from research to development; limited government R&D investments in biological and social sciences; transnational threat that has greater access to new technologies; reduction of U.S. industry IR&D rates; lack of foreign language skills of U.S. scientist and engineers and its impact on research into foreign journals or conferences; little collaboration across DoD organizations	1.) Establish DDR&E "prospecting" office to encourage application of commercial and foreign technology as well as strengthen the communication among departments 2.) Re-establish the DD 1498 databases so the DoD S&T activities and personnel can be readily identified 3.) Greatly expand the use of "Other Transaction Authority" (OTA) and other means to encourage industry to do business with the Government
Industrial Base	Shrinking number of prime defense contractors has narrowed field and decreased competition; vertical integration within remaining firms can stifle benefits of competition; short-term focus of the industrial base	1.) The DoD needs to assert its responsibilities to ensure warfighter technological superiority and to understand and encourage the health of competition and innovation 2.) Industry needs to better position its investments towards future warfighter needs
Incentives	Incentives are not aligned with desired outcomes; current ways of transitioning technology have become dysfunctional; current acquisition processes do not emphasize deploying technology to operating units in the shortest possible time and shortening the time from concept to operational employment	1.) Allow successful contractors to continue the next spiral of a project with minimal competition and if not, re-compete it 2.) Allow government managers to remain in place and aid transition to the operational user by deploying with the initial operating capability and bringing back lessons learned concerning product fixes and improvements

Appendix B: Glossary

Abbreviations and Acronyms

- ACTD -- Advanced Concept Technology Demonstrator
- ADM -- Acquisition Decision Memorandum
- AFCC -- Air Force Component Commander
- AFRL -- Air Force Research Laboratories
- AFI -- Air Force Instruction
- AFMCI -- Air Force Materiel Command Instruction
- AFRL -- Air Force Research Laboratory
- AOR -- Area of Responsibility
- BOA -- Basic Ordering Agreement
- BAA -- Broad Agency Announcement
- C-MNS -- Combat Mission Needs Statement
- CCD -- Combat Capability Document
- COTS -- Commercial Off-the-Shelf
- CJCSI -- Chairman of the Joint Chiefs of Staff Instruction
- CPD -- Capability Production Document
- CP3 -- Core Process Three
- CSAF -- Chief of Staff of the United States Air Force
- DARPA -- Defense Advanced Research Projects Agency
- DSB -- Defense Science Board

FAR -- Federal Acquisition Regulation

GWOT – Global War On Terrorism

ICD -- Initial Capability Document

IOC -- Initial Operational Capability

IPT -- Integrated Product Team

IRB -- Internal Review Board

iSUN -- Innovative Solutions for Urgent Needs

JCIDS -- Joint Capabilities Integration and Development System

JFC -- Joint Forces Commander

MAJCOM -- Major Command

NaIL -- Naval Innovation Laboratory

NGA -- National Geospatial-Intelligence Agency

OEF – Operation Enduring Freedom

OIF – Operation Iraqi Freedom

ONR -- Office of Naval Research

OPR -- Office(r) of Primary Responsibility

PMD -- Program Management Directive

POM -- Program Objective Memorandum

PPBE -- Planning, Programming, Budgeting, and Execution system

QRC -- Quick Reaction Capability [obsolete]

RCO – Rapid Capabilities Office

REF – Rapid Equipping Force

RRAC -- Rapid Response Assessment Council

RRP -- Rapid Response Process

S&T -- Science and Technology

SECAF -- Secretary of the Air Force

SME – Subject Matter Expert

TRL – Technology Readiness Level

UNR -- Urgent Need Request

USSOCOM – United States Special Operations Command

WMS -- Wartime Materiel Support

WRAP – Warfighter Rapid Acquisition Program

WUN -- Warfighter Urgent Need

Appendix C: Human Experimentation Requirements Exemption Notice



DEPARTMENT OF THE AIR FORCE
AIR FORCE RESEARCH LABORATORY
WRIGHT-PATTERSON AIR FORCE BASE OHIO 45433

MEMORANDUM FOR

FROM: AFRL/Wright Site Institutional Review Board

SUBJECT: Request for exemption from human experimentation requirements

1. Protocol title: Enhancing Quick Reaction Capabilities: Investigating methodologies and best practices for rapidly inserting technologies to meet urgent needs.
2. Protocol number: F-WR-2007-0087-E
3. The above protocol has been reviewed by the AFRL Wright Site IRB and determined to be **exempt** from IRB oversight and human subject research requirements per 32 CFR 219.101(b)(2) which exempts "research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior."
4. This exemption applies only to the requirements of 32 CFR 219, DoDD 3216.2, AFI 40-402, and related human research subject regulations. If this project is a survey, attitude or opinion poll, questionnaire or interview, consult AFI 36-2601, Air Force Personnel Survey Program, for further guidance. Headquarters AFPC/DPSAS is the final approval authority for conducting attitude and opinion surveys within the Air Force.
5. The IRB must be notified if there is any change to the design or procedures of the research to be conducted. Otherwise, no further action is required.
6. For questions or concerns, please contact the IRB administrator, Helen Jennings at (937) 904-8094 or helen.jennings@wpafb.af.mil OR Lt. Douglas Grafel at douglas.grafel@wpafb.af.mil or (937) 656-5437. All inquiries and correspondence concerning this protocol should include the protocol number and name of the primary investigator.


MICHAEL RICHARDS, LT COL, USAF, MC, FS
Chair, AFRL/Wright Site IRB

Appendix D: Interviews

Primary Research Question: Are there innovative methodologies/best practices being implemented within various levels of the Government where rapid reaction projects have been successfully demonstrated that could be cross-pollinated to the DoD S&T community, and specifically AFRL, in order to refine the current processes to address urgent warfighter needs and reduce the time it takes to field new technologies?

Investigative Questions:

- 1.) Is the government succeeding in rapidly delivering new capabilities?
- 2.) Are there institutional barriers that limit the effectiveness of rapid reaction approaches?
- 3.) What are the road blocks to reducing the rapid reaction cycle time?
- 4.) Is there a well defined and documented strategy for meeting urgent needs being implemented across the government (inside and outside of the DoD) that leverages all of the current rapid reaction processes?

Research Sponsor: Headquarters Air Force Research Laboratory (HQ AFRL)

Interview Questions:

<i>Area/Enabler</i>	<i>Question</i>
<i>General Questions</i>	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	4.) What is your average time from concept to working prototype?
	5.) What are the main roadblocks to quickly delivering capability?
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
<i>Human Resources</i>	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	8.) What measures are used to train and retain personnel within your organization?
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	10.) What is the optimal team size for a rapid reaction project?
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e "quick-pull" knowledge capability?
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	18.) What process do you use to obtain funding for your rapid reaction projects?
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	26.) How long are offerors given to respond to a request for proposal?
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?
	28.) What innovative contractual incentives have you had success with?
	29.) How much autonomy do employees have to help new ideas flourish?
	Note: The enablers/areas on the left hand side are taken from a Feb 2007 DSB study and represent areas they postulate will be critical to maintaining the United States' ability to effectively combat emerging threats and reducing the time it takes to field new capabilities. Items in bold are questions I will ask every interviewee and the others will be used as time permits. No identifying personal or organizational information shall be revealed as part of this research without consent.

Interviewee: **DARPA (Tactical Technology Office) - Interview #1**

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints. In order to protect the identity of the participant or the technologies and customers they work with, certain items have been omitted and replaced with "XXXX" where appropriate.

Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	What roles does innovation play...it's interesting the way you phrase it. Our organization's goal is to develop and demonstrate technologies. We don't field weapon systems; that's the Service's role. Our job is, as our Agency director describes it, to remove the technical excuse. So we are in fact looking at exclusively demonstrating new technologies and innovations. That is at the core of our mission. Not that innovation enables us to do it. The processes are focused on supporting innovation and new technology development and demonstration. One of the things that helps us do that is that we are not as concerned with incorporating into our efforts the systems engineering of the entire product life cycle. So, what makes us more agile is that we do, in fact, ignore some things by design and when we succeed that often leads the transition customers a little disappointed that we've left some things on the table, but because the percentage of things that we succeed with is small, on balance, it is the right decision to make. We don't burden ourselves with thorough systems engineering of the life cycle on day one because it may not work, so that would not be a good investment.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	One is that there is an open BAA, and our role is that we are open to submittals from the outside. There is a huge burden to respond to those, and the majority of those are either already underway because they are not aware of what we are up to, or they are not innovative, but one process is this open broad agency announcement. Effectively it is annual, or there is a new one that comes out annually, so we have this open invitation for ideas from the outside and that fosters the recognition that not everything is invented here, actually very few of what we do is embedded internally. Second process is that we have a very small staff with high turn over, so there is almost no concern about career agendas because people know they are not staying no matter what, so its not about the individual, it's about the technology. A third process is very highly agile with a high percentage of discretionary funds. I think the most valuable thing is the willingness to invest in something almost immediately and the willingness to cancel something almost immediately. The infrastructure costs of start up and shut down are so small because everyone recognizes that that's how we operate, so it puts performers at risk, but it also gives them high incentive, and there's a premium. Another one is not a process, but it is really my perception of what the environment is, we are highly focused on rate. We're rate limited, not funding limited, so nothing ever stretches out until there's adequate funding; everything is done as rapidly as possible; if there isn't sufficient funding isn't done and that's about the agility. If it needs more funding, and it's important, it pulls from something else of lower importance. If it needs money and it's not that important, it gets killed in a heartbeat. There is no peanut butter jelly spreading of the funds.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	4.) What is your average time from concept to working prototype? (i.e. months, years, etc?)
	Depending on the size, I'm talking about the Tactical Technology Office, which tends to work on systems, aircraft, spacecraft, components, not basic science work, that typically, we have a one year first phase which gets us to a PDR and there will be a six month ceiling in advance, and then another year to 18 months takes us to a CDR and then we have a perhaps one and a half to two year program to complete the build, fabricate, integrate, and verify that the system works functional testing and then demonstrate and that's a flight demonstration. And that rate is sometimes limited by the administration - how long does it take to get on contract, waiting around to get those pieces in place. Sometimes it's waiting on a side effect, like if it's a space mission like orbital express, it needs to find launch time, and then the bureaucracies outside our organization for approvals, like release or for launch release, safety of flight review and so on. The internal processes would only be limited by the ability of the performer to do the work. But, typically, major programs have got a one year first phase, one year or 18 month second phase, and a two year third phase, and they follow the 6 month ceiling.
	5.) What are the main roadblocks to quickly delivering capability?
	Ok, if you are going to define delivery and capability as a weapon system to the warfighter, our largest is after we finish a program, or as we approach phase three, which often requires partnership and sponsorship from the Services, which includes POM funding. Because our mission, we are not to be working to existing military requirements, because that's the role of the Services. Our job is to demonstrate new technology, so we often demonstrate something and it will only be capped by the fact that we didn't do the full and robust systems engineering as I mentioned before like supportability, spares, and training, and fully understanding that, and those consequences might cause a re-design of the system, which is why our systems lead to an SDD program and isn't often a completed weapon system, and might be considered a prototype. The technology hits what we call the "valley of death", and that's not my quote, so don't quote me on it, but you'll probably hear it elsewhere, and that is that after demonstrating the technology, it is not immediately picked up because there is no inertia in the Services - the requirements folks haven't been on board, because we're working on something that's not being perceived as a requirement, we're looking at enabling a new capability and the requirements haven't caught up. The acquisition community has a narrow history and background on it because we're not in the Service, we're not a program of record, we're leading to an SDD program. Often the acquisition folks have the duration of an SDD program to decide how they're going to acquire and get the funding in place, so after the technology has been demonstrated, and DARPA puts it on the shelf, there isn't a process or an organization or infrastructure that is necessarily behind it unless there is an individual champion in the Services, often a flag officer, or general officer, who wants to get this out there and experimented with. The OSD TTP Process is an attempt to bridge the gap from the technology demonstration of something very capable right into some kind of experimentation or limited fielding, but that's often slightly older technology because there is a high likelihood it is going to work, it's not clear it's going to work so the user doesn't have to get spooled up if it may not work, and then when it starts to work, the desire is to go put it out there, but the requirements and acquisition community and the funding and all those other administrative activities that go along with other major programs are hitting it completely flat footed.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?

	As I said, the funding agility. The ability to place sufficient funding in very short order is probably the greatest capability, and of course, that comes with the willingness to kill something else so that there's funding.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for? I may not be in the right position to do that, a woman by the name of XXXXXXXXXXXX who I am meeting with at 1030 by the way. Part of it is that the reputation helps, the latitude to propose ideals and sell those ideas is really inspiring. That's really the draw, is that there is funding available to go do innovative things essentially. Among the key requirements is to push an idea...the two, the old two requirements to make a program is that a program manager is willing to sell it to the agency director and leadership - and that the agency leadership is willing to fund it, which involves innovative and DARPA hard and military capability and not being a requirement, and there's a whole lot of those, but the opportunity for that kind of access and that kind of resources actually sells itself. Plus, it's very short - it's not a career. (Interviewer: So everything gets funneled through Dr. Tether?) Yes, that's how Dr. Tether is currently running the agency. Previous agency directors have given more latitude to the office directors, so it's more a matter of current policy and not agency rules, laws, or statutory. It's current policy that goes with the agency director, and even when it doesn't there is more authority with the office directors, it still constitutes discretionary, so regardless of whether Dr. Tether, or the office directors fill that latitude, it's pretty powerful. (Interviewer: Is there a certain trait or background that you look for...i.e program management, engineering background, etc ?) I can't make that decision, right not Dr. Tether does all of the interviews and makes all of the decisions. He would have to answer that...I think in the public you could find, especially now that DARPA is short on program managers and has been publicly advertising, especially if you go to the DARPA tech website, that's what they're hiring and what they're looking for. Now, what's published may not exactly have all the right words or all the details, but that's all we're really free to do; I couldn't say.
	8.) What measures are used to train and retain personnel within your organization? There are orientations, there are support, an number of support staff that are permanent employees like the ADPM, the assistant director of program management in each office, is permanent staff...but there is an expectation that program managers hit the ground running. They are..I was late my second day, I was already late on three programs that I inherited, so it's all...since it's rate limited, there isn't as rigorous a training activity.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	10.) What is the optimal team size for a rapid reaction project?
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
Systems Engineering	13.) What role does systems engineering play in your organization's process for rapidly delivering capability? Our organization is the sponsor, and funds and manages that all funding...not all funding, but the majority of funding only goes to industry performers and we rely on them to do systems engineering of the products and we focus on delivering products and doing demonstrations. Our organization is challenged...one of the things it has given up is a rigorous systems engineering process because our organization relies on people who come in for a short time...so they bring experiences from elsewhere that we don't have that tribal knowledge. We don't retain tribal knowledge, which puts us at risk...it's one of the choices that's made..to have a highly dynamic personnel gives us the benefit of lots of perspectives that we often lose some of the benefits, the rigor of systems engineering, so we've abandoned...I wouldn't say abandoned, but we've chosen to reduce the emphasis on the systems engineering piece .
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization? - - I know you said you don't particularly deal with military needs, so I guess I could re-phrase the question to say "how do you target specific areas you want to invest your time and money in"?
	There are missions, each office has got some initiatives that they have to go and pursue, but we have the latitude to anything if it is a warfighter capability enhancement; dramatic warfighter capability enhancement. DARPA will develop criteria for its programs - very challenging criteria, and each phase of a program is by no means guaranteed...the funding isn't available until after - phase 1, I'll call it "go/no go" criteria, which are internally developed, very challenging - must be met before the funding comes for the next phase, and again that's where the willingness to kill a program if it doesn't meet it's criteria; it often doesn't continue to the next phase. The question had to do with the requirements changing - DARPA , see as the phases are on the order of a year or 18 months, and the criteria used for success are internally developed to DARPA, of course, based on warfighter needs, but they're not based on requirements, per say - they're based on gaps. They're based on gaps where the requirements, even if satisfied, might not fulfill what the warfighter wants to go do, so DARPA will pick some criteria, and our go/no go criteria...we're testing against those within a year, or within 18 months, and as a result, and at that time when we start the new phase, they have the latitude to change the criteria - as a matter of fact, there is almost always a requirement that changed.. sometimes they get more stringent, so the rate at which we work, keeps us from getting out of phase with, I'm going to say, "the customer's requirements". Part of that is, let me just add to it, part of that is as we said we've abandoned some of that systems engineering. Systems engineering says, no, all the requirements, keep them all in mind for the life cycle of the program - and that means you're thinking about things 15 years down the road, and that means that there's the likelihood that they could change on you. Maybe one of the strengths of DARPA is that we don't allow requirements creep during a phase - we finish and then we re-assess.
Budget	17.) Are funds readily available to your organization to pursue new ideas? Absolutely, not to the organization, but within the organization. The organization exhibits great agility and discretion within the organization.
	18.) What process do you use to obtain funding for your rapid reaction projects? And that's - a very flat organization, means there's very few decision makers - we don't go to Tradoc in the Army and we don't go to N88 or N8 in Navy OPNAV to go vet what we want to go do. So it's very shallow and all internal to the organization.

	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects? That's as I said, there's an open solicitation at all times, and we're always soliciting new ideas. (Interviewer: And that would be the BAA?) Yes, BAA, plus the latitude for people to go directly to program managers - a program manager's role is to be available to anyone with new ideas.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry? (communicate, etc.) It's ...I don't think there's anything formal...program managers have regular - are in constant contact to their heart's desire. I don't think there is anything formal - there is a liaison...maybe that's the right answer. There is a full time liaison working in the agency director's office from each Service. There's an Army Colonel, an Air Force Colonel, Marine Corps Colonel, and a Navy Captain - all 0-6's that work for the agency director and their primary responsibility is a liaison to their Service. There are also Service interns and there are fellows - I think fellows come for a year and interns come for three months. There's usually around 10 interns at any given time.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas? (i.e. conference, etc.) We have a meeting every year called DARPA tech, which is where we publicize what we've done and what we're interested in doing. Other than that, each of the offices has open broad agency announcements, and that is open to all offerors, there's no limitation there, and it allows us to accept ideas and to consider ideas, and in the context of fair and open competition, engage in discussion of those ideas without the rigor of a formal RFP process, and really we can't do that because an RFP suggests that you know what you need. We normally use BAAs as opposed to RFPs.
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry? Now a point that's probably not in your questions, but may just be a little color commentary is that agency director very much prefers to fund industry rather than labs because of that valley of death. If industry demonstrates that they can do it, they will have the incentive to go make a product and sell it; Government labs don't have the incentive to go and sell their technology, they have the incentive to show they know how to do it, but they're not going to make products...so, there's a preference to have industry demonstrate the technology so that they will help with transition.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past? It's all related to the fact that we have discretionary funds and the advanced development folks recognize that we're not going to help with transition; we hand off, and the advanced development folks continue to come back to us, of course, seeking investment for their good ideas.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	26.) How long are offerors given to respond to a request for proposal?
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times? I think the answer to that is none...no, the answer is not quite none. There is more emphasis on transition now and the agency director requires, whenever there is investment, to point to what the transition is, but because we're often doing things that haven't been considered by the requirements folks, you know like autonomous engagement by UAVS...no one's going to let a UAV decide and fire weapons today - that's a rules of engagement issue the Services wouldn't do, but DARPA's role is to make the technology available so the Services can make that choice. We have to identify the transition customer. Often we need a letter of agreement or letter of intent from a transition customer saying that they like this and it would provide them capability, and then as we get to phase three, often, there's a requirement that we have an MOU or an MOA signed by a transition customer that says that if this is successful, that we will POM funds. So that will...I wouldn't say accelerate, but at least it increases the likelihood that there's some transition customer looking for this.
	28.) What innovative contractual incentives have you had success with? Incentives toward what? (Interviewer: Facilitating shorter overall cycle times? Is there a certain contract vehicle such as the BAA or are there clauses or other incentives that you use with your contractors to facilitate a more rapid response?). You know, intellectual property rights are an issue. The Government will like unlimited rights, or unlimited use rights, but sometimes vendors would like to protect that, protect their rights, and that is one of the incentives. Mostly, it's the fear that if we don't meet their time and performance deadlines, the program will just stop. So, inherent in the way we do business is the rate limit, and the rate incentive. We leave it to them for transition...again, we don't concern ourselves with transition, per se, there is the belief that in doing, that this technology will be of value and will transition itself. And there's many examples of great technology that doesn't transition - sometimes for technical reasons, sometimes for administrative or political reasons.
	29.) How much autonomy do employees have to help new ideas flourish?
<i>Wrap-up</i>	Sir, I appreciate your time, that's all the questions I have...can you recommend another organization or person I should talk to on this topic at DARPA in the Rapid Reaction Initiative Office? XXXX responsible for rapid reaction initiative, or XXXX. They typically deal with more mature DARPA technologies and operate on much shorter timeframes like six months for actual hardware.
	Are you ok when I try to summarize my results that I reference your office? Response: yeah, that's ok. I don't think I've given you anything that's not in the public domain...I've just summarized it based on your questions.
	Thank you very much sir...happy holidays.

DARPA Interview #2

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints.

Area/Enabler	Question
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<i>General Questions</i>	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	That's what we do - all we are is innovation.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	Reach out and discover technologies that we already developed. Not coming up with something brand new. Getting it out there.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	DARPA is not about process. There is no process. We get a hold of people who care and get the job done. Organizations who develop processes usually fail. We strive to understand the technology, work with transition partners, and develop an approach to get it in the hands of the warfighter. There is no checklist.
	4.) What is your average time from concept to working prototype? (i.e. months, years, etc?)
	Depends on the technology. There is no average time. We're into innovative R&D.
	5.) What are the main roadblocks to quickly delivering capability?
	The "not invented here mentality" and lack of transition funds. Lack of a written requirement.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
	We understand the need.
<i>Human Resources</i>	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	We look for people that have ideas. We recruit and everyone goes through a personal interview with Dr. Tether before being hired.
	8.) What measures are used to train and retain personnel within your organization?
	Everyone is a temporary employee, meaning they are only here on a 4 year contract. This is vital because it forces no personal ownership of the technology...people do the best job they can while they are here.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	All technical.
	10.) What is the optimal team size for a rapid reaction project?
	N/A.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	We generally hire temporary science and technology expertise as needed.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Most program manager's do not see a program through to the end.
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	We have tech development efforts and systems engineering plays a role in that, to a degree, if it is a system.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	No, N/A.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	N/A.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization? - - I know you said you don't particularly deal with military needs, so I guess I could re-phrase the question to say "how do you target specific areas you want to invest your time and money in"?
	Visiting the customer or customers call us.
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	POM process.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	Ad hoc. They are funded within the normal processes.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
	N/A.
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	Issue BAA...FEDBIZ and advertize goals.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry? (communicate, etc.)
	they visit us...we visit them.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas? (i.e. conference, etc.)
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	BAA process. A huge amount is done by industry.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	None...each bid stands by itself.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	No.
	26.) How long are offerors given to respond to a request for proposal?
	It depends...whatever the BAA requests.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?

	None. The fact that they are here is incentive enough.
	28.) What innovative contractual incentives have you had success with?
	None. We follow all of the traditional rules.
	29.) How much autonomy do employees have to help new ideas flourish?
	A whole bunch. We are a self-starting organization...very horizontal.
<i>Wrap-up</i>	Sir, I appreciate your time, that's all the questions I have...can you recommend another organization or person I should talk to on this topic? The Rapid Equipping Force (REF) or the JIEDDO office.
	Are you ok when I try to summarize my results that I reference your office? Yes
	Thank you very much sir...I really appreciate your time.

Interviewee: Big Safari

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Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	It is basically the number one priority we have to support the warfighter...we can't always get the 100% solution, but if we can get the 80% solution fielded they can take advantage of it and tell us what's right and what's wrong and we can make it better each spiral.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	Well, a lot of the things we do are based on kind of the desires or feedback the warfighters have and what could make their life better. Let me give you an example from Rover. Rover's innovation, or the idea for it, came from lesson's learned from the early days of OEF and Afghanistan. The AC-130 gunship would go in on a target, and the way they fly their profiles and what not, they were spooking the target if you will, so they were fleeting or disappearing before they could shoot at them, so the idea was, hey, is there any way we could get situational awareness on a target before we get to it and you know kind of have a solution already plotted, to be able to fire as soon as you came up to the target...but, the idea was what if we could get Predator video to us of the enemy on the aircraft, and we were able to do just that. That's where Rover started. It began as something coming from the warfighters, what can we do...solves their immediate problem.... that's really the genesis of it, and then Rover 2 follows right behind that, we had an army green beret show up kind of unannounced and said, hey, we know predator is flying overhead, what can we do to get that video to us on the ground? You know, in a matter of two weeks, he went back to the war with kind of the same solution that was on the gunship, but one for him on the ground with antennas and things he could use. (Interviewer: Ok, so as far as in Big Safari, is there some sort of brainstorming session that you all go through and identify potential solutions before you go to the contractors or is your main methodology just putting a broad announcement out and seeing what they come back with?) Well, you kind of have to understand how Big Safari operates. We're not like a traditional acquisition organization...we have kind of a core group of contractors that we deal with on a regular basis and we are comfortable with them and they are comfortable with us...they know how we operate...and we do things very quick and fast. Now, brainstorming sessions - yeah. An example on Rover folks got around the table and said hey, what can we do. They start thinking and brainstorming and come up with solutions rather rapidly. We have alot of smart folks that work for us - you know the guys with 50 lb brains - they're very innovative; thinking out of the box; and very smart about technology and kind of understand how to put technologies together to get solutions that are desired.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	4.) What is your average time from concept to working prototype?
	Depending on the scope of the project obviously, I'll give you an example with an aircraft that we bought, lots of different sensors, comms gear, and it all had to be integrated on the aircraft and it was delivered in about six months. In the case of Rover, it was done on a weekend...prototype in a matter of two weeks. It's just that we were fortunate there was some technologies, or some hardware that already existed and it was just a matter of putting that hardware together - and the thing you've got to understand about Big Safari is that we don't do alot of R&D stuff - we take some of alot of existing technologies or equipment and maybe find new ways to use that equipment together and integrate things differently. We have tools in place that allow us to move fast , and we have special tools, if you will, that allow us to do business without competition or very limited so that if you have a contractor that can work at capacity and knows what the job is, the he can go ahead and do it without competition.
	5.) What are the main roadblocks to quickly delivering capability?
	Probably the largest one is the concept of having the money to actually go make something . Sometimes you have the idea of how to do it, but the solutions requires actually getting the money in hand to go out and do it.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
	I think it is just our core business sense and how we execute everyday, and that methodology is just engrained and it's what we do all the time and we don't think of it as long-term acquisition programs.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	To start off, a lot of it is by word of mouth. Somebody knows somebody and recommends them and the biggest thing Big Safari does predominantly in the hiring is that they're first off to hire operators, guys from the field and not necessarily a program manager and the philosophy is that the operations guy, its easier to train a guy to do acquisitions, than it is to train an acquisitions guy to become an operator.
	8.) What measures are used to train and retain personnel within your organization?
	They have to go through all the normal acquisition classes and certifications to become full up program managers; there's no short-cutting that system. It's really just hands-on, quick learning and your hiring of the right breed of people that are adaptable sand able to learn quick.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	10.) What is the optimal team size for a rapid reaction project?
	That's an interesting question. Here's why, because on Rover...the team consisted of me. Now, I wasn't here when it started, so we have to back up but spiral development of the personnel. The initial concept you know, sometimes the thinking is too many cooks, you can't get anything accomplished, so there is definitely 4 or 5 guys of the right caliber, like backgrounds.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?

	Yes, absolutely. It wasn't just me. I mean, I'm not an engineer, I'm the program management type so if I had engineering questions, I could pull from anyone across the organization to help you know answer questions.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Typically, you know, program managers - it depends on the type, lets say you have a guy he will typically see it through to fielding and sustainment, but we have contractors who keep programs going ...some have been here for 5 or 6 years. It just depends on where things are.
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	Well it kind of goes back to the part I was talking about you know we're not an R&D organization, we deal with technology integration, so a systems integration perspective is kind of part and parcel of what we're doing and it's to take a look at the integration of a particular technology or capability. (Interviewer: So, would you say it's pretty much non existent then, or I guess where I'm going with this is you know typically a lead systems engineer is looking at the whole piece of the pie and how that particular capability fits in with other capabilities in the field, you know looking across things like sustainability; multiple areas...so, from your perspective, systems engineering plays a small role then I guess you would say?) Yes.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	We do, yes.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	Well, it is done with a team effort..you know you can nominate or reject something, but it has to get looked at from different perspectives. Most of the impacts are down to cost and fit because it is rapid.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	Usually, needs come in from all different means - sometimes its just a phone call that gets things started...you know the paper work has to follow after you come up with ideas to what they need ..there's a process that we have to follow. But then there is the urgent need statement and combat mission need statement and all those kinds of things that will come to an organization. (Interviewer: I noticed recently that there was an AFMC policy on warfighter urgent needs that was sent out in Early Nov, so I mean are you guys going to be included as part of that?) I'm not sure what that one says.
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	Generally speaking, anything coming to us or gets assigned to us goes through the typical iterations to get their money available to do the project, but we are not going to take on a project unless we have money or have money allocated to do it. And likewise manpower. (Interviewer: So these problems come with associated funding and support?) Most of the time, but not always. Generally, we don't have cash available to do projects - we have to have money coming in for a particular project.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	Like I said, it kind of ...before we are willing to accept a project, we have to have the resources identified and the budget.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	It kind of goes back to the earlier response about having the right, smart people working for you. That are in touch or in tune with technology as it evolves in the commercial world and are always keeping their fingers on what's new and what's out there so we can get our hands on it as soon as it comes out.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?
	A lot of it is word of mouth and knowing people from those other organizations and places, academia and industry, and through partnering agreements or contacts - you know some guys who are doing that sort of thing. People that are always out looking for new technologies...alot of networking.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	It kind of goes back to what I've been saying all along...you know, we have a core group of contractors..capable contractors, that kind of cover the gamut of the work we are doing and have been involved with the rapid and quick vehicles are that we have our contracting basic ordering agreements in place with our contractors, and they generally do very quick proposals for us.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	Yes, absolutely, I mean again it goes back to those BOAs...a BOA can last for 2 or 3 years at a time and that way you keep the relationship alive and you know you find good contractors who are capable and comfortable with the contract vehicles.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	There are limits of what we can do rapidly that way - we try not to go out to those who don't already have a BOA, but it can be done.
	26.) How long are offerors given to respond to a request for proposal?
	Depending on the project and how fast we need to respond, generally speaking it is about a month to get us a proposal, and then there are cases where we'll do a UCA, and undefinitized contract action. Sometimes its seeing how something fits with your NTE and looking at the detailed proposal down the road.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?
	Well, that comes back to the hiring and the people. A lot of the folks are "Type A" personalities - always going, always ready to do more, compressing the time. I think a good part of that is looking at new ideas. They are given flexibility - you know, here is the requirement and here's the need and you know you're kind of given alot of leeway to just go out and do it and there's not alot of hands on supervision or looking over the shoulder; you're given the authority to press on and get things accomplished.
	28.) What innovative contractual incentives have you had success with?

	There's a piece up front that I haven't touched on yet and it's called a dash-6 J&A. That document allows us to rapidly proceed without doing a competition or anything. (Interviewer: Can you explain a little more about the dash-6 J&A - is it like a generic J&A?) There's different categories of J&As, I don't know then all, but there's a dash-2, urgent and compelling, which most programs can go out and get, and a dash-6 is kind of an urgent warfighting one.
	29.) How much autonomy do employees have to help new ideas flourish?
	A lot of autonomy actually. No new idea is a bad idea - we're always looking for that next best thing; always looking for ways we can do things better, faster, cheaper.
Wrap-up	Sir, that's the end of my questions, but one thing I have been asking all of the folks I interview is: based on the line of questioning and the research topic, is there any other organization you feel I should take a look at as part of my research - both within the DoD and outside of it? Nothing comes to mind immediately - something I really didn't talk a whole lot about yet is that you have to understand that these Big Safari type organizations can't just stand up overnight - Big Safari's been around since 1952 if you will, so you know, it's taken a lot of time to develop and nurture those relationships...and to try to do things rapidly, we get the question frequently from other Services of ways we could help them do things quicker and it's a package thing - its time to get your organization established and be able to deal with things rapidly and of course there are the tools like the dash-6 J&A and things that allow you to do things quickly.
	Sir, thanks again for your time and if you have any other questions feel free to give me a call...good luck with your move.

Interviewee: National Geospatial-Intelligence agency (NGA) - Innovision Directorate

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Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	Well, certainly, it doesn't play as large a role as everyone would hope it does, but certainly working in a Government context and a National Security context, there are certain boundaries on innovation that we're all kind of strapped to that - although people talk a lot about innovation - is it really true innovation happens much more rarely than people would imagine..I guess would be a fair answer. (Interviewer: So you are saying within the Government context?) Yeah, in the Government and you know kind of national security and intelligence where you have all the constraints 1.) of being a Government agency, it kind of holds you accountable for dollars and certain accounting processes 2nd.) you've got all the constraints of working in an intelligence context, which then adds layers of concern and obstacles in terms of security levels and security rules and things, and I guess the acquisition process, which has its own boundaries and constraints and things like that, so you have to work not only technical issues, but you've got to work contractual, accountability issues, security issues, and then just the political science piece of doing things, so there's a lot of focus on the technology when people give gee-wiz briefings that when you get into the ugly reality of trying to do it in the operational context, there's a lot of sort of invisible constraints that come in to play.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	Well, there's certainly no set of coherent you know consistent process for encouraging out-of-the-box, but there are various ways to award people for just doing responsible and good things...there's not too many specific things that they do that are targeted just on innovation, but there are numerous ways to award people through, you know, there's external bodies that offer things, and there's different mechanisms that you can write people up for, for doing things, but there is no specific process that says, you know, this is the process for awarding out-of-the-box thinking an innovation; it doesn't exist to my knowledge.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	Well, it is obviously a struggle and we do have a rapid technology insertion council...I'm confident that numerous documents exist on how the process would rapidly deliver you know things; how it should work...there's technology insertion procedures - there's a lot of formal meetings, talk, documents, and discussion on how to do it, but when you look at the actual number of outcomes and number of successes of what's been rapidly delivered and what's truly going from idea to prototype, to fielded capability, to a component in an operational architecture, the process-to-outcome ratio is, I think, sadly out of whack.
	4.) What is your average time from concept to working prototype?
	Oh gosh, you're right, this is a tough one to answer with one specific answer...I guess, and average - there's a whole continuum of things depending on the size of the problem they're working and what they're doing, but still from a concept to a working prototype...my guess is that's going to be, on average, weeks to months; you know, to a working prototype.
	5.) What are the main roadblocks to quickly delivering capability?
	I kind of highlighted it up front - there's just a number of different constraints that are already built in - from our perspective, the TPED architecture, or you know, the national geospatial systems overarching, you know, streamwork of the baseline that we work with NRO IMINT. It is not so much the processes used to inject things in that's broke, it's the baseline that we're trying to insert the technology in, is just not designed for change. It becomes very frustrating...we tend to deal with the symptoms rather than, you know, get to the source and revamp the whole fundamental architecture.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
	Well, one thing I believe NGA does well is I believe that we have people embedded with forward units, and we also have people from our , you know , kind of weird science department incorporated into the operational elements of NGA as well...so, we do, I think, have a good practice of sitting with the customer and understanding their problems, you know, first-hand, and I think that is one of the highlights in working to do this, is to stay close to the customer and, you now, really understand what their true need is and then have mechanisms to get those needs back into the process that's going to create the solution. I think in a lot of cases, we pretty much have a good understanding of the problem, but where we break down is in trying to consistently deliver solutions that are sustainable.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	Well, you know, we have a very orderly process for bringing in new people, that is guided to be very balanced and fair, you know , make sure that we support diversity, you know, we have, any hiring board has to have a minority rep, a woman rep, an indian rep, you know, just a mix of people on it, and gosh.....we look within the agency, we look within the community, we reach out to academia , so they do a pretty broad sweep of trying to get people in, and they have a pretty orderly process, it's just sometimes the process itself is a little cumbersome, but the agency does a good job of trying to pull in people from different perspectives. (Interviewer: How much of a role does work of mouth play in bringing the right person to the job?) Well, I don't think that plays a big role in terms of new hires so much...I would say that word of mouth works more obviously with more senior positions or exchanges across agencies or within the agency where you actually, you know, have people who are knowledgeable of other people and have people with a track record, you know, within the Government and so, I'd say that at mid-level to senior positions, there's more word of mouth, but obviously with new people, there's not much word to spread around.
	8.) What measures are used to train and retain personnel within your organization?

	<p>Well, gosh, they have a wide range of education programs..both, I guess, within - they have an NGA college...there's other schools within the intelligence community...the various offices that conduct operational activities have, you know, kind of OJT and formalized training things...there's a broad effort to train people...retaining people is a little tougher, that, I don't know that the managers have as much flexibility as they would like to retain people. I am trying to think of ways we're constrained - well, certainly, just from a fiscal perspective, in the Government, there's no way we can pay the kind of dollars that some of the young, talented kids can get with Google or, you know, other companies that are in information/technology realm, that sort of thing. So, I think we're a little constrained in terms of salary, not that that's the only thing that motivates people...obviously, there's a lot of good people in Government who could make a lot more money outside, but they enjoy the challenge and, you know, the opportunity to work for the Government, but I think there is going to be pressure to keep the Government competitive and retain people. The other part is the whole Government info structure that supports people - you know, young kids are used to carrying their i-pods and their i-phone and, you know, blogging and doing all that kind of stuff,</p> <p>and you come into the Government and they give you a cubicle, you know, a secure phone, and you have to leave all your electronics outside, and a lot of hard copy paper flying around -- and I'm not sure the next generation is going to think that is a very fun work environment. (Interviewer: So is Innovision doing anything to counter that..that view within NGA?) Well, they're thinking about it, but I couldn't give you a specific initiative that says, you know, we're trying to be cooler...again, we have to operate within the policies that are defined, at large, for intelligence agencies, or people who participate in that, and there are certain rules in terms of acquisition and contracting about how you can share information, and non-disclosure agreements, and , you know, everything that is encouraged in terms of free-flow of information on the outside...when you get in, obviously, there's issues about controlling information between Gov't and industry...there's security level controls, there's a lot more valid reasons where information has to be constrained or managed more tightly, that go up against the emerging information sharing culture that's happening in the world around us.</p>
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	10.) What is the optimal team size for a rapid reaction project?
	Well, it's probably some number of people less than 10, you know, and I think we've had good results with teams working on more of about 4-7 people. It just becomes a communication challenge to keep everyone in the loop - it just too much, I think, when you get beyond 10.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Well, this is an area I think the Government has not done as well - well, some people, like the contractors we work with like Booze Allen, you know, some of the other SETA contractors - Mitre, or whatever, they make pretty good investments in sort of documenting where the smart guys are, and creating a good information web, when they need help on a certain topic, they can just go to a browser, put in a topic, and it kind of goes out like an APB their other Booze Allen folks or whatever, on the same level, and they're able to do it. The Government is much more of a struggle...we don't have an organized way to capture the expertise that we have, and so that - right now, I would say on the Government side, not just NGA, but most organizations I've worked with - we don't have a good capture of our formal knowledge or the tacit knowledge that our people have.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Gosh, I really...it would be speculation to say it, but oh, gosh, I feel more confident in answering the second part of this as, yeah, initially, the person who starts it, is the one who's there at the end, but some of the rapid projects..whether it's taking 18 months or 2 years to get through and that seems like a paradise - how can that be a rapid reaction project that, you know, takes 2 years? But, you know, that's the world we live in.
Systems Engineering	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	Well, there's the NGA systems engineering, although they don't refer to it as that..within NGA, it's called enterprise engineering, and they are the sort of the god's of the processes, and they sort of orchestrate the formal tasks for delivering things, but I don't know that they are always seen as the accelerator, and often more of a roadblock than an accelerator.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	In most cases not. You know, in NGA we actually have very few engineers - we have people who are more integrators, I guess, as opposed to engineers, and it certainly would help to have, you know, people who have knowledge of the system and the big-picture perspective, but engineering skills are very rare.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	Well, there's you know formal mechanisms - they have our giant requirements database that catalogs things, and then there's less formal ways - like NGA has customer reps that sit with all the various commands or different units and it's actually a pretty diverse continuum of how the needs come in and some of them kind of get aggregated into just broader challenges and other ones are, you know, addressed as sort of specific taskers to respond to meet a specific unit's need or a specific thing, so it's a pretty diverse process and it's not as orderly as one would hope.
Budget	17.) Are funds readily available to your organization to pursue new ideas?
	No, I think that's one of the flaws in how the Government works obviously, you can't just tell Congress or anybody that, hey, we would just like to have \$15 million in a pot that in case some good ideas come up in FY08, we're ready to respond. They'll say, oh, that means you are asking for \$15 million dollars that you don't really know what you are going to do with, so we'll give that to other agencies in the Government who are already in the hole and they know what problems they need to fix, so we're going to take that \$15 million from you. It's just the brutality of our accounting system.
	18.) What process do you use to obtain funding for your rapid reaction projects?

	<p>Obviously, within our directorate, Innovision, the director creates a margin fund by kind of taxing existing projects - that, you know you have to go through the President's budget request, and then Congress and all those people to get the money, and then once it's given to the organization, there's different ways of creating management margin. You know one way is to put say a 2% tax on every project within the directorate that has to kick 2% back up to the director and that's where you create, I wouldn't say a "slush fund", but that flexible fund that will be applied to things you didn't anticipate or you know do it that way, so that's one way....um, other ways is to just do trade-offs within, you know, the project space that you have to say...if you actually have a solution that you think you can deliver quickly, and maybe there are some other projects that are longer-term, and maybe they wouldn't miss a couple \$100K here or there, you know, you might make some trades across those kinds of projects, or you might look for external funds that are out there - lets say, for example, that the JIEDDO, or whatever, there's an organization that has a pot of money for working problems with IEDs or something like that..you would look to say, gosh, how can I map my project on to that solution space and maybe bring external money to fund it.</p> <p>(Interviewer: So would you say that any of your rapid reaction needs or requirements come with funding or that's something that your organization looks to find after you get the requirements, because I know with some of the people I've interviewed, they only work an urgent need if funding comes with the requirement.) Yes, see that's what I was trying to highlight that the brutality of our - the path to hell is paved with good intentions...everybody wants to make sure that all the money that's given out to the Government or agencies or, you know, program offices or whatever - that that money is spent on the purpose that it was intended. But that assumes that you always have prior knowledge of what you're going to do, and the ability to respond to things that you didn't know about really goes against the character, the way we want to account for and program for acquisition dollars, and that's what creates the inability for people to respond, because it's like well, we didn't line up and say hey, we're going to have 6 rapid reaction things coming up next year, that we don't know what they are.....we're just going to keep this little fund aside in case they do. You almost have to do some creative accounting to do that to protect it from - because every agency, everybody's always got you know shortfalls, and whenever they come looking around for money, if you can't tie it to a specific purpose that people can understand, then you are vulnerable to these other problems that are out there.</p>
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	<p>20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?</p> <p>I think NGA does a pretty good job of surveying industry, academia, other agencies...there's continual forums that go on to try to do cross-walks to let everybody know what technologies or tricks are out there and what everyone's doing, but it's a challenge just to have situational awareness of all the things that are happening because, obviously, NGA is tied to information technologies...you know the whole explosion of the Internet and network technologies, software technologies, and you know, new applications for making sense out of non-linear data or non-literal data like radar or hyperspectral or ...I mean, there's just so many science forums you'd have to be aware of and information technology forums...it's a big challenge, I mean we go out there an survey it, but it's kind of information overload about what the technological possibilities are.</p>
	<p>21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?</p> <p>Well, there's a whole continuum here of kind of big sort of formal forums that might meet like once or twice a year at the high level and then there's a whole range of meetings that happen with players lower down in the food chain, but there are lots of, I'd say, structured interactions, to share things, you know, within the Government, with Government to academia, with Government to industry, and there's probably a list of tens of forums and interactions that happen...there's conferences, symposia...there's lots of stuff being shared.</p>
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
<i>Industrial Base</i>	<p>23.) What process do you use to solicit proposals for rapid reaction solutions to industry?</p> <p>Well, you know they have some acquisition things like calling a Broad Agency Announcement, or a BAA...I don't know if we have a specific methodology that's designed though for a rapid reaction solution...I don't think we have a special process just for those.</p>
	<p>24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?</p> <p>Probably more word-of-mouth than any structured database. Obviously in contracting process itself, you know, when you're reviewing competitive bids, there's a whole section in there that has to talk about, you know, what things the contractor has done successfully in the past or whatever, but I'd say it mostly happens through word-of-mouth and, you know, just reputation and people who had a project that was successful and, you know, they pass on to other people what gets things done, and what does not get things done.</p>
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	Gosh, no, again since we don't have specific things for rapid reaction, we're pretty open to, you know, small businesses and other people, but it does become a problem in that, you know, you can't just go to Nintendo and say, "hey, we have this national security issue we'd like to see how you can apply your smarts to our problem." You know, there's security boundaries and there's certain, I guess, constraints, that companies who just want to work with the Government, they have to fall under these different regulations and sometimes those regulations are just biased towards larger companies or the ones who can afford to make the investment to write the proposals in the format and everything that the Government has laid out. You know, that takes a lot of work and knowledge of the Government processes to do it, and smaller companies may not have that or be made up of a bunch of worker bees and not people who know how the process works.
	26.) How long are offerors given to respond to a request for proposal?
	Well, it's a continuum there too I guess...depending on the size of the proposal and the competitive nature or whatever, I think it could be as short as like 3 to 10 days, or it could be 90 days just depending on the scope of the work.
<i>Incentives</i>	<p>27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?</p> <p>Gosh, all we can do is keep reminding people of the urgency of why this stuff is needed and, you know, the importance, and, you know, there's people out there risking life and limb to protect our values and, you know, the enemy doesn't go to boards, not that I'm aware of...it's just giving people a sense of the urgency of the mission is the thing that I've found that is the most effective.</p>
	28.) What innovative contractual incentives have you had success with?

	I think this is an area where, not just NGA, but the Government could see a large improvement from...when we think about R&D and rapid technology insertion and stuff, we always think about the data of a new tool and stuff like that, and there's not as much thought given to the kind of thing that you're looking at, which is why don't we experiment with different processes and see how, you know, the R&D process itself needs to change right...you know, we've become sort of like the Soviet Union where you had 5 years central planning bureaucracy, where Al-Qaeda are kicking our butts where...nobody told the British they had to wear red coats, march in straight lines, and shoot single shots, while we hid in trees, didn't wear uniforms, and shot them in the ass and that kind of thing.....I think there needs to be more R&D focused on more, I don't know if you call it process innovation, but just looking at the whole meta structure of how we get through these contracts and security and other wickets; that could use considerable innovation.
	29.) How much autonomy do employees have to help new ideas flourish?
	Gosh, we're certainly encouraged to come up with new ideas and that sort of thing, but that we've not been told to use our brains or anything, but I just think the status quo has just such a grip on things that despite all the cheerleading to think different and out-of-the-box and be innovative, when you get down to the crunch, it's still "the process".
Wrap-up	Are you ok within my research that I reference the NGA as a place that I actually interviewed? Oh yeah, not a problem.
	Based on that line of questioning and your understanding of where my research is focused, is there any other organization within the Government that you feel I should speak to on this topic or anybody in particular? Well, you said you were working with AFRL? (Interviewer: yes sir) I don't know if there's anybody you could talk to in the CIA, but they would probably tell you they get rapid innovation done by not telling anybody what they're doing. (Interviewer: Actually, that's one of the places I am trying to get into, they have an In-Q-Tel division that I'm trying to get in touch with, but I've had no success so far, so I would really like to talk to those guys if i could, but I haven't found anybody that knows anybody I could call.) Well, NGA does work with In-Q-Tel and I could give you a POC to work from. You know, certainly an example might be, if they have time, to talk to SOCOM or JSOC or the Navy SEALs...those are really the early adopters for the Government because those people are no shit doing stuff and if the status quo doesn't work then they invest in things to make it work for them...it's just it takes a while for the innovations to flow into the bigger, broader military.... well, I want to thank you again sir for your time, especially on a Saturday.

Interviewee: Office of Naval Research (ONR)

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints. In order to protect the identity of the participant or the technologies and customers they work with, certain items have been omitted and replaced with "XXXX" where appropriate.

Area/Enabler	Question
	<p>(Interviewer: Before we start sir, do you have any questions for me?) The only question I have is...I'm very much aware of AFRL's Core Process 3, and so when we talk about this, what do you define as a "fielding" of a technology? And I think that's critical to the discussion - we normally would take something to a TRL level 6 and then turn it over to a PEO...the ONR does not field hardware except in a demonstration form. We don't procure systems that are used in Iraq except in extreme cases, and they're very few in number...mostly, we would field technology that we would demonstrate and get to the level that a 64 shop would do. So you know your materiel command would take what AFRL does - that's what we do. When I read some of your questions, you know you talk about rapidly fielding new technologies - it's new technologies that are given to another command before they're fielded, and yeah we have a big role in that, but we're not the fielding agency in the most part. It's an inappropriate use of S&T dollars. (Interviewer: understand, and that was one of the problems I had in trying to characterize the niche that I was trying</p> <p>to look at here, and because I am going across the government, I had to use some sort of generic term that that says) - and oh, yeah by the way, do I think that's a problem - oh, you bet, because the big problem isn't finding, in my opinion, the innovation...the big problem is schooling the innovator in the acquisition field so he understands this mine field of regulations and processes that we've put in place to protect the taxpayer and the warfighter. And, you know, there's two reactions to that big Government bureaucracy; you either complain bitterly and stand there and look at it or, you know, you charge through that mine field...and organizations like ONR and AFRL, I think our role is to enable the innovation to get through the mine field. (Interviewer: I agree, I agree) So now you know my core mantra and my mission in life. (Interviewer: well, I agree with the way you stated your organization's role and that's exactly the type of organization I'm trying to find across the Government, so obviously, CP3 would be another example...I think I'm going to have a hard time, in some cases, in making a comparison with some processes that don't address some urgent needs, but I guess what I'm trying to target are both innovative organizations from a standpoint that they are doing things differently than the 10-15 year cycle times that we've seen throughout I don't know how many decades of Government projects and I'm also trying to target, where possible, those organizations who address rapid needs, so when you ask me what I feel the term "fielding" means, it's exactly as you stated, it would be AFRL's ability to demonstrate this to a user and have them either adopt it and transition it over to a formal acquisition arm of their branch who could formalize it as a normal project, ...so I think we're on the same page for that one).</p>
	<p>Before we get started, as the XXXX, do you oversee a portfolio of projects, because someone pointed me to one called "Swampworks"...) Well, I'm responsible for about 20% of the portfolio here at ONR- the quick reaction swampworks and experimentation, and then the innovative naval prototypes. So these are both high risk, high pay-off portfolios - one is short term...very similar to your CP3...the other is long-term big efforts: rail gun, free-electron laser...these are 20-50 million dollar a year projects that are so high risk and so high pay-off that the 4-stars have gotten together and agreed we should do them. (Interviewer: Ok, excellent. Well, it sounds like I am in the right place.)</p>
General Questions	<p>1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?</p> <p>It's a huge piece of, if you're going to grab on to a recent break-through and demonstrate a new technology, that is innovation defined. Take an idea, take an invention, apply it in a new way, and then demonstrate it to a TRL level of say, six.</p>
	<p>2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?</p> <p>Well, you know you definitely do your teaming from diverse groups and diverse organizations, but I think the key piece that drives innovation more than anything we do is year of execution funding. I mean that we have many processes in place that mature, reflect, and contemplate, and plan, invention - our whole 61, 62 portfolio is for invention, and our 62 and 63 portfolio that we call our future naval capabilities, which are a transition piece, looks alot like your CP2. It is all about transitioning to our materiel command. The only dollars that we have that can reward and jump on a new emerging technology, or a new emerging threat are our rapid reaction dollars. That process which says, hey, you have an idea that's high risk, high pay-off that meets an emerging threat or need from the field; we're interested in it. That's the process.</p>
	<p>3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers? AFRL's example is CP3, do you have something similar?</p> <p>Yeah, that's Swampworks.</p>
	<p>4.) What is your average time from concept to working prototype?</p> <p>A year</p>
	<p>5.) What are the main roadblocks to quickly delivering capability?</p> <p>Contracting</p>
	<p>6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?</p> <p>So...the best practice/methodology we have...let me think about which one is the best of our best practices...I'd say it's our interaction with the potential customer. You know the rapid reaction-funded efforts are fleet driven. Those come from a "hey, I need" and it's the conjoining of the "I need" with the scientist who has an idea that is probably the best practice. (interviewer: Ok, and is that warfighter involved throughout the entire process?) Yes.</p>
Human Resources	<p>7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?</p> <p>You know, we recruit very heavily out of our, out of who we sponsor. And since we're a sponsoring organization, our pool of performers, you know, investigators, is who we're currently funding...for the most part. And so, our process is to go where we fund. (Interviewer: Ok, so you actually pull those individuals with operational experience into the ONR?) Oh, operational experience, but also, if we're funding a university, and I want a scientist to fund, a university scientist, I get them from universities.</p>
	<p>8.) What measures are used to train and retain personnel within your organization?</p>

	You know we're a Government agency so, you know we're fully in bed with NSPS, and fully in bed with defense acquisition university, and then what do we do in spite of those...um, yeah, you know we have a very big mentoring program. I think that's probably one of the bigger ones that - you know, what do we do, we mentor and we set up those individuals, you know career development plans for our people, is probably what we do.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	You know, we're predominantly a technical lead organization. There may be some people who are program managers first, technical second, but I can't think of them.
	10.) What is the optimal team size for a rapid reaction project?
	I...ah, 15 at the most.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Yep, so you know, we go to our naval research enterprise as needed. So, we can go to our naval research laboratory and to our warfare centers.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Yeah. Yeah, because they're one, two year projects, soall projects are...very rarely do we have projects that didn't get seen through.
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	Well, I think we're all very cognizant of system engineering techniques, and so it plays a role in that if we know we want to transition something, you've got to do it from a systems engineering perspective. (Interviewer: Ok, so even the very short term, 6-9 month projects still have that emphasis?) Well....it's noted. People are aware of it. It may not be the most important piece of the project, but it's done.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	No.....I shouldn't say that. I'd say about half of them do. I can't think of a project we've got...each project has a Government lead...that Government lead is an engineer or a scientist, typically an engineer, who acts as the chief engineer for the project. We don't have any program manager that's not...you know, there isn't anybody that's doing one of our projects that's not...that doesn't have an advanced degree in engineering and isn't DAWIA certified as a, you know, level 3.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	Our project leads own the projects.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	Well, I think one of the key differences between a traditional project and a rapid reaction is that there's tacit acknowledgement that things are going to change. And, you'd like to have them change earlier rather than later, but they are going to change, so you know, you've got to do it. (Interviewer: Ok, so do those requirements come directly from the field?) Yeah, for the bulk of the projects. Certainly, you know from the customer, I mean if...people want to go straight to, you know, downtown Baghdad for an assessment of what the warfighter wants, and that's not the important piece of it. It may be the driver that gets you involved with a systems command, but at some point, the system command has to be part of the project, or it's not...and requirements guys have to be part of the project because they own the resources, so if it's going to transition, that's where it's going to transition to. So, yeah, we listen very carefully to what the warfighter wants or UNS...you know, that's the voice of the warfighter. And what we do is typically is try to go back and figure out who it is that wrote it, and work with that person. Burt, it's got to go to the concept development commander, the school house, or to the requirements shop, or it's just going to fall on the floor. And we have to educate them on what's technically feasible in the timelines they want.
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	You know, there's never enough money for anything. You can say our quick reaction portfolio is roughly 10% of our portfolio. (Interviewer: Ok, so there's no, some sort of investment capital type fund waiting there for you guys to just fund a new idea if it looks promising?) Well, you know it would be a good research project...is to go look at the marks that the Hill does on the defense budgets for under execution and then see how many of those were tied to rapid reaction. I would say that you would find quite a few of them are tied to rapid reaction and they get marked for under execution because you're waiting...let's say you kick out half your money in the Oct/Nov timeframe, and then you're waiting till May to kick out the second half because you want to be responsive, you know, and you get dinged for under execution. You gotta be aware of how the Government handles...what's our fiduciary responsibility to the taxpayer. You know, you have to be able to work within that system.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	So yeah, we do an investment balance review every year, which we defend portfolios, and then once it's in there, the portfolio manager makes some decisions on where to spend the money. And that's a part of being rapid. How many processes and how many layers do you have to get to between the guy that's got the idea and the guy that's got the dollars. The fewer steps there are, the more effective and rapid it is. The more people that have to say yes, the less exciting the project gets..I mean the less the exciting the project is.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	Hummm.. So, you know, we're always looking everywhere...so, what process? We engage the technical community in a variety of forums looking for ideas, but our project officers here in the building are some of our best resources. They're tied in with the requirements shops, they're tied in with the warfighters, and so, if something comes up they're aware of it...and so, our process is to enable our people to be that venue.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?
	You know, the same thing. We've got quite a few existing relationships across Government, academia, and industry...you know, we fund academia and industry, so our process is...we have outreach through portions of the organization, which are global - I see the next question - you know, we have a very large global outreach effort. And we have associates all over the world working to find that next idea and that next invention that matters. (Interviewer: Ok, is that maintained there in some sort of database?) Yeah.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
	See response above
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	Well, so you know, we're tied to BAAs and RFPs and, so, you know, we use FEDBIZ and we use our website.

	(Interviewer: I guess a question that just came up that's not on the sheet is: due to the nature of all of these projects, often times, it's sensitive, so is there some sort of, what's the word I'm looking for here, sanitization of the problem that's put out for like anonymous bid and solution...is that accurate?) Yeah...you know, it's a challenge, and so, we're relying on - you know, one of the things on Government funding organizations, is that they're hard to get work from unless you get work from them, so...and that's true. And part of it is because you want to be able to work with somebody that you can pass information to easily...those kinds of things take time to set up, and so, if you've worked with them in the past, it's easier to work with them in the future. So, our BAAs go out, obviously, they're unclassified, and I don't think we even use classified annexes for our stuff.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	They're on the mailing list for our conferences and workshops. You know, and at the project officer level, we maintain pretty good working relations with people we've worked with in the past.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	Not on purpose...in fact we've been actually taking some steps to try to get the language in the proposals to be more...less Government-ese. Instead of looking for , I'm not going to be able to do it off the top of my head, but, you know something in very specific military language...you know, try to put it in an academic flavor, and try to get some academics to bite. (Interviewer: Ok, but that's assuming those individuals know where to go look right, like FEDIZ opst?) We have a pretty good database of email addresses that we will send to, that include all of the, you know, association of American Universities, you know there's a long list of associations that we send a list to...and so you know going on a recent BAA we had 400 proposals, and I say probably better than 100 of them were like, wow, were did they come from?
	26.) How long are offerors given to respond to a request for proposal?
	You know, I'll say a month, but I'm not sure it's that long...you would have to go look them up on our website - I couldn't tell you .
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?
	Hmmm...I'm not sure. You know, we don't do development, we don't do acquisition, we do, you know S&T, so you know, we typically have fairly lean processes anyway.
	28.) What innovative contractual incentives have you had success with?
	So, you know, we invented the grant, and we think that is probably the most innovative business process to be invented in the last 100 years. You know that grants and the... cost plus fixed fee contracts for small business were invented here.
	29.) How much autonomy do employees have to help new ideas flourish?
	Quite a bit - you know, they run a portfolio in their area of expertise and they're really in charge of it.
<i>Wrap-up</i>	Would you be ok with me referencing your organization in the write portion of my thesis?
	Yes
	Can you recommend any other places I should investigate as part of my research?
	The innovation directorate...gosh, who do I know down there....CIA, the one you really one to talk to is In-Q-Tel.
	Sir, I really appreciate your time and all of your help...
	Best of luck...happy holidays.

Interviewee: Air Force Rapid Capabilities Office (SAF/RCO)

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Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	I'd say that probably the best thing for the innovation that plays in there is - we typically go out looking for partners that could help fund...that might be one way to view it, mainly because, if they had started it off, and it's things we can leverage from them, which fits in nicely with the economy act...the other part is, there are some existing technologies that exist out there that we should be able to leverage whether its military off-the-shelf or commercial off-the-shelf, and we look for opportunities to do just that so we don't end up in a very expensive or long, enduring development cycle.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	I think probably the best way to answer that is, you try to hire the people that think out of the box.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	We actually have a charter and I'll go through the six bullets - the first one is utilize standard acquisition process with few waivers, and then the second one is short, narrow chain of command, early and prominent warfighter involvement, small integrated team operating within a single office, high DoD and Industrial precedence ratings, and then probably one of the key things is funding stability, and waivers to and deviations from any encumbering practices, procedures, policies, directives, or regulations.
	4.) What is your average time from concept to working prototype?
	It depends on the type of a project that we would take on - we have done things in months, less than a year...we also have things that span the FYDP, so it depends.
	5.) What are the main roadblocks to quickly delivering capability?
	The main roadblocks that I would see would be predominantly be formalized bureaucracy, and as long as we can avoid that...we are typically streamlined enough to get past a lot of roadblocks. (Interviewer: Ok, is part of that driven by the short chain of command you have within your office?) Yes, absolutely. In fact, I would say that going along with hiring the right people, the streamlined approach that we have that was set up by the charter that allows us to have a board of directors that approves what we do, and that board of directors is the Chief, the Secretary, and AT&L - that streamlined approach and getting the board of directors to approve that is very helpful in getting past alot of roadblocks.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
	It comes back to, I think, really the right people and attitude, and really being focused on the right overall objective and priority to meet what the board of directors has asked us to do.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	I think that is pretty much the same as most Air Force organizations. The bubba network, you know, social network, if you will, of people out there and character references on people that you may or may not...see, since we're a selectively manned unit, it makes it a little bit easier if we wanted to go through and check on some highly qualified folks within the Air Force. Overall, we look for a person to fit not only within a project, but certainly within the way our organization is organized if you will. But, in general, mostly the social network of checking out who's the right person at the right time.
	8.) What measures are used to train and retain personnel within your organization?
	Since we're an acquisition organization predominantly, and use the standard acquisition training...defense acquisition university and a number of different abilities to keep yourself aware and current on the best acquisition practices. Clearly, there's a number of symposiums and conferences, not only within acquisition, but certainly within other areas that we consider important to us...like, for example, aircraft survivability etc....we attend those.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	Mostly technical, but along those lines if there's a project or a program that we're managing that has funding associated with it, it would have program management aspects, but in general the folks we have, that we hire, have quite a bit of engineering background or engineering types of degrees. So, you see that mix plus with a mix of program management.
	10.) What is the optimal team size for a rapid reaction project?
	Again, that goes back to timelines and it really kind of depends. It depends on what you term the rapid part, but for our projects, the ones that fit into the rapid category, the smaller the team the better. And, in fact, in most cases, whether it's a rapid program or one that's across the FYDP, typically we have a very strong Government team that works very close with what I'll term a "trusted contractor". And that we leave alot of trust in the contractor delivering what's required to meet National Security needs.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Absolutely, we lean very heavily on FFRDCs, such as MIT Lincoln Laboratory - we lean heavily on Air Force research lab...we have interactions with them, I would say, weekly...so yeah, there's a number of folks out there that we clearly go to to help us out.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Right now, since we're a selectively manned unit, typical tours here are 3-4 years on the military side. If you're in a rapid program, you know less than that, clearly, you'll see a project through...but I would say, for the most part, that the timing is driven by the selectively manned aspects of it more so than a program that exceeds the 3-4 year period.
Systems Engineering	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	Like any other SPO out there, it plays a significant part.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	Yes, each of the teams we have has a chief engineer on it - one of the larger groups we have has a technical director for that specific portfolio and then I have a technical advisor who's an IPA that reports to me.

	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance? I would say as long as it doesn't change the scope of getting the requirements or needs as stat, as much leeway as they want.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	Well, they come at all different levels...clearly, MAJCOMs COCOMs...we deal quite a bit with the COCOMs, but we've gotten needs through joint staff and OSD, and as far as changes permitted, are you talking about changes to the requirements or customer needs? (Interviewer: Yes sir.) So if there's a customer who comes in that wants to change that requirement, clearly we tell them you need to bring money. So, yeah, you can change all the requirements you want, but we've got to execute a program based on original requirements, so a change need or a change customer requirement could be deemed an "unfunded requirement".
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas? We're funded based on the specific requirements, 1.) and 2.) based on the approval by the board of directors.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	Standard PPBE Process
	19.) What process/method do you use to establish cost estimates for rapid reaction projects? Certainly our program offices or our projects try to pull together a cost estimate based on when a requirement or need comes in, but we've leaned heavily on OSD CAIG and AF CAIG to provide a basis for budget.
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects? So based on what we've been asked to do, we'll lean heavily on again FFRDCs, whatever labs are out there that we're familiar with, and in some cases, like AFRL, we've gone to the commander of AFRL with, "here's a need", and he will turn us on to the right location and we also work closely with contractors.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry? I don't know if you actually need a process to make a phone call, but we work with all of those folks...the process we use when given a need is to socialize it within our office, and then get in touch with the folks who could help us meet those needs, whether it be the Air Force or some other organization.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas? We don't use them.
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry? Standard FAR process, and in some cases, probably most cases, we'll try to streamline that process as best we can. (Interviewer: Ok, is there a particular method or contract vehicle you use to do that?) Well, I don't think so...it's a standard contract method. I think the best way to describe it is that we don't...we don't have a very large contracting office or teams, or we don't bring in a bunch of people on IPTs in each individual area - we depend on, again, small teams to come up with the right way and then get that approved through a streamlined process.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past? There's no specific process...like I said in the previous question, the contractors that we do work with, since we are a small Government team, we kind of trust them explicitly to be able to deliver on time; kind of a trust but verify approach. So again, no specific internal process that we have to find the right contractor.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors? Well, we do have efforts to utilize those small businesses etc.
	26.) How long are offerors given to respond to a request for proposal? Actually, we don't have a standard ...I don't even know if there's a standard out there that dictates a certain timeframe, but clearly, if we were going to put something out that's looking for a response from an offeror, we would have our own expectation of what the timeframe was and we would pass that timeframe on to the offeror.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times? That one's kind of interesting...well, 1.), I don't think we focus the incentives on our own personnel that's based on an acquisition cycle time. Clearly, the folks that work in our organization, and I think other organizations that do acquisition, you know, they're going to get pats on the back, if you will, awards, personal recognition associated with a job well done in support of National Security objectives, so I don't think we have any specific ones out there. That's a hard one to answer, I mean, time off awards, quarterly awards, like for example, SAF/AQ has its own quarterly and annual awards that we compete with and actually we compete quite nicely, so those awards actually get entered on the OPRs or EPRs and the promotion recommendation forms. (Interviewer: Ok, I think one thing XXXX and I talked about yesterday, at least in my mind, is that one of the incentives your office might give the personnel there is an increased level of autonomy, and just a trust basically from upper management that they can go and execute the program within their bounds and within their means as quickly as possible.) Considering that we're not...our office is very streamlined with the board of directors...we also try to make sure that we're somewhat streamlined in our own organization in that once they start executing, as long as we have that contract with them, they do have the autonomy.
	28.) What innovative contractual incentives have you had success with? I think the biggest one is the employee incentive fee and that is one where the employees who are doing the work, and as opposed to just the contractor, the employee actually gets the incentive. And that does a good job of incentivizing the folks that are at the working level.
	29.) How much autonomy do employees have to help new ideas flourish? I would pretty much say quite a bit of autonomy. In fact, anytime we get a question or a task that comes down from one of the board of directors...we meet with the secretary weekly...we do look in some cases to the organization to help us address that question. And I know that most folks in the organization, when they have a good idea, they bring it forward.
<i>Wrap-up</i>	Well, sir, that concludes all the questions I have...every interview we have, I've added a couple of questions at the end, and one is would you have any objections when I write up my thesis, would you have any problem with me writing that the RCO is one of the organizations I spoke with? Oh, no...not at all.
	The last thing is, as you can imagine, this is a pretty specialized and focused topic...and is there any other organizations or office across the entire Government (both inside and outside of DoD) that you would recommend I take a look at as part of this research?

	I saw the list that you had put together and I think you've pretty much tapped all the resources that I know of...I don't know of any others. If I run across one or think of one after this, I'll give you a call.
	Ok sir, well, I know you're extremely busy, but I want to thank you again for your time.
	You're welcome and good luck on the thesis.

Interviewee: U.S. Special Operations Command (USSOCOM) - PEO FW

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Area/Enabler	Question
General Questions	<p>1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?</p> <p>Before we jump right into the questions...I wanted to try to give you some bumper stickers up front that I thought really summarized everything we'll go through here, but I came up with my own 5 keys to streamlining procurement and acquisition based on experience I just had at when I went out to satisfy a combat MNS to put a gun on the XXXX, which is getting ready to deploy in 2008. My lessons learned were 1.) understand the need; what are the real KPPs and get everybody on board. You can easily get derailed and, not so much with requirements creep and moving fast, but everybody wants to hang their respective Christmas ornament on the tree, so understand what the real needs are...get buy-in, and move on real fast; that helped us. 2.) I felt that knowing the law and policy was essential. Time and time again people tell you can't do that, you can't do that, but if you know what Title 10 says, FMR, FAR etc., you realize that there's quite a bit of room to drive through to understand that you can use it to your advantage. 3.) Question everything. Anytime anybody said, "this is how we do things", I learned that you have to ask why. Often times not because of the law or statutory or regulatory requirements, but because that's what their most comfortable with, or that's what the policy...the draft policy....might say and so on, so question everything. 4.) Optimize your team composition and minimize the size. I think we all recognize we don't have all the right expertise and we might have to go out and get it, but don't just throw another body at the problem; you know, get the right expertise for that position. 5.) And finally, fifth, pre-positioning helped me alot. We drafted ADMs, RFPs, the briefings all the way up to, and including, the final source selection briefing was done before we had proposals in hand. We did alot to get everything mobilized before we needed it, and that allowed us to move quickly once we had the fill-in data. We also used RFIs to our advantage to get industry mobilized and they started working on proposals I believe and getting ready to respond to our RFP. So, those are 5 key things that I learned out of that recent experience(Interviewer: Ok, those are excellent - actually, they hit on alot of what I was going to ask here in the interview, so) Yeah, I think we'll talk about them, but I wanted to you know, up front, hit on a few key points there. I looked through your top investigative questions on your spreadsheet and I'd like to give you some thoughts there too and tell you a little bit about how SOCOM addresses it before we get into specific questions.....1.) Is the U.S. succeeding in rapidly delivering new capability? Personally, I don't believe we are, in general, but where you have the right expertise, the acquisition corps expertise, in my mind, has been watered down quite a bit in the short time that I've served in it, but you don't often have the right people with the right expertise working at the right place working on the same project. From what I've seen in the program offices outside of SOCOM, is you end up with a few ringers in each SPO, but not really enough to be effective, and if you want to move quickly, they often pull those ringers into one place to go execute at the detriment of the other programs. We're constantly, it feels like, playing whack a mole here trying to hit the highest priority programs...and that works to some extent, but really does so at the detriment of some of your other programs. 2.) Are there institutional barriers that limit the effectiveness of rapid reaction approaches? I'll tell you...here at SOCOM, in contrast to my experiences in the Air Force and the National Reconnaissance Office (NRO), we're really just limited to what the law says and FMR and FAR. So, we do have limitations on what we can do, but one of the ways that SOCOM has been effective at streamlining some things is to make it very clear in our budget exhibits, when we go talk to Congress, that there's certain amount of ambiguity in them because we simply don't know what the needs are when we get to execution of those dollars. And at small dollar levels, they've been very comfortable with that..the Congressional staffers have. So, wherever possible, we've written out exhibits to allow us to go off and start tackling problems before we wait for the budget cycle to catch up...for example, we'll often go do risk reduction studies and conceptual refinement and so on, with other very specific authorization, and then at the same time be working our budget approval for the next POM to actually go forward and initiate a major program. 3.) Roadblocks to reducing the rapid reaction cycle time...I'd say alot of it is just policy and alot of it is just personal inertia from what I've seen. People that are reluctant to do something different and newwhen you get the right people lined up that find solutions, rather than barriers, you're much more successful. And that's why its important to me that you understand...we as program managers really understand what the law allows. 4.) Is there a well defined and documented strategy for meeting urgent needs? Specifically, USSOCOM has a combat MNS process...we have a SOCOM directive that spells out how to go about doing that. Fundamentally, when one of the theatre components that come in with a requirement, it goes through something called a rapid requirements team...we bring in acquisition program managers, requirements guys, operators, and we all sit down in an IPT format and vet what the requirement is and how executable it might be. SOCOM also maintains a combat MNS</p>

pool of funding and an authorization. Congress gives us roughly \$20M dollars a year to go do this, urgent, quick reaction sort of things. Generally, we go off and buy stuff that's already in production...that's the nature of SOF equipment, but the program I just finished, or just got a contract award on, it is to procure and qualify a gun on...a standard gun, but a unique installation on the CV-22. Generally, we look at about a 6 month turn time to get it into the fight...in our case, we're going to be about 8 or 9 months just because we're tied up in the NAVAIR qualifications and flight test. So, is there a well and defined documented strategy...yes. For the requirements validation piece of that, we on the acquisitions side of that, respond to that need with something called an urgent deployment acquisition, a UDA, and the AE who sits here can establish UDA either from a CMNS or some other COCOM priority activity, and it just means we get all support and streamlining we need to get the job done. For example, he retains milestone decision authority to delegate documentation approval to his principal deputy and we do abbreviated SAMPs and alot of just streamlining up and down the chain. That is not as well documented, but it is standard process, and we have a person here who works on the AE staff for managing all the UDAs. **(Interviewer: Ok, that's excellent, I appreciate your thoughts on that. And again, I think we're going to get into some of those so if you find that I'm asking a question you feel you've already answered, just feel free to elaborate, or we can move on to the next one.)** Ok, no, I'll give you the specific as we go through those questions. Ok, so the general questions.....**(Interviewer: First one is, what role does innovation play in your organization's ability to rapidly field new technologies and capabilities?)** We are not a technology focused organization here at SOCOM. The Air Force is much more technology minded for alot of different reasons, but we really look for innovative processes, innovative applications of COTS and NDI solutions to current problems. I've heard both the last and this COCOM say, the 80% solution in the field today is worth 10 times the 90% or 100% solution 9 or 10 years from now, and so we often just go and buy something that is as close as we can get, modify it a bit, and get it out into the field. And that's rapid capabilities for SOCOM...and I realize that the Air Force tries to think about how to leverage technology in the field and to me they are really different things. They're handled differently. **(Interviewer: Just to give you a little more background of where I'm coming from in this thesis, is I'm being sponsored by HQ AFRL and I'm really looking at one of their process to meet urgent needs, which is called core process 3, and its targeting a 6 to 9 month turn around and problems where minor integration is needed, so it sounds really similar to what you're describing that you do there at SOCOM. It's not a full up development effort, and its not a fully COTS solution either. So, just something for you to think about as where I'm coming from with some of these questions)** Yeah, we do alot of what I think are similar such of things for mods...you know maybe there is a technology that has been demonstrated on a HUMVEE or a ship, and we say, wouldn't this be cool on an airplane, and we'll go put it on an airplane. Case and point is the U.S. Marine Corps Mark 44 Bushmaster 30 mm gun. Putting it on the XXXXs right now...and we're not doing that real quickly, but we're trying to take similar technologies and apply them towards different solutions. If you've talked to the Air Force Rapid Capabilities Office (RCO), I think we're probably a little bit closer in line with what they're doing because...or maybe we're both in lock step, but you know, we're trying to get stuff into the field, not just into programs...like I said not usually technology...not usually cutting edge technologies.

2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?

Yeah, this is a tough one to answer...I think it starts with leadership. I've been here now for about 2.5 years under several different types of leadership styles, and what works the best is having senior leaders who push you to think outside of the box and innovatively find new and better ways to get things done....question what you're doing...and it's really infectious. You know, you get everybody doing the same thing and I find myself coming up with ten different scenarios before I go in and talk to the boss because I know he's going to be asking those kinds of questions. I don't know that I'd say that SOCOM has done alot to instill out of the box type thinking processes - we have processes that bog everybody down, but I think with the right leadership, you can overcome alot of that.

3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?

First and foremost is out combat MNS and there's a directive on that, which I'd be happy to share with you if you'd like - that establishes the requirement, and the acquisition folks are involved in that up front. Then, from that, we go through the UDA, and our goal is 6 months into the fight. And again, we really go out and only limit ourselves by what the law says. SOCOM has some pretty unique authorities under Title 10; we're essentially our own purple service and we're all here in Tampa. The requirements guys, programmers, and comptrollers and I can get together in a 20-30 minute, short notice kind of timeframe, so it helps us alot.

4.) What is your average time from concept to working prototype?

Again, we don't do a lot of the traditional concept development, per se, that I would say in the AFRL construct, but for us, we'll say here's the requirement, here's the stuff I need and the capability and in getting something into the field our goal is 6 months from the time the requirement is validated, until it gets in the hands of the warfighter. For the XXXX gun that I just worked, we went from validation of the requirement to contract award in just under 30 days with full and open competition. We were very fortunate that there were some industry investments out there that we could leverage, and our trial install was in in under 30 days...so, about 60 days from requirements validation to first install; I guess that could be a prototype. **(Interviewer: if we have some time here at the end, I'd like to hear some more thoughts on maybe how you guys...I've never heard of a full and open competition being done that quickly, so maybe of you could expand on that later, that would be...)** Sure, well, I tell you what...when we finish this, I'll walk you through the whole soup to nuts of what we did.

5.) What are the main roadblocks to quickly delivering capability?

Number one for me is the budget process and our authorization. If you've got a comptroller that supports a liberal interpretation of your authorizations, it's worth it's weight in gold because you can go out and do a lot of stuff. If you've got one, as we sometime have here, that requires you to go to Congress every time you want to do every little...change out every little nut and radio on the airplane, it's very, very painful. In my experience...we use the Services for alot of our program office support and what I see them doing is center level standards...what has to get approved, by whom, and at what dollar threshold things get progressively harder to do, and the formality of all their documentation goes up and really it doesn't have to be. I mean, I think there's an interest...everybody wants to be, everybody wants to do acquisition streamlining, but when it comes down to it, everybody wants to have a checklist and make it as easy as possible - if you do this, then you do that - so in reality, in every acquisition, if there's a good program manager, they will tailor his program to what needs to be done. Either by necessity or by the law. In any case, I would question the ASC standard or guideline policies; I would question it if you didn't think it was necessary....and that goes for any center or lab.

6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?

	It depends on which stage of the acquisition life cycle you're in but, one example, I've worked here for a couple of years now is our SOF XXXX...XXX that are in sustainment. Not a lot going on on them, but we have a funding line called our low-cost mod line. Every quarter, we go out to AFSOC, our customer, and ask, "what's important to you...what's going on?" And they will come back to us with a prioritized list on an AF Form 10-167, which are aircraft mods. We turn around to our program office at Warner Robbins and have them go start costing out and building a program around each one of those. And most of these are in the \$500K to \$2M range. They come back with cost estimates and schedules and we go get money. I go steal money from any program I can to rapidly address those cost mods that AFSOC has prioritized. So, we're on about a 90 day cycle with my counterparts at AFSOC, A5, and our program office at Warner Robbins where we are continually buying down those needs. Again, those usually aren't usually technology driven...they're more along the lines of replacing obsolete equipment and improving integration on the airplane...improving reliability, maintainability...but what's nice about it, what's effective about it is that is having that AFSOC program office and PEO folks all linked in and working on that kind of battle rhythm to identify, scope out, and fund upgrades. Delivering more capability is what it comes down to. Again, fortunately, we have a fairly liberal authorization to go do that kind of stuff and when things get around \$500K or so, we get alot more visibility into what we're doing...and, we do do new starts regularly...in fact I've done 3 or 4 in the last year just on the XXXX, so we're not afraid to do that if we don't have to. If you have higher than \$500K programs, then you're really tied to the whole processes and then another thing or key point is JCIDS. When you're talking about acquisition, JCIDS is probably the longest pole in the tent because I worked the recapitalization of the legacy XXXX and we spent about a year getting an ADP through joint staff for recapitalization of an old XXXX with a new production line XXXX - it's just crazy how long it takes to push through the JCIDS piece of that. And that, in turn, slows down the acquisitions folks from doing their job, because with out a capabilities document you can't do anything. Now, those are ACAT 1 programs...smaller stuff that we do here...I'll just walk over to the requirements guys and I'll get them to sign a letter and we're done.
<i>Human Resources</i>	7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?
	We are all joint officers...joint-coded billets...all critical acquisition positions, and we're all level 2 and higher. Being in a joint command, it's a little different. You get the ability 1.) to be a little more selective in who you hire, and 2.) you get more senior folks generally. But, it was just like any other assignment for me. AFPC pushed a few resume's, including mine, and he picked two of us, and here we are...you know, it was not green door or anything like that. You know I think he will look at...the 0-6's and higher will look for people...of course they look for all the traditional experience. They do try to hire folks with Air Staff experience, for one thing, and the right acquisition certifications. The command encourages everyone here to get their level 3 certifications in program management especially.
	8.) What measures are used to train and retain personnel within your organization?
	I don't think there's anything new in that area - we use DAU course. I recently got the opportunity to go to PMT 352B. We do have a DAU representative down here that helps push courseware availability and encourage use of DAU to the SOCOM personnel. Retaining them...I don't have anything to add to that; it's pretty traditional. We have all the Services in the military here.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	All of them that I've seen are level 3 in program management, but there's a good number, and I don't know if it's by happenstance or intentional, a good number of us also have system engineering backgrounds. I happen to be both level 3 in systems engineering and program management. And, why is that important - well we don't have a big organization. I don't have a systems engineer I can go pull over for a project like that, so you're sort of doing that jack of all trades work. Actually, in my mind, the perfect rapid reaction project lead is level 3 program management and level 3 systems engineering and at least level 2 or equivalent experience in financial management. Because they need to understand how to trim the fat on some of the procurement efforts.
	10.) What is the optimal team size for a rapid reaction project?
	I would pick a team no bigger than 4 or 5 people, but pull in subject matter expertise (SME). For our gun, we pulled in a guy from crane, a guy from NAVAIR, and actually 2 from NAVAIR, and a tester. I handled the program management and systems engineering...and then a couple of support folks and that's really all you need.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Being a joint organization, that's an interesting question. We pull not only from the Air Force SPOs, primarily at ASC and Warner Robbins, but I'll go to NAVAIR, craine, little rock, air armament center, I mean there's really no one off limits for us because we're a purple organization. I can walk down the hall and talk to guys buying guns for SEALs or helicopters for the Army, so we have alot of very diverse expertise here and then we reach out to the Services as well.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Generally, they see it through to the end because it's a 6 month effort. Generally, at the end of 6 months, it either becomes a permanent program or it gets adopted by the Services and one thing that's unique about SOCOM is that by Title 10, we're only authorized to buy SOF unique equipment...meaning, none of the other Services have it or use it the way we use it. Once one of the Services adopts it, then they are required to buy it for us as well, so that happens alot. Alot of neat capabilities that get developed quickly down here end up becoming Army, Air Force, or Navy standard equipment.
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	I'll tell you, I was a little disappointed, I still am, in SOCOMs use of systems engineering. They don't generally have a chief engineer, which is your next question, but again, many of us are systems engineering and I don't know if that is by accident or by happenstance or design. We tend to go so quickly and accept the 80% solution that I don't think systems engineering is as important because we're happy to get something out in the field that does a decent job. We don't spend alot of time sharpening the pencil, which is what I think the systems engineers really do is they take the time and make sure things are done deliberately and increase the likelihood of the end product meeting the desires. But, again, if they can get something in the field that does a good job, that's usually good enough for SOCOM. I think that's they've accepted that systems engineering doesn't have as strong a role here as some other places.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	Generally not, but I know for me, I got engineering experience - we brought in a gun engineer on an aircraft, structural engineer, and then I was a systems engineer, so I was comfortable that between the three of us, we could cover all the engineering needs of the program. We don't have a chief engineer or systems engineer assigned to the PEO XXXX, but I think there is some expertise out there that we can leverage.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?

	Well, I think the PM has a lot, and if you say the PM does so on the council of the systems engineer, than fine, but, for me, I was both I guess and I had a lot of authority to make system trades. We spent a lot of time, as I was telling you in the beginning, understanding the need and that was very important. We spent alot of time...we nailed down the KPPs and beyond that I felt I had the full authority and trade space to make system trades.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	Are changes to the requirements permitted after arrival...after the requirements arrive at the organization? (Interviewer: Yes sir.) Ok. I'll give you an example of a rapid capability...I'll give you a couple of examples. So this XXXX gun, sat down with AFSOC and said what are you guys looking for here, and they kind of said well, it needs to do this, and this, and this. And it wasn't real clear, so we went out and wrote an SRD. We came back to them and said alright guys, tell me how you're going to employ this gun. And so we had them walk through a CONOPs in the mindset of our SRD. Then we had them turn around and said...and we did that to make sure the requirements supported their intended employment of the system. Then we turned around and said ok, lets go through the systems requirements document (SRD) - does that really equate to what you're trying to buy. So, you're trying to come at it from both sides to ensure the initial customer requirements are what you start the program with. Also, explain to them very clearly that for a requirement written in such and such a manner, it may prevent them from getting something that can do "x". Is that ok, and we actually deleted alot of the requirements out of the SRD after doing that drill. Then we awarded the contract...we reminded them that there's going to be warts on this thing, and if they want it, they need to leave them be and we'll get them later. And so far AFSOC's been very successful at that. For our XXXX, we do a quarterly review with them and we don't change the requirements of any given low-cost mod per say, but we are continually reprioritizing based on their emerging needs. For our rapid reaction projects, there's not enough time to really have requirements creep; you just go do. Not sure I really answered your question, but we do permit changes, but we try and get something out in the field first and then start talking about changes.
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	Yes, is the short answer. If it is a priority, we go find the money and we'll reprogram it or realign it as appropriate. The trick is having the authorization to do it right at the start. If you write your budget exhibits up the right way...you've got a liberal comptroller, you can get alot done.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	Yeah, that's real similar. We go out...the PEO here not only manages execution of funds, but he also has program management authority. If we've got programs that aren't executing well, or their behind schedule, we'll just take the money and through a reprogramming or realignment and pay them back next year. we also use new starts if we don't have a current authorization.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
	We use a variety of methods...not very formal. For our XXXX gun, we went out and got some imperials on some similar guns and we tried to build up an estimate ourselves and I think we did a fair enough job. I think we've got a willingness of our leadership to accept that if costs come in higher, its not always because of cost growth or requirements creep, but as long as we're close, we're usually ok. We try and go find similar types of systems and get impericals and go from there.
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	You have three key areas here...where we here use RFI's liberally...we don't always use RFI's to..as a precursor to a contract or an RFP. We just put them out to someone and say hey, what do you have out there. We just finished up one on all our XXXX and we've got some gaps we've gotta go fill, so we put an RFI out there and got lots of good input form industry - folks who would love to compete with XXXX. We also have an annual acquisitions program briefing to industry in conjunction with SOF week, a major SOF convention down here in Tampa...industry has their booths out here, but we sit down and do one on ones with just about any industry rep who is interested. Also, not just a result of the RFI, but we maintain steady contact with industry...key folks that have good ideas, we keep them...not on the speed dial, but keep their business cards handy and if something comes up that might be relevant, I'm not afraid to go ping them just to see what's out there. That doesn't preclude us from going full and open if I'm just looking for information. If I feel the need, I will use and RFI to keep people informed.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?
	We don't do a whole lot with academia, but I mentioned we do have the support of all the major Services here and some organizations...we leverage all the Service's program offices that do this sort of work...ASC, air armament center, ARMY TAPO and so on, so we do alot through them, either through the program offices or directly.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	We use...really the typical process. RFIs, RFPs, do market surveys...I mentioned the APPBI...there's not any rocket science there and we follow the FAR.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	Our program offices do a pretty good job of that...we do that...we will, sometimes we will send them money to do studies for us and kind of keep that momentum going for industry partners who have good ideas. Often times, when we're ready to go...we're ready to go now, and we need them to spin up quickly and by maintaining that relationship with prior industry partners, you have a much better chance of having something you can kick-start once everything's ready to go.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	The answer is clearly no, but in our business here doing XXXX, we are generally involved with the big contractors and smaller defense contractors. I know some of the other offices here at SOCOM will use non-traditional contractors - they have medical research branch...alot of personal kit, SOF warrior gear, we've bought Toyota's, ATVs, you name it...so, alot of gear that's not defense specific, but for us in the XXXX, we're mostly dealing with XXXX, so we don't do alot with non-traditionals.
	26.) How long are offerors given to respond to a request for proposal?
	I couldn't give you anything really specific...and you know on average a number of contracts, but on tow that I have participated in recently, both were given 30 days, which is what's required by law. The first one was a several hundred million dollar contract and they were given 30 days from release of the final...they had a draft RFP for some time. For the most recent one, which was the XXXX gun, there was an RFI, and it closed on the 16th or so on our side, then we'll release the RFP and give them 30 days to respond. But let me say that we also acknowledge the detail was not going to be in that proposal, and we were ok with that. So initially, it's 30 days from the RFP being out there.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?

	I don't think that there's anything specific that's given out - they don't have any military of the quarter or that kind of thing here. All of us that are here though, are here for one reason and that's to deliver capability to the warfighter and those that don't have that as their priority don't usually do well here.
	28.) What innovative contractual incentives have you had success with?
	We use a lot of firm fixed-price contracts. Another thing that I saw recently that is intriguing me..the jury is out on how effective it is, but I saw a contract where the CLINs were set up on an even-driven basis and they couldn't close out the CLIN until they finished the event, meaning they couldn't start charging the different rates; the higher rates as they went through the program. Until they had actually completed PDR and they completed trial install and so on , so it really incentivized them to move on. We did something similar to that with the XXXX gun, but it was fixed price, so they're not going to earn their money until they actually close out.
	29.) How much autonomy do employees have to help new ideas flourish?
	In some areas a lot..as a program manager, I was given a lot of autonomy..not a lot of time to experiment and flesh out new ideas, but I thought I had a lot of autonomy.
<i>Wrap-up</i>	Do you mind if I reference that I interviewed you as SOCOM as part of my thesis write up?
	I don't. I actually work for the PEO FW...I just don't want anybody to believe that you came in formally through the SOCOM acquisition and logistics center front office or anything like that. (Interviewer: Ok, so specifically reference your PEO FW?) fixed-wing, yeah.
	Can you recommend any other organizations or POCs in other branches of the Government that I should talk to as part of this research?
	Yeah, I can only think of two...I mentioned to you the NRO ACE the other day and I couldn't find a name for you yet...I'll keep digging around. NRO ACE is acquisition center for excellence and they fall under a whole different paradigm when they're doing acquisition, so they're not under DoD 5000, but they are under similar things. And then the Air Force's space office really isn't under DoD , but it's on it's own..it has it's own acquisition policy documentation and so on, so and the only area I can think of is operationally responsive space - they're looking at how they can streamline and field space capability quickly. It's led by SAF/USAC I believe. You might be able to track down something there. And also, SAF/USAM is space policy - they could be able to give you some ideas. I used to work there and they generally think in timelines of 5-10 years, but operationally responsive space is looking at things that can get them there much faster.
	Ok, those are excellent sir, I really appreciate your time and I'm sorry we had to rush through some of the last ones there, but I'll shoot you an email and maybe we can set up a time to talk a little bit more about the XXXX experience you just had.

Interviewee: Naval Innovation Laboratory (Nall)

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints. In order to protect the identity of the participant or the technologies and customers they work with, certain items have been omitted and replaced with "XXXX" where appropriate.

Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	I think that our organization is very much in line with what you described your study to be. So we occupy a very specific niche in that if something were off the shelf, then it is not a candidate for our program. If the technology is not mature enough...it could become sufficiently enough developed to make it a candidate so our niche is basically technology that can be rapidly developed or can be fielded within 9 months. So we're looking at things that are above around a TRL level 6 and so it's some development and some integration and then get a prototype into the field. And so if you can innovate within that cycle, you know I guess it depends on what you mean by innovation, so there might be an innovative capability that isn't fielded at all that you could bring to bear, but I think you have to be careful because if it's too conservative, then they're like you're not an acquisitions program if you buy stuff off the shelf...if you're pushing the envelope too much then you're in the risky area as far as delivering something useful. So, you have to be somewhat cognizant of the niche that you occupy and what you're trying to do.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	Wow...well in our particular organization, we're pretty much a start up of a few folks, so it is...you know, there is a lot of rapid table talk, but I can talk to you about the process we have that allows us to look at the technologies and look at the alternatives. What we try to do is get an early look at the problem...at its inception, when it enters the system...even while decisions are being made and try to help the formulation of what bin it should go in. So now, I guess you could say we really have two products and that is...1.) is development of a fielded prototype and along before that, it is actually providing advice on urgent needs of all varieties, but what are the development paths. Through that look at all of the urgent needs, and we're only talking about maybe a hundred per year, you know if you look at all of those and the technologies out there that can meet those urgent needs...and through that process of trying to match needs to technologies...you know if you call that an innovative look or a process that allows you to get innovative looks. Other than that all we have is...at the inception of a particular program, we find it helpful to have IPTs to get a very diverse look when you are having subject matter experts come in to take a look and the start of the program you get another kind of a look and than at the beginning of the project, you bring other folks as far as an IPT...you know alot of different opinions about the problem.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	Well, I think I pretty much described it...I mean, basically, our approach is that we sit on...what we try to do is...because the Marine corps has a much more, I guess, robust capability, it is a little easier for us to do it for them, but we try to do it for the Navy too, and that is we try to get an early look at all the candidates and try to develop a baseline technical approach...you know the candidates and alternatives that might be used to solve those problems...and provide the advice to go forward on it. I think through that process, we have a pretty good handle on what the issues are on any particular urgent need as it comes up and what potential solutions there are. So you fold in your own organic look at it, you fold in subject matter experts across the naval enterprise and the other thing we try to do is we try to select, I guess you could say, the best project leads. If we have an organization that has alot of experience at you know radars, we will go to that organization to lead the project even if it involves alot of other different facets other than radars. If we have a project that has alot of different components, and you just need a very experienced systems integration organization, we'll go to that particular organization. We try to look for the best organization to lead the project for us. (Interviewer: Ok, so then your office is actually chartered to find an organization within the Navy or Marine Corps that could in a sense execute that project?) Right.
	4.) What is your average time from concept to working prototype?
	I guess where do you want to start...from the time that we get approved for the project to start the clock? (Interviewer: Yes sir.) I'd have to say about 7 months. Well, when you say on average, we've only had like three total projects since the inception of the program, so now the problem with a 9 month thing is you've got to...in the beginning, you've got to quickly come to a decision about what you're going to do and then the last part of it is kind of a logistics part and then the delivery and the training. So when you start the testing and delivering training, you've pretty much got to have all your ducks in a row...with the actual formal delivery happening in 9 months. (Interviewer: And that's post demonstration?) Right. So, you've demonstrated it...you've trained and now you're fielding it in 9 months and then you begin support. So you've got to have something reasonable on the table, I would say, around 7 months and you've got to have your decisions made early on in the project because you've got to pick a course. Now you can have a bunch of...like one of our projects, you can have multiple development paths as to which one you're going to follow, but eventually you have to pick one and ride.
	5.) What are the main roadblocks to quickly delivering capability?
	The experience we've had is 1.) you don't know what you don't know...so making sure you're covering all you bases, because if you're taking too narrow of a look, then decide too quickly and somebody comes out of left field and says hey, have you heard of this, so you want to make sure you do a good enough look at technology, so you don't get blind sided. I think the other major roadblock for speed besides funding and the constrained environment is getting the operational forces to participate in the development and the testing so that you get a very useful product and that the operational forces have ownership of it. Basically, they're busy and so you're developing something and then you need to take time out of their busy day to come participate in a test or get trained. You know we say you need to reserve some time, so it's just lining that up...and I wouldn't say that's a problem, but it's something you need to pay attention to. Because it seems to be easy for us to get the scientist to do their job...it's more difficult to get the operators to be involved in the development when they need to be involved in it.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?

	I think that our process...we have our own organic technical assessment team that does nothing but look at urgent needs from the beginning...you know from the time they roll into the process and I think that we've had some success with it and it's been the only thing that allows us to...you know, we have very...our timeline for delivery of a proposal is 10 days from the time we get asked to do it. So, to the extent that we get a forward look, and have looked at the problem before, that's the extent of a good proposal. I think as far as our best practices, you know, it takes a while to do anything of quality and if you can sort of stick with the problem for a while and look at it and look at the technologies, so we can get a warm start to it rather than a cold start/we need this in 9 months...you haven't seen the problem before...you don't know who's out there...it's a much harder problem and you're forced to overlook a lot of things that you might have wanted to overlook.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are there certain traits you look for?
	Well, the first thing is we have a very small office right now. What we look for are experienced folks. You know, I mean we have very few...we have myself, we have a military liaison, and ex-Marine Corps Colonel, and I'm in the process of hiring a program manager. So, basically, I'm looking for people who I know have experience in rapid delivery of products to the field and experience with both programs and technology development and operational organizations. I'm not doing a whole lot of hiring and firing...I'm sort of cherry-picking who I think is suitable for the program. (Interviewer: Before we move on, so I understand how your organization is aligned...do you report back up through NAVAIR and OPNAV or N78 or how does your chain work?) We administratively...there are two chains to think of...there's the operational chain, and then there's the administrative. So administratively we work for NAVSEA - we're physically housed at a Naval Warfare Center at Dahlgren, VA. Operationally, we take our marching orders from the rapid development and deployment committee (RDDC), which...the way the process works is, you have the N8 or the commanding general make a request and have the NaIL make a proposal on an urgent need. And so, we'll make a proposal and send it back to the RDDC and they will either say yay or nay and decide how much money we can spend on a particular proposal. That RDDC is really chaired by a representative of you know ASN/RDA. (Interviewer: So someone on Mrs. Etter's staff?) Yeah, right.
	8.) What measures are used to train and retain personnel within your organization?
	Wow. We haven't lost any yet. You know, I guess it's just...what you hope in a project like this is that it is interesting work that engages people of quality and you know you can provide the tools and provide them enough guidance, but enough leeway that they have sort of control over their destiny and can contribute. We don't do a lot of looking at timecards...you know, we're looking at products and what people contribute and whether the program is moving forward and the quality of their ideas and make them part of the process and part of the team. And, hopefully, they'll stay around if they don't get stressed out too early because it is a somewhat stressful environment because the urgency of the problem and the level of visibility that it gets. Typically, we're sending our monthly reports to the 3-star level and we have sort of a shared funding on what we're doing, and the Services are putting in money and they're interested in that it's well used and if it comes with a price somebody has to pay for it because it is year-of-execution reprogramming. And so, they are interested in that it is being well spent and also because the urgency of the problem, they want to make sure that a quality product meets their need. There's a lot of impetus to do a good job and do it on time. If you can get past that, and think about what the actual mission is and that you're meeting, or being part of completing a mission or saving lives, then that's a pretty good reason for people to stay around.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	I would say they have a healthy dose of technical, program management, and operational experience. All three of those factors. I mean they come from an engineering background, with a significant amount of program management experience.
	10.) What is the optimal team size for a rapid reaction project?
	I would say the team size is small...I would say 3 to 5 people, but the amount of people they need to reach out and touch is large. They have to involve the community. It also depends...we have an ongoing project now, the guys who's heading the team in Tampa...it's him and a few other people working for him, but he's touching a lot of other people across the different warfare centers. You know a much larger group than he's responsible for, so the team itself, I mean the IPT is maybe 30 members. But the team that's reaching out to them and trying to coordinate their efforts is maybe 3 folks...3 to 4.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Yes, there are and I talked about it a little bit. The Navy has, I guess we have...I have my own opinion about this and maybe there's a lot of subject matter experts...and you need to tap into the enterprise level experience to get the best and brightest. But, getting them together in a timely manner and getting the product out is sometimes difficult. I think having your own group that does some level of integration of all that data, both with market research and what they find from their real subject matter experts, is helpful. (Interviewer: Now is that your assessment team that you mentioned earlier?) Yes.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Yes, we've done three projects and on the first one it was seen completely to the end by experienced folks and the second one is in the ending phase - you know beginning to end by the same team, and the third one is just beginning.
Systems Engineering	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	It plays a significant role, but it's non-traditional systems engineering I guess you'd say. If you think about the classic ACAT process and all the steps you have to go through, this is a much more restrictive environment as far as that, so things have to be done...you can't skip any steps. You have to worry about logistics, you have to worry about training, you have to worry about life cycle, maintenance - you know you have to worry about spiral development and how what you're doing plugs into the larger picture because you're only delivering a prototype, because its legacy is to get picked up to be used by a larger program of record, so you can't ignore the systems engineering aspect of it...either to get the job done or to ensure it has a life beyond what you're delivering and can be used. But, it's not the...check the box, you know, one size fits all systems engineering that you see with larger programs.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	We have a slot called the chief of engineering, but it's not filled yet. Basically, I have somebody...our military liaison, who also happens to be an engineer, is filling that spot; sort of dual-hated.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	I think they have considerable authority. I mean, they have considerable authority to make decisions and put together the plan, although I expect them to brief it and keep me informed say, hey, I think you need to go in this direction or you need to do this, but generally, I try to give them as much authority as they can stand, and as much freedom to make choices on how the program should go, but not lose oversight and control over it.

	<p>16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?</p> <p>Like I said, we get an early look at it, but then the formal request goes to the RDDC and usually some sort of documentation about what the requirement is, and then they'll send it to us...we probably already know about it by then...and they'll say to give us a proposal on it. As far as changes, we kind of take them at face value about what the need is...and there's a lot of room for clarification or interpretation about what really needs to be done, but what we don't try to do is get a requirements document out of them. So in the spirit of the urgent request, you have to do some digging to find out what's really needed, but we don't do a whole lot of changing with the requirement, we take it at face value at what their needs are and just try to execute that. (Interviewer: before we go on, you mentioned you get an early look at the need before it goes to the RDDC...could you elaborate at all on how you do that?) Yeah, the military liaison goes down to Quantico and sits on their urgent needs board. The other thing we're doing is sort of, to try to make it one...I guess the way we're trying to look at it is, we're not a separate organization from the Marine Corps or the Navy and to the extent that we can share the larger urgent needs/rapid development process...a shared experience is a good thing, so what we're trying to do is, as we work on projects, we do a lot of documentation of the technology and the alternatives that we apply...and we are trying to meld our information database with their information database. So that technologically, we can look at what's on their plate as far as needs to be solved, and they can look at what's in our database and see what we're working on that are solutions to their requirements. So, that experience of sharing information and creating a common information database is something that's high on our priority to do. I think that also contributes to that early look and shared experience and part of a community, so that you're just not a receptacle for hey, can you do this for us. We're part of their effort and you're providing value added all along the way.</p>
Budget	<p>17.) Are funds readily available to your organization to pursue new ideas?</p> <p>Well, I guess the one thing you have to understand about our organizations that you have to understand, that I should have mentioned at the beginning, is that ours is a pull system, so we don't push things out to the fleet. We only work on validated urgent needs, so if somebody comes to us with a great idea, we'll take that, document it in our technology database because one of the things that we are chartered to do is maintain awareness of what technologies are out there, what capabilities are out there, who's doing what. So, we'll take that, document it, and stick it in our database, especially if it applies to a past or ongoing urgent need. We'll say, we couldn't do this urgent need back then, but here's some new technology...can we do it now. So we do a lot of maintaining situational awareness on organizations and the current state of technology. Where we don't go, hey, this is a good idea...why don't we try this. There are other programs that do that. I guess you talked to XXXX up at ONR. His program is more like that...he's got money that people put in to work on things. Nobody puts their proposals to us...we just work on...as far as money, we have a POM budget, which is intended for start-up money. We are sort of working it out now with the Services on how much they pay and how much we pay is I guess the best I can put it. Coming up with new money is an interesting problem. (Interviewer: You know that is a common theme that I've seen throughout these interviews is that money is not only a roadblock, but it is also one of the critical keys to success.) You know that's true. We have POM'ed money, and so basically, we don't want to pay for it even...you know, we would really not like to pay for all of the project because we want the Services to be involved; have an interest in it. So we do have some budget, but the theory behind it is hey, we'll do 30% and the Service will do 70%, but right now, we're more at the we'll do 70% and the Services will do 30%. We're still working through that right now...you know how the share will go. Yeah, but the budget is a significant issue in being able to address urgent needs.</p>
	<p>18.) What process do you use to obtain funding for your rapid reaction projects?</p> <p>We get a budget and we are asked to make a proposal and we make a proposal based on how much we...we're still in flux, but the thought is that we provide start-up funds and give the Services time to reprogram money to satisfy their urgent needs. That's the theory...the practicality is that since we're a start-up organization, we're in a transition between ratios of what we'll provide and what they'll provide.</p>
	<p>19.) What process/method do you use to establish cost estimates for rapid reaction projects?</p> <p>As part of that technology assessment, when we start looking at technologies, if something looks like its going to be sent forward, we start to develop a program plan and do market research. We do relative estimates of merit and kind of rough cost/schedule kind of stuff.</p>
Technology Reach	<p>20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?</p> <p>We do an awful lot of calling to companies and a lot of outreach of people around the Naval community that we think would have technologies that would apply. I think that's the best way to put it. Part of our charter is to maintain awareness of the capabilities that are out there across the Navy, across industry and sort of maintain an inventory of capabilities within the community. To the best extent we can do that...we do. That's a good theoretical answer to the extent that we're a relatively young organization and we still have a long way to go towards collecting that inventory of capabilities. Like right now, I'm trying to do outreach...you know, visit...on top of the technology assessment, we're trying to do, what I'm trying to do and my boss' trying to do is outreach to other organizations to see what capabilities they have and see if it might...so, you know I've made it a point to visit about maybe one or two organizations a month. (Interviewer: And in finding those organizations, is most of it word of mouth?) A lot of it is word of mouth. The technology research is mostly driven by the urgent needs, but to find organizations to go visit and do the grin and grip and hey, we're the NaIL, but there doesn't seem to be any lack of organizations to go visit.</p>
	<p>21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?</p> <p>I would say that right now, we're mostly a self-contained organization although we do try to get the word out and I did have the chance to speak to a science advisory meeting up at OPNAV the other day. I think there's a lot of room for cooperation. I think the issues about handoff...when we work a projects that are too difficult for us...too far out...you know, how do you hand off urgent needs into the S&T community and have them report back...you know, take the project on and have them develop that. You know, maybe they're a few years out, but maintain the same account of rigor and accountability that we have impressed upon us such as level of visibility, of meeting it, etc., etc. It's easy to keep focus when you have a 9 month timeframe and from beginning to end, people are popped up and looking, but once you send it off to the S&T community, it's first, who's going to pick it up, and second, if it does go there, does it just go into the big black hole or what actually comes out of it?</p>
	<p>22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?</p> <p>We don't. And like I said before, we go searching for other folks...we don't just take a good idea and say hey, this is a good idea; you need to fund it. That's not what we do.</p>
Industrial Base	<p>23.) What process do you use to solicit proposals for rapid reaction solutions to industry?</p>

	Basically, what we've been doing is calling them up and finding out what their capabilities are and asking them for a proposal. Say...hey, we've got this problem; can you solve it...do you have any technologies available that we could apply to it? It's somewhat of a, I don't want to say catch as catch can, but its not a rigorous process as of yet I think...or, it could be more rigorous. You know, we do our own...our system team does some of that, but we happen to be working on...for one of our projects has to do with an urgent need that I went down to some friends of mine downstairs who have a process that allows them to reach out to industry and do inquiries of anybody that has a capability that could meet this need and they put in the inquiry, and I got some answers to it and we go out to the warfare centers and they use their contacts...you know, we ask folks to use their resources to find out what the technology is and we fold that back into our database, so it's not only sort of a continuous process from our early looks all the way into engaging the different warfare centers and using their contacts and abilities.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	26.) How long are offerors given to respond to a request for proposal?
	I think it really doesn't apply to us...you know, we really don't do the formal proposal that I think you're talking about. (Interviewer: Ok, so basically, you all go out to industry, find someone who has the ideas, and then you take a proposal forward to your leadership?) Right. (Interviewer: So how then does that contractor get turned on?) So far, we have found existing vehicles to get to them. Or because its an urgent need...if there's no existing vehicle, we say...this is an urgent need, we've done our market research and these guys have the capability and we need it. Now part of the thing incumbent upon us is to develop a little better acquisition strategy to have different types of vehicles in place that we can sort of address through our own internal methods for how to get to a contractor. But, right now, we've been lucky in that the people we go to already have existing mechanisms that we can utilize.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?
	I don't know that you say we have incentives other than the motivation of the job. You know, the going in proposal is that we're going to do it in this amount of time, so just being good stewards of the Government's money and responsible scientists and engineers...you know, give me a plan that gets me to where I want to go from where we are. I'm not sure that really answers your question, but... (Interviewer: Well that question...originally my scope was to look at industry and within the Government, and I know industry has alot more flexibility to different things and so I also wanted to see what, if anything, was being done within the Government.) Well, you know one of the things we did on a contract was offer the contractor some incentives to make an early delivery because we were worried about the schedule. He gave us his reasonable estimate and we said it was on the edge of being able to make it, so if you can get one and build it by this timeframe, then we will give you incentives to do that. So if that's what you're talking about with incentives..yeah, we've done that.
	28.) What innovative contractual incentives have you had success with?
	That and well..I think we're a little too young to answer the question in and of ourselves, but I've taken the models I use...I came from an organization that when you talk about acquisition strategies had a terrific acquisition vehicle and they took a long time in constructing it, but when they got done, it gave them...I don't want to say you could drive a truck through it, but you could meet aloft of requirements with it. And they were the type of organization that addressed alot of different requirements, so they needed a very flexible acquisition vehicle. And it takes time to get it in place. But, once you have it, you can use that to address a whole host of issues that you're not really sure what's going to come down the pike, but you'll be able to provide solutions that requires you to do the things you do, so it provides things from equipment to services to, you know, a wide range of disciplines and areas. That sort of pre-positioning of yourself with this acquisition vehicle when you're not really sure what's going to come down the road allows you to rapidly turn on people and find the expertise that you need and to do the job and can be very valuable. What I intend to do is adopt that in my own organization and figure out if we can get a vehicle or develop an acquisition strategy along that line.
	29.) How much autonomy do employees have to help new ideas flourish?
	Well, I mean you are talking about my own person, but as far as I'm concerned, I think they have a lot of autonomy. You know, we have a small staff and they all are very experienced at their job and the people that surround us..our office sits within a larger office of experienced folks, so there's alot of sharing of ideas. I think that climate of strategic thinking and bouncing ideas off of each other and valuing people's opinions is encouraged, so I think if you ask each one of them if their ideas are well thought of and they could contribute at any point...they would probably say yeah. I mean we don't have a whole lot of attrition so, they must enjoy their job.
<i>Wrap-up</i>	Sir, that is the end of my formal questions, but I do have two questions that I have been asking every interviewee, and the first one is would you be ok with me referencing the NaIL by name in my write up?
	Oh yeah, sure...that would be fine. I don't think I've mentioned any programs or projects and we should stay away from those...but can I see what you're going to write about the NaIL before you actually publish it...is that possible? (Interviewer: Yes, absolutely. All I had really planned to do is...I don't know if my advisor wants to have copies of all the interviews transcribed as an appendix, but all I had planned to do is have a table of all the organizations I interviewed and then my findings section will pretty much be a summary of the comments...so lets say, maybe 68% of the interviewees answered this way vs. that way, so it's going to be pretty generic and there's no identifying information that would tie anything back to the NaIL other than saying I interviewed them.) Yeah, no problem with that....no problem at all.
	The other question I have is that I have a classmate who is going to possibly be implementing some of this research with the AFRL group that I mentioned to you and I'd like to pass along your name to him if that is ok?
	Oh, sure...yeah.
	Because he's working for the group that I was talking about and I think the relationships that you were talking about with reaching out to other members of the S&T community and various other organizations doing the same thing is crucial.
	Actually, I'd be happy to come down and talk to them.

	Well, I tell you what...I will shoot you an email this week with the process owner's name and then I'll also send you kind of his go to guy for CP3 as well and so that way maybe of you guys have some questions...I think CP3 is a relatively new process as well...maybe not quite as young as the Nail is, but not more than a year or two ahead of you guys. They've only had a handful of projects as well, so I think there is an area for some synergies here and the exchanging of ideas and that sort of thing.
	You know, I think this whole thing about rapid development is new in general from what I can gather....you know, there's a whole lot of people at the Naval base where I work who are very experienced at these long, traditional programs..the concept of putting something on the table rapidly doesn't have a large following and its a very select group of people who seem to be able to do it successfully. Or even recognize it as a skill.
	it is and unfortunately, that is one of the things I found about midway through my thesis when I started to sit down and look at interviewees that I could gather and I'm saying, there's really only a few people that I could talk to, so ...
	Yeah, but you have a pretty good list there. I was looking at your list of people you're talking to and you seem to be hitting all the ones that are doing anything.
	Well, I certainly appreciate your time sir and if there's anybody else you can think of in the rapid reaction community that you think I should interview, please let me know.
	Alright, I will keep that in mind. Let me think about that a while and if I can find anybody, I'll shoot you a name.
	Ok, sir, well I have taken up more of enough of your time today, so I really appreciate it
	Well, good luck and I'll be interested in reading your thesis once you're done with it.
	Ok, sir...will do
	Take care

Interviewee: Telemedicine Advanced Technology Research Center (TATRC)

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints. In order to protect the identity of the participant or the technologies and customers they work with, certain items have been omitted and replaced with "XXXX" where appropriate.

Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	<p>I would say it is very critical. Ok, let me back up and do a quick overview of my piece of the organization. Our organization is actually the telemedicine and advanced research technology center. We've been tasked to be a joint medical research group to do joint medical technology research for the DoD. So, we're looking at technologies that will fit...so, looking at academic, looking at industry, and looking at the DoD for technologies that are out there to see how we can take what's already out there and take what's already being researched and merge it into requirements that are being developed by DoD to benefit the military. So...we don't always want to reinvent the wheel...we don't want to start a new program, we want to take things that are already being developed and just kind of tweak them where we can to make them more beneficial. Sometimes they're completely new, concepts and sometimes they're completely new innovations, but not always. Sometimes, we can take a sensor that's being developed for some kind of reactant...we can take that and steer that research into a different area so it can be useful in other areas where DoD has a key need. My piece of that...we're a mobile computing group where we're looking at how we can take existing technologies, or pieces thereof, and put them farther forward on the battlefield. So, we're looking at how we can harden those technologies or ruggedize those technologies...how we can make them easier for the users to manipulate when they're further forward. We're looking at how we can document health care further forward on the battlefield..whether we're doing it through stylist taps...finger taps...different types of keyboard mechanisms...different types of voice input mechanisms and those types of things. So we're all familiar with how we input data on a desk...but how we do it on the battlefield; it's a whole paradigm shift. You've got bullets flying, you've got background noise...you've got helicopter blades, you've got people yelling, you know, you've got ECUs yelling in the background...you've got you know all kinds of background noises that you don't encounter in a desktop environment, so no you've got different things distracting and taking your attention away, so how do we effectively...not necessarily in a combat or trauma situation, but even in a pseudo desktop environment, how do you get that input. How do you draw these guys attention and how do you do those. So we're looking at how you do that. Mobile computing is difficult when you don't have bandwidth, when you don't have connectivity, and you know our fixed facilities when you're doing healthcare that's easy - you've got a bandwidth, you've got a LAN cable plugged in....so you can validate user credentials. You can't always do that on the battlefield. We don't rely on the CAC cards to authenticate in theatre, so how do you do that? So we're looking at all these types of things. How does innovation play into that? Well, we've got to solve alot of technical issues that have never been solved before....we've never had to solve them before. Innovation plays a very key role in that ...hence it's critical that we think..and I'm skipping into another question I know, but we have to think outside of the box and think of how we can do this...we've never had to think this way before. You know, trying to think of how we can authenticate users when we don't have any way to reach back to authenticate them with a centralized server...you know, coming up with ways to do that in an austere environment where you don't have a way to reach back; that's just completely never been done. So while they've been doing that at the corporate level, we're looking farther forward. There's an organization that we fall under called the Theatre Medical Information Program (TMIP) and they're looking at the corporate architecture for the AHLTA theatre and for the DMs, which is the logistics program - there's a whole suite of solutions, that just putting together all of these pieces....and we're doing alot of the research for the development pieces that are going to plug into those mobile computing pieces. Specifically, we've been developing the AHLTA mobile. That's one of our bigger successes where we've enabled the provider to basically document at the point of injury or at the point of first encounter with the patient - the full medical record. You know he can have a handheld, a tablet, or even an ultra mobile device out there in the field and they can begin documenting at a trauma cite or at a mass casualty site or even when they're doing sick call and that is actually making it into the full longitudinal medical records for these guys out there in Iraq today. So, through innovative thinking, and through nothing more than innovation...thinking of how we can serve these guys and thinking of how we can help them help themselves. This process has happened - we went from prototype to delivery in 10 months. And I kind of skipped into a couple of other questions there, but you know, that's something that's completely unheard of in the acquisition cycle. (Interviewer: Absolutely. Well, that's exactly why I wanted to get your thoughts here because the process I'm looking at at the research labs targets meeting urgent warfighter needs in a 6-9 months turnaround from from concept to prototype and or demonstration - so that's really where I'm coming from with these questions.)</p> <p>Well, and we're kind of doing this again...we've got another hot one that has just come in to us...four months ago, we got an urgent need statement, or an urgent need that came in...it wasn't even a statement..it was an urgent need for a traumatic brain injury tool. It's called the MACE form...it's military acute concussion evaluation form. It came to us as a very high priority to include in the AHLTA mobile product. It needed to be included in the AHLTA mobile...go out to the theatre...it's something that the first line responders are being asked to record on every respective concussive event...meaning any event that's being suspected to have been of an concussive nature. If the soldiers being part of a blast incident, part of a motorized vehicle, part of a fall, part of anything that could possibly cause a concussion...the first responders are filling out this MACE form. And what the MACE form does, is it helps to triage the patient...to assess the probability of a traumatic brain injury because traumatic brain injury is a huge part of this conflict. This war has seen more than we ever imagined, so the MACE form has traditionally not been captured electronically - it's all been done on paper, so far. So about 4 months ago, they began putting together the need and the requirements for this form- last month, we delivered electronically - we're still going through testing right now, and it will be delivered to the users next month. (Interviewer: Ok, so that total timeline was how long?) Less than 6 months. Beginning with actually generating the technical requirements to delivery to the users. So, I mean, that's a small piece and you know its a huge impact to the users, but you know, we're doing things in ways we've never done them before because we're starting to realize, especially with IT, that you can't follow the typical acquisition chain.... you know, if you go through all your requirements process, by the time it hits the users hands, it's too late. You've to insert these technologies where they make sense and how they make sense; you've got to use a more rapid application of ...at a bare minimum...you've got to insert these technologies at a higher milestone...you can't follow the same process for IT development as you do for other systems.</p>
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?

	We do a lot of brainstorming. I think that's probably the main thing...we do a lot of brainstorming and a lot of user meetings where we either go to the users or we bring users in and we ask the users, what do you need? What do you want? How can we impact your business process?
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	Iterative development...I'd say that's probably the biggest thing. We either give them small, incremental deliveries through engineering drops to say, here, how's this looking or we'll send them screen shots...non-working prototypes so to speak to make sure we're on track before we give them a full delivery that doesn't meet the needs. (Interviewer: is your goal at the end of lets say the timeline we used for the concussion add-in...is your goal also to do a demo and then deliver it or is your end goal just to deliver it in the field and then do some real-time testing?) Just deliver it. If we've done enough...with the MACE form specifically, there was a working group that was put together specifically by subject matter experts (SMEs), functional user reps. Luckily, we've got a lot of good folks who have come back from theatre that are in the D.C. area and a lot of those lead SMEs live actually at Fr. Detrick out of AFMESA, and she would come over to our site at Fr. Detrick and she would kind of look over our shoulders and go through the screens with them and say, no move that over - oh, that makes more sense to be over here or on the next screen. We had a lot of interaction with the SMEs and with the working group as we were developing the requirements and doing the development work. So, we try and be as involved with the user community as we can when we go through it - that way we don't have to back to the drawing board after the fact. We try and do it right the first time so we don't have to go back and, you know, once we deliver it and it goes forward to the users, a few of us are in OT with the user community, unless it gets delivered to the users. Typically, the users, they'll go through an OT with it and they might come back and have changes they want us to make. It will be functional, it will interface with AHLTA theatre and it will make it up to...it will do what its supposed to do by the requirements given to us by the functionals out of the working group. They might want to see changes made and we'll go back to do that, but there will be no severity ones or severity twos, meaning it will be functional, it will work, it will meet the letter of the intent but there might be changes, but it's not going to be a show-stopper.
	4.) What is your average time from concept to working prototype?
	I guess that kind of depends on the function points. If it's a total complete re-write of a huge functionality, it can be longer...like I said with the whole, what used to be BMIST and now is AHLTA mobile, that whole core program was launched in about 10 months. And its kind of grown and it's got a lot more functionality in it now. If we had to do a complete re-write of it now, it would take about 18 months. It kind of depends on what we're launching and how in-depth the requirements are and how integrated it is.
	5.) What are the main roadblocks to quickly delivering capability?
	For IT projects, I would say it is security and policy. (Interviewer: Ok, when you say policy, do you mean DoD policy or TARTC policy?) No, Government policy overall. You've got a lot of folks out there that believe if it hasn't gone through the full DoD acquisition cycle...it can't possibly be. You know, there's still a lot of the older policy people out there that believe its got to go that way or it just can't be right. Change is hard. The security piece is a huge, huge thing as well. There's a huge split between your garrison applications and your theatre applications. Your garrison applications- that's one network that's run by your...or in the Air Force your SBC perhaps. On the theatre side, the Services maintain their own infrastructure...Microsoft updates, virus updates, etc. - they happen a lot more on the garrison side than on the tactical side.. There's a big problem being able to put those tactical applications on a garrison network. There's a lot of those types of things that cause a lot of problems on the security side. You just can't put tactical applications on garrison networks. Security is a huge headache trying to go back and forth - and you know, in the military we always preach, no matter what branch of the Service you're in, train as you fight. Until it comes to IT. You know a lot of times you can't use the same kinds of applications in the tactical world as you do on the strategic side. And it's not even a classified, unclassified thing. It depends on what color your network is...is it a tactical or is it a fixed.
	6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?
	Oh, wow. Wow, that's really a tough one. I would say responding to customer needs.
Human Resources	7.) What process does your organization use to identify and recruit highly qualified personnel and are there certain traits you look for?
	They have to be self-starters. They have to be motivated. And they have to have follow-through. (Interviewer: Ok, so what would you say is your way of identifying those individuals to bring them in?) I think, and I'm not speaking for all of TATRC, I can speak definitely for our mobile computing group. Our team has been pretty solid. Our team has been together - well, we've got one guy who has been around longer than I have, but most of the team has been together for going on 5 years. We recently brought someone else in to the team and he kind of stuck out a lot because he asked a lot of questions. He did research before the interview. He asked us a lot of questions about what we were doing...I mean specifically to the product..programs, to our users, I mean he actually went out and dug about what we were doing. And asked more questions than we expected. You know, you could tell he was interested and wanted to fit in with where we were going. But we definitely...if we were bringing someone else in, we would need someone who took the time to find out who we were and what we were doing before they walked through the door. You know somebody who just walks into the interview like it was any other interview - we don't want someone coming in blind...we want someone who is as interested in us as we are in them. (Interviewer: Ok, so you don't really seek out new individuals..you are kind of looking for people to come to you at this point?) Well, we have looked for people, but it's really hard to find...we do handheld devices, and we do imbedded devices and that employment pool is very slim. I think there are only about 2,500 that are registered with Microsoft. That's kind of sparse. We send all of our developers annually to at least one Microsoft certified conference and training event. We do keep our eyes peeled for people that do kind of stick out in some of the very niche training events that we do attend there. We might capture a couple of business cards or we might ask a couple of questions and we might look around and see if anybody catches our eyes, but normally its people we know or people we've worked with on other projects; it's usually somebody we know that we'll try and capture. Sometimes it's somebody off the street, but it's not often. It's always somebody who asks questions and who comes looking. But you can always tell somebody who's highly interested not somebody who's casually looking for a change in scenery.
	8.) What measures are used to train and retain personnel within your organization?
	We also do give our developers the opportunity to spend a little bit of time going over and working together to study for Microsoft certification exams. We don't force them to take classes of course, but if they do want to take tests, we let them study together. We give them the time to go take exams. Most of our team does take the opportunity to go take exams and usually they'll take one or two a year to keep their skills fresh. So we encourage that - that's professional and personal growth. They all need to keep up on their skills and they recognize that. Everything's a competition.
	9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?
	Mostly technical - we do have one on the team that has a little bit of program management in their background, but most of it is technical.
	10.) What is the optimal team size for a rapid reaction project?

	4 to 6. It's small enough to be tight, but big enough to be able to handle a pretty complex task.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e. "quick-pull" knowledge capability?
	Yes, we've got a couple that can inevitably pull a needle out of a haystack and if they don't know it, they have a couple of other SMEs that they can tap into.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	Yes. As a matter of fact, we did have one person that left, but they stayed on until the end of the big project that they were working. We do have such a tight team that loyalty is key. I think that's another key to what we've been able to do. The loyalty of the team to the team and to the project. You know, you can have the best developers in the world, but if they're not a tight team - almost to the point of being a family - I think it works much better, having the team be able to be a cohesive unit. I mean, we're not quite doing extreme development, but we're close. I mean, we're not doing development in pairs...it's kind of a combination between extreme programming and rapid programming.
<i>Systems Engineering</i>	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	A lot. See everything we do for AHLTA mobile/BMIST ties into a bigger system. We have to ensure that everything - ever architectural decision we're making will plug into the bigger system-of-systems under TMIP. So we have to ensure that our decisions work, so we have to work closely with the TMIP engineering staff. So each functionality lead - whoever the team member is that is going to be implementing whatever functionality we're implementing - they have to work closely with the systems engineering folks at TMIP to ensure that we're doing the right thing.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	Yes, we have one overall senior systems architect, but depending on which functionality - somebody will be assigned as a lead for that development effort. If they run into problems, they will go back to the senior architect and he'll help work through whatever the problem is, but he likes to let the person in charge of that project - that sub-project if you will - run with anything unless they have a problem. That gives everybody the chance to learn and grow more. You know, everybody gets their turn.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	Not much. We're dealing with a mobile device, a handheld ultra mobile or a tablet a little more, but with a handheld, system resources are at a minimum, and everything is done to maximize the resources that are already limited.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	We get those requirements in many ways. Sometimes they will come directly to us from the user meetings and sometimes, they'll come to us as input from a conference, sometimes the users will come to us directly, or sometimes it will come through the TMIP organization; it totally depends. Depending on what those needs are, we might get a user that says, hey you really need to add this drug to the drop down menu here...that would be a requirement, but we've got to find...first we have to decide is that a functional requirement or is that a technical requirement. If it's functional, we have to make sure that the theatre functional working group agrees with it. If they agree with it, then we go forward. If it's a technical change, then we have a little bit of flexibility on how we do it. So yes, then we would have some changes that we could do on our end. If it's a functional requirement, we have to wait for the big ball and chain of TMIP to tell us how we're going to do it. We don't have any flexibility if it's functional. But if it's technical, we have a lot of flexibility on how we implement it and when we implement it. We try, if the users come directly to us, we try and feed back to that user what we're doing...how we're doing it...to make sure that they know their feedback was valued and that we're getting that change in.
<i>Budget</i>	17.) Are funds readily available to your organization to pursue new ideas?
	Yes. TMIP funds us for most of what we do. We do get funding to do development and some R&D from TMIP...we also do because of TATRC's mission and because we sit at TATRC, we also do get some Congressional funding for some of our efforts. For instance, last year we got some Congressional funding for a veterinary module to be developed for military working animals and for a veterinary module. We also got some Congressional funding for a product called TRAVIX, which is a hospital's capability locator on the handheld. We've also gotten some funding for a voice input module. You know, we get Congressional funding, or other funding, for various sorts of projects to be able to do other, cool sensor inputs or different things like that. So, we get different types of funding for different things.
	18.) What process do you use to obtain funding for your rapid reaction projects?
	We don't go out and solicit funding. We're in the POM line for TMIP, so we do get money from the annually. We don't go out and say hey, we want Congressionals because we are a Government organization. There are people who go out and solicit, whether its through a BAA or their Senators or whatever. They go out and they look for ways to procure funding to do what they want to do and we end up managing those products. Again, they're looking at ways DoD needs to meet requirements...we're looking at ways we can take these Congressional programs that are going to get funded for meeting our own needs; our DoD needs. We'll get the oversight of the products. We'll merge them into the requirements we know exist to put then our requirements for DoD with TMIP...they'll get their money to do their thing...we'll get our products to do our thing. There are vendors out there that will apply under our Broad Agency Announcement. They'll get their funding to do their speech input, or their new keyboard, or their new this or their new that and we'll get our product to do our whatever. So it's not necessarily our funds that are coming to us, but it's our products that we didn't pay for that are coming to us.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
	A lot of it is estimation based on prior experience. Whether its our empire experience or other projects that have come through TATRC through TMIP and other partner organizations...things that other people have done. It might be by hour or it might be by lump sum based on...we've seen a similar project that's taken about this amount to accomplish...knowing we're going to need this amount of hardware, knowing we're going to need this amount of travel, you know, a standard cost estimate.
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects?
	Standard analysis of alternatives. We go out and we canvas every resource we can find. We look academic, we look commercial, and we look DoD. We'll knock on every Service door... we'll knock on every academic door.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry?

	TATRC is known for bringing together a lot of those organizations that have never been brought together before. I don't know if you've ever heard the term triple helix? That's one of the things TATRC has been real good at, especially over the last 5 or so years. We bring together people who never knew they should be brought together. We do a lot of product line reviews where we have a product that we know...for instance, a battery technology. We know that there are people here in science and technology that would be interested...you know, say in the Air Force and the Marines...in the Navy in SOCOM...in communications, you know, different communities...both academic, both DoD, and in commercial that are all interested in this technology. We find folks in all of these different organizations and we invite them to a product line review to review this technology proposal that came to us asking for money. And we ask them to provide comments on a panel review board...we bring all of them to the table to have them give input on this product before we agree to fund it or not fund it. And what we find, more often than not, is that all of these people...some of them have seen it, some of them have not...we develop this unique synergy that has never been before. And all of these people find themselves in a room together and they didn't even know they should be talking; now they're talking. So, we do that a lot for a lot of different things....we've brought together a lot of groups that way. When it comes to looking at new technologies...when we're trying to get people to cooperate, we do that a lot. It seems to be pretty effective.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas?
	We have...mobile computing, not so much. We don't have our own processes...we on the same processes that MRMC and DoD at large use. We have the BAA...we have all the traditional contract vehicle options that everybody else does.
Industrial Base	23.) What process do you use to solicit proposals for rapid reaction solutions to industry?
	Same thing...nothing new. (Interviewer: Ok, so the BAA again?) Yes.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past?
	I guess that really depends on the contractor. If it was a one-time thing and we were happy with the work they did, and we think we might have the potential to do work with them, we might communicate via email from time to time or...I'm trying to think if there's been a company that I've really kept in touch with after a contract and I can't really think of one.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors?
	No...not at all. I'm thinking of one that we've actually got work with now...if we would have limited our search to traditional, this guy probably would have never been picked up for the work and it's completely non-conventional and it's wonderful. (Interviewer: Now did they come to you through the BAA?) Yes. Actually, this particular one was an SBIR this was a phase 1 awardee, there were three phase 1 awardees and only one was selected for phase 2...this one was dumped. He came back at a BAA, and he was selected for a BAA...he was given a BAA award and it's phenomenal work. This guy's company - I think it's a two man operation and I think they don't have much PR. They're not a marketing company. So, you know, when they did their marketing plan and all that, it just wasn't very well polished. So it didn't present well. But...it's very scientifically sound...it's wonderful. But, had we looked at the traditional, we would have looked right past them.
	26.) How long are offerors given to respond to a request for proposal?
	I think it really depends on how long it's open. I think some of them are longer than others, but I don't know how long the BAA's or proposals are usually open. (Interviewer: Well, for instance, on the AHLTA mobile, or the 10 month project, how long did you give those guys to send you a proposal in order to meet that timeline?) Oh, that was done in house. That was TATRC. That didn't go out...we do our own development. We've only...the veterinary module and the dental module....that's the only time we've farmed out a module. We've done it all in-house.
Incentives	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?
	Praise. Pats on the back...really, we can't. I mean, not much.
	28.) What innovative contractual incentives have you had success with?
	None. We haven't been able to do any innovative contractual anything.
	29.) How much autonomy do employees have to help new ideas flourish?
	Limitless. I ask my staff to continually brainstorm with anything they can think of. To give you an example of how innovative I want them to be, we're looking at laying out new screens that are so cutting edge that we're looking at how we can even take...are you a techie? (Interviewer: I guess I would say that I try and pretend to be...but, no, I have a management background) Ok, I'm going to give you a really quick overview of the mobile device market. Handheld devices as we know them - the handheld PC devices are shrinking. Everybody's looking at the smart phones like the I-phone and phones like that to take the market. The tablets are a little too big because you can't fit them in a cargo pocket, you can't set them in your purse - you know, they're a little too big and the handhelds are turning into cell phones. So now you're seeing this new thing called an ultra mobile device show up...and it's about the same size as a Sony portable or a Nintendo DS - you know, kind of a medium sized device. And the way you hold it...it's kind of like a landscape device, but it's really nifty to hold in two hands. And the way they're looking to lay out the screens for AHLTA mobile now...instead of having all the buttons on one side and the little anatomical man on the right side, they're looking at how they can put buttons on the right and buttons on the left and a little anatomical man in the middle, so that the kid never had to move his hands - he can just hold on to the device and use his thumbs to navigate through the screens. You know, it's a total, radical shift from anything we've ever done, but it's funny when you hold it like that, it feels like a game. It doesn't look like a game, but it feels like one. Our market that we're trying...not they we're trying to hit, but we've always developed the AHLTA mobile/BMIST for the front-line medic. Your combat medic is your E-1 through about your E-4, maybe E-5 and once you become an NCO, you're going to start to become a team leader, a squad leader, you're going to start doing more administrative stuff...you're going to start sitting at a desk more, you're going to start picking up more of the back-office kind of stuff...you're going to start being at the back of the line...you're going to start doing more of the direction...you're not going to be out there pulling bodies out of an ambush. You know, you're not going to be the guy using the device. So these are the guys that are going to pick it up and feel that its like a game. So it's kind of a psychological thing as well. But, the team is kind of looking at how can we take advantage of...it already looks like a game, it already feels like a game, how can we make the application kind of carry that feel forward. You know because change is hard...no matter what it is, change is hard. You know, go forward and we'll take it to some users...you know, if the screens don't work, we'll take it to some users and see what they think see what they feel...we showed it to a couple of users and they said, whoa this is cool. You know...do what they want to do...we'll see what the users think. If the users like it, we'll push it forward to the functional and if the functional says to go forward, then we'll go forward. If I put a ceiling on them, then they stop dreaming.

<i>Wrap-up</i>	Well, that's the end of my formal questions, but I did have a couple of questions for you, and the first one is in separating the actual thesis part of my research from the practical application, I have a classmate of mine who might be implementing some of what I find out in his next job and the question I had for you is, do you mind if I provide your contact info to him?
	Oh, not at all.
	Because what I'd like to do is just reference that I interviewed TATRC, in general, in my report....and then I would give him the specifics of you know, your name and your number so I don't have to worry about personal information precautions, I guess I would put it, and dealing with that kind of stuff in my thesis.
	Ok, that would be fine.
	Ok, I'll just reference TATRC then, and leave it at that. Ok, the last question is, I've asked everybody I've interviewed if they can think of any other organization across the entire Government that does rapid reaction type things that you think I should speak with...and I've got a pretty comprehensive list and if you say somebody and I've already interviewed them, I'll try to let you know real quick...but can you think of anyone that you think I should talk to?
	I'm thinking of the Army's Rapid Equipping Force.

Interviewee: Army Rapid Equipping Force (REF)

Items in bold are Capt Solomon's questions or responses and items not in bold are those of the interviewee. If a section is highlighted, that question was not asked due to time constraints. In order to protect the identity of the participant or the technologies and customers they work with, certain items have been omitted and replaced with "XXXX" where appropriate.

Area/Enabler	Question
General Questions	1.) What role does innovation play in your organization's ability to rapidly fielding new technologies/capabilities?
	Frankly, innovation is key and essential from the standpoint that we're dealing with an enemy that thinks...that's changing it's...uses it's tactics, techniques, and procedures to attack soldiers in combat. We want to look at what threat there is...and then, is there anything out there that is new that can help us defeat that threat. And we'll look everywhere...we try to leave no stone unturned. But, we primarily find our equipment that is needed for soldiers through the use of Commercial-off-the-shelf (COTS) and Government-off-the-shelf (GOTS) solutions.
	2.) What process or practice is used to encourage out-of-the-box type thinking and innovation within your organization?
	Just by nature of what the REF is and how it was cluged together approximately five years ago, in itself, is out-of-the-box. Now, since that inception, and since we've been able to build our staff up and with the current director we have, we are always looking for technologies that will support. but, within the own organization itself, I'll describe the building..I mean, we're in trailers right now, and we'll go to buildings at some point here in the future based on BRAC, but the trailers were compmatmentalized. Well, we've taken all of that compmatmentalization down and we have basically a big, open space. And we're built around teams. Acquisitions, operators, and logisticians...contracts, personnel, and budget people. So we're all within ear shot and can see each other with respect to that. And then we've come in and we've put in natural light lighting, and you know, different things to help with the person in the workplace. No cubicles. A lot of this is based on XXXX, the director's goal to try to...if you want people to think outside the box, then don't put them in a box. We've gone out to Applied Minds in CA, which is a dynamic organization in Burbank, in the old Disney buildings, and they have just a unique way of doing business and how they set their places up to have people work. So, we're always looking at different ways to make it different...not the status quo in terms of how we set ourselves up and how we think through processes. So, we really do encourage that and we really encourage people to..you know, there's never a wrong question, there's never a right answer. You know, you just continue to look and work what you can to accomplish the task.
	Before we go on, I failed to mention at the beginning of the interview if you have any questions for me based on what limited information I gave everybody about what I'm researching and the processes I'm looking at across the Government and at AFRL?
	Based on what I've read here on your paper (interview questions), and what we've talked about so far, I understand what you're trying to do. It's good....I mean, we've got to...one of the things we have to do is, in the military, regardless of the branch of service, is that we have to challenge the status quo. And I'll get into that a little further in here because, you know, we have the REF, which is a dynamic organization that's trying to help everyone, and that works fine within the REF, but now, you've got to take the standard budgeting process and the standard contracting process and try to work through that to accomplish the REF's mission...and I'm going to tell you, that's very hard. It's very hard. And, there's reasons for it because of laws, policies, and those kinds of things, but those are lwas and policies that were written years ago. It's almost like a cold war mentality. I mean, you talk about immediately buying stuff, but to get the money, you have to go through a 5 year POM process. So, there's some major challenges here.
	3.) What is your organization's approach/process for rapidly delivering innovative and new capabilities to your customers?
	Obviously, that is once we find a capability that looks promising to either mitigate or defeat an enemy's capability, we rapidly get it out there. Obviously, we try to get our equipment out there as fast as we can. We've had some products in the field in less than 48 hours and some, depending on the complexity, have taken up to a year. But on average were about 90-120 days on getting out to the field.
	4.) What is your average time from concept to working prototype?
	Again, you could probably put around 100-120 days.
	5.) What are the main roadblocks to quickly delivering capability?

	<p>Well, you may or may not know that we may come upon a piece of equipment that looks good...well if you read the FAR and do all the contracting stuff, you're supposed to compete who can buy that thing. And it makes it difficult because of the FAR and the rules that are established for what I would call, "non-wartime acquisition of equipment", to react quickly, so you know, we have to go through the standard, let's put the statement of work, contract, J&A, and we have to have that. It's got to go to contracting...once it goes to contracting, you know, it has to go through their processes...you know the KO, the contracting officer, looks at it...it's got to go for a legal review, so you know you're talking 30, 60, sometimes even 70 days to get a piece of equipment that we already know will work and we have it...we have the money to buy it, but we've got to go through the contracting process to get it. So, that's where our problems lie and, again, I don't mean that to be pejorative...I mean, that's just the way things are, but the rules for standard business and what we do from a rapid equipping perspective don't match. So it's frustrating. (Interviewer: So really it's the bureaucracy of the government acquisition system as a whole?) That's correct. As I said before, sometimes it can be money...we deal in three colors here, well, actually, four colors...we have the OMA, which is basically our overhead dollars, we have the OPA, which is other procurement Army dollars, and I'm sure the Air Force has something similar....and then of course, we have Research, Development, Test, & Evaluation (RDT&E). We do need a certain amount of RDT&E ...not so much for the R&D, but for the T&E. By law, we're required to send pieces of equipment to be in the hands of the soldier while in use, to be tested by our testing community to ensure that we're not sending something down there that's going to be bad for soldiers. And, I don't necessarily call it a roadblock, as much as it's just another process that we have to go through. So, that, in fact, cuts into time in getting the piece of equipment down range. It's good on the one hand, because we want to make sure what we give people is safe, but on the other hand, it slows things down and the soldier wants it...and you probably realize that what you see depends on where you sit. So a soldier waiting for a piece of equipment that's a great capability, but we can't give it to them because it's not been tested, doesn't go over very well. (Interviewer: So how much would you say the percentage of your products that you put out in the field require minor integration vs. simply just coming off the shelf as is?) That's a good question, and I would say, perhaps, a quarter to a third...depending on what type...again, it just depends on what it is. You know, if we give them green-light lasers, which they use to help at checkpoints and that kind of stuff, there's no issue with that. If we give them a piece of a camera system that they're going to use to put at a FOB, then there's no issue with that. But, if we're going to give them a piece of armor or we're going to give them a vehicle, or we're going to give them something that they have to operate that's close to them, then of course, it has to be tested.</p>
	<p>6.) What would you cite as one of your organization's best practices/methodologies for rapidly responding to customer needs?</p> <p>We just flat don't give up. When we get a requirement from the field, we go after it until we determine, 1.) what they're asking for isn't exactly what they need, or 2.) what they're asking for we just can't get out because it costs too much money, or 3.) what they're asking for and once we've briefed it to senior leadership, they understand, but they can't have it. (Interviewer: so does your organization primarily deal with only...let's see, I don't know if I'm using familiar terminology, but verified urgent warfighter needs?) No. We look at anything and everything. And if a soldier, sailor, airman, or Marine tells us they need something, then we go after it to fix it until we've had an opportunity to vet it. And once we've vetted it, then we'll make that decision. But, anybody can call us...we work with this thing called a ten-liner. It's an internal organization..basically, the who, what, where, when, and why kind of thing. And then we look at it and trying to help them with their capability.</p>
Human Resources	<p>7.) What process does your organization use to identify and recruit highly qualified personnel and are their certain traits you look for?</p> <p>First of all, let me talk about the military guys. It's just like any other military organization, Dave...we get what we get, military wise. Obviously, on the operational side we get combat arms, combat support, combat support services arms, soldiers...within the acquisition side of the house, the people that we get are acquisition trained officers. And they're normally defense acquisition workforce improvement act (DAWIA) III, or as a minimum, DAWIA II certified. And they come to us both as material developers and contracting/budget kind of folks. The contract workforce is a contract workforce. We put out a statement of work...people bid on that statement of work...and then the company that wins it provides us people by full time equivalents (FTEs). Generally, the types of people we get are program analysts, budget analysts, and some of them come with degrees...some of them don't come with degrees...some of them come DAWIA certified...some of them don't come DAWIA certified. The we have contractors that we just hire based on their operational experience with the military. For example, we've got non-commissioned officers working here that were delta soldiers. And then we've got contractors working here that are retired...I mean I have a retired general who works for me...retired colonels, you know, and they come from the Army, the Air Force, Navy, and Marines. So, in terms of highly qualified people, then when it comes to a government service person, obviously, you know there's the PD, you know the, position description, and then we interview, depending on how many people we get to apply for the job. The thing that's difficult about this is that the REF is a new type organization, so we are growing and developing within ourselves. The types of people we hire are generally the 301 field...program management, and so on ad so forth. We do look at the PM side of the house and that's where the DAWIA certification comes in. We look at logistics people who have logistics background and then we've got a couple of admin. And then for operations, it's just basically, what have you done. So, again, it gets back to me as one of the primary guys who does the hiring and firing here...it's just looking at them in the eye and going off my understanding of what we do in the REF and, in fact, like in my case, I think I told you before that I commande da battalion, which was about 1,000 people...I commanded a brigade, which was about 5,000 people, I was the chief of...you know, several life experiences so, that's what we go off of. What I try to do through the interview process, which is not the easiest thing to do, is to take a look at what they've done and how long have they done it. The second thing is that I try to look for a work ethic and tenacity, you know, in dealing with a problem that is hard, do they try to go around it, over it, through it, under it, you know, that kind of thing. Just looking for a general understanding of the person in terms of...and you get alot of that from how they answer questions. You know, agressiveness...that kind of stuff.</p>
	<p>8.) What measures are used to train and retain personnel within your organization?</p> <p>That in and of itself is a difficult one because what we have herein the REF is something that's new and there's no training programs for REF, if you will. Again, it gets back to - in terms of the acquisition side of the house - the acquisition has training and stuff that they have to do to get the certifications that they have. From an operational perspective, you're talking about what they bring to the table based on previous operational experience. Now, we do send people to training within the job here that deals with actual execution of the job, but other than the standard stuff that you're familiar with in the military where you do ethics trianing and you do the training for equal opportunity and that kind of stuff, we don't really have what we call a REF trianing program. We are now beginning to look at that because we've matured enough where that is something we want to develop a POI for, and start to do, but we're in the infancy stages of that. Actually, the training is whatever they do to keep themselves alive, or what they can bring with them from previous assignments.</p>
	<p>9.) What type of background do most of your rapid reaction projects leads have (technical, program management, etc.)?</p>

	Again, I think I've hit on that - they're either operationally prepared, program management prepared in terms of DAWIA certification, and the technical thing we look for are their educational things such as PhDs, you know, that kind of stuff. And we've got guys and gals working for us that have PhDs in thermal or in ceramic metals, electrical engineering, fluid dynamics, I mean, we've got all sorts of that and it's not so much that they use that degree...it's the fact that they understand the scientific method and they understand the right questions to ask from a scientific perspective...especially when we're taking a look at a new technology or an emerging technology.
	10.) What is the optimal team size for a rapid reaction project?
	Well, again that could be based on the size of the project and then there is obviously the team involved...you know, the operational portion that provides the requirement, the program management folks that provide the cost, schedule, and performance, obviously, the budget persons that would help us in terms of the color of money, the contractors that would help us develop the type of contract that we need to either buy or sustain this piece of equipment, and then the logisticians, who not only get the equipment shipped to where it has to go, but also provide the sustainment and the interface with the Department of the Army...the Army Acquisition Executive...Army Materiel Command (AMC) and those types of things. So, you know it could be as little as one, up to 10 or 15 people depending on the size of the project and the urgency of the project.
	11.) Are there a group of Subject Matter Experts (SMEs) you can tap into as required - i.e "quick-pull" knowledge capability?
	Yes, there are. We keep companies on tenure and we also have people that we can pull in that are pretty sharp. The network that the Col has established with DARPA and Technical Support Working Group (TSWG) and OSD and some of the skunk works that are out there, like out at Tennessee and Boeing and some of these others, that he can talk one on one with. Then of course, we have companies like Applied Minds and Exponent and other companies that are pretty big companies that help us solve problems. So yes, I do have knowledge pull capabilities.
	12.) What is the average tenure of your rapid reaction project leads; do they see a project through to the end?
	In terms of what you mean though as an acquisition professional, or training to be an acquisition professional, it's not exactly the same. Like I said, for example, they have a requirement for green-light lasers. We go get the lasers, we get it through the system, we give it to the troop in hand - that could last a couple of months. We have special missions that come up, for example, where we had to buy ladders one time for a certain mission down range and that was a short project. Then, we have other projects that we work, like you know, cameras and stuff like that, that we're still working them...and essentially, they keep that project until it's transitioned to the Army, if, in fact, that's what they want us to do. We niche it...put it on a shelf, or we just terminate the project. Generally, as I said, we try to get a project out of the project manager's hands within 120 to 130 days. The it goes to the operators, I would say, to monitor and for the logistics people to sustain up to two years, and then the decision will be made to keep it, throw it away, or, you know, that kind of thing. Because, remember...the rapid equipping force does not field. It equips. There's a big difference between fielding and equipping. (Interviewer: yes, that's one thing I've noticed with the way I've phrased a couple of my questions when I generically put the term "fielding" in there...I've notice that alot of people interpret that differently, so I appreciate you making the distinction there with that one.) Fielding is usually life cycle management, you know, cradle to grave, you know, go through all the TRL levels, go through all the testing...the regression analysis, and all of those things associated with a project that an acquisition team has to do. We'll go buy something off the shelf and then we'll "equip" a certain number of forces with that piece or item. (Interviewer: So, could that be considered a prototype in a sense?) I guess it could be considered a prototype, but my understanding of a prototype is something that's invented...you're looking at it...and, you may use it. Like one of those fancy real cool cars, but they never sell them to you. That to me is what a prototype is. Ours aren't necessarily prototypes, but then again, on occasion, depending on what it is - it could be a prototype. We generally just buy a piece of a kit...either spiral it from something that's going on in the military now and bring it forward, or we just go buy it from...I mean, we've gone to radio shack and bought some stuff. So, I guess, "it's not as cut and dry" is what I'm trying to tell you.
Systems Engineering	13.) What role does systems engineering play in your organization's process for rapidly delivering capability?
	Again, not a whole heck of a lot because we usually buy something that's already made...or we tweak something that's made. We don't have a huge engineering staff here.
	14.) Do you have a chief engineer as part of your rapid reaction teams?
	No.
	15.) How much freedom and authority is the systems engineer given to make trades concerning system performance?
	I can't basically answer the question as it is written, other than to tell you that the Vice Chief of Staff of the Army has told us to go out and get stuff and get it to the hands of the soldiers - if it works, it works...if it doesn't, throw it away and find something else.
	16.) How do you receive initial customer needs and are changes permitted after arrival to your organization?
	The answer to that question is...we get our requirements in any form or format that we can get them in. We don't...we're not hung up on process, we're hung up on executing the mission. We can always change it - if we can make it better, we'll make it better. (Interviewer: Ok, so let's say, you have things coming in from individual soldiers in the field, and also like a COCOM or something like that?) Exactly. You're familiar with integrated priority lists and then there's COCOM integrated priority lists and then there is...FORCECOM has a priority list..I'm sure the 8th Air Force has a priority list...you know, that kind of thing. And of course, down range, a soldier, or brigade commander, or company commander will call, email, talk to our teams up forward and say, hey, you know this widget we have here doesn't work real good and we want a widget like this. Ok, well, we'll take a look at that and see what we can do for you. If we can make it for them, buy it for them forward, we do...if they can't do it and need a little more time to develop it, they send it back here and we get on it.
Budget	17.) Are funds readily available to your organization to pursue new ideas?
	In a sense, yes. I don't know if you are familiar with the budget...I don't know how it is for the Air Force..I'm sure they have something similar, but we have the POM. We have colors of money...OPR, OMA, and RDT&E. And a certain amount of that money is given to us to do what we do. So, we do have money. Sometimes, RDT&E is a challenge, but for the most part, we work our way through that. But see, I think something needs to be said here that's important...the REF budget is generally around \$200M dollars a year, across three colors of money. Now the total obligation authority (TAO) for the Army last year, I believe, was about \$133B dollars. \$200M dollars is moon dust. Ok, so we do a whole lot of good for not much money, because, remember, it's equipping, not fielding.
	18.) What process do you use to obtain funding for your rapid reaction projects?

	The POM...we're in the POM now because they're building us to be an enduring organization. So, we have to be in the POM in terms of the out years, across those three colors of money. In the past, that money generally came to us through supplementals or Global War On Terrorism (GWOT) dollars. That's changing. (Interviewer: So, do your users ever bring money to the table - is that ever a requirement for the REF to take something on?) No. Generally, we're the ones that fund something that they don't have money for.
	19.) What process/method do you use to establish cost estimates for rapid reaction projects?
<i>Technology Reach</i>	20.) What process do you use to gather information about technologies that might be suitable for your rapid reaction projects? We read, and we attend, and we ask questions across the spectrum of organizations in the United States...both military and non-military... that might be looking at or providing a solution to a problem down range. That's the best way to say that. (Interviewer: Now, do you have certain individuals that are chartered to go do that vs. the day to day execution or operation of your programs?) No, I understand what you're saying. Everyone here is happy about what they do and about what they do for the soldiers, sailor, and Marine, so everyone is always looking. Our science and technology, or what we call our tech management branch, is generally the one going out and looking at industry and seeing what's out there.
	21.) What process do you use to collaborate with organizations across the Government, Academia, & Industry? Well, obviously...when we were first trying to do what we were doing, there wasn't a whole lot of cooperation going on, but now that people have seen what we do and what our value added is, they come to us. We do talk with academia, industry, and government about emerging threats and what emerging technologies might be there to mitigate these emerging threats. And it's just basically getting out and beating your boots and slapping your gums and contacting people. It's just darn hard work and interfacing type stuff. (Interviewer: Ok, so word of mouth more or less?) Correct. Plus, we have a website and we got to websites and that kind of thing. We appear in articles - I've done several interviews for magazines. I just did an interview with The Economist magazine about a month ago and we just do a variety of things.
	22.) What process do you use to encourage foreign or non traditional DoD/Government contractors to solicit ideas? We'll always look at something worldwide. We've gone worldwide to a couple of countries and here recently, the foreign countries have contacted us and want to know more about the REF...how we put ourselves together. We're currently working to have a British liaison here, for example, that will be part of our team, so they come to us...we go to them based on what pieces of equipment they have that might help the warfighter.
<i>Industrial Base</i>	23.) What process do you use to solicit proposals for rapid reaction solutions to industry? That's a very good question...I want to qualify myself before I get started by saying, I am not an expert. And I'm certainly not being pejorative to anybody...I don't want it to sound that way. The vast military industrial complex is old and outdated in terms of how they do stuff. It appears to me, on the surface sometimes, that we still have the cold war mentality of solving problems. Now, does that mean that the industrial complex is all screwed up...no. I mean, that's how they were trained based on laws and those types of things, so it's basically...I ain't gonna show you what I got until you show me the money. Well, we need to change that. The need to show us what they've got, and what they're working on, and then maybe we'll show them the money. That kind of thing. But getting them to take risk...either to begin, to develop technologies that might benefit the warfighter now seems to be a little bit problematic. Now, does that mean that's the case for everybody...no. That's not at all. There are big organizations and then there are mom and pop organizations that develop stuff and call us on the phone and say hey, do you want to come out and take a look at it. But, at the same time, they need to understand what we're looking for, so we the Government have to do a better job of saying, ok guys and gals, here's the big stuff that's out there...homeland explosives, command wire, whatever it may be...and what are you guys doing to defeat that. Again, you're talking to a 19K here Dave, I'm an armor guy. I've learned a great deal here about all this stuff, but that's my view from where I sit. What you see depends on where you sit. So, I think the process needs to evolve more and needs to be less tied to how we did stuff in the past and more to how are we going to do things in the future to make it more rapid. (Interviewer: I can tell you from other organizations I've interviewed, they use a BAA...are you familiar with that sir?) The name doesn't sound familiar, but I can basically tell you we just go out and say, can you make this...but, we're not as formal. We just basically pick up the phone and have them submit us a proposal.
	24.) What process is used to maintain a relationship with previous contractors who have done work for your organization in the past? We never let them go...you know, we just stay after them. You know, we continue to work with them. Now, they may be one dimensional. Do you know what I mean by that? They just produce one kind of product, meaning when they are done producing that product, we're done...but we do have contractors out there who have provided us a variety of products and we just continue to work with them.
	25.) Do you limit your search for potential offerors to traditional DoD and Government contractors? (Interviewer: Already answered in responses above - therefore, did not specifically ask this question.)
	26.) How long are offerors given to respond to a request for proposal? That's a good question. Well, like I said before, we have some things that we've gotten to the field in 48 hours. Generally, we'll look around a couple of weeks. You know, but we say, get it..kick the tires and light the fires and let us know what's going on.
<i>Incentives</i>	27.) What incentives do you provide to your own personnel in order to reduce development/acquisition cycle times?

	<p>We provide incentives and we reward people for just doing a good job. We do not have anything at all that says hey, if you do this faster, then we'll give you this. And let me address that just a second, and I don't want to sound draconian, but to serve is the most wonderful thing you can do. And that's why, after 35 years of military service, I still came back into the Government. I didn't come into the government because of money, I didn't come into government for anything else other than the fact that I felt, at least in my life, that it's my responsibility to serve the Nation and to serve the people of the Nation as best, and as long as I can. And that's the type of people I look for. (Interviewer: Ok, well, let me give you a little background on that questions and where I'm coming from and maybe it will spark some thoughts, but basically, when I started looking into this research, I wanted to compare government and industry, and what industry was doing to accelerate providing a capability or product to their customer. And, I quickly found out that comparing those two is like comparing apples and oranges because of the government's constraints...I know industry has a lot more mechanisms, a lot more freedom, if you will, to provide their employees bonuses, awards, you know, what have you, but I wanted to see if any Government organization addressing rapid needs had come up with an innovative way to reward their employees within the Government context.) Yeah, I mean, every year, I always give bonuses...every year, I always give a bump to pay...I give time off as best I can...I help people out as best I can. But the government, Dave, is not designed to do what industry does in terms of money. Now, the difference here too is, you either produce in industry, or you get let go. You don't get let go here unless you break the law. And, for the most part, unless there's something bad going on...you're going to get a pay raise, you're gonna get some sort of bonus. I was in industry for a very short period of time when I retired from the military and did not like it one bit. I did not like the culture...I did not like what I call the dangling modifier, that is you know, hanging the "here's how much money you can make based on how much you bring or how much business you bring". I don't like that culture. I'm not saying it's right or wrong...I'm just telling you from my perspective, I just didn't fit into that. And that's not what I'm looking for in terms of people here. We have the REF and the Air Force, and you serve in the Air Force because you're serving your country and your Nation...we're not here to make money; we're here to do a job.</p>
	28.) What innovative contractual incentives have you had success with?
	The contract that we have for the REF, in terms for the people who work here, is a cost plus award fee (CPAF) contract. The harder they work, the more award fee they get - bottom line.
	29.) How much autonomy do employees have to help new ideas flourish?
	There are no dumb questions...we are constantly asking everybody to think about everything and try it. If it doesn't work, go on to the next one. Nothing gets held back here. No stupid question...no dumb idea...nothing. Think, think, think...put yourself in the soldiers position and what can we do to defeat the enemy.
<i>Wrap-up</i>	Sir, those are the end of my formal questions, but I have a few that I've been asking every interviewee when I finish, and the first one is: I have a classmate of mine who might take part of what I find in my thesis and in his own work and implement it...do you mind if I pass along your name and contact info in case the research labs need to contact someone at the REF in the future?
	That is fine with me.
	The other question is that in trying to keep all personal identifying information out of my thesis, do you mind if I just reference that I spoke with the REF in general as part of my write up?
	You certainly can - you can use my name if you want to. But yeah, go ahead and use the REF and we're glad to be a part of your work, and you can certainly, you know, now and in the future, contact me - I'll be here for a while. If you run into anything from your perspective in your Air Force career...I'll be glad to help.
	Ok, sir, well I will try to provide you a copy of my final product because I believe I've interviewed a fair number of folks you interface with and, for what it's worth, I hope it helps or that you find it useful.
	I think it will be very interesting to read what you're writing...it's always interesting and good to hear a different point of view from a different set of eyes.
	Ok, well, I appreciate it sir - thank you again for all your time.

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