Stakeholder Characteristics in Rapid Acquisition

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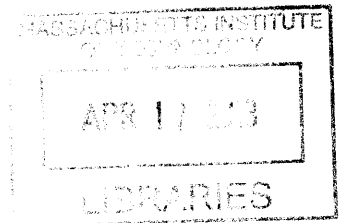in Partial Fulfillment of the Requirements for the Degree of

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ABSTRACT

The number of Joint Urgent Operational Needs has exploded with the Global War on Terror and the campaigns in Iraq and Afghanistan. The challenge to smaller urgent programs is the programs are not large enough to obtain top priority for all stakeholders. Even if the entire stakeholder landscape agreed to the urgency of the requirement not all stakeholders can or will increase their urgency the same amount. Four critical stakeholder attributes are examined in rapid acquisition: Cachet, Advocacy, Operational Need and Optempo. A method of dynamic tracking of these four stakeholder attributes is presented along with data from three rapid acquisition programs confirming the importance of Cachet, Advocacy and Operational Need to the success of rapid acquisition programs.

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The discussions with my brother Fellow, Marc Baumann, were illuminating and wonderful. His thoughts and ideas strongly influenced this thesis and will continue to influence me throughout my career and my life.

I would like to thank my children, Jessica, Kevin, and Alexa, who put up with Dad being down in his office studying or writing and for also knowing just when it was time to ask Dad to play catch or shoot some hoops.

Finally, I would like to thank my wife, Laura, whose love and strength has kept me going through deployments, flight test programs, various schools, and the whirlwind that is Air Force life. She is proof God exists.

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Chapter 1: Stakeholders in Rapid Acquisition

"The essence of the problem is the need to field militarily useful solutions faster. The reality is that the Department is not geared to acquire and field capabilities in a rapidly shifting threat environment. Current long standing business practices and regulations are poorly suited to these dynamics. Today, the DOD is saddled with processes and oversight built up over decades, and managers leading them who are often rewarded for risk aversion."

> **Report of the Defense Science Board Task Force on the Fulfillment of Urgent Operational Needs, July 2009**

The number of Urgent Operational Needs and Joint Urgent Operational Needs has exploded with the Global War on Terror and the campaigns in Iraq and Afghanistan, reaching over 7000 individual requests (Defense Science Board, 2009). The ability to rapidly develop combat capability to meet the changing needs of warfighters and counter the changing tactics of the enemy is itself a critical and strategic capability.

The Urgent Operational Need spectrum breaks down into smaller categories. This spectrum is broken down graphically in Figure 1 and shows the continuum of urgent needs from a broad perspective. On the one end, the urgent need can be satisfied by the items already in the property book or by a redistribution of inventory from other units. The continuum proceeds to items not usually used by that unit but other unit types are issued the equipment and the urgent need is only for the authorization to acquire this new equipment. Often, in the author's experience, equipment that is used by Special Operations Forces (SOF) units and is proven successful tends to migrate by urgent request to more conventional units (Halberstadt 2006). The unifying characteristic of this end of the need spectrum is the equipment has already been acquired by DoD for some unit and there is normally a contractual vehicle already in place to obtain the equipment quickly. This area is primarily a logistics function and does not require a new acquisition program.

Further towards the right of the figure is the situation where a commercial item is available but it has not been purchased or vetted by DoD. If the piece of equipment is inexpensive (< $2500) and not a sensitive item, such as weapons or communications gear, the unit will often buy it using the International Merchant Purchase Agreement Card (IMPAC) card, basically a commercial debit card linked to a US Government unit's funding account. However, if the quantity is large or the equipment is expensive, the unit must engage the DOD contracting system and this will normally require special contracting authorities to move quickly using a Justification and Approval (J&A) of a Unusual and Compelling Urgency exemption to the Federal Acquisition Regulations (FAR Part 6.302-2). However, the purchase of a commercial item in an urgent manner will not normally require a dedicated acquisition program.

Continuing to the right of the figure, equipment or capability in the test phase of the acquisition cycle but designed under the normal defense acquisition system can often be accelerated to meet an urgent operational need. This normally requires a higher level of risk acceptance by the user and a preliminary release of results from the test community. The author has participated in a number of these programs and the final test report before operational use can be as simple as an email communication stating the system is ready for operational use. These procedures for early operational use are well-documented in the test and acquisition community and vary program to program. A good example of this acceleration from testing to operational use was the early entry of the J-STARS radar ground surveillance aircraft in the 1991 Gulf War (Healy 1991).

Along similar lines, the Advanced Concept Technology Demonstration (ACTD) program type is a construct designed to allow early operational evaluation of a technology demonstrator and normally retains some residual operational use at the end of a program(Department of Defense 2012). At the risk of oversimplifying the deployment of new technology, accelerating these ACTD programs is similar to accelerating a normal defense acquisition program in the test phase. Successful ACTD programs accelerated into combat include the MQ-1 Predator remotely piloted aircraft and the Voice Response Translator from the Language And Speech Exploitation Resources (LASER) ACTD (M. J. Sullivan 2009).

On the far right of the continuum is the urgent need that can only be satisfied by the development of new technology. The classic example of this type of urgent need is the

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Manhattan Project during World War II which resulted in the development of the humankind's first atomic weapons. While the basic physics were understood, many areas of new technology, such as large-scale Uranium separation and precise conventional explosives, had to be developed to bring the first atomic weapons to fruition (Rhodes 1986).
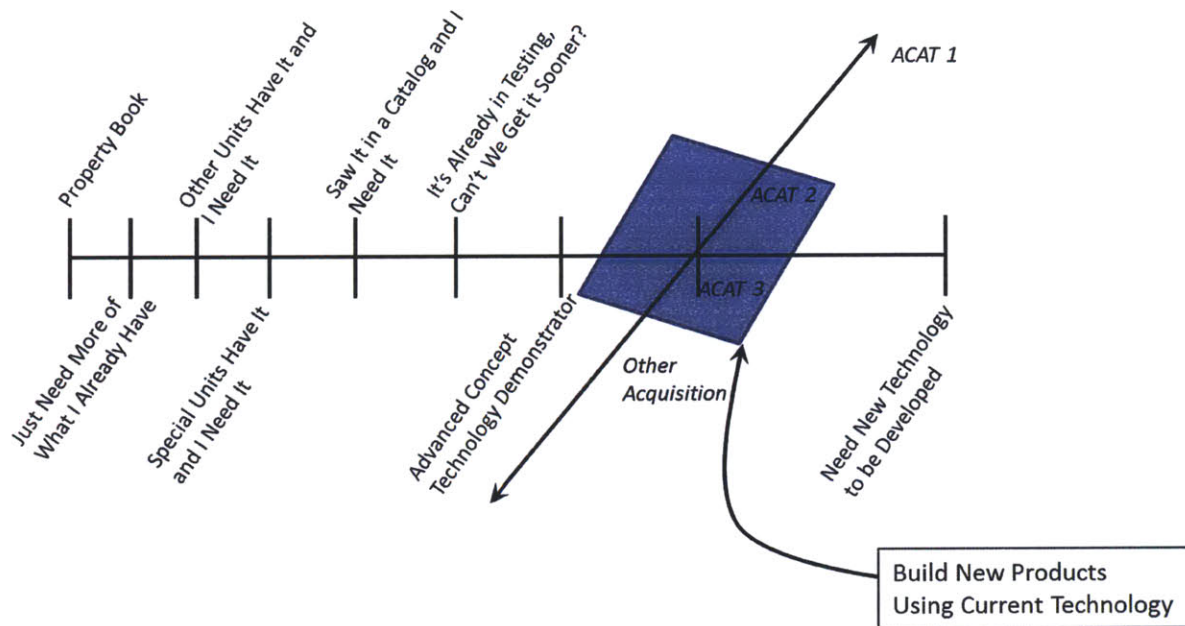
Figure 1: Continuum of Urgent Operational Needs

On the orthogonal axis of the rapid acquisition spectrum are the large-scale programs like the Mine-Resistant, Ambush-Protected (MRAP) wheeled, armored vehicle program. This program was a JUONS tied to the attempt to protect US troops from the Improvised Explosive Device (IED) threat in Iraq and Afghanistan. Through December 2010, the total of all MRAP contracts was valued at over $22.7 Billion (M. J. Sullivan 2009). Obviously, a program of this size and urgency will have a highly-successful Senior Military Officer (O-6 or Flag Officer) with a confirmed track record of acquisition program success assigned to lead it. Also, these programs will receive the funding, personnel, and support needed to guarantee success with significant influence on the Office of the Secretary of Defense (OSD), the Joint Staff, and, even,

the US Congress. Traditionally, large programs with a well-publicized urgent need are politically very difficult for the US Congress to restrain by restricting resources.

However, the need to rapidly develop and acquire new military hardware for ongoing conflicts is not limited to large programs and the smaller programs present special challenges to the DOD program manager. These challenges include, but are not limited to, a lack of dedicated program enablers such as contracting, logistics, training, and test personnel and the difficulty of attracting top contractors to bid on the requirement. In addition, at acquisition centers with many programs, the ability to get the attention of senior decision-makers can also be a challenge for the smaller programs. Even though a large percentage of Urgent Needs are for non-developmental items (95.5% of US Army Urgent Needs were for inventory redistribution), a non-trivial amount of rapid development was performed over the last ten years for Operations IRAQI FREEDOM and ENDURING FREEDOM (Defense Science Board 2009). In addition, the large number of urgent needs over the last ten years swamped the ability of DOD to only assign Senior Military Officers with proven track records as program managers to these programs. In the Better Buying Power 2.0 Initiative, the Department of Defense admitted this fact: "The Department has many highly qualified acquisition leaders, but the bench is not deep enough and there is significant room for improvement (Kendall 2012)."

The problem area, and the focus of this research, is represented in the blue box in Figure 1. Rapid acquisition in this context is architectural innovation using current technological components with little or no technological innovation. In other words, the program does not have time to innovate at the technology level but still has the freedom to put the pieces together into an innovative and effective architecture. Using the concept of technology readiness levels (TRL), rapid acquisition must take components at TRL of 7 or 8, which are components demonstrated through test in a relevant environment, and combine them into architectures with much lower TRLs. Then, during the rapid acquisition program, the system must be matured from a TRL of 5, a system model in a relevant environment, or a TRL 6, a system prototype in a relevant environment, to a TRL of 9, the actual system proven through successful mission operations (Dept of Defense 2002). A further challenge for a rapid acquisition program is the deployment of the system directly to a combat environment, without the period of peacetime service to catch and correct any deficiencies.

These rapid acquisition programs are at the intersection of urgent need, smaller resources, and large numbers of stakeholders. These program managers do not have the luxury of a large ACAT 1 acquisition staff and do not have the immediate attention of OSD- or Congressional-level personnel. In addition, these urgent programs have a complex and dynamic set of stakeholders that is quite different from the set of stakeholders for a traditional defense acquisition. A program manager of a rapid acquisition program has to manage a fundamentally different set of stakeholders at a different clockspeed than a program manager of a normal acquisition program. When a program moves from a normal pace to a rapid pace, or in other words, as the urgency of the enterprise increases, the characteristics of each stakeholder change. This construct also applies when an urgent program is formed from a standing start but the program management team does not have the benefit of having a stakeholder template.

The challenge here is the size of many of these smaller urgent programs is not large enough to obtain top priority for all stakeholders. Even if the entire stakeholder landscape agreed to the urgency of the requirement not all stakeholders can or will increase their urgency the same amount. This concept is shown in Figure 2, where the overall program urgency is the resultant vector and the urgencies of the various stakeholders are represented by the colored arrows. When an urgent need is realized, the program management team must generate the increased urgency out of the field of stakeholder urgencies. The Report of the Defense Science Board Task Force on the Fulfillment of Urgent Operational Needs presents the challenge of trying to run a rapid acquisition program in a stakeholder environment comfortable with normal acquisition processes and timelines:

> "'Rapid' is countercultural and will be undersupported in traditional organizations. Rapid acquisition often challenges traditional systems, practices, and cultures. The current defense acquisition workforce is rewarded for following complex procedures with accuracy and precision and is punished for bypassing them. Rapid responses necessitate creativity and workarounds that go against these norms (Defense Science Board, 2009)."

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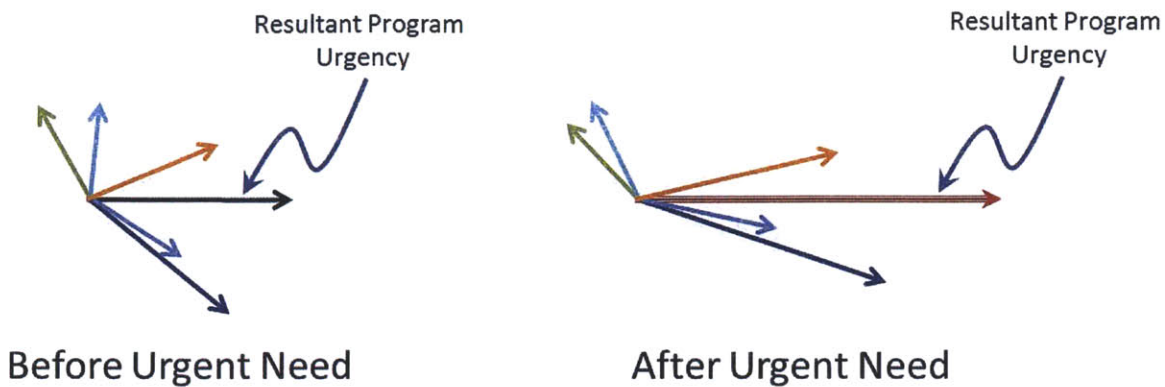
Figure 2: Program Urgency as a Resultant of Various Stakeholder Urgencies

As shown in Figure 2, some stakeholders will increase their urgency, some will align with the program's direction, but others will react in opposition to the increase. However, in spite of the changes to the stakeholder landscape, the program manager must still move the entire enterprise forward. The program manager of an urgent program has to answer the question: How does the enterprise deliver value faster when the urgency of the entire enterprise greatly increases but the program is still constrained by limited power and limited resources?

This research will, in particular, attempt to answer the question: What are the stakeholder characteristics in a rapid acquisition program and how should they be used to achieve program success? This research was inspired by three interwoven threads. The first thread is that the Department of Defense and the acquisition have a habit of learning lessons from conflicts and promptly forgetting them. At the initiation of the next conflict many lessons must be relearned, often at a terrible price, a lesson learned painfully in Korea (Toland 1991). In addition, the rapid acquisition experiences in support of the wars in Afghanistan and Iraq are recent and fresh and the time was ripe to capture these lessons before they were forgotten. Hopefully, we will have a period of peace and we won't feel the urgency to use this rapid acquisition capability. History, though, has a way of making older lessons relevant again. The next time the nation calls for a rapid capability development, the hope is the lessons from this research will allow the future program manager to have a head start to lead their program to success.

Additionally, during this research, it appears there is a feeling that a fundamental tension between rapid and normal acquisition exists. This tension seems to point to a belief that the rapid and normal acquisition systems are a threat to each other. However, the communities must realize that both types of acquisition address different needs and address a different point on the spectrum of innovation. This research argues there is no tension between these because they address different needs. The ability to rapidly acquire combat systems to cause an effect on the battlefield is a dynamic capability for the Department of Defense.

In Chapter 2, the relevant literature is reviewed and the discussion of four theoretical areas of research as they deal with rapid acquisition is presented. The first theoretical area explored is the literature on rapid acquisition itself with a focus on DOD studies. The second area of study is the rapid product development literature. Since rapid acquisition has a strong component of rapid product development, the literature has strong potential for cross pollination. Decision making in rapid acquisition is then presented through the framework of John Boyd's theories on strategic competition and the Observe-Orient-Decide-Act, or OODA, Loop and the literature reviews closes with an examination of principal-agent theory as it applies to government procurement in general and rapid acquisition in particular.

A theory is proposed in Chapter 3 of the importance of stakeholder characteristics in rapid acquisition that includes the dynamic nature of rapid programs. The four key characteristics are Advocacy, Cachet, Optempo, and Operational Need. These ideas are developed and a tool for tracking stakeholder characteristics over time is presented. In addition, the research methodology using email and phone interviews along with document reviews and published article research is presented.

In Chapter 4, the first case study of a rapid acquisition program is presented. Program A was an ACAT II program to develop a unique capability on an existing aircraft platform to meet an underserved operational need. The Program A platform was envisioned as augmenting other assets on the battlefield that were performing roughly the same role, but to do so with a different combination of sensors, weapons, and communication equipment.

We examine in Chapter 5 Program B, an ACAT III program to develop a unique munition capability in order to meet an operational need in Operation ENDURING FREEDOM

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(OEF). The User Command saw the munition from Program B as a way to increase the freedom of airpower to assist the counterinsurgency aspects of the campaign in Afghanistan. It was an additional means of controlled and precise use of airpower on a non-linear battlefield. A strong benefit of this program was the ability to avoid a large amount of flight-testing due to the weapon's similarity to other previously certified munitions. This offered the promise of a quick deployment to combat. The program involved a degree of technological development, munition design, aircraft integration, and test of this system over a 15-month period.

We finish our case studies in Chapter 6 with Program C, a small ACAT III demonstration program to develop a lightweight loitering munition capability in order to meet a potential operational need. The program was actively sponsored by the User Command as a demonstration for a future planned program with similar requirements and was funded by a Congressional Appropriation not requested by the User Command in the normal budgeting cycle. The program involved contracting for, and flight test of, multiple contractor systems over a 9-month period.

The cross comparison of the cases is presented in Chapter 7 along with the conclusions drawn from the cases. The three programs examined for this research present a clear snapshot of the importance of the stakeholder characteristics when conducting a rapid acquisition program.

Chapter 2: Survey of Rapid Acquisition Theory and Literature

Over the last decade, the wars in Iraq, Afghanistan, and the global nature of operations against Al Qaida has stressed the ability of the Defense Acquisition community to keep abreast of the equipment and capabilities required by the warfighters. Many of the processes for rapid acquisition have evolved and mutated and been codified in regulation (Dept of the Air Force 2011; Schaefer 2009). The literature on Rapid Acquisition is not well developed but US Government Reports and some general business literature point to lessons learned. The main theoretical backgrounds for Rapid Acquisition are found in the amalgamation of four areas. These areas are rapid product development, Boyd's decision cycles, principal-agent theory, and the generalized stakeholder theory.

Rapid Acquisition

A powerful Defense Science Board report was published in 2009 written by a panel led by Jacque Gansler. In this report, written after an exhaustive study of over 7000 Urgent Operational Need and Joint Urgent Operational Need requests generated during Operation ENDURING FREEDOM and Operation IRAQI FREEDOM, the study team found that all of DoD's needs could not be satisfied using the same acquisition system. In addition, the rapid approach was countercultural to the deliberate acquisition system and the approach would never be fully accepted by the system due to institutional barriers such as people, funding, and processes inhibiting the ability of a program to go faster.

In light of these findings, the Defense Science Board recommended a dual-track acquisition system, a deliberate track for normal acquisition programs, and a rapid track for urgent operational needs. Figure 3, taken from the report, shows the relationship between the two tracks and how a rapid acquisition program would become a program of record if the capability was remain in the inventory after the conflict. The report also recommended standing up a new agency to absorb all rapid acquisition activity and would become a permanent part of

the Defense Acquisition System responsible for all future rapid fielding of equipment (Defense Science Board, 2009).

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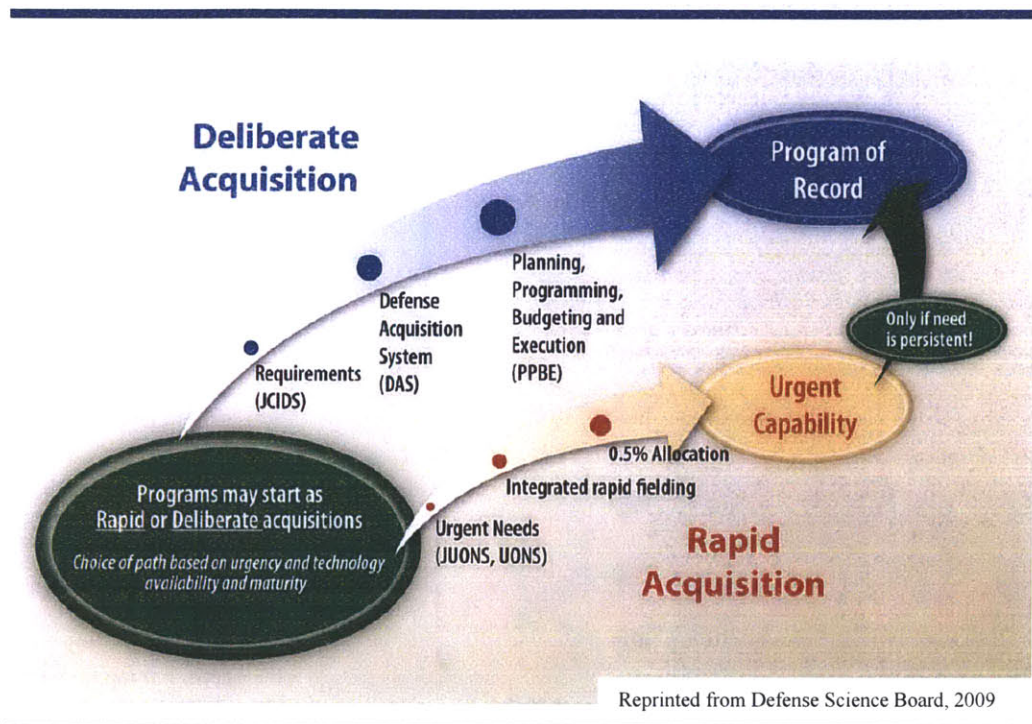
**Figure 3: Defense Science Board Dual Acquisition System
(From Defense Science Board, 2009)**

O'Reilly and Tushman (2004) also recommend that an organization that wants to develop radical innovation and protect traditional business areas should build organizationally distinct units which only combine at the senior executive level. These two organizations, with two separate customer bases, allow a single company to venture into exploratory businesses while the still holding on to the fully-developed profitable product lines. Their recommendations are echoed in the Defense Science Board Report but applied to the Defense Acquisition System where Rapid Acquisition plays the role of the organization venturing into the exploratory business. Farr, Johnson, and Birmingham (2005) take it a step further and break the development into three separate tiers based on platforms, components, and component-level solutions. They propose that each level has a separate clockspeed and different initiator of development (Farr et al. 2005)(see Figure 4).

Technology Cycle Times

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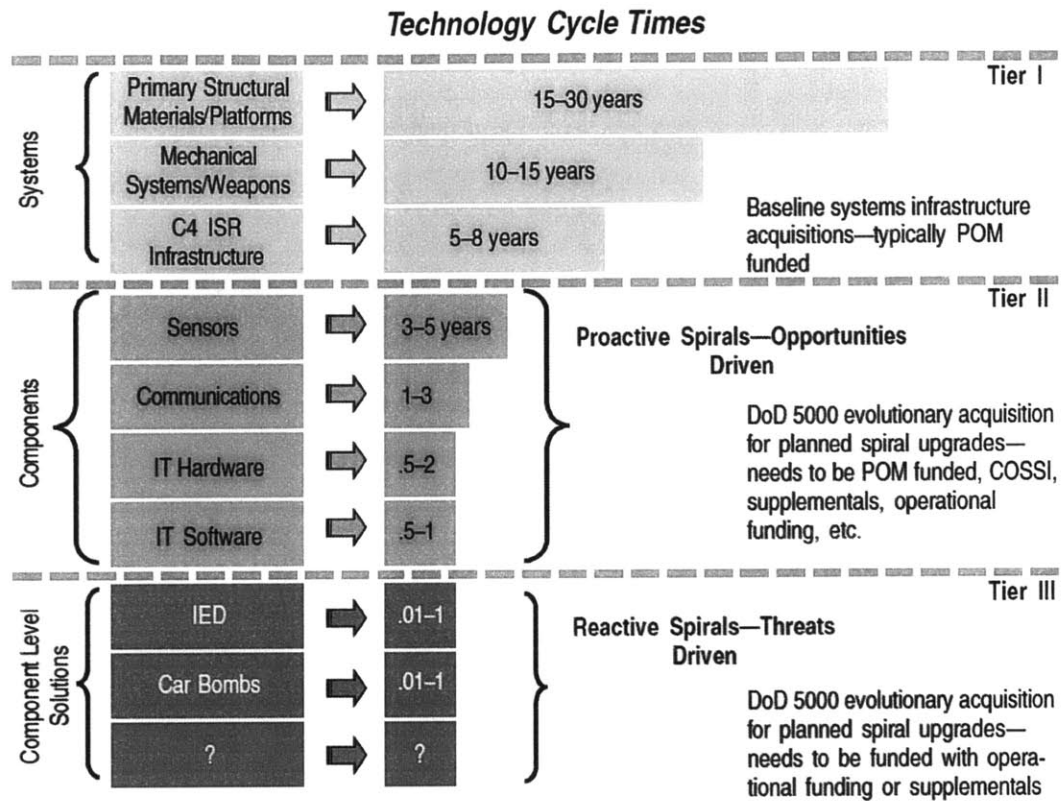
Figure 4:Proposed Multitiered Approach to Army Acquisition (Farr et al. 2005)

Pelczynski (2010) examines the impact of the diversion of resources away from programs of record and towards rapid acquisition programs. He notes that "streamlined procedures have disadvantages, however, that must be reckoned with over time. These disadvantages include risks created when testing is reduced or requirements waived. These risks must be mitigated and managed as the program matures. Unfortunately, some risks become exponentially more difficult to manage as the program progresses." Similarly, in the accelerated product development literature, Crawford (1992) points to the riskier side of rapid development processes. He casts doubt on the claims that faster development lowers cost and permits a reduction of risk and highlights that faster development may put strong pressures against innovation. Pelcyznski and Crawford both point to, but do not name, the concept of technical debt in a rapid acquisition, a construct to characterize the long-term effects of the gap caused by short-term compromises between the actual system as built and the ideal system that would have been built in an optimal

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environment (N. Brown et al. 2010; Klinger et al. 2011). This concept was not prevalent in the literature on Defense Acquisition but has value when applied to the tradeoffs made in rapid acquisition. Brown, et al (2010) and Klinger, et al (2011) point the way to an application of the concept of Technical Debt to Rapid Product Development in general and Defense Rapid Acquisition in particular.

Rapid Product Development

Different industries have different clockspeeds but many companies, industries and government organizations realize the potential benefits of developing products faster (Fine 1998). Henderson and Clark (1990) strongly presented the idea of architectural innovation as a reconfiguration of existing technologies. Rapid product development, they argued, required extensive component knowledge in order to determine new ways to put components together. In essence, strong understanding of component technologies was a critical enabler to architectural innovation. However, it presented a dilemma to organizations because the orientation had to change from one of refinement of stable, profitable architectures to new, constantly changing and uncertain ones. This dilemma was expanded by Leonard-Barton's (1992) paper wherein she noted "core rigidities are the flip side of core capabilities. They are not neutral; these deeply embedded knowledge sets actively create problems." She emphasized that corporate cultures matter greatly and new values, like a bias for speed, will not take root unless they are rewarded and incentivized. In fact, highly skilled personnel are often reluctant to contribute to projects they perceive as undervalued or doomed to failure, so the negative assessment of the project does not rub off on the personnel. One way to avoid these cultural issues is to encourage teams with a sense of pioneering spirit, overcoming rigidities, and voluntarily promoting a sense of cultural isolation (Leonard-Barton 1992).

Improvisation as a key factor in rapid product development was also a recurring theme. Anderson and Tushman demands that program managers and executives expect technological discontinuities and proactively develop competencies to survive these upheavals (Anderson & Tushman 1991). Dynamic capabilities are crucial to surviving in high-velocity markets, argued Schreyogg and Kliesch-Eberl, and the only capability that truly matters is the ability to learn

quickly and improvise effectively. These dynamic capabilities are the mechanisms of adapting, integrating, and reconfiguring resources to match the rapidly changing environment (SchreyOgg & Kliesch-Eberl 2007). This, however, is easier said than done. The rapid acquisition dynamic capabilities run afoul of standard operating procedures and the organization that uses them is remarkably insensitive to feedback. These routines, often recursive through multiple organizational levels, can run amok and act as solutions searching for problems and severely hamper improvisational behavior (Weick 1974). However, when the technological discontinuity exists or, in the case of military operations, we must respond to new enemy tactics or capabilities, an improvisational model that allows organizations to adapt and learn quickly becomes more appropriate. This does not mean "winging it" but does mean prior planning must be viewed only as a guide and not a blueprint. Deviations from the plan are not symptoms of failure but realizations that the assumptions made during planning were not 100% correct (Orlikowski & Hofman 1997).

Improvisation is the simultaneous blending of conception and execution such as in a live Jazz performance or the fluid nature of soccer game. The classic example of engineering improvisation is the repurposing of the Apollo Command Module square CO_2 scrubbers for use in the Lunar Excursion Module's round CO_2 scrubber receptacle on the Apollo XIII lunar mission made famous in the movie Apollo 13 and in Jim Lovell's book Lost Moon since renamed Apollo 13 (Lovell & Kluger 1994). Organizations using improvisation are more likely to seize attractive opportunities, benefit from unexpected developments, overcome obstacles, or avoid disastrous situations (Moorman & Miner 1998). Frequent interactions between improvising individuals appears to enable collective, or team, improvisation, where teams begin to feed off each other's improvisations to explore new directions. In Weick's study of firefighter improvisation and Eisenhardt and Tabrizi's look at the computer industry, we see the team improvisation initiated by a disruptive, sometimes dangerous event (Weick 1993; Eisenhardt & Tabrizi 1995). These disruptive events, such as a rapid change in enemy tactics, are also the reason some rapid acquisition programs are initiated (M. J. Sullivan 2009). Moorman and Miner found that rapid environmental turbulence increased the odds that improvisation would provide value but, in a slow change environment, improvisation would be disruptive rather than an asset. Therefore, a strong need for improvisation must be recognized in the organization or the

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tendency of the existing knowledge and structure to dominate and limit innovation will win out (Moorman & Miner 1998).

The effects of leadership in rapid product development were a strong theme in the literature. McDonough and Spital found that successful rapid projects had high visibility, strong management support, clear specifications and expectations, and project leaders with a strong combination of engineering and business skills (McDonough & Spital 1984). In a follow-on study, McDonough found that the source of new technology influenced the leadership style required for rapid success, with internally-developed technology requiring a more participatory style and external technology requiring a less participatory style of leadership. The downside of a participatory style emerges if the leader does not set the overall timing and technological direction of the program which can allow a project team to flail and remain unfocused during product development (McDonough & Barczak 1991). Karagozolgu and Brown found that top management's role in new product development could cut both ways. While their work cited benefits during feasibility and prototyping phases from top management involvement, they also noted that frequent and formal controls tended to consume precious time polishing documents and status reports and destroyed a rapid development team's sense of autonomy. However, too little involvement by top management limits the feedback and heading checks required to guide a project to a successful completion. In addition, they found that an informal and flexible structure only allows a team to go faster if faster is a part of the organizational ethos (Karagozoglu & W. B. Brown 1993). When McDonough extended the research to include the team characteristics, he came to the conclusion there was no perfect team leader for a product development because the perfect selection depended on the characteristics of the project. He found that, for radical projects, younger project leaders with team members with fewer years in the organization correlated with project success (McDonough 1993). McDonough does not answer why this correlation exists but, in the author's experience, younger leaders with newer teams tend to be oblivious to long-held organizational cultures and ignore the reasons why the smaller and younger team can't succeed. They didn't know they were supposed to fail, so they didn't.

A prevalent subject in the acquisition literature with application to rapid acquisition is the concept of compressed schedule programs in general and the concept of schedule as an

independent variable (SAIV) in particular. Neves and Strauss point to a few lessons learned from these programs and have strong recommendations for the program manager:

> Attempting to plan, execute, and manage a truly schedule-driven development effort as if it were a standard acquisition program done faster will not work, will slip, will cost more – and will probably get you fired.

In addition, they point to the need prior to starting a rapid program to be resources correctly, have clear performance requirements and to insist on engineering discipline throughout the program (Neves & Strauss 2008). Mounce recommends keeping team size to a minimum to speed up programs and change the default answer from "no" to "yes" and forcing the bureaucracy to prove why the answer to a program request should be "no". Also, he points to the role of leader immediately above the program team as a facilitator of resources and shield against distraction, allowing the team to focus on the mission at hand (Mounce 2006). Potts points to the responsibility of the program manager to meet schedule comparing the program manager to a battalion commander in a military operation. "Just as other units depend on the battalion commander, so PMs have both the soldier and other acquisition programs depending on them to deliver on schedule (Potts 2004)."

Decision Making in Rapid Acquisition

Colonel John Boyd, arguably one of the most relevant strategic thinkers since Carl Von Clausewitz, presented his ideas through briefings to military officers and influential civilians from 1976 until his death in 1997 (Correll 2008). Boyd generated his theories over his entire career and packaged them into five briefings given often at Air University at Maxwell AFB, Alabama. The five briefings, in a single package called "A Discourse on Winning and Losing", were entitled "Patterns of Conflict", "Organic Design for Command and Control", "The Strategic Game of ? and ?", "Destruction and Creation", and "Revelation" (Osinga 2005). Among the many concepts on military and strategic thought in this work, the concept of the Observe-Orient-Decide-Act command and control decision cycle or OODA loop has taken hold in military strategy, sports psychology, and business (Richards 2004).

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Plehn asserts that the OODA loop is not only useful in the military strategy realm but has applicability to other areas of competition and organizational behavior.

"The OODA Loop is a general model that describes human and organizational behavior. Although John Boyd developed its fundamentals from observing air combat in the skies above Korea, it has an applicability that ranges far beyond mere tactical aviation implications. It accurately mirrors the basic principles of behavior described in psychological and behavioral theory, forming a consistent framework with which to describe and examine human action (Plehn 2000)."

An often forgotten benefit of the OODA loop construct is its simplicity. As seen in Figure 5, the simplified version of the OODA loop is simple to remember and simple to apply to many organizational problems. Boyd himself expanded the OODA loop concept into a more complex theory by expanding Orientation into a general environmental and informational synthesis step, as seen in Figure 6 (J. R. Boyd 1995). However, the mental construct of the four steps and the requirement to cycle through those steps more frequently than an adversary has a powerful application to many fields.
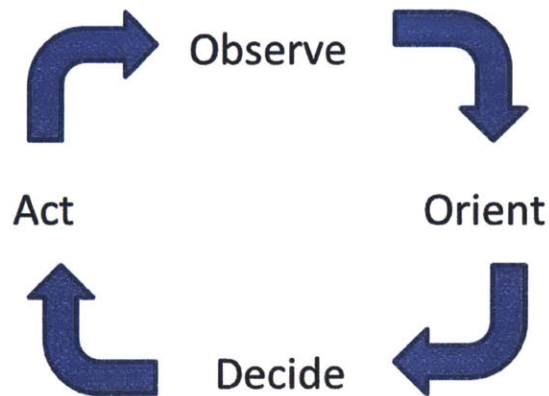
Figure 5: Boyd's Simplified OODA loop (J. Boyd 1977)

Observe   Orient   Decide   Act

Unfolding Circumstance

Outside Info

Implicit Guidance & Control

Implicit Guidance & Control

Observations

Genetic Heritage

Cultural Traditions

Analysis & Synthesis

New Experience

Previous Experience

Feed Forward

Feed Forward

Decision

Feed Forward

Action

Feedback

Feedback

Unfolding Interaction w/Environment
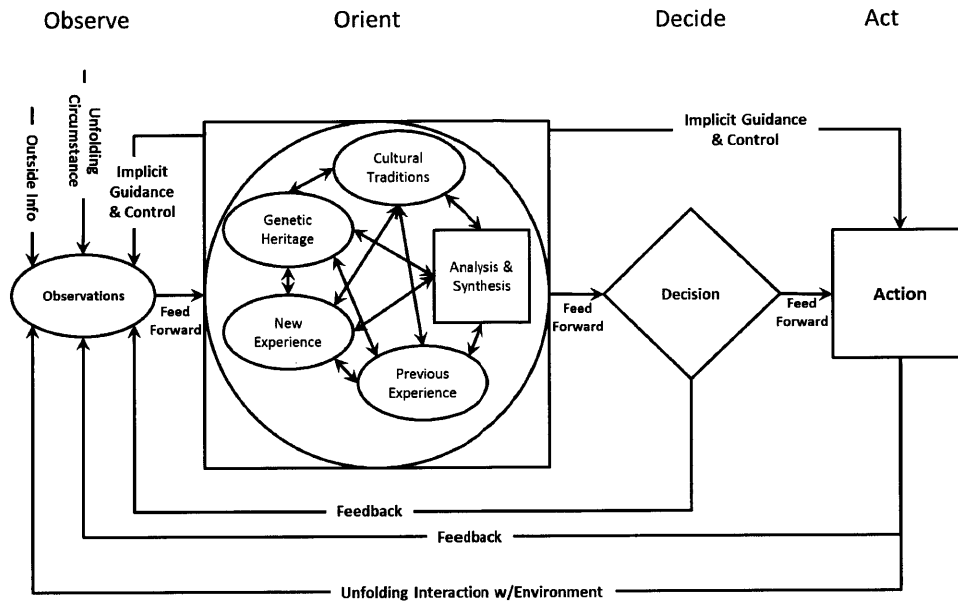
Adapted from Osinga 2005; J. R. Boyd 1995

Figure 6: Boyd's Expanded OODA Cycle (Osinga 2005; J. R. Boyd 1995)

In normal acquisition programs, the frequency at which a decision maker goes through the OODA loop is slow, on the order of months and years. In a rapid acquisition program, the OODA loop frequency is on the order of hours. Often, during a Company Grade Officer's 36-month assignment to a normal acquisition program, they may go through the entire decision cycle on the order of five times. If the program is large enough, junior personnel will not make those decisions at all, severely restricting the opportunity for junior personnel to learn from these OODA cycles. On a rapid acquisition program, the rapid acquisition team will go through the cycle five times per week. The lesson of the OODA Loop is that learning and growth happen when a person executes the OODA Loop, digests the feedback, and learns from it. The more one goes around the OODA Loop, the better one gets. Anecdotally, the growth of junior personnel after an assignment on a rapid acquisition program is phenomenal and highly gratifying for the leaders.

The simplicity of the OODA Loop, however, hides some complex leadership philosophies that directly apply to rapid acquisition. John Boyd's theories require empowerment and decision making at all levels of command and do not allow any level to just follow orders.

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In fact, the strategic ramifications of Boyd's theories, whether in warfare or business, require vigorous, thoughtful action at all levels. The upper echelons set the direction and boundaries where lower echelons must remain. These upper echelons then must give up any requirement to control what happens within those boundaries and allow the latitude at the lower echelons to make decisions and react to local events. This directly applies to a successful rapid acquisition program where the senior leaders and Program Executive Officers must allow the Program Managers, the name given to a program commander, the latitude to make the program succeed without begging for permission. While arguing for this very latitude, Osinga (2005) said it perfectly:

> "Through trust, you gain respect, loyalty, and common purpose, without it you need detailed orders to run things. By giving units and subordinate commanders trust and freedom of action they can ensure the optimum conditions for the actions, they can adapt as necessary. This leaves room for initiative. Combined with a common outlook and a common doctrine all one really needs is a goal. If everyone understands clearly and is attuned to the organization's purpose or the commander's intent, explicit communication beyond the objective is superfluous for a unit."

Principal Agent Theory

The application of Principal Agent theory to public procurement in general and Defense Acquisition in particular is not a new phenomenon. Beginning with the theory of organization, or in this case, the firm, Jensen and Meckling stated the organization:

> "serves as a focus for complex process in which the conflicting objectives of individuals (some of whom may "represent" other organizations) are brought into equilibrium within a framework of contractual relations. In this sense, the behavior of a firm is like the behavior of a market; i.e. the outcome of a complex equilibrium process (Jensen & Meckling 1976)."

This equilibrium process is further complicated in Defense Acquisition by the confusing roles of the principal and the agent, where, depending on the level in the Defense bureaucracy, a

particular individual may be both a principal and an agent (Mayer & Khademian 1996). A key insight of Principal Agent theory into Defense procurement is the idea of monitoring and bonding costs. These costs are borne under the intention that they will align the agent's conduct with the principal's interests. The imposition of layers between the agent, in this case the rapid acquisition team, and the principal, either the public, User Command, or the battlefield user, may badly distort the incentives and drive unwanted behavior (Yukins 2010). In fact, the monitoring and bonding costs are often borne not by the principal but by the procurement agent, driving strongly risk-averse behavior and suffocating innovation. This effect may be caused by the fact that all benefits of careful acquisition accrue to the principal, the Government, but a large portion of the costs are borne by the agent, in this case the acquisition program team. In trying to satisfy the Government Principal, the acquisition program team will have actively dissatisfied the other stakeholders, such as the user or the contractor, and added more work to their own plate (Yukins 2010). Of course, the confusion over the principal-agent role of any single organization can lead to a suboptimization where the pursuit of lower-level goals harms the overall objective of the US Government (Franck & Melese 2008).

Conflict between program stakeholders, sometimes open, other times covert, can have serious consequences for a defense program. While private firm stakeholders have an incentive to cooperate to limit the overall costs, this is not always true in government procurement (Hill & Jones 1992). The costs for open conflict can be lower in government procurement than in the private sector and the subsequent incentive to cooperate is also lower. The solution to this is incentive, monitoring, and enforcement structures which impose costs, both in financial and performance terms, to programs and lowering the resources applied to the problem at hand. This subsequently causes the organization to limit the costs of the required information and puts pressure on deterrent mechanisms, possibly causing them to fail. If the monitoring enforcement fails, the stakeholders may withdraw support and funding from the program, canceling the effort entirely (Hill & Jones 1992).

The Defense Acquisition system has always had a built-in inconsistency due to the long-term planning timelines but a short, one- to two-year budget cycle (Kadish 2006). However, there has been a strong and consistent debate between the outcomes of the acquisition system and the behaviors of the agents in the acquisition system. Risk aversion is a perfectly

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understandable reaction to a system that punishes behavior-based failures such as procurement scandals or conflicts of interest. If the system was focused more on the outcome of the acquisition system (was the best weapon system deployed?), then the risk aversion of the agents in the system would naturally decline (Eisenhardt 1989). However, since the principals are very difficult to pin down and the agent perceives multiple strident and competing principals demanding satisfaction, it is impossible for the agent to focus on system outcomes. Therefore, the system has retreated to a rigid set of behavioral rules intended to avoid organizational chaos and pain (Mayer & Khademian 1996).

These behavioral rules build strong norms and rigid operating procedures over time. Once the urgency of a combat need is added to a program and the timeline is shrunk, the principal-agent confusion in defense acquisition actively harms the overall goal of delivering combat capability. If the programs were confused when they had 48 months to figure out the principal-agent relationship, a 12 month deadline will only increase that confusion. This is a strong argument for the dual track acquisition system outlined by the Defense Science Board in Figure 3 (Defense Science Board 2009).

Stakeholder Theory

The discussion of the role of principals and agents and the multiple numbers of each in a Defense Acquisition Program leads us to the overall discussion of stakeholder theory. The discussion usually begins with a definition and there are a large number of definitions of a stakeholder. However, Freeman's definition from his seminal 1984 book, Strategic Management: A Stakeholder Approach is still very strong:

> "A stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives (Freeman 1984)."

With this definition in mind, we can dive into stakeholder characteristics in a rapid acquisition program.

Culture matters and the culture an organization finds itself in can also affect how stakeholders are managed. In highly dynamic environments or when the culture is undergoing large-scale changes, the ability of managers to significantly change stakeholder management strategies is increased. Additionally, if others in an industry or large organizations are changing their stakeholder management strategies, it is much easier for individual firms or subordinate organizations to change their stakeholder management strategies. A culture of change permeates through an industry or organization and makes it more acceptable to change (Shropshire & Hillman 2007).

Rowley found that viewing the stakeholder environment as a network was a useful construct and adapting it to a rapid acquisition program provides insight. In a sparse network, the freedom of the organization in enhanced because the ability of stakeholders to monitor and pressure the program are much less. In addition, the closeness centrality of a network measures the program's ability to independently and quickly access the different points of the network. Rowley asserted that a program operating in a low-density network with high closeness centrality would be able to adopt a commander role and have the ability to shape stakeholder behaviors. He also asserted that the most effective role may be as a solitarian, or hermitlike, program cut off from demanding stakeholders in order to develop and execute the plan. His classic example of a hermitlike program was NASA's Apollo program, solely focused on a lunar landing and return (Rowley 1984). The unclassified rapid acquisition program seems to the author to occupy more of a commander role than a solitarian role.

Inside this network, the characteristics of individual stakeholder carry their salience to the firm or acquisition program. Mitchell, Agle, and Wood categorized stakeholders by their urgency, legitimacy, and power and built a scheme of stakeholder salience based on the strength of each of these characteristics. They defined urgency as "the degree to which stakeholder claims call for immediate attention (Mitchell et al. 1997)." For the definition of legitimacy, we revert to Suchman and use "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions (Suchman 1995)." Since there are many kinds of power, Mitchell et al. use a definition based on what power can do. "... A party to a relationship has power, to the extent it has or can gain access to coercive, utilitarian, or normative means, to impose its will in

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the relationship (Mitchell et al. 1997)." The combination of these three attributes identified the salience of each stakeholder and presented strategies for interaction. This combination is not presented as static but as a snapshot of a dynamic process. They warn:

> "managers should never forget that stakeholders change in salience, requiring different degrees and types of attention depending on their attributed possession of power, legitimacy, and/or urgency, and that levels of these attributes (and thereby salience) can vary from issue to issue and from time to time (Mitchell et al. 1997)."

An example of the dynamic nature of stakeholders harming a program was highlighted by Meier (2010). He found that the large-scale defense acquisition programs were actively harmed by having to manage too many stakeholders. The changes to requirements brought on by many involved agencies and the amount of non-mission work, such as process reporting, tours, briefing requests, and non-essential contract deliverables were seen as a major cause of the schedule delays. Additionally, in order to satisfy a large group of diverse stakeholders, large quantities of reports and documentation, all having to be reviewed prior to release, were generated costing critical time and resources. This type of situation bred an environment "where many people can say no but nobody can say yes (Meier 2010)."

Literature Review Summary

The four theoretical areas of rapid product development, Boyd's decision cycles, principal-agent theory, and the generalized stakeholder theory, blended together, gives a strong foundation on which to build a theory of rapid acquisition. Rapid product development has pointed to the requirement of having leaders with strong technical and business skills sets and teams capable of collective improvisation in the face of uncertainty. Boyd has shown us the pathway to rapid learning through the OODA Loop construct and given us a strong basis for pushing decision making down to the lowest level. Principal-agent theory has highlighted the consistent internal logic of some bureaucratic structures that a rapid acquisition team must overcome or outmaneuver. Stakeholder theory has stressed the collaborative nature of programs, the dynamic network of actors, and has shown us that we must carefully distribute the limited

time and management attention only to the stakeholders that move the program forward. In Chapter 3, we build this theory of rapid acquisition.

Chapter 3: Theoretical Background of a Rapid Acquisition Program

Stakeholder Theory as applied to the Defense Acquisition System

In Chapter 2, we surveyed the literature for the theory of how to conduct a rapid acquisition and found the literature specific to rapid acquisition to be sparse. By combining the four theoretical communities of rapid product development, John Boyd's decision cycle theory, principal-agency theory, and, finally, stakeholder theory, we are closer to building a theoretical background for Rapid Acquisition. I propose a theory of the importance of stakeholder characteristics in rapid acquisition that includes the dynamic nature of rapid programs. The four key characteristics are Advocacy, Cachet, Optempo, and Operational Need.

Four Critical Stakeholder Attributes in Rapid Acquisition

Advocacy

The Merriam Webster online dictionary defines Advocacy as "the act or process of supporting a cause or proposal". As a stakeholder attribute, however, advocacy can also be the act or process of not supporting a cause or proposal. For instance, a Program Manager of a large and controversial acquisition program may have to deal with stakeholders who actively support the program and stakeholders who actively try to cancel the program. Both of these stakeholders are advocating for a particular course of action. However, if the Program Manager wishes to be successful, the PM bolsters his positive advocates and negates his negative advocates. In the best of all worlds, the PM convinces his negative advocates to become positive advocates of the program.

Advocacy is the stakeholder attribute linked to coalition building and determining the forces detrimental to program success. Defense Acquisition University, in the PMT 401 course

for senior program managers, considers Advocates or Adversaries to have high engagement along with high commitment with the program. Stakeholders with high engagement are knowledgeable about the Defense Acquisition system and have a high understanding of the programs goals. Stakeholders with high commitment are tied to the outcomes of the program whether through obligation or emotional attachment (Defense Acquisition University 2012).

Cachet

The online dictionary www.thefreedictionary.com defines Cachet as prestige; distinction, A mark or quality, as of distinction, individuality, or authenticity. In government acquisition circles Cachet is that certain property that allows some individuals to successfully deal with compatriots of equal rank but achieve influence to achieve acquisition program goals.

When breaking down Cachet as a stakeholder combination, the primary components resolve into legitimacy and power. Mitchell, Agle, and Wood state that "a party to a relationship has power, to the extent it has or can gain access to coercive, utilitarian, or normative means, to impose its will in the relationship (Mitchell et al. 1997)." In Defense Department acquisition circles, power is almost perfectly correlated with the level of funding controlled by the programs. For example, the Joint Strike Fighter Program Manager has more perceived power than the F-15 Eagle Program Manager based on the level of funding each program has under its control. Since funding flows throughout the defense bureaucracy like a river delta system, with the funding stream breaking into smaller and smaller rivulets as it flows down to individual program, I argue that power is transitive through the layers of bureaucracy. However, a dollar is a dollar and the power of that funding does not lose individual power as it changes its location. In other words, power does not change as it flows through the system and it is represented by the amount of funding.

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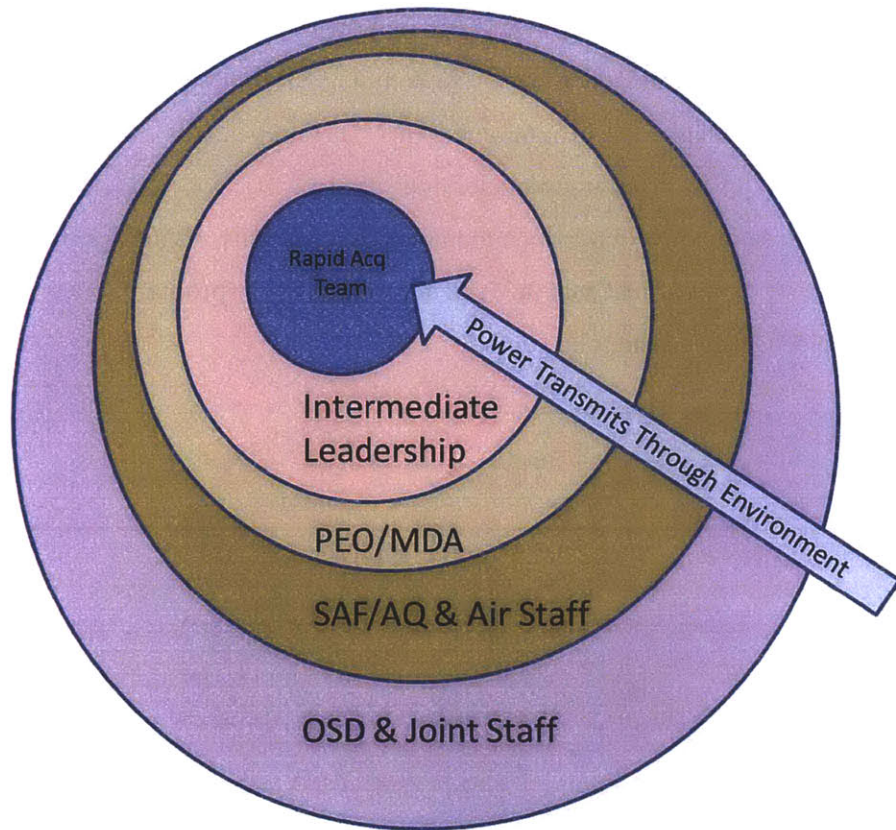
Figure 7: Power's Transitive Nature Through the Defense Bureaucracy

Legitimacy, on the other hand, is not a property that flows from the funding mechanisms but flows from the perceived importance of the program goal and the freedom provided by the next higher level in the bureaucracy. Legitimacy, when flowed down to the local program level, allows the local program manager to manage their individual stakeholder environment for the interests of the overall program. This allows the local program to innovate and operate independently and provide value to the overall program that was not anticipated by the upper levels of the program. In essence, when legitimacy is flowed down to a local level, the program is allowing a bidirectional feedback system that cycles to improve the end product. This feedback loop is set up at every level of the legitimacy flowdown from the highest echelons, such as OSD & Joint Staff, through the various intermediate levels until it reaches the rapid acquisition execution team. This recursive, bidirectional feedback system is the key to fully realizing program goals (see Figure 8).

By flowing down legitimacy and power to an empowered, effective subordinate, a leader frees up precious management time and attention to complete more tasks. However, if legitimacy is not flowed down and the program manager has to repeatedly ask for permission to move the program forward, that program manager does not have cachet. The effect of this on the other local stakeholders can be profound since the delay in repeatedly asking for permissions demonstrates to the local environment that delay is acceptable to the program. This is a poison to a rapid acquisition program's schedule.
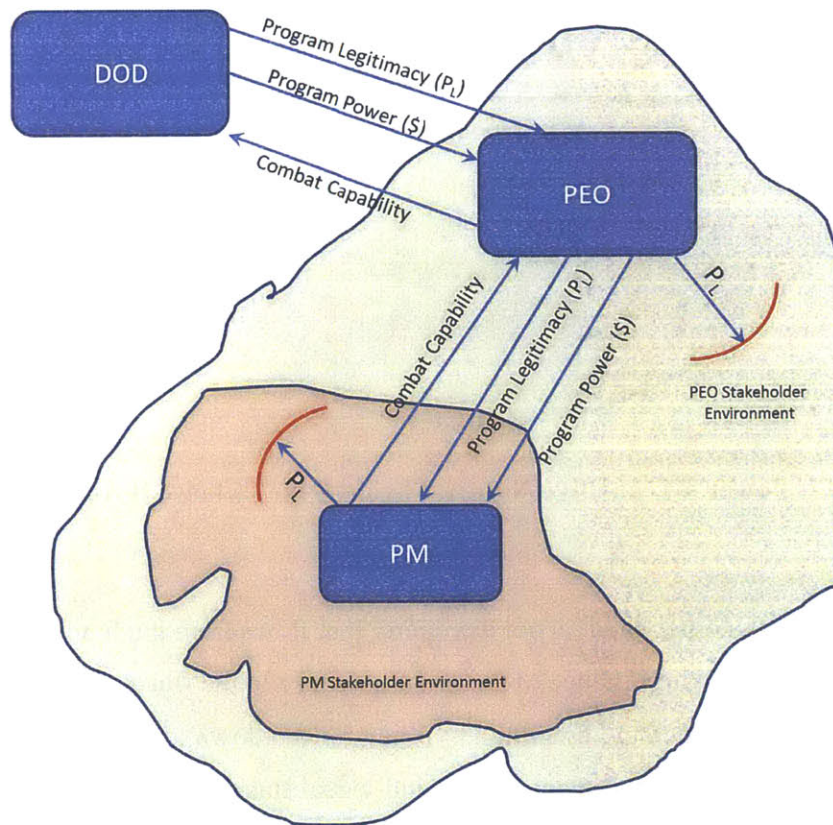
Figure 8: Legitimacy Flowdown to the Local Stakeholder Environment

Optempo

Time is a critical component of any acquisition program but is especially relevant to a rapid acquisition. Often, rapid acquisition programs require program managers and other program staff to work 12 to 16 hour days, 7 days a week to complete all the required program

tasks. There is no time left to work "nice to have's" or "desirements". Dealing with a stakeholder who is not absolutely necessary is not a good use of rapid acquisition team's time. Therefore, Optempo is the critical factor in which stakeholder's are actively managed and how they are actively managed.

Optempo is a measure of the inherent urgency and operational turns through the command and control loop an organization can achieve in a set amount of time. In my experience, organizations operating at different Optempo's will require significantly more time and effort to interface and will have more misunderstandings than two organizations that operate at the same Optempo. Therefore, in order for a rapid acquisition program to succeed, the rapid acquisition team should limit the number of stakeholders who do not operate at the rapid acquisition program's Optempo to an absolute minimum. If required, higher level leadership should take over the role of managing critical stakeholders with lower Optempo's to free precious rapid acquisition program management time and attention to focus on the higher Optempo stakeholders.

Optempo As a Function of Organizational Location

Another way to define Optempo is as the frequency at which an individual or organization completes a cycle through the Observe-Orient-Decide-Act loop. The Optempo of a test pilot while flying a test mission may be on the order of milliseconds for control inputs but might be hours or days for the frequency of missions flown. For a rapid acquisition program, the engineers designing and building hardware are making decisions hourly but the Service Acquisition Executive making a milestone decision would be cycling through on a quarterly or longer basis. Therefore, Optempo is a local property based on the job and program assigned. As outlined in Figure 9: OODA Cycles at Different Organizational Levels, the Optempo increases the closer one gets to a rapid acquisition program, requiring more decisions and more information to achieve success. The figure can be viewed as a whirlpool, in which it is very easy to fall into but from which it is very difficult to climb out. Once a team or portion of a team begins to make rapid decisions, the more the program will depend on these rapid decisions to

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meet the required schedule. In addition, the personnel at the bottom of the whirlpool will have the best and freshest local information allowing the best local decisions. The rapid acquisition program team is at the bottom of the whirlpool with the highest Optempo. As one moves up the organization, the Optempo slows and the whirlpool becomes less chaotic.

This analogy can be carried into the rapid acquisition program as well. Technical personnel involved in the design, manufacture, and testing of the end item are closer to the center of the Optempo whirlpool while the Program Manager is a level above and operating at a slightly slower OODA cycle than the technical personnel. When decision authority is pushed down to the lowest appropriate level, in line with the Optempo at that level, this frees up the upper levels to perform their leadership functions and allows each level to manage their local stakeholder environment. At each role, the individual team member must manage a stakeholder subset critical to their portion of the program. When the Optempo's are aligned in the whirlpool in Figure 9, the program achieves internal alignment where the appropriate individual is dealing with the appropriate stakeholders but it also allows an easier identification of problematic stakeholders that will have to be handled by more senior individuals. This alignment of Optempo's furthers the use of legitimacy in the local stakeholder environments, as seen in Figure 8.
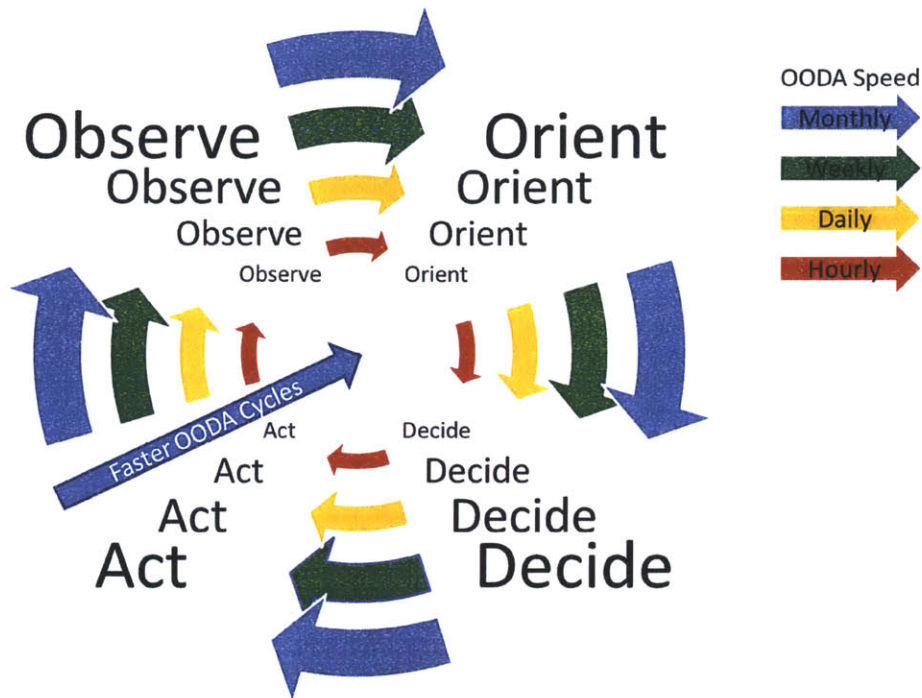
Figure 9: OODA Cycles at Different Organizational Levels

Boyd's Framework of Observe-Orient-Decide-Act Applied to Rapid Acquisition

The question for the Rapid Acquisition Program Manager and the Program Management team is how to allocate the precious time between achieving the desired cost, schedule and performance issues and taking care of the stakeholders. I will use a framework developed by Colonel John Boyd known as the Observe-Orient-Decide-Act Loop or OODA Loop to view the stakeholder landscape of a rapid acquisition program (Osinga 2005; J. Boyd 1987).

Observe

The PM must observe and understand the stakeholders of the program. All possible stakeholders of the program must be identified using Freeman's definition of a stakeholder as "any group or individual who can affect or is affected by the achievement of the organization's objectives (Freeman 1984)." Time spent in this phase must be considered an investment, as it

allows all further steps to continue. Observation also continues throughout the program's lifecycle and must not be considered a one-time event. If possible, an initial evaluation of the four rapid acquisition stakeholder attributes should be conducted.

Orient

The PM must orient his management attention to the stakeholders with the highest stake in the program. This orientation should be a structured process where the entire stakeholder landscape is examined and sorted through the lens of mission urgency. "Orientation, seen as a result, represents images, views, or impressions of the world, shaped by genetic heritage, cultural tradition, previous experiences and unfolding circumstances (J. Boyd 1982)." How the program team chooses to orient to the rapid acquisition environment and structure itself may be the key to program success. Stakeholders whose urgency and Optempo match the tempo of the rapid acquisition team should be actively managed by the rapid acquisition team. Stakeholders outside of the program office with this level of urgency will traditionally fall into three categories. The first stakeholder is the user or lead operational command. This stakeholder normally has the attributes of legitimacy and urgency. The primary programmatic traits of cost, schedule, and performance will satisfy the requirements of this stakeholder.

The second stakeholder category is the stakeholder with urgency, legitimacy and power, what Mitchell, Agle and Wood call the Definitive stakeholder (Mitchell et al. 1997). These stakeholders will always be operating at the rapid acquisition team's tempo and the team must devote some of the management time to keeping this stakeholder committed to and engaged with the program.

The third stakeholder category is the stakeholder with urgency and power, known as the dangerous stakeholder. In a rapid acquisition setting, the primary dangerous stakeholders are the other programs of record which have something to lose if the rapid acquisition program is executed or fills the need the program of record is slated to satiate. In Pelczynski and the Defense Science Board, the disruption to programs of record is noted as the primary point of

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resistance from inside the defense acquisition community (Defense Science Board, 2009; Pelczynski, 2010).

Decide

Since time is precious, the decision process should necessarily remove a significant number of stakeholders from active management. These stakeholders do not have to be entirely ignored but the program management team should not spend their time dealing with stakeholders that do not have an immediate impact on the program schedule. The responsibility for these stakeholders and their concerns should be moved away from the program management team, either to a higher headquarters or to other staff not directly working the rapid acquisition. In light of the time pressure placed on a rapid acquisition program, I assert that a stakeholder without urgency must not be managed by the Program Management team until the time pressure has been released. As part of the decision process, if a non-urgent stakeholder is on the critical path, the Program Management Team must either generate urgency for that stakeholder or work around them to achieve program goals. The use of Operational Need as a prod to generated urgency is particularly useful in a bureaucratic system.

In addition, this step also involves a commitment to the definitive and dependent stakeholders to keep them involved in the program. The user (dependent stakeholder) is satisfied with the program management functions of controlling cost, schedule and performance. The definitive stakeholder's are managed and satisfied by other measures like constant contact, consultation on important decisions, invitations to meetings or test events, etc. Therefore, stakeholder's that lack urgency should not be actively managed by the program management team during a successful rapid acquisition program.

Therefore, any stakeholders that do not fall into the dangerous, definitive or dependent categories should be managed by higher headquarters or by other staff. The Program Management Team in a successful rapid acquisition program should limit their stakeholder management activities to *definitive and dependent stakeholders.*

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Act

Once the stakeholder map has been reduced to the essential group, these stakeholders must be actively engaged and kept informed to solve the rapid-fire, and often out-of-the-ordinary, problems that occur during a rapid acquisition. The Rapid Acquisition Team must not fail to act. The only unforgivable action in a rapid acquisition program is inaction. A Carl Von Clausewitz quote teaches a perfect lesson here, "It is even better to act quickly and err than to hesitate until the time of action is past (Clausewitz n.d.)." If the program manager does not act, the OODA loop cannot be completed and the opportunity for learning is lost. In fact, the entire OODA loop concept is about rapid learning: "It also fits hand in glove with his [Boyd's] proposition that, if one wants to survive and prosper, one must be able to adapt, evolve and learn better and faster than the opponent (Osinga 2005)."

Operational Need

I have adopted the term Operational Need for the stakeholder attribute that combines urgency and legitimacy. This attribute is not just an additive function of the other two characteristics but is, in a sense, multiplicative. The combination of urgency and legitimacy is a new stakeholder characteristic because the combination of these two characteristics allows a program manager to overcome bureaucratic barriers and allows the end user to have much more power in a rapid acquisition program versus a normal acquisition.

Operational Need is an effective psychological tool to overcome bureaucratic barriers because it negates the two primary causes of delay. The first cause of delay is the need in a bureaucratic office to spread the risk of a failed program. In a risk-averse culture, if there is no way to spread the risk, a program or initiative will be pushed to the back burner continually until the program dies or is overcome by events. Operational Need negates this defense mechanism by demanding urgency on the part of the organization and presenting the course of action of doing nothing with a higher organizational risk. In other words, Operational Need presents a risk-averse culture with a choice of action as the lower risk alternative.

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The second cause of delay is the need of an office to limit the amount of new work entering the door. Without a profit motive and a notoriously difficult human resources process, an acquisition office is almost always undermanned for the assigned tasks from the acquisition system. When new, unplanned work is suddenly dropped into an organization, such as a rapid acquisition in support of an ongoing conflict, Operational Need is the attribute that a Program Manager uses to get in the door of that required office and get the attention, priority, and required resources to complete the program. Without Operational Need, with its combination of urgency and legitimacy, it is very difficult to get the program the attention it needs, even when funding is available.

Dynamic Nature of the Critical Stakeholder Attributes Through a Program's Life

A program will have individuals representing stakeholder groups but, in general, stakeholders can be grouped into five distinct categories and these are the stakeholders that should be tracked by the Program Manager in a rapid acquisition program. The five categories were the senior oversight and direction community, the program management community, the user community, the test community, and the logistics community.

The senior oversight and direction community was made up of organizations with command or funding authority but no actual execution abilities. These organizations provide the direction and funding to organizations capable of executing an acquisition program. Examples of these stakeholders are Congress, Office of the Secretary of Defense, or, in a commercial company, the Chief Executive Officer and other officers in the C suites.

The program management community is the community that receives the direction and funding and transforms it into an execution strategy and carries it out. This community is normally dominated by Government program offices but the program management functions of contractors also belong in this community as well.

The user community is made up of organizations that will be the operators or owners of the system for its intended use. This group is often called the end-user in the literature, however, this community also includes the lead command headquarters and its various staff functions. In a commercial company, the customer would fall into this category.

The test community is made up of organizations dedicated to the verification and validation of the realized system. Developmental test is the portion of this community dedicated to verification, the process of making sure the system is built correctly. The Operational test portion of this community is dedicated to validation, the process of making sure the correct system was built.

The logistics community is made up of organizations that actually build and maintain the system. The contractor is usually the predominant stakeholder in this community but government depots, line-maintenance, and other providers of parts and services to keep the system operating are also significant parts of this community.

These four stakeholder attributes, Advocacy, Cachet, Optempo, and Operational Need, are not static values but are properties that vary across time. In fact, a critical task of a program manager is to understand and deal with the dynamic nature of stakeholder relationships. I offer a mental model for a tool to be used for tracking the dynamic nature of these relationships in Figure 10. In this tool, each stakeholder is evaluated against the four attributes at the same point in time and listed in a page linked to that time stamp. At a regular and frequent interval, depending on the dynamic nature of the program, the stakeholders are again evaluated and the values for the four attributes are tracked in a graphic similar to Figure 11. This graphic is a useful tool for a Program Manager to track how stakeholders change over the life of a program. The particular shape and meaning of these curves has implications to how a Program Manager should manage the stakeholder environment. However, discovering the meaning of the particular shapes are beyond the scope of the current research and will require much more work but these graphs should be on a Program Manager's dashboard.

Stakeholders	Advocacy	Cachet		OpTempo	Operational Need	
		Legitimacy	Power		Urgency	Legitimacy
Congress						
MDA						
Etc						

Stakeholder ID and Salience for Rapid Acquisition

Milestones

OODA Loop

Figure 10: Dynamic Stakeholder Scoring Tool

Stakeholder Characteristics
Advocacy, Cachet, Optempo, Operational Need
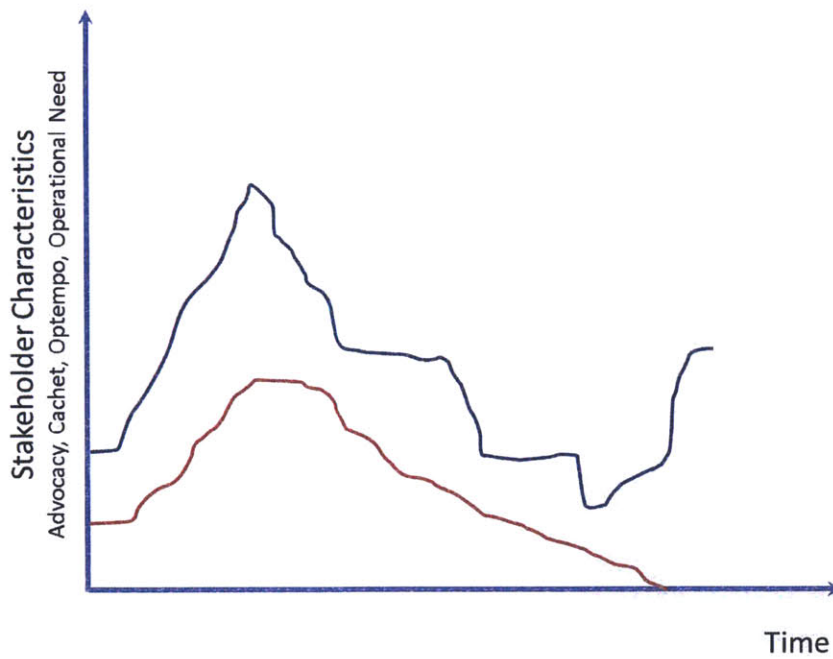
Time

Figure 11: Stakeholder Attributes Over Time

Method

Members of the rapid acquisition team were identified and offered an opportunity to participate in this research through email. Each member was chosen as a representative of a role in the rapid acquisition team. Teammate A was always the closest to the technical or engineering aspects of the program but had some program management responsibilities. The discussion with this teammate furthered the exploration of the concept of rapid acquisition as architectural innovation from current component. Teammate B was the first-line program manager running the hour-by-hour decision process of the program. The discussions with the first-line program managers allowed the examination of how program managers were able to influence their local stakeholder environment directly impacting the rapid acquisition program. Teammate C was the first-line program manager's immediate superior in the program chain of responsibility. At this level, the study surveyed the effect of leadership on a wider stakeholder environment. This allowed us to examine the role of the gatekeeper in shielding and protecting a rapid acquisition program from stakeholders without a sense of urgency. Additionally, with the three levels in a vertical organizational structure, the research was able to examine the effects of flowdown of Cachet and Operational Need and the effect on program success. A word of caution is required here as some first-line program managers reported to two superiors depending on the issue. A number of the personnel in this study reported to a different supervisor for personnel or administrative issues. However, the teammates interviewed in this study were in a direct chain of responsibility for programmatic decisions. After consent, a phone interview was arranged using the 12-question protocol in Table 1 below.

1. In your view, how does Rapid Acquisition differ from normal acquisition? What is the nature of the innovation you expect from a Rapid Acquisition?
2. Who were the stakeholders to whom you paid close attention and who were the stakeholders you ignored to achieve the desired results?
3. Were their particular stakeholders you would have paid close attention to on normal pace acquisition program but did not during this program in the interests of schedule constraints?
4. Did any of your stakeholders significantly change with respect to your program over the life of the program? If so, how did you deal with that?
5. How often did you revisit or rethink which stakeholders were important to your program success?
6. Would you say your program had senior level attention? If so, how much senior attention? Did it help you complete the program on-time?
7. Did you feel the ability to change tactical aspects of the program to achieve the overall program strategic intent?
8. How did the Advocacy of the program change over the life of the program?
9. How did the Optempo of the program change over the life of the program?
10. Did the personal feeling of Operational Need drive you to conduct the acquisition differently? How?
11. Did your program have the ability to get program tasks done without interference? Did your program have Cachet?
12. Were there any stakeholders who were not operating at your Optempo that you felt you needed to accelerate?

Table 1: 12-Question Interview Protocol

The responses to each of the questions was compiled and compared across the program and then compared between programs. The individual program results are detailed in Chapters 4, 5, and 6 of this thesis. Chapter 7 gives a cross-program analysis and overall discussion of the results.

In addition to the interview data, program documents and new articles were examined for the mention of names, organizations, and timelines involved with the program. Program documents were solicited directly from the participants and were downloaded directly from FedBizOpps.gov (www.fbo.gov) when available. In addition to the request for interview email, there was three email strings per interviewee collecting program documentation, detailed program timelines, and post-interview approval of the general themes discussed. Two of the

programs were able to provide detailed lessons learned documents while the third provided additional email discussions regarding the lessons learned. LexisNexis searches, performed through the MIT library system, uncovered 69 separate news articles on the three programs primarily from trade journals such as Aerospace Daily and Defense Report and Defense Technology International.

Once these stakeholders were identified, the program documents and news articles were examined for evidence of advocacy, Cachet, Operational Need, and Optempo throughout the program. Since each program had different durations, the data was normalized to an 18-data-point set for each program. For Program A, this yielded a data point per month of the program while, for Program B, it yielded a data point every 25 days. For Program C, the shortest program, the 18-data-point choice gave a data frequency of every 2 weeks.

For each stakeholder identified, the stakeholder characteristics were assigned a value on a numerical scale for each time period of the program. The advocacy scale used a 7-point scale ranging from 3 to -3, allowing both positive and negative advocacy for the program. This scale was chosen to balance positive and negative advocacy across a neutral point. Positive advocacy was defined as a supporter of the program while negative advocacy was defined as an adversary of the program. The wording of the scale is represented in Table 2 below.

Point Value	Advocacy
3	Very Strong Positive
2	Strong Positive
1	Weak Positive
0	Neutral
-1	Weak Negative
-2	Strong Negative
-3	Very Strong Negative

Table 2: Advocacy Assigned Point Values

In Table 3: Cachet and Operational Need Assigned Point ValuesTable 3, the point scale was chosen to represent the fact that Cachet and Operational Need do not have negative representations. Since Cachet and Operational Need are combinations of power, legitimacy, and urgency and these properties do not have logical representations as negative values, Cachet and Operational Need were evaluated using the 1 to 7 7-point scale represented in Table 2 below. Again, each of these properties was evaluated using an 18-point data set through the life of the program.

Point Value	Cachet	Operational Need
7	Very Strong	Very Strong
6	Strong	Strong
5	Somewhat Strong	Somewhat Strong
4	Neither Strong nor Weak	Neither Strong nor Weak
3	Somewhat Weak	Somewhat Weak
2	Weak	Weak
1	Very Weak	Very Weak

Table 3: Cachet and Operational Need Assigned Point Values

The scale used for Optempo was time-based in order match how the participants thought about the frequency of decisions in a rapid acquisition. Since acquisition programs tend to be thought of in hours, days, weeks and months, the scale for measuring Optempo was designed to match this mental construct. Optempo was evaluated over the life of the program but a detailed time-series of OODA loop frequency could not be reliably constructed based on memory and interviews. Therefore, Optempo was determined through the interview process at critical points of the program and those values were reported.

Optempo
Hourly
Daily
Weekly
Monthly
Quarterly
Annually
Longer than Annual

Table 4: Optempo and Decision Cycle Scale

Chapter 4 Program A

Background

Program A was an ACAT II program to develop a unique capability on an existing aircraft platform to meet an underserved operational need. The Program A platform was envisioned as augmenting other assets on the battlefield that were performing roughly the same role, but to do so with a different combination of sensors, weapons, and communication equipment. The program chose and combined existing and available technologies from a wide variety of Department of Defense weapon systems. The program involved design, integration, test, training and deployment of this system over an 18-month period culminating in the successful use of the capability in combat. In conjunction with the acquisition activities, the existing aircrews required training and exercise experience in the new mission areas with the upgraded platform prior to deployment. This training and exercise requirement shrank the available time to develop and test the system, adding significant pressure to the acquisition program team. This amount of acquisition time devoted to training was difficult to quantify because the Program A team was successful at combining test and training events on the same sortie. However, the Program A team felt the pressure to facilitate training of the aircrews as well as develop the system. The program also involved a large number of stakeholders across multiple military commands, acquisition agencies, and contractors.

Motivation

Program A was chosen for this study as it was a recent example of a successful rapid acquisition with complex, interrelated subprograms executed to meet a critical and immediate warfighter capability gap. This program had strong support throughout its user community and the warfighting of a large percentage of the components was already proven. However, the specific integration, testing, and production challenges were daunting especially when faced with the demanding timeline to get the capability into combat in Operation IRAQI FREEDOM (OIF)

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and Operation ENDURING FREEDOM (OEF). Program A was a perfect example of architectural innovation using available components.

The organizational structure of this program was different from other acquisition programs in that each of the locations where acquisition activity occurred were structured as independent units reporting to a central command and coordination element. This different organizational structure made this program uniquely attractive to study from a stakeholder perspective because each unit operated in a local stakeholder environment but shared similar program characteristics. The program participants were also available and willing to talk about the details of the program. In addition, the program documentation was available along with multiple published news articles in the trade press tracking the progress of the program. In effect, for this research, Program A was both ideal from a theoretical standpoint as well as practical.

Interviewee Data

Each interviewee and their interview data has been sanitized such that each will remain anonymous. Any references to gender or other characteristics not specifically germane to the study of the stakeholder characteristics have been randomized. The specific roles played by each Teammate in the Program have not been obscured.

Teammate A was a Company Grade Officer and was primarily in charge of all aspects of modification of the current aircraft into the variant with the specific needs required by the warfighter. His modification team was the final delivery point for many of the systems delivered from other locations. In addition, Teammate A also served as the liaison between the flight test community and the program management community.

Teammate B served as the civilian program manager for the effort initially and took over the deputy program manager role after Teammate C was put on the program as the overall Program Manager. Teammate B was not co-located with Teammate A.

Teammate C led the entire Program A effort from the same Headquarters location as Teammate B. He was a military program manager with over 15 years of experience in

acquisition program management and had served at various acquisition centers throughout his career. Teammate C led all contacts with senior Department of Defense officials and was routinely asked to brief on the success of the program.

Program A Teammates	Role	Military/Civilian	Acquisition Experience
Teammate A	Technical/Aircraft Modification Lead	Military Company Grade Officer	< 10 Years
Teammate B	Deputy Program Manager	Civilian Program Manager	>15 Years
Teammate C	Program Manager	Military Field Grade Officer	>15 Years

Table 5: Teammate Acquisition Role and Experience

Results and Discussion

Advocacy

Program A enjoyed strong advocacy across the Department of Defense throughout the entire program. The warfighting need for the aircraft, as demonstrated in Operation ENDURING FREEDOM and Operation IRAQI FREEDOM, was strong. Previous attempts to increase combat capability had stalled and the current fleet of aircraft was wearing out. From the interviews, three stakeholders were considered the most critical by the program team. Congress, however, was not convinced initially that Program A could succeed on the aggressive timeline put forth by the Rapid Acquisition Team. Funding for only one-third of the aircraft required by the user was released and Congress held back full advocacy until evidence of success. When the program successfully flight tested the aircraft and demonstrated the required capability, Congress increased their advocacy and released the funding to modify the remaining two-thirds of the fleet and pushed for the aircraft to be used overseas. This effect is clear from the blue trace in Figure 12. Once the program achieved a demonstrated success, Congressional Advocacy rose. The

User Command never wavered in their advocacy of the program and continued to push the Rapid Acquisition Team to deliver the capability faster. They demonstrated their advocacy by delivering the required legitimacy, power, and urgency to the program, and further reinforced the advocacy by communicating it with the entire acquisition and user communities. The advocacy of the User Command was driven by the Operational Need to provide the combat capability in the field. The Office of the Secretary of Defense and the Joint Staff advocacy was very strong from the beginning but dropped a small amount after the program was funded and running. This should not be considered a loss of support but a reallocation of the available time to other priorities (See Figure 12: Program A Advocacy over Time). In essence, once they handed off the requirement to an acquisition team, the priority, and hence the advocacy, dropped.
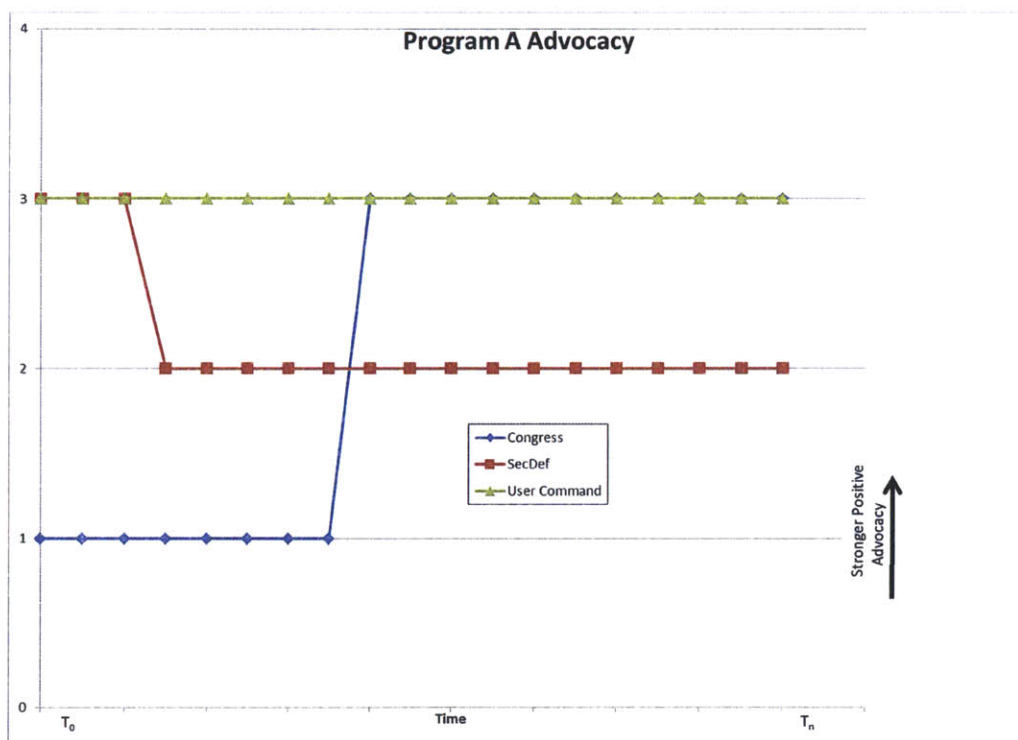
Figure 12: Program A Advocacy over Time

Optempo

The Optempo of each Teammate varied and showed strong agreement with the proposed theory that the farther away from the center of the program, the slower the Optempo. Teammate A reported an Optempo that varied between hourly and daily. Teammate B reported an Optempo that varied from daily to biweekly. Teammate C reported a highly variable Optempo based on the program phase but it varied from hourly to daily. Being the lead Program Manager, Teammate C was often called upon to fill other specialties roles and make decisions until able to assign the responsibility to other personnel. In essence, Teammate C filled multiple roles in the program and agreed that his Optempo increased the closer he got to the point of program execution.

In addition to the decision cycle for programmatic issues, each Teammate also scanned the stakeholder environment to identify a new stakeholder or reconfirm a current stakeholder's importance. As reported by all three interviewee's, the stakeholder list continued to grow and very few stakeholders were removed. However, the scanning frequency did appear to slow down as the Teammate moved farther away from the Rapid Acquisition point of execution.

Teammate	Scan Frequency
Teammate A	Hourly
Teammate B	Semi-Annually
Teammate C	Weekly

Table 6: Stakeholder Environmental Scanning

Cachet

Program A had a large amount of Cachet. During the interviews with acquisition personnel on Programs B and C, Program A was repeatedly cited as an example of a rapid acquisition program with legitimacy and power, the essential components of Cachet. Each Teammate on Program A strongly agreed that this program had an overwhelming amount of power and legitimacy. In fact, Teammate A was able to selectively choose his local program

team members with little searching because the program was attracting personnel with a strong desire to work on this rapid acquisition. Teammate A said it perfectly, that "a lot of young CGO's wanted to be part of our team, wanted to be movers and shakers."

Program A also demonstrated the concept of physical and organizational separation as a Cachet generator. The Program A team was separated organizationally from their normal Headquarters and reported directly to the top two echelons of their User command. This separation increased the perceived and actual power of the organization by increasing access to key decision makers. Additionally, physical separation from normal day-to-day routines and the ability to selectively ignore taskings from other staff elements was also cited as a generator of Cachet.

Cachet was a significant enabler to performing program tasks without interference. As an example, Base support agreements, where a base receives an amount of funding to support a program, were waived as a needless interference. The program was given priority in range time in which to conduct flight and ground tests and was able to waive certain flight test restrictions in order to deliver the aircraft faster.

However, Cachet has a downside. The success of this program increased the demand for program information briefings and aircraft tours, draining valuable program time from the Rapid Acquisition Team. While these briefings were generally useful to increase and spread the advocacy throughout the DoD, the requests were seen as increasingly harmful to successful program execution. This time commitment primarily landed on the program leadership, distracting the very people who needed to remain focused on the program execution.

In the beginning of the program, Cachet grew sharply with the support of senior leaders in the User Command. These leaders repeatedly and publicly announced their support for the program and, therefore, the cachet rose sharply. This is the first large increase in Cachet seen in Figure 13. The second, smaller increase was caused by successful developmental testing of the system. As Program A became more consistent, successful and stable, the Cachet began to drop. Each Teammate viewed this as a symptom of success because the aircraft was recognized as an important capability that the User Command would sustain for the future. The physical and

organizational separation was dissolved and the program began to be subject to standard reporting channels. This can be seen at the tail end of the time series in Figure 13.
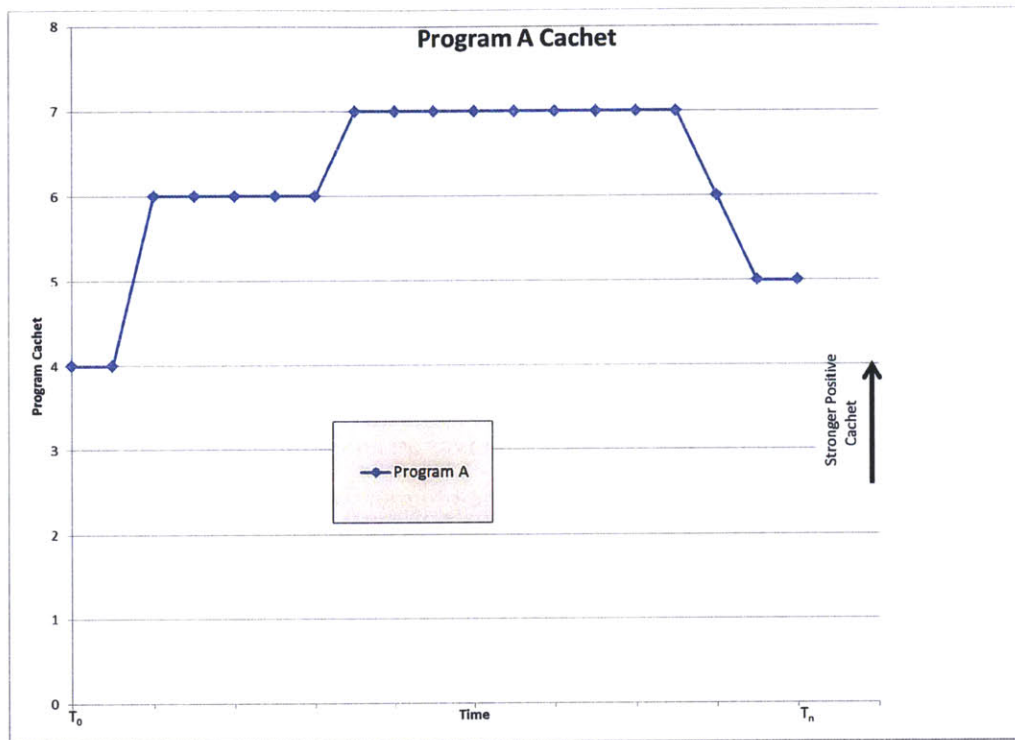
Figure 13: Program A Cachet over Time

Operational Need

All three teammates expressed a strong sense of Operational Need and agreed with the characterization of Operational Need as a combination of urgency and legitimacy. Teammate A used this sense of Operational Need to generate flight test sorties faster and convince the normally very conservative test community to move at a faster pace. Normally, the flight test community is fundamentally and philosophically opposed to the concept of "Fly-Fix-Fly". The accepted practice is not to fly again until the problem is fully understood. The Operational Need,

combined with a strong safety analysis, allowed Program A was able to overcome this hesitancy and generate test sorties.

Teammate C was also able to keep the complexity of the system to a more manageable level through the use of Operational Need. As the system became more successful and well known, other programs expressed the desire to add their components to the Program A system. Using Operational Need, Teammate C was able to shield the Program A configuration from becoming overly complex and delaying fielding. Teammate B expressed how Operational Need allowed the team to move faster by removing the negative stigma to a component failure or system immaturity. In effect, the sense of Operational Need allowed a faster development cycle because the team did not fear small failures but did fear overall system failure to provide the required combat capability. A compilation of instances in which the various teammates were able to use Operational Need is given in Table 7.

Teammate	Role	Operational Need Example
Teammate A	Technical/Aircraft Modification Lead	Generating Test Sorties Rapidly
Teammate B	Deputy Program Manager	Overcoming Component Failure
Teammate C	Program Manager	Limiting System Complexity

Table 7: Examples of the Use of Operational Need to Overcome Obstacles

Active Stakeholder Management

Each member of Program A interviewed actively managed their local stakeholder environment to achieve program success. Each Teammate used the stakeholder attributes above to actively manage the gives and takes from the Program to the stakeholder environment. The attention paid to the local stakeholders fell into three categories: Performance, Dependence, and Decision Authority.

The ability of stakeholders to keep up and perform at the required pace was essential to Program A. Stakeholders that were able to perform at the required level and pace were cultivated while stakeholders who could not keep up were culled. Teammate A relayed an instance of stakeholder culling. When one acquisition center's contracting processes were too slow to meet the program needs, Teammate A surveyed the other acquisition centers already on the team and switched his efforts to the contracting office who could keep up, saying, "I didn't want to tell the boss that we can't get this done."

However, this ability to cull stakeholders was tempered by Program A's dependence on stakeholders who could not be replaced. Teammate B relayed an instance of having to train a stakeholder in a contracting specialty in order to move the program along. This particular acquisition center held the airworthiness certification authority for the aircraft and, therefore, could not be culled without damaging the ability to move forward. Therefore, Teammate B recruited specialized contracting help to train the airworthiness authority's contracting personnel in particular aspects of the Federal Acquisition Regulations pertaining to rapid acquisition. This dependence criterion was used in two ways, however. If the program did not have any dependence on a particular stakeholder in order to succeed, that stakeholder was ignored. For example, Teammate A was able to ignore his local base's requirements for base support agreements and base support funding by using the Program's Operational Need and Cachet as a shield. This saved the program almost $6 million in overhead fees normally charged to support acquisition programs on that particular base. Both Teammates B and C were able to ignore reporting requirements from Headquarters Staff elements as well, greatly freeing leadership time and attention to focus on program performance rather than reporting. Teammate C stated, "Unless it was absolutely necessary, we did not respond to any taskers or any of the bureaucratic overhead."

Another common element in the stakeholders ignored by Program A was the inability to say "Yes" but the ability to say "No". Teammate C was told by his senior leadership that any organization could tell him "Yes" and provide the required support but only the two individuals at the top of his chain of command could say "No" to a program request. Teammate C interpreted this as the authority to ignore any outside organization who wanted the program to slow down or stop for any non-safety reason. This authority allowed the rapid acquisition team

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to ignore reporting requirements to Staff elements, overcome test community documentation requirements, and streamline local contracting office processes. Both Teammates B and C strongly stated that this ability did not allow them to ignore strong program management practices but allowed them to leap the multiple layers of bureaucracy before reaching the decision authority.

Program A's stakeholder dependence also had a dynamic element. The importance of individual stakeholders changed over the life of the program. The program was initially funded for only 33% of the required aircraft by Congress. The stated reason for the funding limitation was an expressed hesitance by Congress to fully fund a program that Congress did not think could be executed in the required time. This required the Program team to pay close attention to Congress as a whole, particular Congressional Staffers, and the various Program Element Monitors in the Secretary of the Air Force Acquisition Staff. However, when Program A showed success and full funding was released, Congress' importance to the day-to-day operations of the program dropped. Conversely, logistics, supportability, and communication interoperability issues rose in importance as the program progressed. This was driven by the need to support and operate the aircraft in upcoming operations.

Case Study Conclusions

The organizational structure of this program, with each element of acquisition activity was structured as independent units reporting to a central command and coordination element, set Program A apart from other rapid acquisition programs. This structure allowed the command and control element to be unusually lean and gave each acquisition location autonomy in order to produce for the entire program. In addition, resources were not consumed needlessly by a command element and were pushed down to increase the probability of success. Along with these resources, legitimacy and strong strategic intent were also passed down allowing wide latitude to innovate and building the positive feedback loops discussed in Chapter 3.

Also, Program A was a perfect example of the negative implications of strong Cachet for other rapid acquisition programs as well as traditional programs. The success of Program A increased the demand for program information briefings and aircraft tours, draining valuable program time from the Rapid Acquisition Team. Teammate C led the charge to give these briefings to keep the rest of the team focused on the program execution:

> "I think I briefed a 1-Star or above on the program once a week for a period of two months up to [high levels in DOD]. It was good for team recognition but I didn't see any tangible benefits....every two days prepping for a briefing was two days away from work that needed to be done....it may have been good for someone but, from my myopic view from the program side, it wasn't beneficial."

Program A was a successful rapid acquisition program because it possessed the right Stakeholder Attributes and was conducted by a dedicated team of smart, dynamic people. This program had strong positive advocacy from the very beginning and that advocacy did not waver. It was staffed by acquisition professionals with the ability to operate at the hourly OODA loop cycle required by rapid acquisition. The Program was given the power and legitimacy, the Cachet, to positively influence the local stakeholder environments towards program success and this Cachet did not waver until the program was already a proven winner. The Operational Need, the urgency and legitimacy of the program, were communicated far and wide and it was used to knock down or ignore barriers to acquisition success. The program team actively managed their stakeholder environments. They culled underperforming stakeholders if possible, encouraged or pushed stakeholders on which the program depended, skipped or ignored stakeholders who only had the power to say "No", and drove the program to success.

Chapter 5 Program B

Background

Program B was an ACAT III program to develop a unique munition capability in order to meet an operational need in Operation ENDURING FREEDOM (OEF). The User Command saw the munition from Program B as a way to increase the freedom of airpower to assist the counterinsurgency aspects of the campaign in Afghanistan. It was an additional arrow in the quiver in which to prosecute a controlled and precise use of airpower on a non-linear battlefield. A strong benefit of this program was the ability to avoid a large amount of flight testing due to the weapon's similarity to other, previously certified munitions. This offered the promise of a quick deployment to combat. The program involved munition design, aircraft integration, and test of this system over a 15-month period. Program A was challenged by an unexpected need to develop technology that the program team believed was already fully mature. The original schedule was extended from the original 9 months to 15 months when these technical problems with the munition caused a redesign. The program also involved a large number of stakeholders, including a deployed user command and multiple Services, acquisition agencies, and contractors.

Motivation

Program B was chosen for this study as it was a recent example of a successful rapid acquisition with complex, interrelated subprograms executed to meet a critical warfighter shortfall. In addition, during the course of Program B, technical issues arose that caused a delay, testing the stakeholder attributes in an adverse schedule environment. Program B also covered a more traditional user and developer space from the other Programs studied, with all organizations having long histories of conducting traditional acquisition programs. While quick reaction capability plans were in place, the predominant activity for this organization was traditional acquisition and procurement functions.

In contrast to Program A, this Program took place entirely within an established acquisition center and used a traditional program office organizational structure. However, the rapid acquisition team was organizational separated from all other duties and significant levels of bureaucracy were removed between the acquisition team and the decision makers. This program also allowed the examination of the ways in which an established acquisition organization changes to meet a rapid acquisition requirement.

The program participants were available and willing to talk about the details of the program. In addition, the program documentation was available along with multiple published news articles tracking the progress of the program. In effect, for this research, Program B allowed us to expand the space where the stakeholder attributes in rapid acquisition apply.

Interviewee Data

Each interviewee and their interview data has been sanitized such that each will remain anonymous. Any references to gender or other characteristics not specifically germane to the study of the stakeholder characteristics have been randomized. The specific roles played by each Teammate in the Program have not been obscured.

Teammate A was a civilian engineer and was primarily tasked with overseeing the technical aspects of weapon design, qualification, and integration into various aircraft platforms. He also interfaced with other Military Service's engineering community to certify the munition for Joint Service use. In addition, Teammate A had a significant background in munitions ground and flight test and led the technical aspects of these for Program B.

Teammate B served as the civilian program manager for the effort initially and was the acknowledged government leader of the effort. Teammate B had over 25 years of acquisition experience and was considered one of the most knowledgeable program managers in the entire center. Prior experience included other rapid acquisition programs and this teammate was considered somewhat of a superstar program manager by others at the center. In fact, Teammate

B was mentioned in the interviews of Program C as a person to seek advice from when conducting any rapid acquisition program.

Teammate C was a senior civilian with prior program management experience and oversaw the portfolio of rapid acquisition programs at their acquisition center. She was frequently called upon to put together teams for rapid acquisition programs and built and oversaw a number of successful rapid acquisition programs in the recent past. All three Teammates were co-located.

Program B Teammates	Role	Military/Civilian	Acquisition Experience
Teammate A	Technical Lead/Engineer	Civilian Engineer	< 10 Years
Teammate B	Program Manager	Civilian Program Manager	>15 Years
Teammate C	Program Manager's 1st Line Supervisor	Civilian Program Manager	>15 Years

Table 8: Teammate Acquisition Role and Experience

Results and Discussion

Advocacy

Program B enjoyed strong but inconstant advocacy during the lifetime of the program. The warfighting need for the munition, as demonstrated in OEF, was strong and the munition had the capability to change the perceptions of airpower in Afghanistan. Its use in a counterinsurgency campaign was highly desired by the deployed warfighter. The key technology had been demonstrated and the rapid acquisition team believed this key technology was ready to go into production. Four stakeholders were considered critical by the program team, the Senior Oversight such as DoD and HQ USAF, the User Command, the Program

Management Community, and the Logistics Community. Advocacy from the User Command and Headquarters Air Force was very strong at the beginning of the program. Funding was available soon after the program started and the Joint Urgent Operational Need was validated by the Joint Staff. Since the requirement for this munition was validated, both the senior leadership and the program management communities kept strong advocacy throughout the life of the program. However, when the program hit some technical difficulties exposed during testing, the advocacy for the munition waned at the User Command. The Logistics Community took their cues from the User and let their advocacy for the munition fall as well. This dip in the advocacy of the User Command and the Logistics Community is seen in Figure 14. The rapid nature of the program may have been forgotten at the User Command as the munitions, once produced and ready to ship, were placed on an ocean freighter and took approximately two months to reach the theater of operations. Traditionally, urgent munition deliveries are flown directly into the main operating base and quickly transferred to the combat units for use. However, once the munition was used in combat and the forward deployed users began to ask specifically that this munition, the advocacy from the User Command regained its strength. This accounts for the sharp advocacy increase near the end of the program in Figure 14. The logistics community, taking their cues from the User Command, regained their advocacy once the munition proved itself in combat.
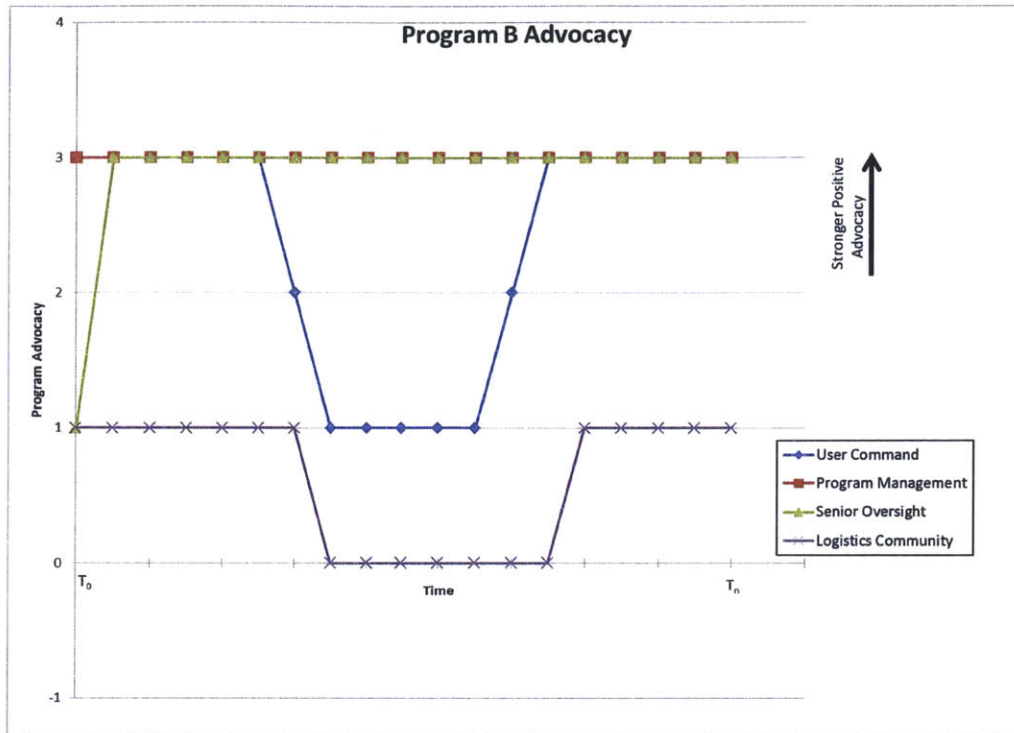
Figure 14: Program B Advocacy Over Time

Optempo

The Optempo of each Teammate varied and showed strong agreement with the proposed theory that the farther away from the center of the program, the slower the Optempo. Teammate A reported an Optempo that varied between hourly and daily. Teammate B reported an Optempo that varied from daily to biweekly. Teammate C reported a weekly Optempo but stated that the Optempo for this program was higher than what was expected at the beginning. She stated that her expectation that the Optempo would decrease over the life of the program was not realized and the Optempo stayed elevated throughout the program lifetime. Numerous problems in the technical and contracting realms increased the frequency of the decision cycle.

In addition to the OODA loop decision cycle for programmatic issues, two of the Teammates interviewed scanned the stakeholder environment to identify a new stakeholder or reconfirm a current stakeholder's importance on a weekly basis. Both Teammates' scan

frequency was driven by a weekly reporting cycle to senior leadership. This reporting requirement, with its defined distribution list, forced the stakeholder reevaluation to a similar cycle. Teammate A did not scan the environment for new stakeholders and stated that he was too busy with program details to scan for new stakeholders and felt that the other Teammates were more qualified to handle that responsibility.

Teammate	Scan Frequency
Teammate A	Did not Scan
Teammate B	Weekly
Teammate C	Weekly

Table 9: Stakeholder Environmental Scanning

Cachet

Program B had a high value of Cachet. The Teammates on Program B each strongly agreed that this program had a large amount of power and legitimacy due to its connection with Operation ENDURING FREEDOM and the Joint Urgent Operational Need calling out for this solution. Teammate C was able to select the best and brightest from the acquisition center to staff the team for Program B and she selected only "A+ players":

> "Our best and brightest, our A+ players, only 1 deep in each function...we had a closed door session with other [leaders], populated the team with these A+ players who would owned by their parent [organization] but under our leadership. We then moved them to our spaces, collocated them, and set the cadre up."

Program B also used the concept of physical and organizational separation as a Cachet generator. After the Program B team was selected, they were separated organizationally from their prior organizations and reported directly to the top two echelons of the acquisition center, allowing rapid access to the senior decision makers. This separation increased the perceived and

actual power of the organization by increasing access to key decision makers. Additionally, physical separation from normal day-to-day routines was also cited as a generator of Cachet.

Cachet was a significant enabler to performing program tasks without interference. The program was given priority in range time in which to conduct flight and ground tests and was given priority to other resources such as personnel or office space. The Program Manager, Teammate B, also felt that the Program Cachet also rose on successful tests. I believe success in testing increases a program's legitimacy by showing the value of the system to the organization. When a rapid acquisition shows success through testing, combined with the power from the validated need, the Cachet of the program rises.

Program B fought the downside of success and Cachet by allowing senior personnel, outside the rapid acquisition team, to satisfy the demand for program information briefings. The fielding of briefings by senior personnel allowed the rapid acquisition team to focus their precious program time on the program and not the public relations. This also had the benefit of making the senior leadership part of the team and giving them a sense ownership in the program.

While the advocacy for Program B by the User Command dipped when technical issues arose, that did not cause a drop in Cachet in the local acquisition environment. Each of the teammates pointed to a strong process of enabling the rapid acquisition teams at the local acquisition center. This appeared to reinforce the Cachet even when the program hit technical difficulties and allowed the program to successfully influence its local stakeholder environment.

Operational Need

Each of the three teammates expressed a strong sense of Operational Need and agreed with the characterization of Operational Need as a combination of urgency and legitimacy. The urgency and legitimacy for Program B originated with Operation ENDURING FREEDOM and the needs of the front-line warfighters for precisely the capabilities of Program B's munition. At certain times, as relayed by Teammate B, the rapid acquisition team's sense of Operational Need was so strong they wanted to "take clubs over to the guy who didn't get it and beat them over the head with it" to remove any roadblocks to program success.

Teammate C also stated that the sense of Operational Need was very strong from the beginning and was well transmitted through the organization from the senior leadership down to the individual acquisition team members. A close relationship with the User Command and the careful communication of the consequences of not having the capability instilled a strong sense of Operational Need throughout the team. This feeling of Operational Need allowed to team to overcome bureaucratic roadblocks and keep the momentum of the program going even in the face of technical difficulties. An example of the power of Operational Need was the use of actual combat radio recordings from Joint Tactical Air Controllers (JTAC), an Airman attached to a ground unit who specializes in the battlefield use of airpower, calling for the required air support. When this was coupled with the knowledge that the munition from Program B would allow the JTACs greater use of, and more flexibility with, airpower on the battlefield, Operational Need knocked down many barriers to program success. Using Operational Need, Teammate A was able to rapidly negotiate an acceptable testing arrangement with a sister service, speeding the delivery to the field and eliminating redundant qualification testing. Teammate C, feeling the contractor had not did not fully understand the urgency, used her sense of Operational Need to intervene and accelerate the contractor's efforts. She stated,

"they were used to researchy kinds of things ...they weren't thinking in terms of production, of getting to rate, and having to meet a timeline and a schedule."

Her efforts got the contractor nearly back on schedule and the convinced the contractor leadership of the need for everyone in the program to have a strong sense of Operational Need. A compilation of the effects of Operational Need on Program B is presented in Table 7.

Teammate	Role	Operational Need Example
Teammate A	Technical Lead/Engineer	Eliminated Redundant Qualification Testing
Teammate B	Program Manager	Eliminated Document Reviews
Teammate C	Program Manager's 1st Line Supervisor	Engaged with Contractor to Increase Work Pace

Table 10: Examples of the Use of Operational Need to Overcome Obstacles

Active Stakeholder Management

Two of the three Teammates of Program B interviewed actively managed their local stakeholder environment to achieve program success. These Teammates used the stakeholder attributes above to actively manage the gives and takes from the Program to the stakeholder environment. Teammate A stated he did not actively manage his stakeholders but relied on Teammate B to manage the environment for him. He attributed this to his lower level of acquisition experience and the fact that Teammate B was so respected in the community. The attention paid to the local stakeholders fell into two categories: Dependence and Decision Authority.

Program B focused on the stakeholders required for program success. This dependence criterion was used in two ways, however. If the program did not have any dependence on a particular stakeholder in order to succeed, that stakeholder was ignored. For example, Teammate C was able to ignore the local functional (engineering, program management) communities and deal directly with the leadership elements in order to staff the program with "A+ players". Program B depended on the safety community, both safety certification for operational use and range safety for test use, throughout the program. The safety community has a strong voice in the munitions community for obvious reasons and, in Program B, they were an important stakeholder. Program B worked closely with this community and worked all issues they brought up. Another community that the program was dependent on was the Science and Technology community. When the program started, the belief was that the weapon system was mature enough to go into production. In fact, a significant S&T effort was needed to reduce the technical risk of the system enough to go into production. This community received funding and attention in order to solve these problems.

Another common element in the stakeholders ignored by Program B was the inability to say "Yes" but the ability to say "No". This authority allowed the rapid acquisition team to ignore reporting requirements to Staff elements, overcome test community documentation requirements, and streamline local contracting office processes. As well, the program was given the authority to bypass levels in multiple chains of command and this had an accelerating effect on reporting and briefings as well. Both Teammates B and C noted how much easier it was to

report results and concerns because the briefings and reports were not subject to repeated pointless editing to conform to the intermediate level preferences. In Program B, reviews and reports were still completed and strong program management practices were used but the strict formality was dispensed with in the interests of speed. The informal nature of the reporting increased the value of the information flow by delivering the content with less time and effort.

Program B's stakeholder dependence also had a dynamic element. The funding of the program was initially very important, with the Secretary of the Air Force Staff taking a dominant role. However, after the funding was received, the relative importance of this stakeholder diminished. However, the safety community increased throughout the program especially as the munition neared operational employment. However, once the approval was obtained the importance of the community dropped. Another dynamic stakeholder was the S&T community. This stakeholder was brought in to reduce specific technical risks and, once they were solved, their importance dropped.

Case Study Conclusions

Program B was a successful rapid acquisition program because it possessed the right Stakeholder Attributes and was conducted by a dedicated team of smart, dynamic people. This program had strong positive User advocacy from the very beginning and, while the User Advocacy dipped when the program ran into technical difficulties, the advocacy from the Program Management and Senior Leadership communities did not waver. This User and Logistics inconstant Advocacy had a negative effect on the delivery of the appropriate quantity of munitions to the field. After the technical difficulties were overcome and the team was ready to ship, Teammate B stated:

> "[the User] lost the bubble on why they were requesting this in the first place but once it hit the field and was starting to be used, the advocacy shot through the roof again. They told us 'this is the greatest thing ever and how can we get more'"

Of course, this begs the question of whether a more constant advocacy would have allowed the program to deliver sooner and with quantities more appropriate to the need in the

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field. Teammate B stated that if the User had not lost their focus they would have had more munitions available for use sooner.

This program was carefully staffed by experienced acquisition professionals with the demonstrated ability to operate at the hourly OODA loop cycle required by rapid acquisition. The fact that the team was carefully selected made known throughout the local environment. This team was operationally separated from their home offices but remained attached to them for administrative purposes. They had different offices, collocated as a team, and were given frequent and direct access to their senior decision makers. Also, the routine bureaucratic practice of frequent review of all correspondence and documentation was removed from this team to facilitate rapid information flow.

The Program was given the power and legitimacy, the Cachet, to positively influence the local stakeholder environments towards program success and this Cachet did not waver. Successful tests of the munition overcame any loss of Cachet during the technical difficulties. The Operational Need, the urgency and legitimacy of the program, was personally felt by the team and was used to overcome or ignore barriers to successful fielding. Most of the program team actively managed their stakeholder environments. They focused on stakeholders on which the program depended, skipped or ignored stakeholders who only had the power to say "No", and drove the program to success.

Chapter 6 Program C

Background

Program C was a small ACAT III demonstration program to develop a lightweight loitering munition capability in order to meet a potential operational need. The program was actively sponsored by the User Command as a demonstration for a future planned program with similar requirements and was funded by a Congressional Appropriation not requested by the User Command in the normal budgeting cycle. The program involved contracting for, and flight test of, multiple contractor systems over a 9-month period. Significant test safety issues arose and required the program to shift test ranges for the final series of tests. In addition, the funding for the follow-on program was cut near the end of the rapid acquisition program. The program also involved a large number of stakeholders, including the User Command and multiple Services, acquisition agencies, and contractors.

Motivation

Program C was chosen for this study as it was a recent example of a smaller rapid acquisition with complex stakeholder interactions that did not field an operational system used in combat. The program did not have an identified critical warfighter shortfall but was treated as a rapid capability development. During the course of Program C, safety issues arose that caused a change in stakeholders as well as the funding cut for the follow-on program, testing the stakeholder attributes in an adverse advocacy environment.

The program participants were available and willing to talk about the details of the program. The program documentation was available along with multiple published news articles tracking the progress of the program. Program C also covered a different user and developer space from both Program A and Program B. For this research, Program C allowed us to expand the space where the stakeholder attributes in rapid acquisition apply.

Interviewee Data

Each interviewee and their interview data has been sanitized such that each will remain anonymous. Any references to gender or other characteristics not specifically germane to the study of the stakeholder characteristics have been randomized. The specific roles played by each Teammate in the Program have not been obscured.

Teammate A was a Company Grade Officer and was initially tasked as the deputy program manager. However, when Teammate B, the lead program manager, was deployed to Afghanistan in support of Operation ENDURING FREEDOM, Teammate A took over the role of program manager.

Teammate B was a senior Company Grade Officer with significant experience in technological development and acquisition. Teammate B served as the primary program manager for the effort initially and was the acknowledged government leader of the effort. However, Teammate B was chosen for a 6-month deployment to Afghanistan and was unavailable for the last 50% of the program.

Teammate C was a senior civilian with prior program management and technological development experience and oversaw a portfolio of unmanned aerial vehicles at the User Command. Teammates A and B were co-located but Teammate C was at a different location.

Program C Teammates	Role	Military/Civilian	Acquisition Experience
Teammate A	Technical Lead/Deputy Program Manager	Military Company Grade Officer	< 10 Years
Teammate B	Program Manager	Military Company Grade Officer	<10 Years
Teammate C	Program Manager's 1st Line Supervisor	Civilian Program (S&T) Manager	>15 Years

Table 11: Teammate Acquisition Role and Experience

Results and Discussion

Advocacy

Program C did not have strong advocacy during the lifetime of the program and when the funding was cut for the follow-on effort, the advocacy plummeted. The effort arose from a requirement in Operation ENDURING FREEDOM but was not granted an Urgent Operational Need status. While the advocacy from the User Command was strong, the senior oversight community had not planned to perform the demonstration program before the follow-on, full-scale production program. The funding became available through a Congressional Add, where funding is provided by Congress but was not requested by the User Command. Therefore, the advocacy for the demonstration was muted. In addition, the follow-on program required the support of multiple service components to receive full funding. When this did not happen, support for the follow-on program collapsed as did the advocacy for Program C.

Teammate C did not seek out senior level support and advocacy at the User Command as a tactic to avoid program interference. She stated "the more attention you get, the more holes get poked into your program." She felt the multiple service aspect of this program was a potential cause for program disruption. Some stakeholders also expressed some hesitancy to tackle the challenges presented by a loitering munition in a rapid acquisition fashion. Therefore, Teammate C used a conscious strategy to "fly under the radar" to finish the program.

The advocacy in the Program Management community was strong because this program was seen as a way to generate a successful track record with a new User Community, thereby providing a new customer and source of funding for the future. However, this support did not reach the point where the leadership at the acquisition center was willing to waive local requirements or processes. The acquisition leadership also did not communicate the advocacy to the overall community and allowed the program to operate under normal constraints. Teammate A stated, "Even though we had senior leader advocacy, that advocacy was not communicated well enough." In particular, test range priority for this program was very low as was the priority in the contracting process. The range safety process was also not accelerated for this program and the program team changed their processes to meet the safety timelines. In Figure 15, the

initial uptick in Advocacy by the User Command was caused by the team successfully getting the program on contract sooner than expected. This energized the User and demonstrated the ability of the team to perform. The plummeting of the Advocacy at the end of the program was a result of the funding being cut for the follow-on program.
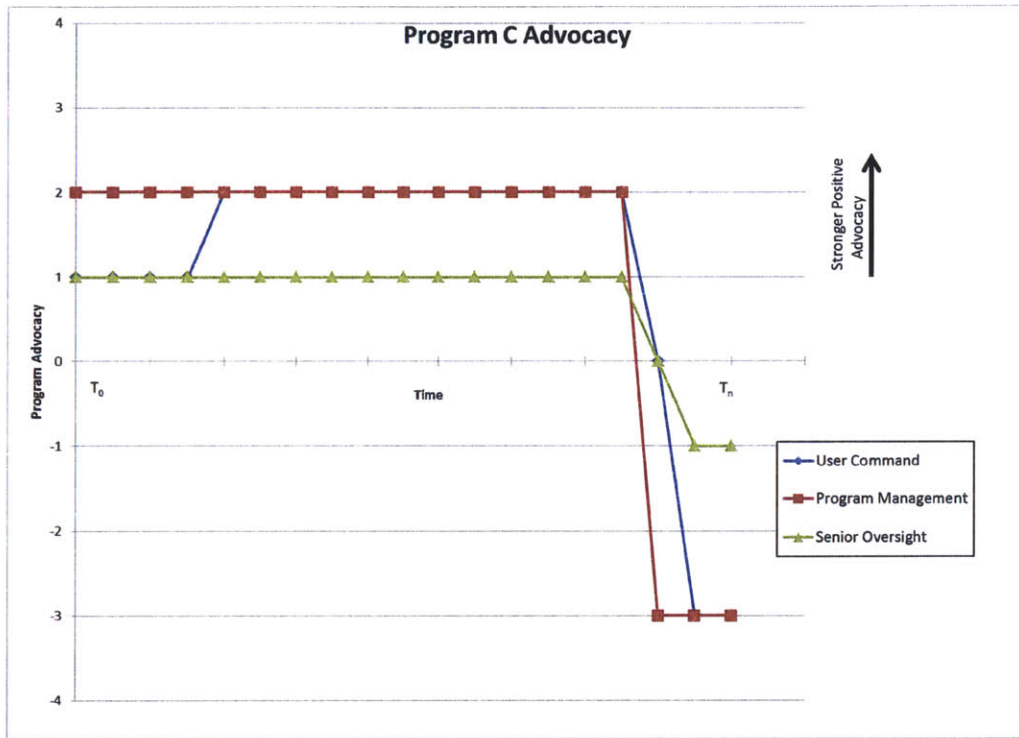
Figure 15:Program C Advocacy over Time

Optempo

The Optempo of Program C for each teammate was clearly tied to the phase of the program. During the initial program announcement and contracting phase, the Optempo of each teammate was daily. After contract award and before initial testing, the Optempo stretched out to weekly. During initial and final testing, the Optempo increased again to a daily cycle. The Optempo of Teammate C stayed much higher in this program, in direct opposition to the theory that the closer to the program the higher the Optempo. Teammate C stated Optempo was daily while solutions to program problems were sought. Teammate C felt that the value of the

munition on the battlefield was important but unrecognized and her Optempo was elevated trying to get the value of the munition publicized.

In contrast to other programs, the majority of the Teammates on Program C did not spend significant time surveying the stakeholder landscape. The only instance when their perceived stakeholder landscape changed was when a safety issue caused the team to move to a different range complex. Teammate C, on the other hand, scanned the environment daily in an effort to smooth the path for the program. Her environmental scan was focused on where she needed to seek authorization or cultivate a working relationship to move the program forward. The ability of the program to apply pressure, however, was hampered by the overall lack of advocacy, Cachet, and Operational Need.

Teammate	Scan Frequency
Teammate A	Single Instance
Teammate B	Single Instance
Teammate C	Daily

Table 12: Stakeholder Environmental Scanning

Cachet

Program C did not have a high value of Cachet. Each of the Teammates agreed that Program C did not have power but was pushed as a rapid acquisition program by the User Command. It appeared the User Command had an expectation that all of its sponsored programs would be treated as rapid acquisition programs. However, Program C ran into a large amount of bureaucratic opposition and did not have the power to overcome these barriers. The program had some Cachet inherited from its sponsor but this was primarily in the form of legitimacy rather than power. Each teammate stated they did not have the power to drive through bureaucratic barriers but had to maneuver around them through creativity and persistence.

The cachet value of Program C did increase with successful testing of the munition. Teammate B described the initial uptick in cachet as a result of excellent program execution. "The way in which we were able to attract a diverse group of contractors, and did so without

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paying any of them through the inert demonstration, was seen as impressive." After the first testing period, the program hit a lull and its Cachet dropped until another increase in Cachet was caused by the successful live-fire demonstration. However, when the funding was cut for a follow-on, full production program, the Cachet of the program plummeted. In fact, Teammate C said the program "pretty much dissolved after the follow-on funding was cut". This can be seen in Figure 16 when the cachet value dropped from 5 to 1. While Program C was still providing valuable data on a munition that was expected to be fully developed and fielded in the near future, the loss of funding, and subsequent loss of power, destroyed the Cachet of the program and made it very difficult to negotiate for resources.

Figure 16: Program C Cachet over Time

Operational Need

Each of the three teammates expressed a strong sense of generalized Operational Need but felt Program C did not have the urgency required to overcome bureaucratic barriers. While

each Teammate agreed with the characterization of Operational Need as a combination of urgency and legitimacy, they did not feel Program C had enough Operational Need to allow the elimination of slow processes and the team did not feel they had the freedom to jump layers in their chain of program responsibility. In particular, Teammates A and B felt they had no ability to overcome scripted timelines for safety and test reviews. In order to speed the program, the program office drafted many of the documents and approvals for safety and test reviews, cutting the timelines. Teammate B stated, "We were able to accelerate them because we accelerated our efforts to be able to accommodate their needs. We did this by adjusting our tempo, how we were operating, and got them what they needed." However, the Program was unsuccessful in using Operational Need to accelerate other organizations.
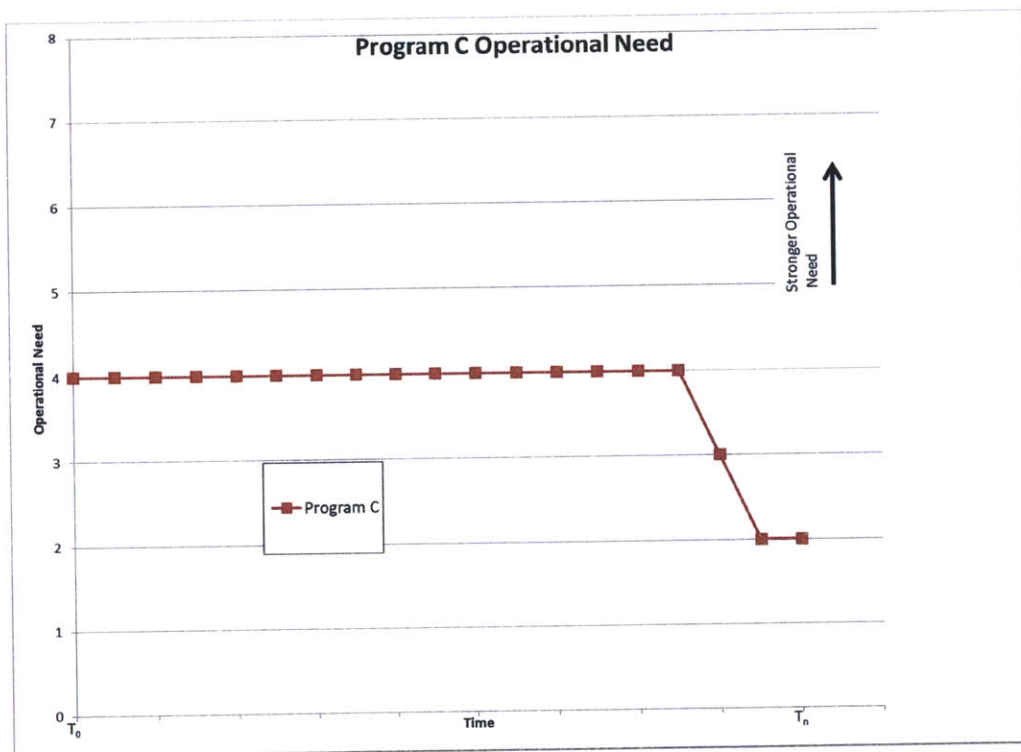

Figure 17: Program C Operational Need over Time

Stakeholder Active Management

The ability of each Teammate on Program C to influence their stakeholder environment was limited by the stakeholder attributes above. While each teammate tried to actively manage the gives and takes from the Program to the stakeholder environment, the program did not have strong enough attributes to influence the environment for full program success. In this program the attention paid to the local stakeholders fell into only one category, Dependence.

The nature of this demonstration allowed the program to ignore the logistics and training aspects of this program. The success of the demonstration did not depend on a successful logistics evaluation or an effective ability to train service members to use the system. This eliminated the ability of the logistics and training communities to interfere with the program. However, each teammate noted this shortfall and freely volunteered that the logistics and training communities were the first stakeholder they would want to add back to the program if the goal was deployment and use.

Program C was not able to ignore stakeholders with only the power to say "No". The program was given no ability to skip bureaucratic levels or avoid any contracting processes imposed by local contracting personnel. Teammate A relayed the frustration of having senior leadership ask questions directly to the team but the answers had to filter back up through each layer of bureaucracy.

> "Even though our [senior leaders] wanted to have updates, we were not allowed to reply to them. We had to go through our branch, then our division, then sit down with our division and made sure they understood what we were doing. Then, once it was cleared through division, we could go up to speak to the senior leaders but we weren't allowed to go without our [division] leadership in the office with us."

This lack of direct, two-way access to decision makers bled away the legitimacy of the program and this was perceived by the environment as a lack of Cachet and a lack of Operational Need.

The program did not have the priority of other acquisition programs and this is shown in the stakeholder characteristics. This caused the team to work very hard on all aspects of the program to meet the rapid acquisition timelines. In the words of Teammate A, "In order to accelerate other stakeholders, we worked outside our swim lanes." The program team was not able to use the Cachet or Operational Need to overcome bureaucratic barriers or shorten timelines. The team, however, was able to maneuver around these barriers and fully demonstrate the systems.

Case Study Conclusions

Program C was a case of a rapid acquisition program where the Defense Acquisition System did not help the program team reach success. While the program was conducted by a dedicated team of smart, dynamic people, the stakeholder attributes were such that full success was very difficult in the time frame available. This program had good positive advocacy from the very beginning and that advocacy did not waver but that advocacy was not strong or communicated well throughout the local stakeholder environment. The teammates were able to operate at the OODA loop cycle required for rapid acquisition but were unable to accelerate many of the stakeholders in their environment. The program lacked the Cachet and the Operational Need to knock down or ignore barriers to rapid success. The program team tried to actively manage their stakeholder environments but did not have the appropriate stakeholder characteristics to skip or ignored stakeholders who only had the power to say "No". The program was able to demonstrate the systems but the program did not lead to a use in combat.

Chapter 7: Discussion and Conclusions

Cross Program Results and Discussion

The three programs examined for this research present a clear snapshot of the importance of the stakeholder characteristics when conducting a rapid acquisition program. The programs varied by total dollar value, intended User Command, and the experience of the acquisition personnel assigned to conduct the programs. This is summarized in Table 13: Program ACAT Level and Combat Use and Table 14: Overview of Teammate Personnel System and Acquisition Experience.

Program	ACAT Level	Successfully Used in Combat
Program A	ACAT II	Yes
Program B	ACAT III	Yes
Program C	ACAT III	No

Table 13: Program ACAT Level and Combat Use

Below I discuss each stakeholder characteristic in particular, but in general, a successful rapid acquisition program requires a high level of Advocacy, Cachet, and Operational Need and must be staffed by a small team of experienced personnel able to operate at a high Optempo and make important decisions quickly.

Program Teammates	Role	Military/Civilian	Acquisition Experience
Program A Teammate A	Technical/Aircraft Modification Lead	Military Company Grade Officer	< 10 Years
Program A Teammate B	Deputy Program Manager	Civilian Program Manager	>15 Years
Program A	Program Manager	Military Field Grade Officer	>15 Years

Teammate C			
Program B Teammate A	Technical Lead/Engineer	Civilian Engineer	< 10 Years
Program B Teammate B	Program Manager	Civilian Program Manager	>15 Years
Program B Teammate C	Program Manager's 1st Line Supervisor	Civilian Program Manager	>15 Years
Program C Teammate A	Technical Lead/Deputy Program Manager	Military Company Grade Officer	< 10 Years
Program C Teammate B	Program Manager	Military Company Grade Officer	<10 Years
Program C Teammate C	Program Manager's 1st Line Supervisor	Civilian Program (S&T) Manager	>15 Years

Table 14: Overview of Teammate Personnel System and Acquisition Experience

Advocacy

The Advocacy level of a rapid acquisition program is critical to its success. Advocacy is initially built at levels above the program and can be thought of as the process of transforming requirements into programs. Advocacy is the result of coalitions built and tradeoffs made before the funding is received or the first contract is let. The advocacy of a program can be thought of as the organizational commitment to the envisioned end result. The User Command for Program A was extremely committed to the battlefield capability provided by systems similar to Program A and saw a critical need being fulfilled by the aircraft from Program A. In Figure 18: Program Advocacy Over Time this commitment can be seen. The Teammates from Program A also stated how strongly the Advocacy from echelons above the program permeated everything the program did from manufacturing to modifications to flight testing.

An interesting effect noted during this research was the tendency for Advocacy to increase with success and decrease with failure. Program C started the program with a lower level of Advocacy because it started as a Congressional Add and was a controversial system. However, after the initial testing showed positive results for the system behavior, the Advocacy for the system and the program rose. This Advocacy stayed strong for a significant length of time until the funding was cut at echelons well above the program. On the other hand, when

Program B ran into the issue of immature technology and the program slipped in order to mature the critical technology, the Advocacy at the User Command slipped. The Program B Advocacy never reached a negative value and the program was able to recover much of the Advocacy with successful testing and praise from operational use. This dynamic nature of Advocacy can be seen in Figure 18: Program Advocacy Over Time.
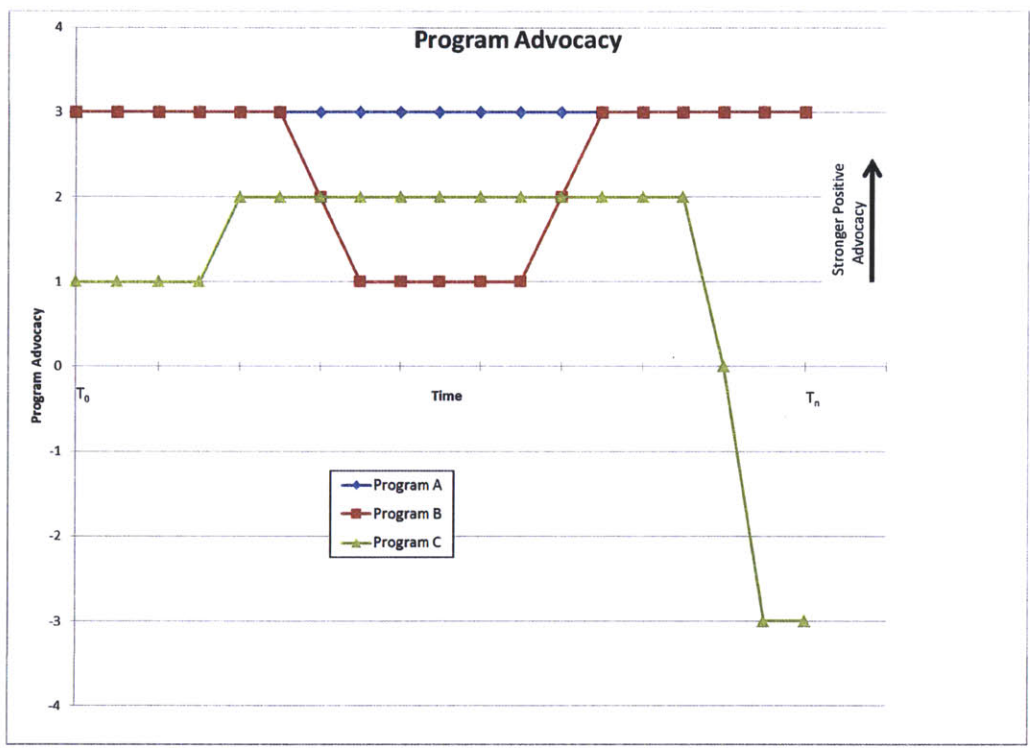
Figure 18: Program Advocacy Over Time

Optempo

The research into these three programs highlights the fact that a rapid acquisition program is a full-contact, extreme activity that drains the mental, physical, and emotional energies of the personnel conducting it. Teammate C on Program C said, "Now, the General Officers want to do this all the time. If you start doing this as a standard procedure, you just burn everyone out. We need to take this on a case-by-case basis or you just ruin it. You come to the

point where everything is an emergency, so nothing's an emergency." The selection process for personnel for these programs must bear this in mind. The Optempos of these three programs required the acquisition personnel to make program-level, high-dollar decisions on a daily, sometimes hourly basis. On Program B, Teammate C consistently referred to the need to pick "A+ players" who can operate independently. Program A lived by this philosophy. Teammate A said, "We were left alone to make things happen. Captains can get stuff done if you empower them and they aren't going to learn if you don't let them make mistakes and learn from them." Often, the personnel who operate best under a rapid acquisition system are not the personnel who do well under a more deliberate acquisition system. The Defense Science Board clearly defined the incentives for DOD acquisition managers. "Today, the DOD is saddled with processes and oversight built up over decades, with managers leading them who are often trained to be risk averse (Defense Science Board 2009)." Rapid Acquisition is a process of taking and managing calculated program risks rather than avoiding them. Acquisition personnel who understand this will tend to chaff and feel stifled under a risk-averse culture. Leadership must be on the lookout for these acquisition personnel who may be stifled under a normal program as they may be the best to assign to a rapid program.

However, on Program C, we saw the consequences of not giving the program team the freedom to innovate and not have to go back to ask permission to execute the program quickly. The need to clear responses through the multiple levels of overhead prior to answering the questions of senior leadership drained vital energy out of Program C and significantly slowed its OODA Loop.

The successful programs appear to have a more rapid Optempo for Teammates A and B, nearer the bottom of the whirlpool, while Teammate C has a slower Optempo near the top. In a conventional acquisition, the number of decisions available to junior personnel during a normal assignment is very limited. However, in rapid acquisition, the more times a teammate executes the decision cycle, the more they learn, and the better they become. This is the culmination of the application of Boyd's OODA loop theory to rapid acquisition. The ability to rapidly make decisions and observe the effects allows a greater amount of learning by the organization. This greater amount of learning, absorbed at an accelerated pace, pushes the system through the acquisition pipeline faster. Without an accelerated OODA loop, rapid acquisition can not

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succeed. In addition, the teammates closer to the execution point must make decisions rapidly in order to protect the leadership's time and attention so it remains focused on the bigger issues. Therefore, I argue that if a program does not have a decision cycle whirlpool, shaped in a V, the program will have more difficulty than one where the decision making authority is pushed to the lowest possible level. In addition, it also appears that the frequency of stakeholder scanning must also be more frequent nearer the execution point and slower as one climbs the organizational ladder.

Program Teammates	Reported Optempo	Stakeholder Scan Frequency
Program A Teammate A	Hourly to Daily	Hourly
Program A Teammate B	Daily to Biweekly	Semi-Annually
Program A Teammate C	Daily to Weekly	Weekly
Program B Teammate A	Hourly to Daily	Did not Scan
Program B Teammate B	Daily to Biweekly	Weekly
Program B Teammate C	Weekly	Weekly
Program C Teammate A	Daily	Single Instance
Program C Teammate B	Daily	Single Instance
Program C Teammate C	Daily	Daily

Table 15: Program Optempo and Scan Frequency

Cachet

Cachet, the combination of power and legitimacy, was found to be a significant enabler to performing rapid acquisition program tasks without undue interference. Since there is not time to waste in a rapid acquisition, a high level of Cachet greatly increases the chances of success by allowing the team to focus only on the stakeholders who have a large impact on the program. On Program A, Teammate A, a Captain (O-3), was able to deal directly with Colonels (O-6) at his location to achieve program goals because his program had Cachet. Also, Cachet, delivered into

the local stakeholder environment, seemed to build a shield to ignore stakeholders with little effect on the program. Every Program studied ignored functional bureaucracies to achieve their goals. The engineering and program management home offices in the matrix organizations, for example, were kept out of the programs from inception to completion on each of the three programs. Cachet is a strong enabler of program performance in rapid acquisition.

One way a leader can help generate Cachet for a rapid acquisition program is to provide both physical and organizational separation. It appears that the effort that it takes to physically separate offices and personnel from the normal operations lends legitimacy to the effort and greatly increases Cachet. The time and effort to move personnel, physically and organizationally, signals to the local stakeholder environment that the program is both important to the overall organization and powerful. Otherwise, the program would not justify the investment. Therefore, the act of separation signals Cachet throughout the stakeholder environment. Additionally, by flattening the organizational structure and allowing the rapid acquisition team to take direction from, and only report directly to, the senior leaders, the Cachet of a program in strongly increased, mainly through the power component. For example, on Program A, Teammate C, the primary government Program Manager, was removed from his normal duties, physically and organizationally separated, and was told he only answered to two other people in his chain of command, both senior government officers. In addition, Program A's Cachet was increased when those two senior government officers published directives to the rest of the organization outlining the expectation of 100% support for the efforts of Program A. Contrast this with Program C, where the government focal point was not authorized to directly answer senior leadership emails without first vetting the response through the next two superior organizational layers. The practice of having senior leaders approve most or all program decisions drains both the legitimacy and the power away from the rapid acquisition team. The message sent throughout the local stakeholder environment was simple: "You can ignore me because I am not the decision maker."

Cachet also builds with success, primarily through an increase in the legitimacy of the program and its approach to solving the battlefield need. In Program B, after the initial technological difficulties, the program was able to score some strong successes, both from testing and from early operational use on the battlefield. The Cachet of the program rose

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strongly and the demand for Program B's munition rose with it. Similarly, on Program C, after strong doubts were expressed over the readiness of the industrial base to be able to quickly produce a lightweight, loitering munition. However, after the initial testing and the systems were demonstrated successfully, the Cachet rose by validating the legitimacy of the approach.

One way Cachet can decrease, but in an acceptable manner, is also through success. Program A was considered a very successful program by all stakeholders and the product was quickly adopted by the User Command. The program lost some of the Cachet of a rapid acquisition program as the aircraft system was absorbed into the normal, day-to-day operations and logistics support. In effect, it lost Cachet because it became a standard part of the operating environment. Teammate C of Program B discussed how bittersweet this was by stating that the program no longer had the Cachet to ignore the normal daily taskings from headquarters staff elements and the paperwork began to increase back to the normal level of an ordinary acquisition program. "When we transitioned back, no longer a direct report but back into the normal chain, we lost a lot of Cachet, and the full burden of bureaucracy was put on top of us, the layers. We were able to keep it at bay for a while but it got to the point where we couldn't deflect it all anymore, after we had fielded and were transitioning into the sustainment side."

A more drastic drop in Cachet happened to Program C. When the funding for the follow-on program was cut from the DoD budget request, the power of the program plummeted. While discussing the effect of the removal of the funding for the follow-on effort, Teammate C of Program C stated: "Everything dissolved. The program became a cleanup procedure as we finished out our contractual requirements." The program was broken on the power level, even if the requirement was still legitimate. Each of these effects on Cachet can be seen in Figure 19: Program Cachet Over Time.
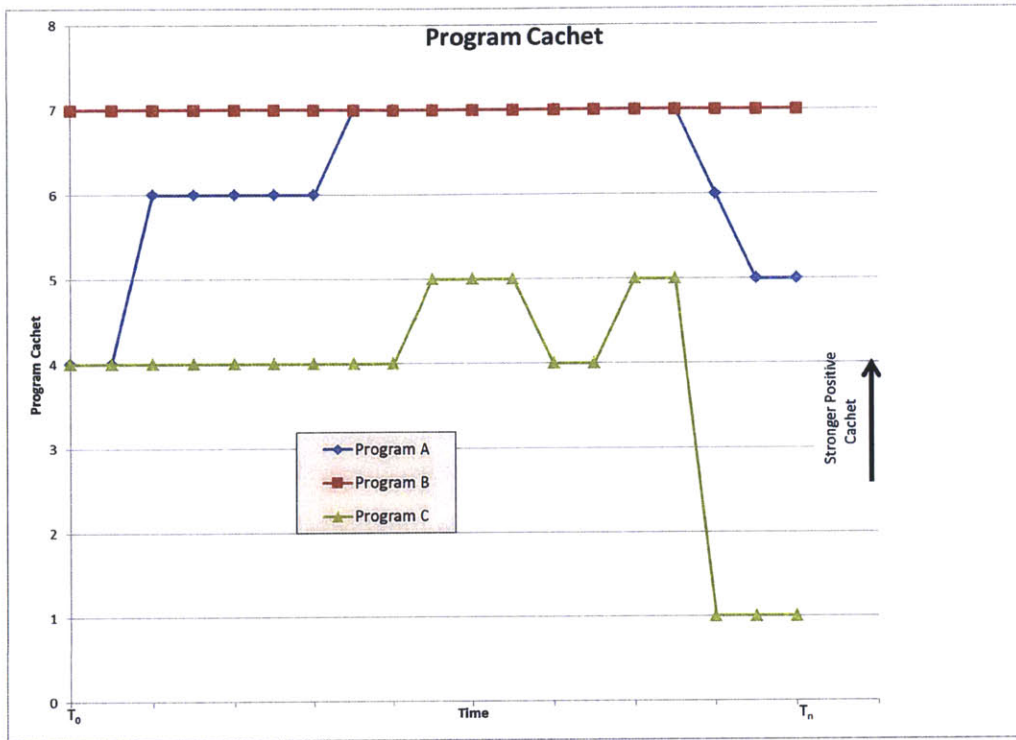
Figure 19: Program Cachet Over Time

Operational Need

Each of the nine teammates expressed a strong sense of Operational Need and agreed with the characterization of Operational Need as a combination of urgency and legitimacy. The urgency and legitimacy for these rapid acquisition programs primarily originated with Operation ENDURING FREEDOM and Operation IRAQI FREEDOM and the needs of the front-line warfighters for new capabilities. Operational Need, however, is a must-have stakeholder attribute in order to overcome bureaucratic barriers. Teammate B on Program B highlighted this perfectly when she said her rapid acquisition team's sense of Operational Need was so strong they wanted to "take clubs over to the guy who didn't get it and beat them over the head with it" to remove any roadblocks to program success. This is exactly the role of Operational Need plays in a rapid program. It is the crowbar that allows the program to pry resources out of a bureaucracy by moving the needs of the rapid acquisition program to the top of the pile of work

and also making it organizationally painful to say 'No' to a rapid acquisition program. Without the strong, communicated sense of Operational Need, programs are slowed and will miss deadlines. This was seen in Program C where the communicated Operational Need was not there and frequent delays in contracting and safety required the program team to spend valuable leadership time figuring out how to work around these organizations instead of receiving the help the program needed.
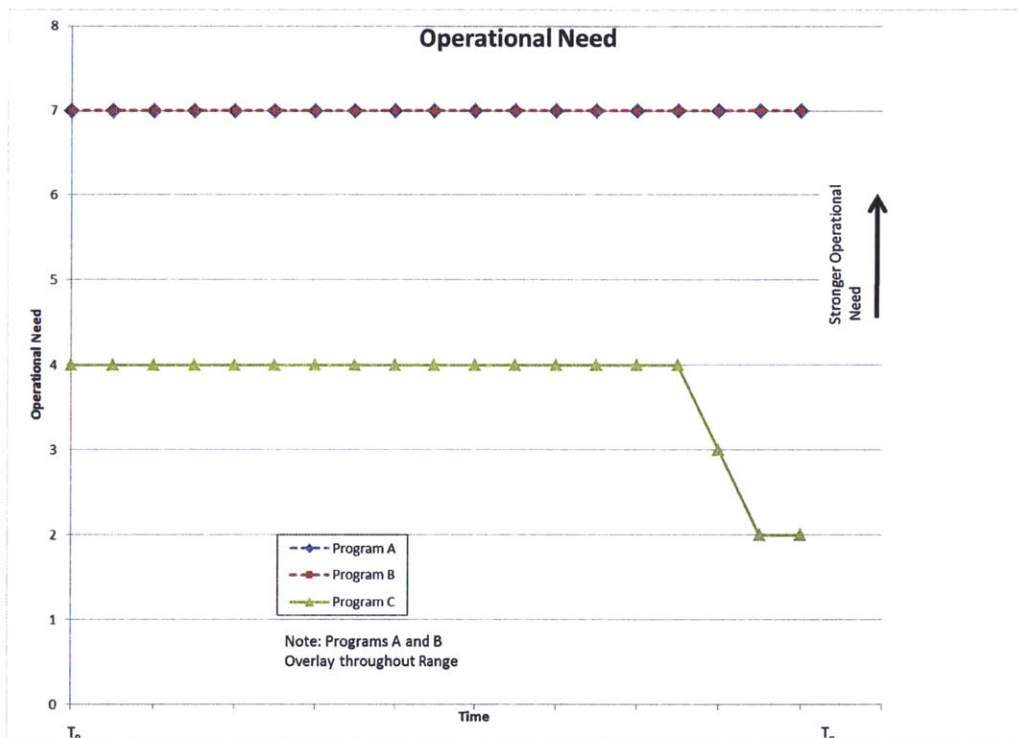
Figure 20: Operational Need Comparison Across Programs

Operational Need's other role is as the driver of architectural innovation. Operational Need provides the impetus to innovate but also limits the time available to do so. A rapid acquisition program does not have enough time to innovate at the component level and does not have the budget to pursue a radical, Manhattan Project-style innovation. Therefore, this blending of constraints points to the novel combination of existing components, architectural innovation, as the only solution available. This realization has human capital implications as well. In order

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to properly staff a rapid acquisition program, an organization must not only build strong component-level expertise but also must build expertise in novel and rapid combinations of components. However, rapid architectural innovation is counter to the standard culture of DoD acquisition programs and personnel policies (Defense Science Board 2009). Henderson and Clark noted the requirement for a different mindset for architectural innovation:

> "Learning about changes in architecture—about new interactions across components (and often across functional boundaries)—may therefore require explicit management and attention. But it may also be that learning about new architectures requires a different kind of organization and people with different skills (Henderson & Clark 1990)."

Keeping individuals trained for architectural innovation in all the areas required by the US Military would require a far-sighted investment in human capital since the accurate prediction of needs during warfare has a terrible track record.

Stakeholder Active Management

Each program examined tried to actively control their local stakeholder environment to achieve program success by using the stakeholder attributes to manage the gives and takes from the program to the stakeholder environment. The programs were not equally successful at controlling this environment but when a program was able to control the environment, it was successful. The attention paid to the local stakeholders fell into three categories: Performance, Dependence, and Decision Authority.

A rapid acquisition team must determine which stakeholders were performing for the program and cull the ones who weren't. Program A was able to switch some contracting activities away from stakeholders who were not performing and move it to stakeholders who were performing. The ability to cull an underperforming stakeholder takes a high degree of Cachet, Advocacy, and Operational Need. Not every program has this luxury. Program B and C were not able to cull marginal performers and had to figure out a way to accelerate them.

However, once a stakeholder has demonstrated the ability to perform at the required level and pace, the rapid acquisition team should cultivate that relationship.

The second category of stakeholders to be actively managed is the stakeholders the program is dependent on and can not avoid. Program B was dependent on the munitions and test safety communities as well as the Science and Technology community. However, since Program B did not depend on the local functional communities or intermediate layers of management to succeed, those stakeholders were ignored. Similarly, in Program C, the logistics and training communities had very little say due to the demonstration nature of the program and the personnel on Program C were able to ignore those communities. However, since Program C was given no special authorities to leap intermediate management or streamline the safety process, those stakeholders were able to extract time and energy from the Program C rapid acquisition team. Program A was very dependent on the test community to use the test ranges and test assets and Teammate A worked very closely with the test stakeholder to achieve program success.

Another characteristic of active stakeholder management was the identification of which stakeholders could only say "No". Program A ignored stakeholders who could not say "Yes" but could say "No". The Program interpreted this as the authority to ignore any outside organization who wanted the program to slow down or stop for any non-safety reason. This authority allowed the rapid acquisition team to ignore reporting requirements to Staff elements, overcome test community documentation requirements, and streamline local contracting office processes. Programs B was also able to accelerate and streamline reporting through informal processes and the elimination of repeated editing cycles on documents. Teammates on Program C did not have the Cachet or Operational Need to deal only with decision makers and the program suffered for it. The Teammates on both Programs A and B strongly stated that this ability did not allow them to ignore strong program management practices but allowed them to leap the multiple layers of bureaucracy before reaching the decision authority.

Active stakeholder management was a process of identifying the performance, dependence, and decision authority of each stakeholder and managing them in accordance with the stakeholder characteristics of the program. A successfully program runs through the OODA loop decision cycle as quickly as required, matching these characteristics against the stakeholders and making decisions. A successful program is able to ignore a stakeholder when

performance is underwhelming, once dependence is solved, and once a definitive Yes or NO answer is given.

Program	Ignored Poor Performance?	Solved Dependency?	Ignored Non-Decision-Makers?	Combat Use
Program A	Yes	Yes	Yes	Yes
Program B	No	Yes	Yes	Yes
Program C	No	Yes	No	No

Table 16: Active Stakeholders Management by Program

Conclusions

In Rapid Acquisition, without a high-performing team, the program is doomed to failure because the pace of execution is so fast. This high-performing team should be kept small and clearly empowered to make decisions to help the program succeed. However, a well-tuned acquisition team with empowered decision-making authority is not enough to guarantee success. When combined with high levels of Advocacy, Cachet, Optempo, and Operational Need, this high performing rapid acquisition team will succeed.

Program A was a successful rapid acquisition program because it had a dedicated team of smart, dynamic people and the program did possess the right Stakeholder Attributes. This program had strong, unwavering positive advocacy. It was staffed by acquisition professionals with the ability to operate at a hourly OODA loop cycle. The Program was given the Cachet to positively influence the local stakeholder environments towards program success. The Operational Need were communicated far and wide and it was used to knock down or ignore barriers to acquisition success.

Program B was a successful rapid acquisition program because it possessed the right Stakeholder Attributes and was conducted by a dedicated team of smart, dynamic people. This program had strong advocacy from the very beginning and, while the User Advocacy dipped when the program ran into technical difficulties, the advocacy from the Program Management and Senior Leadership communities did not waver. This program was carefully staffed by experienced acquisition professionals with the demonstrated ability to operate at a hourly OODA loop cycle. The fact that the team was carefully selected made known throughout the local

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environment. They had different offices, collocated as a team, and were given frequent and direct access to their senior decision makers. The Program was given the Cachet to positively influence the local stakeholder environments towards program success. Successful tests of the munition overcame any loss of Cachet during the technical difficulties. The Operational Need was personally felt by the team and was used to overcome or ignore barriers to successful fielding.

Program C was a case of a rapid acquisition program where the Defense Acquisition System did not help the program team reach success. While the program was conducted by a dedicated team of smart, dynamic people, the stakeholder attributes were such that full success was very difficult in the time frame available. The overall program attributes are synthesized in Table 17.

Program	High Performing Team	Empowered Decision Making	Advocacy	Cachet	Optempo	Operational Need	Combat Use
Program A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Program B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Program C	Yes	No	No	No	Yes	No	No

Table 17: Overall Program Attribute Characteristics

Rapid Acquisition Fits the System to the Problem

In the recent release of the Better Buying Power 2.0 initiative, Mr Frank Kendall, the Undersecretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) highlighted a key area to improve the Defense Acquisition System, the reduction of cycle times while ensuring sound investment decisions:

"This initiative will assess the root causes for long product cycle times, particularly long development cycles, with the goal of significantly reducing the amount of time, and therefore cost, it takes to bring a product from concept to fielding. A full range of factors – oversight activities, funding stability, contracting lead time, requirements processes, technical complexity, use of risk reduction activities, and testing requirements – will be considered as possible contributing factors (Kendall 2012)."

This research has shown a pathway to achieving some of the results desired from this initiative. Rapid Acquisition has already demonstrated useful innovation, in a cost-effective manner, with an effective schedule. The programs have done this by staying in the problem space and rejecting stakeholders who refuse to join the program there.

The DOD 5000 series of acquisition regulations tries to fit the problem of acquiring effective military equipment into a generic system of acquisition processes and milestones. While the system was designed to be tailorable and flexible to meet the needs of the program, often the regulations are used a club to prevent teams from shortening cycle times and achieving results. While rapid acquisition is not appropriate for all situations, it has shown a pathway to shorten cycle times and still deliver effective combat capability.

Lack of Legitimacy a Cause of Failure in Defense Acquisition System

I believe an unacknowledged cause of failure in the Defense Acquisition System is the lack of legitimacy we give to our Acquisition Program Teams. In Steven Meier's 2010 study of cost overruns and schedule delays on large-scale Defense Acquisition programs a causal finding for delay was that a program team had to deal with too many stakeholders involved in program monitoring. He notes, "this type of situation establishes a counterproductive environment 'where many people can say no but nobody can say yes'". Meier also noted that many stakeholders had two major effects on programs: requirement changes and non-mission work. This study has shown a number of examples of rapid acquisition programs that limited these items and were able to succeed. Rapid acquisition shows us not just how to do programs faster but how to do them better.

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The constant need for a program team to ask permission for each phase of the program, while a well-intentioned step to avoid out of control programs, has itself gotten out of control. A glance at the Integrated Defense AT&L Life Cycle Management System Chart (Figure 21) shows the complex nature of the system. Understanding that each of the blocks on that chart is months of pre-briefings and endless revisions to briefing charts, the task becomes daunting. In order to give out acquisition teams the legitimacy to successfully run programs, we must empower them to make the decisions in a timely manner and remove many of the needless rechecking of chart packs. A good start is to remove all reviews and program checks that cannot give a definitive yes/no decision. If a review or office can only say no or stop progress, it must be removed from the Defense Acquisition System. This is not a call to eliminate value-added technical or program management reviews. This is a call to eliminate the bureaucratic practice of having to vet every chart and every briefing through multiple layers of intermediate management whose only role is to change the word "happy" to "glad". This practice destroys the legitimacy and motivation of a highly-educated program team trying to bring a product into the inventory on-time and on-budget. The Better Buying Power 2.0 initiative of "Re-emphasizing the Acquisition Executive, Program Executive Officer, and Program Manager responsibility and accountability" is a great start but without flowing down the appropriate legitimacy as well, this initiative well be difficult to achieve.
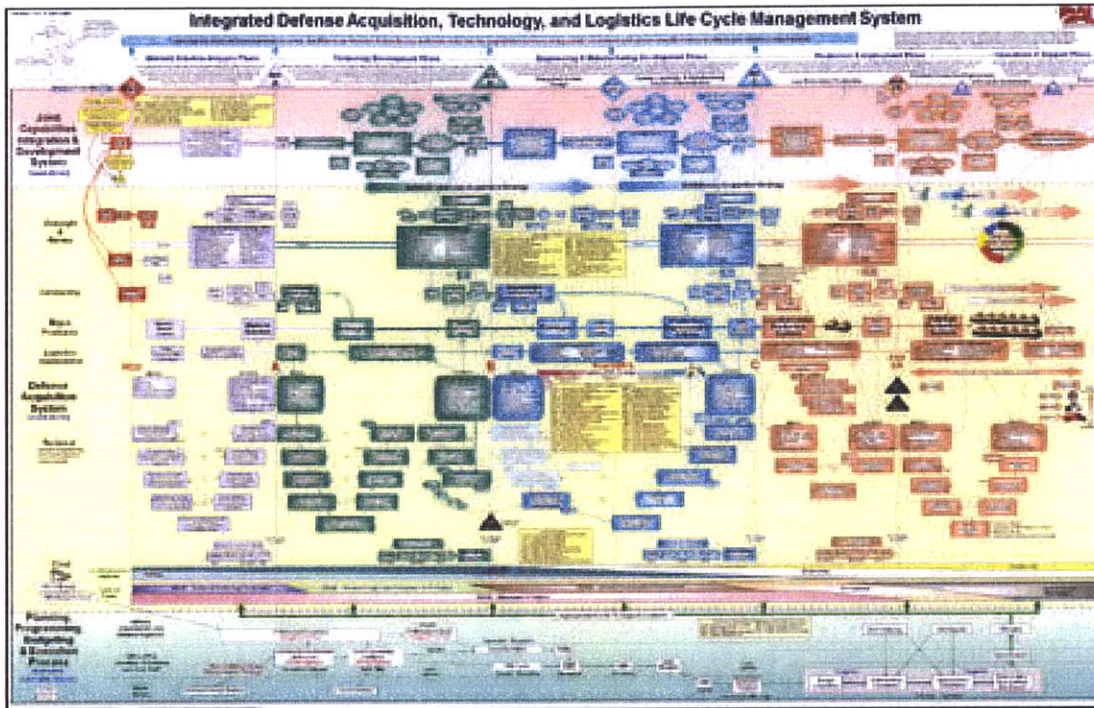
Figure 21: Integrated Defense AT&L Life Cycle Management System Chart
(available at https://ilc.dau.mil/)

Recommendations for Future Rapid Acquisition Programs

This research points to a number of recommendations for assembling a future rapid acquisition team and conducting future rapid acquisition programs. A careful thought process during the construction of a rapid acquisition program can yield great results. These recommendations fall into three categories: Personnel, Leadership, and Organization.

The team should be kept small with a minimum of personnel in each specialty. Each specialty can have backup on an as-needed basis but each position should not be two or three deep (Mounce 2006). Kelly Johnson at Lockheed Skunkworks is a perfect example of how small, energized groups can do wonders. The Skunkworks philosophy was to keep the program offices small but very strong and this philosophy created successes like the SR-71 Blackbird and the F-117 Stealth Fighter (C. L. "Kelly" Johnson & Smith 1985; Rich & Janos 1994). When choosing these teammates, choose people who can make rapid decisions and who aren't afraid to be mistaken. Sometimes, it takes a shoot-look-shoot attitude to get the right solution. Kelly

Johnson was known to say, "you'll never make the grade unless you are decisive: even a timely wrong decision is better than no decision (Rich & Janos 1994)." Beware, however, as the best personnel for these jobs may be mavericks and iconoclasts. The best people for normal acquisition may not be the best for rapid acquisition and vice versa. As a leader assembling a rapid acquisition team, you must search for the individual who chaffs at the bureaucratic delays and organizational restraints but knows the job cold. To prepare for this, make component-level expertise a priority at all times because it enables architectural innovation when the time is limited.

Once the program is over, an effort must be made to ease the team back into the normal acquisition mode. A jarring reintegration back to the slower processes and longer decision-making cycles may cause the members of the team difficulties and dissatisfaction. These are the wrong people any manager would want to walk out the door but a bad transition back to the slower pace may just cause them to leave the organization.

Leaders, in order to increase the rapid acquisition programs Cachet, should publicly announce, to maximum extent possible by classification and Operational Security, that the team has full leadership access and support. This communication should be frequent and continuous because there is always someone in an organization who hasn't got the message. The leaders should also ensure everyone involved has a full understanding of the urgency and legitimacy of the program. A frequent and informal heading check, either in-person or by email, is a valuable tool to generate and feedback understanding. A powerful leader, acting as a gatekeeper who does not have other responsibilities on the rapid acquisition team, must be assigned to fend off or deal with slower stakeholders and organizations who have no role but want to interfere. This can be a difficult role, from personal experience, as the best person for this job is normally one of the best available personnel but the assignment to the gatekeeper role will pay large dividends in the future. The leader must also communicate that the default response from any support agency must be "yes" rather than "no". This can be organizationally tricky because often these support agencies do not have same chains of command. However, the gatekeeper should be given the political responsibility to win this support. This may mean the gatekeeper must move faster than the rapid acquisition team and anticipate delays and barriers and act to remove them before the assistance is required.

Another important builder of Cachet and Operational Need is to physically and organizationally separate the team for the duration of the project. This sends the message to the wider environment that the program is important enough to require special organizational handling. Both Program A and Program B used this organizational change technique and it was a large factor in the perception of Cachet and Operational Need by the wider support environment. Additionally, the wider organization must expect small failures during the development process, have a plan to deal with them, and move on. Budgeting and scheduling for 100% success is not possible in a rapid acquisition and there must be management reserves of both time and funding at the rapid acquisition team level. Requiring the rapid acquisition team to justify and beg for additional funding and schedule will only cause them to lose legitimacy and slow the program down. However, the rapid acquisition team must be under no illusion that program failure is acceptable. A final important Cachet and Operational Need builder is to remove layers of management between decision makers and rapid acquisition team. A layer of management than cannot say "yes" but can say "no" adds no value to the program execution and actively destroys available time. Therefore, the leaders above the program should ruthlessly cull layers of management between the decision makers and the rapid acquisition team. Additionally, within the bounds of classification and Operational Security, this removal of layers should be widely known to the environment. This will increase the Cachet of the team and increase the odds of success.

The final point to leaders building a rapid acquisition team is one of caution. If you are unwilling to pick your best people, assign them to a small team, and empower them with decision-making authority, you shouldn't try to conduct a rapid acquisition. If those people aren't willing to devote the mental, physical, and emotional energies to conduct a full-contact, extreme activity, you shouldn't try to conduct a rapid acquisition. If you are unwilling to put in the effort to ensure the four attributes of Advocacy, Cachet, Optempo, and Operational Need are present, protected, and growing in the right direction, you shouldn't try to conduct a rapid acquisition. Teams and leaders unwilling to do this during a rapid acquisition program are setting the team and themselves up for failure.

Areas for Further Research

The DoD Acquisition system must not be characterized as a buying system or the Department's business arm or as a supply function. DOD 5000.01 says, "The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price." However, the DoD acquisition system delivers a strategic capability to the United States in its own right. The ability to rapidly develop, mature, and deploy superior technology on the battlefield is, in and of itself, a combat capability. Sun Tzu, the ancient Chinese philosopher of war, stated, "the consummation of forming an army is to arrive at formlessness. When you have no form, undercover espionage cannot find out anything, intelligence cannot form a strategy (Tzu 1988)." The DoD Acquisition system contributes the technological aspects of formlessness for the United States. It creates uncertainty in our enemies and puts their plans in doubt. A rapid acquisition capability is a key part of this capability.

Currently, though, the acquisition system is caught in a vicious cycle, where the time it takes to develop and produce a new platform is growing longer. Because this time is growing, the requirements community demands more capability in the future platform to deal with future threat uncertainty. This increase in requirements increases the time to develop and produce the platform and the cycle begins again. One possible way to break this vicious cycle requiring further study is the use of rapid acquisition programs during both peacetime as well as wartime.

The DoD Acquisition system does a good job putting structure to an unstructured problem but is very behavior-based rather than outcome-based. This makes perfect sense when considering the multitude of principals, whether Legislators, DoD officials, or Military Officers, jostling for program personnel's attention. However, a rapid acquisition is a structured problem and we are looking for a solution. Operational Need and combat experience show us the nature of the problem, whether it is the need to defeat an improvised explosive device on a dirt road in Iraq, increase the range of fighter coverage during escort missions over Germany, or jam a SA-2 surface-to-air missile site near Hanoi. Therefore, rapid acquisition is, and must remain, a very outcome-based process.

This begs the question, "How do we have both rapid and normal acquisition approaches exist in the same acquisition force at the same time?" The Defense Science Board recommends setting up a separate agency, the Rapid Acquisition and Fielding Agency, to separate the function from the Services and focus on the problem of Rapid Acquisition (Defense Science Board 2009). However, what do those personnel do when there is no current conflict? Looking through history from World War I to OIF and OEF, we see that conflicts must have an appreciable length before the rapid acquisition paradigm, architectural innovation from known components, takes hold. The hard task is figuring out how to build the personnel for rapid acquisition when normal acquisition is dominant. Is it through an idea of using specialized personnel as a technology delayed differentiation strategy, where we teach, mentor, and guide personnel through a particular career path as the insurance against the need for a rapid acquisition program in the future? Or do we build deep component-level knowledge on technologies and hope the acquisition personnel perform when the architectural innovation is required? Or do we set aside a number of programs, where architectural innovation is required and components are, or nearly are, technologically mature, and execute them as rapid acquisition programs? These are questions that deserve further study.

Technical Debt as the Cost of Rapid Acquisition

Rapid acquisition is a very attractive construct and the question is often asked, "What don't we always go fast?" However, there is little quantification of the cost of this program acceleration. I believe the concept of Technical Debt, taken from the software engineering community, has a wider application to rapid product development and should be studied in hardware and defense systems. Brown et al has a very good overview of the technical debt concept and it would be a valuable addition to the acquisition or rapid product development literature (N. Brown et al. 2010). Klinger et al also has an enterprise treatment of technical debt that could apply to a portfolio management approach to rapid acquisition (Klinger et al. 2011).

Extend Research to a Wider Stakeholder Environment

This research did not include the contractor program management personnel and I think this would be an excellent extension of this work. The contractors bring a different view to how rapid acquisition is conducted and their insights would valuable. In addition, the rapid product development community shares some of the same challenges as a DoD rapid acquisition program and extending this research to commercial products would also have strong value.

Clumpy Fabric of Acquisition Speed

Another area for fruitful research is the matching of speed of the personnel to the speed of the acquisition program. In discussions and interviews in this research, the comfort level of acquisition personnel with rapid acquisition was by no means constant. I noted how some acquisition personnel seemed to love the idea of rapid acquisition and some personnel hated it. I believe that personnel who are comfortable going fast will gravitate to organizations where fast is normal and appropriate. Personnel who are not comfortable going fast will gravitate to organizations were slow and steady is normal and appropriate. This leads to a clumpy fabric of acquisition speed where certain organizations want to go faster and some organizations want to go slower based on the personnel in each organization. However, when we need these organizations to change we will get culture shock and organizational resistance.

Glossary

ACAT Levels

The acquisition process divides acquisition programs into four (4) Acquisition Categories (ACAT): ACAT I, ACAT II, ACAT III, or ACAT IA. The difference between each categories is dependent on the location of a program in the acquisition process, funding amount for Research, Development, Test and Evaluation, total procurement cost, Milestone Decision Authority special interest and decision authority. (USD (AT&L) 2008)

Company Grade Officer (CGO)

A United States Military Officer in the grades of O-1, O-2, or O-3. Typically, these officers will have under 10 years of experience and will focus on tactical aspects of an acquisition program.

Field Grade Officer (FGO)

A United States Military Officer in the grades of O-4 or O-5. Typically, these officers will have between 10 and 20 years of experience and will normally focus on operational aspects of an acquisition program. These grades will often be Program Managers or other first line leaders in the acquisition community.

Joint Urgent Operational Need

Urgent Operational Needs that are identified by a Combatant Command as inherently joint and impacting an ongoing contingency operation. (Joint Staff 2012)

Taskings

An order or request for a product, usually a briefing or short paper, on a deadline from a higher echelon that demands the expenditure of resources or time to complete. Usually, this order is considered outside of normal, day-to-day tasks.

Technology Readiness Level

A systematic metric/measurement system that supports assessments of the maturity of a particular technology and the consistent comparison of maturity between different types of technology (Mankins 1995).

Level	Description
TRL 1	Basic principles observed and reported
TRL 2	Technology concept and/or application formulated
TRL 3	Analytical and experimental critical function and/or characteristic proof-of- concept
TRL 4	Component and/or breadboard validation in laboratory environment
TRL 5	Component and/or breadboard validation in relevant environment
TRL 6	System/subsystem model or prototype demonstration in a relevant environment (ground or space)
TRL 7	System prototype demonstration in a space environment
TRL 8	Actual system completed and "flight qualified" through test and demonstration (ground or space)
TRL 9	Actual system "flight proven" through successful mission operations

Urgent Operational Need

Capability requirements identified by a DOD Component as impacting an ongoing or anticipated contingency operation. If left unfulfilled, UONs result in capability gaps potentially resulting in loss of life or critical mission failure. DoD Components, in their own terminology, may use a different name for a UON.(Joint Staff 2012)

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