

How Fast is Fast Enough?

SOF Acquisition of Emerging Technology

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Executive Summary

The United States Special Operations Command (USSOCOM) should capitalize on existing opportunities to accelerate acquisition of emerging technology. In particular, USSOCOM should maximize investment in emerging technology companies that aren't traditional defense contractors to fill time sensitive, low density tactical capability gaps. USSOCOM should use Other Transactional Agreements to reduce the barriers to entry for small technology companies. Focusing rapid acquisition efforts on emerging technology companies makes the most of a relatively small USSOCOM developmental budget and more rapidly integrates emerging technologies into special operations.

Introduction

In the not so distant past, the United States Department of Defense (DOD) and cutting edge technology were synonymous. During the Cold War, the United States invested heavily in developing state of the art weapons and defensive systems. The US pushed the envelope in areas such as aircraft, nuclear technology and ballistic missiles-- building and refining systems and capabilities that were unrivaled worldwide. Yet as time passed and the Cold War ended, a defense acquisition system tailored to procuring aircraft carriers and tanks proved incapable of keeping pace with rapid technological advancement taking place in the commercial sector. In parallel, US research and development investment peaked at about 2% of gross domestic product in the 1970s before steadily declining until 2018 (Manyika and McRaven 2019). The lethargy of the defense acquisition system along with diminishing investment slowly eroded the technological superiority enjoyed by United States military. The decline in military technological superiority translated into a decline in the competitive advantage that the US had enjoyed in military capability.

Integrating emerging technology into military capabilities is critical to reestablishing technological dominance and, in turn, a competitive advantage. Specific guidance from the Secretary of Defense as well as emphasis in the National Security and National Defense Strategies have stressed the importance of integrating emerging technologies into DOD as quickly as possible (Department of Defense 2018) (White House 2017). Arguably, the best equipped organization within DOD to integrate new capabilities quickly is USSOCOM. USSOCOM enjoys expedited DOD acquisition authorities that enable them to be one of, if not the, fastest capability acquirer within DOD.

The question is: When it comes to USSOCOM acquiring emerging technology: How fast is fast enough?

While USSOCOM is the fastest acquisition element within DOD, there are opportunities for USSOCOM to improve their acquisition responsiveness in addressing emerging tactical capability gaps with emerging technologies. When purchasing end items that are incremental upgrades to existing equipment, like new rifles or body armor, USSOCOM is certainly fast enough. However, when it comes to developing and acquiring emerging, potentially disruptive technologies USSOCOM is far slower than they could be. As the vanguard of DOD acquisition, USSOCOM should accelerate acquisition of emerging and potentially disruptive technologies.

Companies who are not traditional US Defense contractors face a number of challenges when working with the US DOD. The limited earning potential that the DOD represents along with complex acquisition processes associated with DOD contracting, are arguably the biggest hindrances to collaboration. To minimize the existing barriers to entry in working with the DOD, USSOCOM should expand investment in emerging technology companies through using Other Transactional Agreements. Other Transactional Agreements allow USSOCOM to acquire or develop capabilities without using the complex and time-consuming DOD contract process. By taking these actions, USSOCOM will focus investment funding on potential game changing capabilities and further streamline their acquisition process.

Background

Policy Guidance

The 2017 National Security Strategy was clear in its intent to push government agencies away from “an archaic R&D process” toward “an approach that rewards rapid fielding and risk taking.” (NSS, 2017) Likewise the National Defense Strategy (NDS) emphasized the need for DOD to “out-innovate revisionist powers, rogue regimes, terrorists and other threat actors.” To do this the NDS specifically called out expanding the competitive space by reforming the DOD’s business practices to enhance performance and affordability (Department of Defense 2018).

The key initiative in reforming DOD’s acquisition processes is the update of DOD Instruction 5000.02 – Operation of the Adaptive Acquisition Framework. In direct response to the guidance in the NDS and NSS, Under Secretary of Defense for Acquisition and Sustainment, the Honorable Ellen Lord, directed the recent rewrite of DOD Instruction 5000.02 – Operation of the Adaptive Acquisition Framework (Department of Defense 2020). Ms. Lord highlighted the fact that DOD acquisition policy is being deliberately reshaped to enable innovation (Department of Defense 2019).

Acquisition Structure and Authorities

DOD Instruction 5000.02 is undergoing an update that is partially complete. The first updated portion DOD Instruction 5000.02 was released in January of 2020. The DOD 5000.02 update focuses on implementing the Adaptive Acquisition Framework (AAF). The AAF outlines six different acquisition pathways: Urgent Capability Acquisition, Middle Tier Acquisition, Major Capability Acquisition, Software Acquisition, Defense Business systems, and Acquisition of Services (Department of Defense 2020).

The most expeditious acquisition pathway in DOD 5000.02 is urgent capability acquisition. This pathway is designed to deliver finished capabilities within two years with costs not exceeding \$525M. The goal of urgent capability acquisition is to plan for a capability in a few weeks, then develop and produce solutions within a matter of months (Department of Defense 2020).

USSOCOM's Directive 70-1 Acquisition Management System Policy governs USSOCOM acquisition of Special Operations Forces – Peculiar equipment. Directive 70-1 tailors policies for USSOCOM acquisition while complying with the DOD 5000 series of directives. Directive 70-1 was last updated on 20 March 2018 (United State Special Operations Command 2018).

Other Transactional Agreements

In addition to using traditional contracts, USSOCOM uses Other Transactional Agreements for developing or acquiring capabilities. Other Transactional Agreements are authorized under title 10 § 2371b of US code and allow DOD to conduct research, build prototypes, or purchase items without using traditional DOD contracts. Other Transactional Authorities were created to give the Department of Defense flexibility in business transactions principally through using commercial industry standards and best practices instead of adhering to the processes codified in the Federal Acquisition Regulation (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018).

Other Transactional Agreements were first used following the enactment of the National Aeronautics and Space Act of 1958. In 1989, research Other Transactional Agreement authority was extended to the Department of Defense; first to the Defense Research Projects Agency then later to other entities within the Department of Defense. The prototype other transactional agreement authority was made permanent for DOD in 2015 in Title 10 of the United States Code § 2371b (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018). Under other transaction authorities, three types of other transaction agreements can be established: research, prototype, and production.

Research Other Transaction Agreements are for basic, applied and advanced research projects. Research Other Transactional Agreements are intended for dual-use research and development. Research Other Transaction Agreements typically require less DOD investment because products are simultaneously being developed for both civilian and military use. Concurrently the government regulatory overhead required under a typical government contract is eliminated because an Other Transactional Agreement is being used (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018).

Prototype Other Transactional Agreements acquire prototype capabilities for government use. Prototype Other Transactional Agreements can be used to acquire either dual-use or defense specific capabilities. Prototype Other Transaction Agreements allow for a streamlined transition to the third type of Other Transactional Agreement – production Other Transactional Agreements – without open competition (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018).

Production Other Transactional Agreements are noncompetitive follow-on Other Transactional Agreements to successful prototype Other Transactional Agreements. Production Other Transaction Agreements enable the build and delivery of capabilities developed during prototype Other Transactional Agreements. The government is required to notify all competitors for prototype Other Transactional Agreements that the prototype Other Transactional Agreement has the potential to follow-on to a production Other Transactional Agreement (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018).

While Other Transactional Agreements benefit from an abbreviated timeline and more tailorable functional structure than traditional DOD contracts, Other Transactional Agreements come with some limitations. First and foremost, the government doesn't use Other Transactional Agreements when a standard contract, grant, or cooperative agreement is feasible or appropriate (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018). For the bulk of traditional defense contractors, Boeing, Lockheed Martin or Northrop Grumman for example, there is typically an existing contract vehicle or cooperative agreement already in place that can be used for a development, prototype or production action, thereby negating the need to use an Other Transactional Agreement.

Research and production Other Transactional Agreements are the most flexible in terms of their use. Using prototype Other Transactional Agreements, however, comes with more restrictions. To use a prototype Other Transactional Agreement, one of several specified conditions must be met. The

conditions include: participation in a prototype Other Transaction Agreements by small businesses or non-traditional defense contractors, at least one-third of the cost of the prototype Other Transactional Agreement funded by someone other than the Federal Government, or identification of exceptional circumstances (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018). Even with the restrictions levied on using prototype Other Transactional Agreements, they are far more flexible and timely than traditional DOD contracts.

Global Market Environment and Vulnerabilities

When compared to a global marketplace packed with commercial and individual consumers, the DOD generally represents a small amount of revenue and what many companies consider an “adjacent” market (Defense Business Board 2014). In terms of research and development investment, US companies spent \$375 billion in 2016. Only \$16 billion of the \$375 billion total came from the Department of Defense – roughly 4% (Wolfe 2018). In addition to representing a relatively small earning potential, the DOD is notoriously slow in awarding contracts to develop or acquire new capabilities. This was highlighted in the Defense Business Board’s report on innovation prepared for the Secretary of Defense. The DBB report stated that the traditional DOD acquisition “performs as expected and as it was designed: it is slow, careful, [and] risk averse” (Defense Business Board 2014).

Analysis

USSOCOM Acquisition Operational Vignette

In the late 2016 USSOCOM identified the need for a vertical take-off and landing UAV capable of being controlled in real time with an operational range of not less than ten kilometers. The UAV had to be capable of carrying a mission specific subsystem weighing approximately fifteen pounds. Time was of the essence for delivering a system as USSOCOM was ready for immediate operational employment. After canvassing the inventory of UAVs available to USSOCOM, it was determined that a new system would have to be developed or acquired.

USSOCOM assembled a team that consisted of acquisition professionals and operational users and charged them with developing or acquiring a suitable UAV and integrating the mission specific subsystem onto it. Within thirty days the team identified a UAV that was capable of fulfilling USSOCOM requirements built by a small company that was not a traditional defense contractor. USSOCOM met with the vendor for the first time in late January of 2017. After a demo of the system and evaluation of the company’s track record with non-DOD customers, the USSOCOM team immediately moved to

acquire UAVs and integrate the needed mission-specific subsystems onto them. The mission-specific subsystem was built by a second, separate company.

USSOCOM initiated a traditional defense contract action that was awarded within thirty days of the USSOCOM team's decision to purchase both the UAVs and the mission-specific subsystems. After the UAVs were purchased and integration of the mission-specific subsystem was started, there were two additional traditional DOD contract actions initiated. One to purchase additional spare airframes and one to purchase UAV maintenance kits. These contract actions took approximately thirty days each to award. It is important to note that thirty days is a **very** rapid contract award timeline for a traditional DOD contract.

After the UAVs were delivered, USSOCOM immediately started the integration of the mission-specific subsystem. The UAV company and mission-specific subsystem company worked extensively with an USSOCOM engineering team to merge the two emerging technologies. The integration effort culminated with a full mission profile test event in an operationally representative environment. Testing of the UAV and mission-specific subsystem concluded in July 2017. The UAVs were immediately shipped to their operational use location and employed shortly thereafter.

Unfortunately, the conditions within the area of operations had significantly changed just thirty days prior to the UAV's arrival. The change in conditions made the UAVs significantly less impactful than they would have been had they arrived thirty days earlier, in June 2017. The delay in the UAV's arrival can be attributed to the time it took to award three different traditional defense contracts needed to complete the purchase of the UAV.

While USSOCOM's UAV acquisition effort met the criteria for using prototype and production Other Transactional Agreements, at the time this effort was executed Other Transactional Agreements were still relatively new to the USSOCOM program management office that acquired this system. Due to the unknowns in Other Transactional Agreement execution at the time, the program management office opted to use traditional DOD contracts to purchase the needed capability (Deekens 2020). The use of an Other Transactional Agreement would have certainly shortened the timeline for getting the UAVs to USSOCOM operational elements for employment.

A cumulative ninety days of traditional defense contract negotiation and award activities could conservatively have been shortened to forty-five days if an Other Transactional Agreement had been used. Saving forty-five days would have had a real-world operational impact for USSOCOM. Had an

Other Transactional Agreement been used, it would have removed the barrier of a complex acquisition process from rapidly answering a time-sensitive USSOCOM operational requirement. This is one example of the multiple barriers that exist for small tech companies in working with USSOCOM as well as DOD in general.

Opportunities to Expedite

As outlined in the previous vignette, USSOCOM is arguably the fastest element within DOD to transition a need identified by a special operator from concept to reality. Regardless of how quickly USSOCOM can acquire capabilities, for companies building emerging technologies there remain multiple barriers to working with USSOCOM and DOD. DOD's limited earning potential and a complex and time-consuming acquisition process are the greatest encumbrances to collaboration between USSOCOM and non-traditional defense contractors.

USSOCOM purchasing power pales in comparison with commercial earning potential. In 2016, there was \$375B in R&D funding invested in US technology companies (Wolfe 2018). USSOCOM's Research, Development, Test and Evaluation budget for 2016 was a mere \$538M (Department of Defense 2015). In contrast with small tech companies, USSOCOM stands little chance of influencing large tech companies with such a small budget. Because USSOCOM's budget is small, **developmental partnerships** where the cost burden of developing a new capability is shared between USSOCOM and a large tech company, are the most effective means of developing capabilities within reasonable costs. For USSOCOM, however, joint developmental efforts with large tech companies come with significant challenges.

The most impactful limitation to developmental partnerships with large tech companies is balancing a large tech company's developmental resources between commercial and USSOCOM applications. Commercial applications are almost always worth significantly more to a large tech company than any earning potential offered by USSOCOM. For a developmental partnership with a large tech company to work, a large tech company must be willing to take away development resources from commercial product development to focus on USSOCOM requirements. Since USSOCOM's budget is limited, large tech companies place more emphasis on developing commercial capabilities and less on USSOCOM requirements. This lack of emphasis, translates directly to longer development times for USSOCOM capabilities. For time sensitive requirements, a longer developmental schedule is the death knell for a viable capability.

In contrast, while USSOCOM's relatively small budget is barely noticeable to larger, more established companies, an investment by SOCOM of even \$1M in a startup or emerging tech company could get a new capability developed and delivered in short order. A significant challenge in working with a small company is getting the company access to the working capital needed to develop a capability up front. This can be addressed through advanced payments to small companies; however, traditional DOD contracts aren't normally structured for advanced payments.

DOD contracts are typically structured to pay companies after they have successfully delivered a product. This is not an issue for large companies – Lockheed Martin or Boeing for instance – who have plenty of working capital at their disposal. Large companies can fund the development and production of a new or modified capability out of their own coffers. Alternatively, startup companies generally have very little working capital they can leverage to build out their conceptual capability and deliver it to SOCOM. While venture capital firms can step in and fill the funding gap, venture capitalists typically want to see larger returns on their investment than one or two USSOCOM contracts can provide. This puts the desires of the venture capital firm ahead of USSOCOM requirements – ostensibly the same situation that USSOCOM finds themselves in when executing developmental efforts with large tech companies. There are mechanisms available to USSOCOM that allow for payment up front, but the process and approvals required for even small upfront payments are time consuming. An alternative approach would be using Other Transactional Agreement to pay startup companies up front.

Other Transactional Agreements allow the Government to issue advance payments for all Other Transactional Agreement types: research, prototype or production. Other Transactional Agreement guidance empowers the government team assigned to a specific effort to use business judgement when determining when to allow advance payments (Office of the Under Secretary of Defense for Acquisition and Sustainment 2018). Paying a small company up front to develop and deliver a capability harbors a significant risk – the company doesn't deliver a viable product. Assuming the risk of non-delivery, however, is directly in line with the NSS guidance to assume risk in pursuit of rapidly fielding new capabilities (White House 2017). With the flexibility afforded by Other Transactional Agreements to issue payments in advance and a willingness to accept risk by USSOCOM the payment barrier to entry is significantly reduced. Concurrently, the risk of non-performance is mitigated by generally low-cost USSOCOM investment. Non-performance risk can be further mitigated by leveraging an experienced rapid acquisition team.

USSOCOM will have to determine which small companies are adequately resourced to provide viable capabilities. Fortunately, experienced, properly staffed rapid acquisition teams can reduce the overall risk of vendor underperformance. It's critical for a rapid acquisition team to assess potential vendor performance via all available metrics – as was the case in the USSOCOM acquisition operational vignette described in this paper. In the vignette, the USSOCOM rapid acquisition team assessed the performance of the UAV company through coordination with non-DOD customers who used the UAV along with an in-depth review of the company's manning structure and resident expertise.

The structure of DOD acquisition policy overall represents at best an annoyance and at worst an outright barricade to small companies who are interested in doing business with the DOD. The rewrite of DODI 5000.02 is certainly intended to provide DOD with more flexibility in acquiring new systems and shows promise in the potential to ease process burdens on industry partners. USSOCOM should capitalize on the momentum created by DODI 5000.02's rewrite and maximize the use of small companies to develop or acquire new capabilities that answer time sensitive requirements.

There may be additional opportunities to reduce the complexity of USSOCOM acquisition policies in the coming months. Since USSOCOM Directive 70-1 adheres to 5000.02, the update to 5000.02 presents a potential opportunity to update 70-1. An update to 70-1 should emphasize the willingness of USSOCOM to accept reasonable, additional acquisition risk when developing capabilities in direct response to tactical capability gaps. Long standing DOD acquisition policies focus on minimizing governmental risk and maximizing return on investment. In the quest to adhere to policy, DOD has earned a reputation as working to minimize profit (Defense Business Board 2014). Further, DOD's focus on minimizing acquisition risk prolongs the time it takes to award a contract and acquire or develop a new capability. In contrast, empowering USSOCOM Program Managers (PM) to take risk and fail quickly while, in parallel, using Other Transactional Agreements as the means to move funding to small tech companies the timeline for new system delivery is significantly reduced. Coupling PM's assumption of risk and Other Transactional Agreements makes USSOCOM a realistic developmental partner or customer to small tech companies.

Where USSOCOM Should Focus

When working with small tech companies, USSOCOM should focus rapid acquisition efforts on fielding systems on a small scale to meet specific operational requirements. Generally, rapid acquisition efforts should fall into one of the three following categories: outright purchase, modify-and-purchase, or

merge-and-purchase. Outright purchase is exactly what it sounds like - purchasing an existing commercial capability “as-is” and fielding it. Modify-and-purchase efforts are those in which USSOCOM pays a company to make modifications to the company’s existing commercial capability prior to USSOCOM purchasing it. An example of a modify-and-purchase effort might be USSOCOM paying a commercial UAV company to modify their existing gas-powered UAV to run on Jet Propellant 8 then purchasing the modified UAV. Finally, merge-and-purchase would involve taking two existing capabilities and integrating them together. A perfect example of a merge-and-purchase effort is the operational vignette detailed previously which took an existing UAV and an existing sub-system, integrated them together, and then delivered the capability to USSOCOM.

USSOCOM should not use rapid acquisition efforts to conduct ground-up development. The common thread between the rapid acquisition categories outlined in the previous paragraph is that they revolve around purchasing, modifying or merging, **existing emerging technologies**. While the traditional DOD acquisition process is more time consuming, it is also better equipped to manage the greater risk inherent in developing a previously non-existent system. Keeping rapid acquisition efforts focused on delivering capabilities with extant systems at their core reduce overall risk to a reasonable level and help ensure the end product is delivered rapidly.



Figure 1: USSOCOM Rapid Acquisition Focus

USSOCOM should focus rapid acquisition efforts on fielding small quantities of systems to meet specific operational requirements. Generally speaking, USSOCOM should view rapidly acquired capabilities as mission specific solutions – not standard equipment. Delivered capabilities should be acknowledged as addressing mission needs in the short term followed by either shelving or divesting of the capability after operational use. However, if there is a desire to move a rapidly acquired capability into the permanent USSOCOM inventory, the capability should be transitioned to a more traditional acquisition pathway. This transition ensures that the newly acquired capability will not negatively interact with any existing USSOCOM networks or systems.

With nearly all developed or acquired systems containing some form of software, increased speed in developing and acquiring new capabilities increases risk of introducing cyber vulnerabilities and interoperability challenges. To address any cyber vulnerabilities resident in new systems, USSOCOM must develop an expedited methodology to assess new systems prior to integrating them into operations.

Recommendations

As the best postured DOD element for rapid capability acquisition, USSOCOM should expand investment in emerging technology companies through Other Transactional Agreements. By doing this they will maximize the potential to integrate emerging technologies into DOD.

USSOCOM's acquisition acceleration should be focused on the 'sweet spot' where commercial technologies overlap with tactical capability gaps in small scale applications. For instance, purchasing a custom tactical Unmanned Aerial Vehicle (UAV) equipped with an intelligence collection payload to use in an overseas neighborhood occupied by the enemy that couldn't be accessed otherwise. Another example could be developing a custom radio for small scale employment of Electronic Warfare (EW) capabilities in an overseas village or apartment complex. The key is that the application of the capabilities are small scale. USSOCOM shouldn't be using rapid capability acquisition to develop or acquire the next intelligence collection aircraft or large scale EW system.

USSOCOM should focus investment on emerging technology companies as often as feasible. Emerging technologies provide USSOCOM with the greatest potential return on investment for successful programs. Other Transactional Agreements should be used to fund emerging technology company development or acquisition efforts. Other Transactional Agreements minimize the barriers to

entry into the DOD market, namely paying in advance of product delivery and not forcing an emerging tech company to wait while a traditional DOD contract is awarded.

USSOCOM should continue to monitor the ongoing update of DODI 5000.02 and look for opportunities to update USSOCOM Directive 70-1. Updating 70-1 to mirror DODI 5000.02's increase in risk acceptance and streamlining of the acquisition process will enhance USSOCOM's ability to move quickly in developing and acquiring new capabilities from emerging technology companies. While directive 70-1 is not an immediate hindrance to USSOCOM acquisition efforts with emerging technology companies, the opportunity to update 70-1 to maximize its utility should be capitalized upon.

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