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AIR FORCE FELLOWS

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MILITARY ACQUISITIONS
IN A WORLD WITH RISING CHINESE CONTROL



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in Partial Fulfillment of the Graduation Requirements

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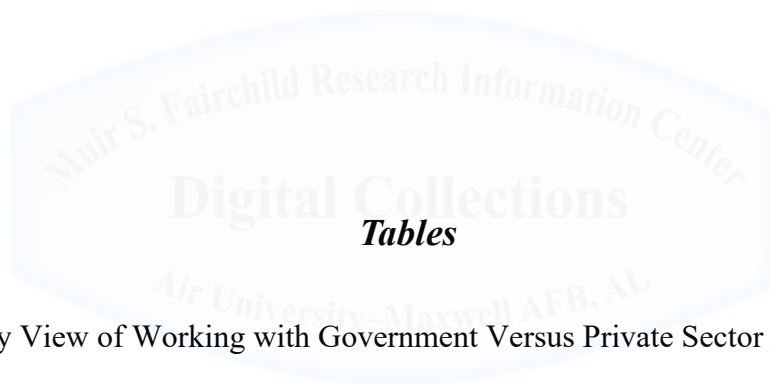
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Preface

The primary purpose of this research paper is to identify aspects of the United States government that negatively impact the acquisition process that should receive additional attention to improve efficiency, effectiveness, and timeliness. There are numerous inquiries sent to Air University (AU) requesting evaluation of the acquisition process that comes from Air Staff, Acquisition organizations, Air Force Materiel Command, Air Force Research Laboratory, and the LeMay Center. Among these submissions are requests that ask how to streamline and enhance the acquisition system to be more effective, efficient, agile, timely, innovative, and what the appropriate level of integration is with commercial partners. Since the day I entered the Air Force as an acquisitions officer, I have been hearing how inefficient the acquisition system is and that we need to “make it go faster.” My first assignment was in F-15 flight test and the problem was evident immediately. Shortly after arrival, I received orientation to learn what was in work and one of the latest upgrades was a hard drive for the F-15 that was recently increased to a capacity of two megabytes and was shown the GPS receiver that was approximately the size of a basketball. At the time, I had a sixteen-gigabyte flash drive and my phone had a microchip with GPS capability. My guide explained that if on that day it was decided that instead wanted a hard drive more in line with commercial storage capacity, it would be years by the time it made it through the required testing and fielding process and one would then immediately ask why it was not as good as whatever memory capability was out at that time years later when today’s idea was finally approved for use. Yet, with more than a decade as an acquisition officer, little appears to have

changed, as reflected in the inquiries sent to AU and my personal experience. Also, the growing discussions about the strategic and methodical “rise of China” puts a compelling need into the development cycle that is impossible to answer with traditional processes implemented with a Cold War mindset.

Improving the speed of a large bureaucratic system is similar to tackling personal time management. Rarely is there a single “silver bullet” that when fixed makes all other problems go away. To improve personal productivity, the typical answer is a collection of small improvements across multiple areas that have a combined result of improving performance to a measurable amount. Acquisitions are the same way; there is no “silver bullet.” The only way I see to have a measurable difference is to attack the issue from multiple directions at once. The process can only go as fast as its slowest moving elements.

The first step to determine areas that need improvement is to understand current initiatives already underway. Only after that can areas be identified that require action. An important source to investigate is how the industry perceives the process of working with the government. If an issue highlighted by industry is true, that is a candidate for evaluation. If what industry says is false, that is still an issue for the government because there is a perception problem that should be addressed by improving messaging and outreach. One reason for an acquisition complaint to be invalid from a technical standpoint may simply be the “old way” of doing business compared to new initiatives where the specific contractor may not yet have experienced or heard about the new process. With this in mind, the focus of my research is interviews with industry and acquisition leaders along with recent news sources to uncover where efforts are lacking to identify the next steps towards improvement.

Abstract

The traditional Department of Defense acquisitions system is adapting too slowly for today's digital age. Activities of China are explored that provide a compelling need for an acquisitions revolution. The new mission-focused approach is driving the contracting community to be offensive-focused business leaders. Scrutiny is being applied to existing rules to take advantage of authorities that already exist. Aside from exercising existing authorities and programs that have historically been under-utilized, a plethora of newer initiatives have also been initiated. Below are recommendations for further improvement:

Contracting: Rapid contract capability for unplanned work.

Manpower: Space Combat Developers; administrative support for acquisition branch chiefs; casual status government civilians; need a more efficient way to quickly add staff; military service pause and return; and programs need to be balanced with available staff.

Funding: Structure program elements to be at the Program Executive Officer portfolio level; expand funds matching/private investment to standard acquisition; and programs should not have funding cut due to efficient spending.

Program Initiation: Push back on laws that say a new organization cannot be stood up unless it is shown to save dollars or people; requirement documents need to transition into problem documents; and working with the government needs to function in a way that is not foreign to commercial businesses.

Security and IT Architecture: Separate classified issues to have more stand-alone portions that can be solved in an unclassified environment; develop new classification levels definitions; security clearances special programs and compartments access should follow the individual; Common Access Cards for support contractors should last longer than the end date on a contract; and high-capacity data transfer and storage methods should be easily available within each classification.



Chapter 1

Introduction

There is not a rapid process anywhere in the Department of Defense. [...] The critical problem is DoD's crippling need to avoid risk. This has led to bureaucratic approaches that value risk avoidance above all else. [...] If you have an adversary who is going fast, and you're going slow, at some point that adversary will catch and pass you.

—General John E. Hyten, Vice Chairman of the Joint Chiefs of Staff¹

The days have long passed where the United States government was the driving force behind major innovations when the military took whatever measures necessary to be the disrupting force that competing nations had to focus on countering. Military acquisitions today are heavily based on current capabilities and the United States seems to be the one always a step behind, trapped in a cycle of always trying to find a counter to the latest capability fielded by someone else. Requirements for upgrades or a new system are heavily structured around market research that outline capabilities that already exist and just need to be integrated or are a small extension to what is already being accomplished. While this is great if one wants to build a low-risk system that has a low chance of program failure, but it is the recipe for how to form an organization that no longer knows how to innovate or adapt to a dynamic environment, which is exactly where the Department of Defense has cornered itself. In the meantime, competing nations have been strategically innovating in faster development and implementation cycles than the United States and taking over entire economic sectors allowing them to close a choking grip around the nation one finger at a

time. Even when the United States possesses better technology, it is frequently not implemented rapidly. The advantage does not go to the country that invents something first, it goes to the one who implements it first. The sluggishly moving, bottle-necked, no-risk approach acquisition processes of the Department of Defense are adapting too slowly to account for today's digital age, especially when the congressional strategic approach to approving new acquisition efforts appears to be more focused on the next election cycle instead of a viable strategy to protect the interests of the United States; if the United States cannot increase the speed of acquisition, improve government and industry synergy, and take control of strategic supply lines, the next major war will be lost before it even begins because slow processes are arguably the greatest military vulnerability of the United States.

This paper will examine current efforts to increase the agility of Air Force acquisitions and synergy with industry and identify areas that need additional attention. To have any chance of improving the acquisition process and changing the culture, the messaging for the requested change must come with a compelling reason. When traditional acquisition activities are too slow, emergency systems and upgrades to react to a crisis are needed more often, which are more likely to have inherent vulnerabilities due to their rushed approach where waivers and special authorities are used to bypass the standard process. The standard processes must be streamlined enough for systems to keep pace with modern technology or any future conflict will require an ever-increasing number of emergency-developed, rapid capabilities. The military must find the "knee in the curve" of due diligence and speed. The layers of bureaucracy have steadily grown with time and the acquisition process has flat-out failed to keep pace with evolving technology and capabilities for more than a decade. Acquisitions currently moves at the speed of obsolesce when it needs to move at a speed that takes advantage of innovative technology that can revolutionize the battle-space.

However, when going fast, there is a real risk of not implementing adequate security measures that simply gives away the achievement to competitor nations and risks wasting taxpayer dollars on programs that end up failing.

Notes

¹ (Hitchens 2020)



Chapter 2

The Compelling Reason for an Acquisition Revolution

The global community must expect that China's world order would be fundamentally different in every respect.

—Bradley A. Thayer¹

China's 100-year Plan

The world has entered a new age of great power competition, which is why strategic competition with China and Russia is the priority of the 2018 National Defense Strategy. One of the major shifts is China's steady progression along its 100-year strategic plan to become the dominant country both economically and militarily. "In some areas, and growing, the U.S. is the near-peer to the superior China and not the other way around."² China is leading in the development of 5G and Artificial Intelligence technologies, developing protocols for their own internet, rapidly evolving their space capabilities, dominating strategic supply lines, plundering intellectual capital, and rapidly expanding their influence in developing countries and foreign businesses.

Beijing has a documented plan to be the premier global superpower by 2049. [...] By 2049, the Chinese economy is projected to be much larger than the U.S. economy—perhaps double or triple the size, according to some estimates. At that point, it will be easy to bring the Chinese military into compliance with the ancient Rites of Zhou by making it four times larger than America's armed forces. [...] The leaders of China have no interest in sharing superpower status with America.

[...] A Citigroup report forecast that Western Europe will only account for 7 percent of the global economy by 2050, while “developing Asia” will account for 49 percent.³

While there are similarities to the Cold War, this new era is more dynamic since there are more than two major players in the game. Where the Cold War was arguably binary, the United States and the Soviet Union, the current political climate includes a major shift in China, a resurgent Russia, and other countries such as Japan, India, and Iran increasing their regional influence, along with the United States trying to maintain their historical edge. The Obama administration pushed a rebalancing, or pivot, to Asia narrative, with the President stating: "Let there be no doubt: in the Asia-Pacific in the 21st century, the United States of America is all in."⁴ “The fundamental goal underpinning the shift is to devote more effort to influencing the development of the Asia-Pacific’s norms and rules, particularly as China emerges as an ever-more influential regional power.”⁵ While the rivalry with China is taking center stage, one of the big differences is economically there are little immediate incentives, especially for the United States commercial sector. Where the Cold War with the Soviet Union involved opposing structures, the economic arrangements between China and the United States are beneficial to both sides. A major issue is while the United States has been largely complacent concerning China, China has viewed the United States with distrust and has aligned their long-term strategy to come out on top. “In Chinese eyes, the United States has always been concerned primarily with protecting its own global dominance — which perforce means doing everything it can to retard or disrupt China’s rise.”⁶ With this view in mind, “[China] is intent upon replacing the United States as the world’s dominant state”⁷ and has strategically played the long-game to put themselves in a position where this outcome is possible if the United States does not adjust course. The following is a statement from Lieutenant General (retired) Steven L. Kwast from a speech he gave at Hillsdale College concerning China’s plans:

The Chinese are open about their plan to become the dominant power in space by 2049, the centennial of the end of the Communist Chinese Revolution and of the founding of the People's Republic of China under Mao Zedong. [...] China's plan is to profit from the multi-trillion dollar space marketplace while simultaneously acquiring global domination. [...] Space is the strategic high ground from which China will seek to gain control of our media, businesses, land, debt, and markets. [...] Space will be a multi-trillion dollar market that will disproportionately benefit the first nation to build a vibrant space infrastructure and define the principles and rules of the marketplace of space. If America is first, its principles—the rule of law and the protection of liberty—will be in a position to prevail. If Communist China is first, the marketplace will look much different.⁸

China's plan to dominate space is not just for the economic benefits. The United States is arguable the nation with the greatest dependence on space assets and competing nations view this reliance on space for both economic and military applications as the United States' top critical vulnerability. Since the dawn of the space age, the space domain has largely been considered a benign environment and defending space capabilities has not been viewed as a requirement. From the 2019 Annual Report to Congress:

China views space as a critical U.S. military and economic vulnerability, and has fielded an array of direct-ascent, cyber, electromagnetic, and co-orbital counterspace weapons capable of targeting nearly every class of U.S. space asset. The PLA has also developed doctrinal concepts for the use of these weapons encouraging escalatory attacks against an adversary's space systems early in a conflict, threatening to destabilize the space domain. It may be difficult for the United States to deter Beijing from using these weapons due to China's belief the United States has a greater vulnerability in space.⁹

A major issue with military conflict extending to space, especially relating to kinetic attacks, is the creation of space debris. This debris can cause collateral damage to any nation's use of space and make certain orbits unusable for decades. For example, "more than one-third of all catalogued debris is from two major events: China's destruction of a defunct satellite in 2007 and the accidental collision between a U.S. communications satellite and a defunct Russian satellite in 2009."¹⁰ With only two events as the dominating source of current space debris, it does not take

much imagination to realize how big of a problem it would be for nations in conflict purposely targeting each other's space assets. China possesses the full spectrum of counter-space capabilities, Figure 1, which reshapes any future military conflict for nations that possess space assets and requires the United States to take actions to protect critical space architectures.

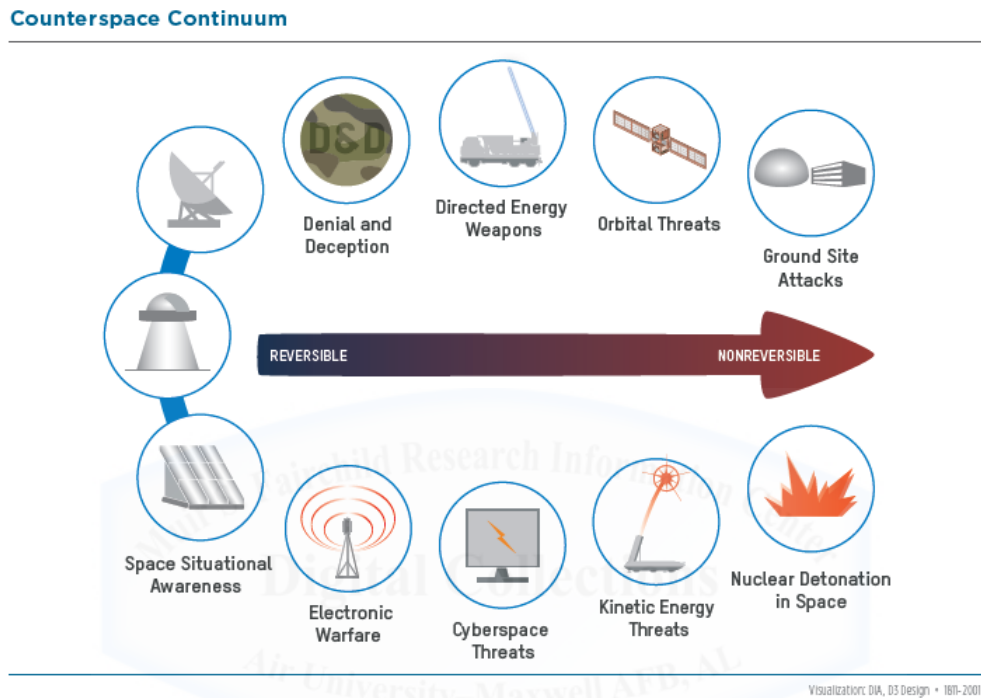


Figure 1. Counterspace Capabilities¹¹

The primary stepping-stone in China's 100-year strategy is to become the dominant economic global power to have the capability to absorb almost any attempt to counter them, and they are succeeding in that goal. "The U.S. has had the world's biggest economy for 140 years (as of 2016) [...] but in terms of purchasing power parity (PPP), the International Monetary Fund now ranks China as the world's largest economy. [...] China's economy is still growing at almost three times the rate of the US – around 7% over the last couple of years [for China], compared to less than 2.5% [for the US]."¹²

One of the major advantages the United States has is the close cooperation with other democratic nations, whereas China does not want to rely on other nations. "The world's

democracies are still about 65 percent of the global economy and if we work together and find alternatives to China, we are going to be successful at preserving a world order in which democratic norms and freedoms continue to prevail. If we fail to do this, however, China may enjoy a relatively unimpeded rise to power.”¹³ However, China has been spreading its influence with other nations, especially in Africa, as depicted in Figure 2:

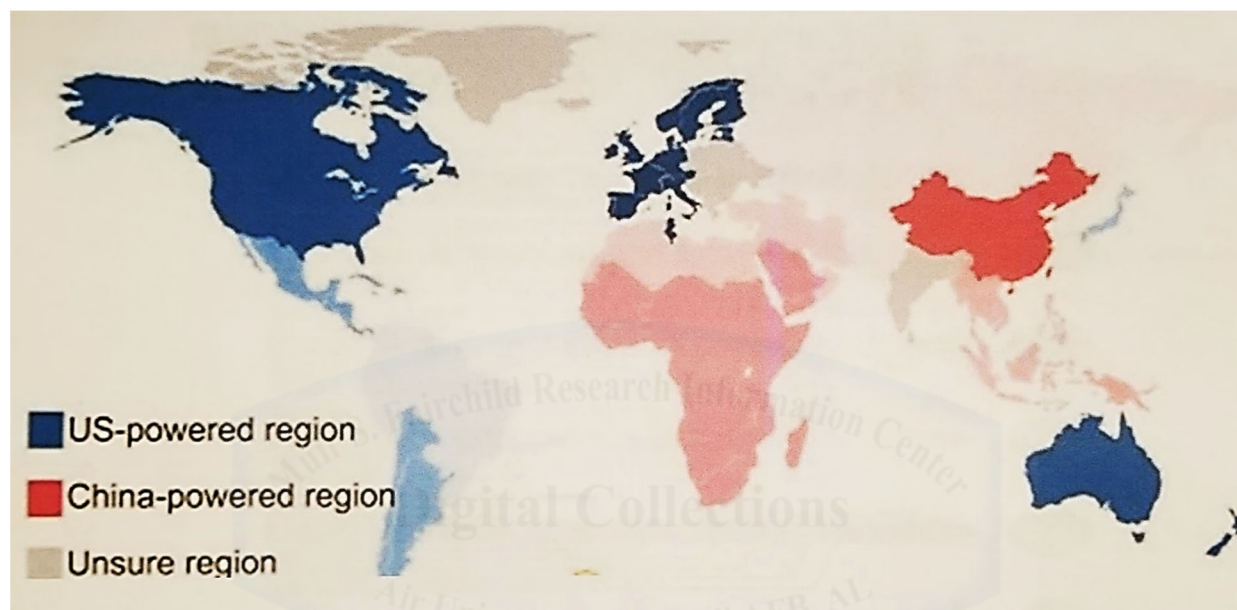


Figure 2. Regions of Influence¹⁴

Some claim that for China to overtake the United States, its economy needs to transition in the same manner the United States did in the late 1900s by becoming more consumer-based and outsourcing labor and resource-intensive manufacturing. However, China is doing just that by outsourcing to countries in Africa, similar to how a lot of manufacturing jobs transitioned from the United States to China. The “Belt and Road Initiative (BRI)” announced in 2013 is a Chinese program to invest in the development of infrastructure in other countries, primarily by offering the target country loans to for the projects that have a high likelihood of default, leaving those countries beholden to China. “Over 10,000 Chinese-owned firms are currently operating throughout the African continent. [...] When we look at Africa, we see many countries chasing

dreams of a better economic future while burying themselves in massive amounts of infrastructure-induced debt that they may not be able to actually afford.”¹⁵ A concern to a wide-spread reliance on China is the possibility of the swaying of a large portion of the international community siding with China’s international policy preferences through heavy-handed tactics China could employ against those countries. “To date, more than sixty countries—accounting for two-thirds of the world’s population—have signed on to projects or indicated an interest in doing so. [...] Morgan Stanley has predicted China’s overall expenses over the life of the BRI could reach \$1.2–1.3 trillion by 2027.”¹⁶

Strategic Supply Lines

China’s long-term goals have included a take over of strategic resources that are useful to both economic and military advancements. This leaves other countries, including the United States dependent on China, which is dangerous considering it leaves China with the ability to cut off other countries from those resources at will. A couple of examples are rare earth materials and medical supplies.

Rare Earth Materials

Rare earth materials, also called rare earth minerals and rare earth elements, are a group of chemically similar elements that have multiple uses, but are critical for components of modern technology products. These elements are found on the periodic table with atomic numbers: 21, 39, and 57-71. Common uses are magnets in computer hard drives, telescope lenses, catalytic converters in vehicles, oil refinement, metal alloys, medical scanning systems, visual display screens, nuclear reactor control systems, batteries, defense electronics, night-vision goggles, precision munitions, vehicle armor, and countless other applications.

Currently, if the United States were to end up in a conflict with China, it is possible China could stop exports of rare earth materials and bring the United States defense industry and high-tech economic ventures to a screeching halt. Even without military conflict, this choke point has already been identified as a possible response to trade wars, “a rising number of Chinese experts are calling on the government to engage in an asymmetric trade war with the US - not to match US tariffs in scale and percentage but to conduct pinpoint strikes that could inflict systemic pain on the US economy. Some said rare earths could be China's trump card.”¹⁷ It is important to note that with proper investments into rare earth materials, other countries can reduce or remove this critical reliance on China. “The Chinese dominance may have peaked in 2010 when they controlled about 95% of the world's rare earth production, and prices for many rare earth oxides had risen over 500% in just a few years. [...] Although China is the world leader in rare earth production, they only control about 36% of the world's reserves.”¹⁸ Interestingly enough, “The US itself also sits on vast rare-earth reserves, but it needs one year to get its supply chain up and running.”¹⁹ Any strategy the United States intends to pursue should include a plan to vastly reduce the time to access domestic sources of rare earth materials to a strategic level of production.

Medical Supplies

Both the quality and quantity of pharmaceuticals in the United States are heavily reliant on China. “The vast majority of key ingredients for drugs that many Americans rely on are manufactured abroad, mostly in China. If China shut the door on exports of medicines and their key ingredients and raw material, U.S. hospitals and military hospitals and clinics would cease to function within months, if not days.”²⁰ The reliance on China is not limited to medications; China is the leading producer of medical personal protective equipment as well. This reliance became an issue during the Coronavirus-2019 outbreak as the world supply of medical face masks was

insufficient and China paused exports. “China made half the world’s masks before the coronavirus emerged there. [...] But it has claimed mask factory output for itself. Purchases and donations also brought China a big chunk of the world’s supply from elsewhere.”²¹

Intellectual Capital Acquisition

In 2015 the Chinese government announced an industrial policy called “Made in China 2025” to make China the leading manufacturer of high-tech products by 2025. “The program aims to use government subsidies, mobilize state-owned enterprises, and pursue intellectual property acquisition to catch up with—and then surpass—Western technological prowess in advanced industries.”²² A primary path for China to increase its technological capabilities quickly is simply to steal information. China is well-known for ignoring intellectual property rights, such as copyrights and patents. “The FBI has about a thousand investigations involving China's attempted theft of U.S.-based technology in all 56 of our field offices and spanning just about every industry and sector.”²³ Investments in foreign companies, foreign education, and foreign researchers have also bolstered China’s growing technological capabilities.

As presented in the book *China in 10 Words*, the Chinese words shanzhai and huyou, roughly translated as copycat and bamboozle respectively, are not viewed with the same negative connotation applied to those words in American culture; copying and fraudulent cheap knockoffs are viewed as a “useful service” in Chinese culture.²⁴ Addressing the problem is difficult due to the Chinese cultural acceptance of information theft where originality does not matter. Moving forward, the international community needs to work together to enforce international intellectual property rules on China, such as collectively applying sanctions against China for failure to comply.

Espionage and Cyber-theft

Numerous examples exist of Chinese military systems that have direct ties to design information stolen from the United States. “Plans for the Lockheed Martin [F-22] design were stolen by a Chinese national named Su Bin. [...] Lockheed Martin’s F-35 Joint Strike Fighter was also compromised by Su Bin, leading to China’s J-31 program.”²⁵ Looking at Chinese military systems reveals copycat versions of the United States and other countries fixed-wing and rotary-wing aircraft, both manned and unmanned, tanks, troop carriers, mobile rocket launchers, infantry weapons, anti-tank systems, and many more. Stolen intellectual property has played a large role in China’s current capabilities, “we’ve unwittingly become the [research and development] base for adversary capabilities and for our strategic competitors.”²⁶ In 2013 an announcement was made that “Chinese hackers have obtained designs for more than two dozen U.S. weapon systems.”²⁷ A major obstacle for stopping China from doing conducting these information acquiring activities is the lack of clear processes for responding to non-kinetic aggression and retaliation comes with the chance to spark trade wars that could damage the United States economy immediately, while repercussions for theft of information generally take time to surface.

Commercial Product Cloning

China has thriving businesses centered around reverse engineering products to sell cheap knock-off versions or fraudulent clones that are claimed to be the real thing. In addition, large portions of manufacturing capability were transitioned to China which allows underhanded business tactics to directly undermined product developers. When a company has a product manufactured in China, it is not only a copycat product that can put a United States company out of business, but the real product using the actual molds and processes. The manufacturer can claim to have issues that slow down the real product to beat the owner to market with their own product.

Another situation is the manufacturer charging inflated production prices to produce extra units to sell themselves at a reduced rate for pure profit. “Trump administration officials estimate that more than 100,000 packages a day from China contain items that could defraud or harm Americans.”²⁸ Unfortunately, the general understanding in product development business today is that a company should plan for products or trademarks to be stolen and cloned by China.



Figure 3. Copycat KFC Restaurant²⁹



Figure 4. Cloned iPhone³⁰

(Left side in images is a real iPhone and right side in images is the clone.)

Foreign Investment

Chinese companies' investments in foreign businesses raise additional concerns. "Chinese companies, both private and state-backed, have been encouraged to invest in foreign companies, notably semiconductor firms, to gain access to advanced technology. [...] Much of this investment comes from [State-Owned Enterprises], or companies or funds backed by the Chinese government."³¹ Through largely legal investments in foreign companies, some through intermediaries intended to hide that China is the source, China has gained direct access to critical design and product information of the companies they have invested in or outright purchased. A larger issue is since many Chinese-owned businesses are state-subsidized, their investments can drive non-Chinese companies out of business by undercutting the competition just to beat them without the need to be profitable.

Talent Recruitment and International Students

Aside from directly stealing intellectual property, China has invested in international education and recruiting talent that allows importing knowledge and research capabilities through initiatives such as their Thousand Talents Plan:

China has created and manages more than 200 talent recruitment plans. [...] The most prominent of which is the Thousand Talents Plan. Launched in 2008, the Thousand Talents Plan incentivizes individuals engaged in research and development in the United States to transmit the knowledge and research they gain here to China in exchange for salaries, research funding, lab space, and other incentives. China unfairly uses the American research and expertise it obtains for its own economic and military gain. [...] China aims to be the world's leader in science and technology ("S&T") by 2050. To achieve its S&T goals, China has implemented a whole-of-government campaign to recruit talent and foreign experts from around the world. [...] China dramatically exceeded its recruitment goal, having recruited more than 7,000 "high-end professionals," including several Nobel laureates.³²

Law enforcement has started targeting researchers that take part in these programs because participants frequently provide China with stolen research, many of which were conducted using

grants from the United States government or contain export-controlled information. In January 2020, Charles M. Lieber, the Chair of Harvard University's Chemistry and Chemical Biology Department, was arrested due to false statements regarding his recruitment in China's Thousand Talents program. "Investigators from the Defense Department — which had extended \$8 million in grants to Dr. Lieber — began questioning him in 2018 about secondary sources of income. Dr. Lieber told them that he was aware of China's Thousand Talents program, but had never been invited to participate, prosecution documents say."³³ Dr. Lieber is just one example of a systemic challenge of China's plundering of other countries' intellectual capital.

China has the largest population of foreign students, with 662,100 overseas students in 2018.³⁴ The interesting shift now occurring is the dramatic increase in Chinese students returning to China after receiving their education. "At the beginning of the century, only one in 10 Chinese students returned to China after studying abroad. In 2017, it was eight in 10."³⁵ This is not necessarily a nefarious shift, but the end result is a greater amount of intellectual capital is no longer being retained by the United States after sharing educational and research opportunities that are now being absorbed back into China. One likely explanation is the growing population of the Chinese middle class makes returning home more inviting than it used to be for many students because a future career in China is now more economically feasible and allows them to return to their families. Another reason may be the United States' tightening of immigration policies may be making it increasingly more difficult for students to remain after graduation, causing a self-inflicted wound.

Notes

- ¹ (Thayer 2020)
- ² (Defense Department Analyst 2019)
- ³ (Miiller 2016)
- ⁴ (Obama tells Asia US 'here to stay' as a Pacific power 2011)
- ⁵ (Manyin, et al. 2012)
- ⁶ (Lieberthal 2011)
- ⁷ (Thayer 2020)
- ⁸ (Kwast 2020)
- ⁹ (Bartholomew, et al. 2019)
- ¹⁰ (Challenges to Security in Space 2019)
- ¹¹ Ibid., 36.
- ¹² (Willige 2016)
- ¹³ (Panda 2019)
- ¹⁴ (W. Roper 2019)
- ¹⁵ (Shepard 2019)
- ¹⁶ (Chatzky and McBride 2020)
- ¹⁷ (Daye 2019)
- ¹⁸ (King n.d.)
- ¹⁹ (Daye 2019)
- ²⁰ (Dilanian and Breslauer 2019)
- ²¹ (Bradsher and Alderman 2020)
- ²² (McBride and Chatzky 2019)
- ²³ (Cimpanu 2020)
- ²⁴ (Hua 2011)
- ²⁵ (Hollings 2018)
- ²⁶ (Lopez 2019)
- ²⁷ (LaGrone 2013)
- ²⁸ (Rappeport 2020)
- ²⁹ (Gabulaite 2016)
- ³⁰ (Buyback 2017)
- ³¹ (McBride and Chatzky 2019)
- ³² (Portman and Carper 2019)
- ³³ (Barry 2020)
- ³⁴ (Wong 2020)
- ³⁵ (Zhou 2018)

Chapter 3

Current Acquisition Initiatives

Organizations with the right leadership can shift policy to allow for greater access [for working with the government] to create bridges and open doors [...] to tip the scales in favor of American/allied interests.

—Unattributed¹

Streamlining acquisition is not always about going fast and shaking things up. Programs need to progress at a pace that ensures an advantage with an appropriate level of risk tolerance. History teaches us that incremental changes in the right direction can be more useful over instant gratification. However, it has been known for a long time that the traditional government acquisition process is considered obsolete by both government personnel and industry for today's dynamic environment. "To keep its edge, the Air Force can no longer settle for a long and risk-averse acquisition process. It has to cut out unneeded steps, sharply shrink timelines, accelerate development, testing, and the writing of new software, take risks, and bring in new vendors who may offer novel approaches to military problems."² However, the first step is to understand the background and purpose of a particular process before improving or removing it, so how a change is implemented is the key to if it will be successful or not since lessons learned from history can still be beneficial.

A lot of the acquisition rules exist because some people have done bad things. Most laws and policies were created with good intentions to fix problems. However, applying those fixes across

the board is not always the correct solution either. For example, some acquisition offices have decided they will not approve Undefined Contract Actions anymore because at times in the past it has caused problems, but taking the option off the table for everything is inappropriate. The government needs to shift to be able to trust the acquirers with delegated authority. “To speed up, the government needs to trust their people and hold them accountable. Trust them, but hammer them if needed.”³

At the 2019 Air Force Association Air, Space and Cyber Conference Air Force Chief of Staff General David L. Goldfein “unveiled the ambitious move toward ‘multi-domain operations,’ [...] he described the need for the Air Force to reshape itself in response to a new ‘character’ of warfare that is driven as much by ‘cognition’ as platforms.”⁴ For this vision of a software-connected service to come to fruition, the force has must change the way platforms are acquired, which will mean a shift to working with high-tech small businesses that are a catalyst for innovation compared to traditional defense contractors. This community is unlikely to dive in under the burdensome ways the government traditionally conducts acquisitions. “With military R&D now accounting for 20 percent of the U.S. total, we will not win on this battlefield working only with Defense dollars inside the Defense Industrial Base.”⁵

Mission-Focused Contracting

For years, one of the common targets for why acquisitions are inefficient is to claim the contracting process is too slow and burdensome. Since contracting officer training includes statements that the contracting officer can be held personally liable for issues, it is not surprising that the goal for contracting has been to painstakingly avoid any mistake to avoid anyone getting in trouble. With military acquisition contracts commonly in the millions and billions of dollars, there is an invisible gun to the head of those personnel. “One of the best ways to speed up

acquisition is to shield contracting officers when things don't pan out. 'You can do almost anything with the FAR [Federal Acquisition Regulation] if you have top cover.'"⁶ Even though it is rare for the government to enforce the liability for a minor mistake, the fact that this liability can be enforced is enough to cause the whole process to screech to a crawl. Furthermore, the contracting rules keep adding layers of rules at multiple levels. Even though a large portion of the rules at a higher level are allowed to be tailored or waived, local policies frequently further restrict what is allowed for their specific contracting office. Furthermore, due to the bureaucratic requirements to allow certain options, a good idea is frequently skipped because it is considered not worth the time to pursue because the inefficient approval process is almost as bad or worse than just doing the inefficient process upfront. "We must reject the culture of recrimination that makes us afraid to learn and try new things. The global strategic environment will not sit back and wait for yesterday's acquisition timelines. [...] We must focus on reducing and incorporating guidance into the Air Force Federal Acquisition Regulation Supplement (AFFARS) and eliminating everything else that is not necessary. [...] Instructional Guidance (IG) will give insight, but not direction."⁷

Another issue the quantity of acquisition and contracting rules make it difficult for small companies to get involved in government contracts. The government has unique business rules that normal businesses would not use on their own due to how ineffective they are. "A generation of highly prescriptive oversight contributed to exasperation, lack of ownership and loss of mission relevance. [...] Highly prescriptive guidance stifled innovation. [...] New business models & archetypes must be created to gain access to the innovative/dual-use tech & small business ecosystem to grow the 21st-century industrial base."⁸ Further exasperating the issue is that contracting officers commonly report to a different leadership chain than the program they support,

which can cause some to feel distanced from the actual mission need. A large portion of their work is ensuring every step is taken to protect the program from the potential of a protest, heavily driven by local policies that hamstring the process ever step of the way instead of leaving decisions to the person on the front lines of the activity to decide what makes sense for the specific situation.

The Federal Acquisition Regulation was structured for the Cold War and harnessed a lower-level official that had to survive their warranted position and was not beholden to the program's chain of command for how money is spent. Right now we primarily do "keep me out of jail" contracting and passive business advising contracting with a focus on trying to show what steps were taken to protect the government from protests instead of being more mature as leaders to think of new things and urgently drive to victory-oriented wartime capabilities.⁹

The new mission-focused approach is driving the contracting community to be offensive-focused business leaders using systemic and entrepreneurial thinking to optimize time and cost savings, exploit innovation, and build credibility. Under this new approach, SAF/AQ "removed 2 layers of contracting oversight, increased senior contracting officials authority <\$1 billion, delegated business clearances, [...] eliminated multiple reviews, removed restrictions on Contracting Officers tailoring contract terms, [...] led effort to eliminate all Mandatory Procedures below AF level, cut nearly 500 pages of red tape, and a [contracting] toolbox [was] adopted by DoD and Deployed to entire department acquisition community."¹⁰

Exercising Existing Authorities

Scrutiny is being applied to existing rules to take advantage of authorities that already exist. There are many cases where the overall process being inefficient is self-inflicted due to adding on additional requirements in lower level policies that are not required by regulation.

DoD 5000 Series Tailoring and Delegated Authority

A surprise to many, but the DoD Instruction 5000 series governing acquisition policy allows requirements to be tailored based on the specific circumstances. The issue is local policies and

approval processes place roadblocks on allowed flexibility for prescriptive one-size-fits-all approaches. “The DoD 5000 has a lot of flexibility to be tailored, but historically it has been hard to get it approved by the bureaucracy.”¹¹ Entire organizations have been created just to get around this hurdle, such as the Rapid Capability Offices: “The Rapid Capability Offices typically have the same acquisition requirements as traditional offices, but they get priority access to money and decision-makers and get to skip a lot of the unproductive bureaucracy.”¹² Reorganizations, such as Space and Missile Systems 2.0 initiative, and the “tools not rules” approach of the new mission-oriented have a focus of delegating authority to lower levels with helps open the aperture for implementing technically allowed tailoring back into the process and cut down on the number of reviews required for approval. According to former Air Force Secretary Heather Wilson, excess reviews only result in “delays getting capability to the warfighter.”¹³ While some authority can be directly delegated, some levels of authority and oversight cannot be directly delegated by the service, especially for requirements pushed down from the Office of the Secretary of Defense, many of which are viewed as part of the problem. “The authority should start in the service and not OSD, which is really hard for the staff to accept.”¹⁴

SBIR and STTR Programs

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) are competitive programs under the Defense Advanced Research Projects Agency (DARPA) focused on engaging domestic small businesses and non-profit research organizations with government research and development efforts. To many, it seems SBIR and STTR are only recently seeing wide attention and advertisement, but these efforts are not new. SBIR was initiated in 1982 to help bring small businesses into government research and development (R&D) projects and STTR started in 1992 to assist partnering between small businesses and research institutions

on federal research endeavors. The main goals of these programs are to “increase private-sector commercialization of innovations derived from federal R&D, thereby increasing competition, productivity, and economic growth” and to be “a vehicle for moving ideas from our nation's research institutions to the market, where they can benefit both private-sector and military customers.”¹⁵ These programs are broken into three phases:

1. Phase I: Feasibility of R&D effort
2. Phase II: Continue a completed Phase I effort
3. Phase III: Initiative based on a prior SBIR/STTR effort, but is not funded by SBIR/STTR

Pitch Days

Pitch days allow a business to make a sales pitch and walk out of the event with a contract and funding. Standard acquisitions frequently cause defense contractors who were awarded a contract to do a lot of initial work using their overhead while waiting for government funding to arrive. This model does not work for most small businesses, such as the high-tech start-up industry because they need the funding to start the work since they frequently do not have a lot of capital to work for the government for free with the promise of money later. “Traditionally, service officials provided the outlines of their objectives at [Industry Day] events, which were followed by a series of meetings, draft requests for proposals, comments, and revisions, often lasting years before bids and selection.”¹⁶ While pitch days thus far have primarily focused on small businesses, there is potential to expand efforts to larger acquisition activities. Below are examples of recent Pitch Days that awarded over 100 contracts on-site at the events:¹⁷

1. March 2019-AF Pitch Day (SBIR Phase 1) [417 Phase I applications; 51 Contracts @ \$8.75M]
2. Nov 2019-Space Pitch Day (SBIR Phase II) [30 contracts @ \$22.5M (\$750K each)]
3. Nov 2019-Hypersonics Pitch Day (SBIR Phase II) [7 contracts @ 5.2M]
4. Nov 2019-LCMC Pitch Day (SBIR Phase II & CSOs) [17 SBIR contracts @ \$14.6M & 6 CSO contracts @ \$865K]

Pitch Days have demonstrated a method to rapidly start projects that can bloom into future capabilities. Having multiple initiatives in the works is vital because invariably some things will fail and some will succeed, and even just a few good wins can be the difference between winning and losing a conflict. Furthermore, these initiatives have proven the Department of Defense initiatives can attract private investments that effectively increase the research and development budget through matching investment funds. “The USAF has developed the capability to leverage the \$350B in private R&D funds to deliver our capabilities at a reduced cost to the taxpayer, reduced technical risk to the AQ community and faster to the warfighter. Using the pitch day model - we have shown that the private sector will provide significant matching funds (\$1B+) if we set aside funds to match them.”¹⁸

Acquisition Initiatives

Aside from exercising existing authorities and programs that have historically been underutilized, a plethora of newer initiatives have also been initiated.

Section 804 Authority Programs

The 2016 National Defense Authorization Act, section 804, established the middle tier acquisitions category consisting of rapid prototyping and rapid fielding programs. The target duration for these programs is between two to five years. The largest benefit of this type of program is it removes the specific requirements applied to major defense acquisition programs, such as applying the DoD Instruction 5000 and everything that entails. What this allows for is a greater level of tailoring and milestone decision authorities to approve what is minimally necessary instead of having no choice but to require all aspects of normal programs even when it is wasteful for the specific effort.

Section 804 allows the Air Force to “Begin prototyping ... nearly a year and a half earlier than under the old system,” Roper and then-Undersecretary Matt Donovan wrote in *Defense News* in August 2019. The new authorities also “give engineers more time for testing and troubleshooting, and keep flawed concepts from entering production and operations—a whopping 70 percent of a program’s total cost.” [...] The Air Force said it had taken three years out of a program to reengineer the B-52 bomber and two years out of an F-22 upgrade plan. Service leaders also claimed a five-year reduction in two hypersonic missile programs.¹⁹

The concern is that higher levels of the bureaucracy will feel threatened by the flexibility these programs legally have and will apply wasteful layers of oversight and requirements that will invalidate the entire purpose of this program designation. Forced requirements for section 804 programs above the legal requirements and above the service level should be fought against with a fever and zeal that borders insubordination.

AFWERX

The AFWERX initiative pulls together the defense industrial base, academia, small businesses, venture capital, and other non-traditional contributors to leverage and accelerate innovative opportunities to revolutionize military capability. “Air Force Secretary Heather Wilson announced the launch of AFwerX July 21, 2017.”²⁰ This effort is a paradigm change since historically most projects needed a very specific purpose upfront to receive funding. “In the past, none of our acquisition efforts focused on opportunities. If an opportunity presented itself, the response was ‘I don’t have a requirement for that’ and the opportunity would usually be missed.”²¹

This initiative acts as an umbrella activity to coordinate other innovative efforts:

The Air Force launched “AFWERX” in 2017 as an umbrella organization that would engage industry, small business, academia, and Airmen to seek out new technologies, mainly those already in commercial service, that could be adapted to provide new combat power. One of its objectives is to “quickly identify, validate, acquire, and integrate” new technologies, products, and solutions. [...] Efforts pair entrepreneurs with Airmen and/or academics to explore new solutions to operational challenges. Among the AFWERX enterprises is “Air Force Ventures,” which seeks private capital to invest in technical solutions, placing bets on ideas’

potential. [...] The intent is to identify opportunities, explore them, and determine their viability as fast as possible.²²

The effort seeks to grow an ecosystem of military and industry partners to foster a synergistic foundation moving forward to avoid the stagnation that has encroached into the traditional acquisition system.

Air Force Ventures

One of the major efforts that falls under the AFWERX umbrella is Air Force Ventures. The organization is a joint endeavor between the service's Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Program, Air Force's in-house innovation incubator AFWERX, and Air Force Acquisitions. [...] The service intends to divvy up almost \$1 billion in contracts among "more than 550 small businesses."²³ The primary focus is to utilize research and development funding to attract investments from commercial partners to effectively increase the overall budget that is driving towards capabilities useful for the military. The "2016 R&D Funding: \$300B Private, \$60B DoD", reveals that the Air Force must leverage the commercial investments to provide a better chance of maintaining a technological edge and this "is how we counter China's civil-military fusion model and win on the innovation battlefield."²⁴ The below chart provides data from SBIR Phase III funding for using a fund match system between the SBIR program, system program offices, and private investments to create a funding synergy that catapults research and development beyond what the traditional approach is capable of:

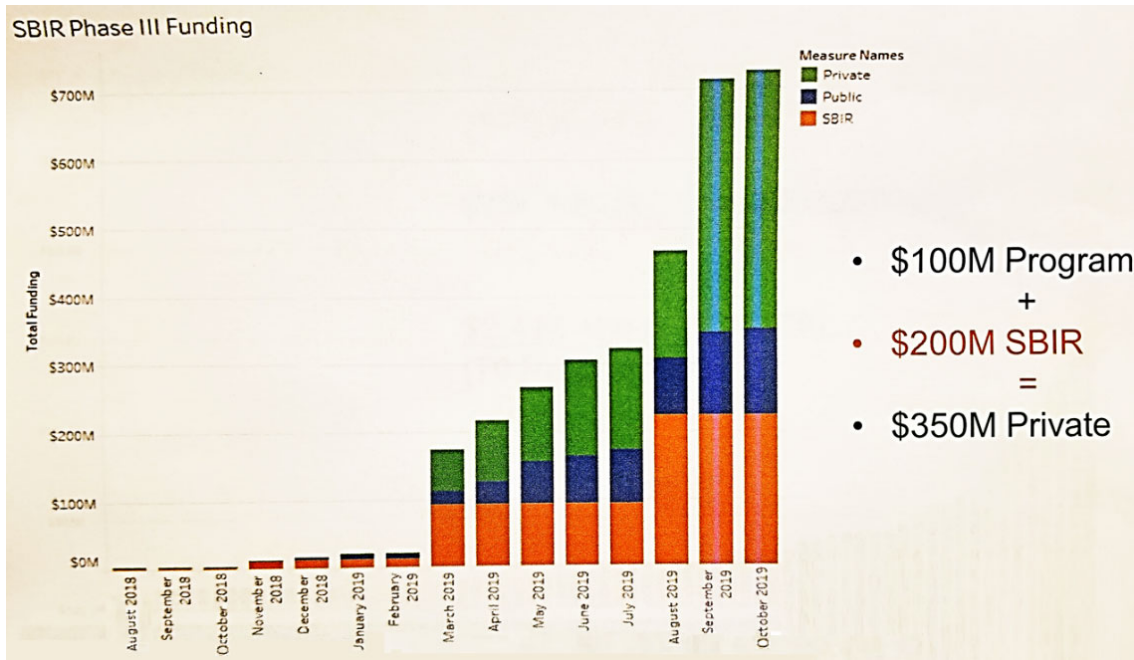


Figure 5. Leveraging Private Investment²⁵

The fund matching approach spreads defense dollars further across a larger base of industry partners. However, defense funds are viewed differently depending on who is asked. The CEO of a simulation software company stated: “Defense revenue is frequently frowned upon for Venture Capital businesses. Working with the government is seen as a sacrifice for the greater good as opposed to being a good decision for the business.”²⁶ Counter to this statement, a high-level Air Force acquisition leader stated: “We are finding that companies with DoD Funds in their company’s budget helps the business attract investors because it develops better diversification; the government is seen as a good bill payer, which can be a problem in industry-to-industry work.”²⁷ Based on these conflicting statements, it appears the Air Force views government funds as a good investment, while some companies have not yet been sold on the idea. If the current trend continues, the Department of Defense may be able to steer the commercial sector in a way that is beneficial to both communities instead of maintaining the ever-increasing divide between the military and the rapidly evolving tech industry.

Moving forward, we need more structure for public/private partnerships and to focus on technology that helps our industry base, in which only 20% is hardware. It is bad that we let private industry progress without a partnership from the DoD, which has left us out of global tech trends. If industry does not use the DoD as a catalyst, the private sector will evolve without any influence from the DoD. Furthermore, we need to work towards private investments in normal acquisition programs as well.²⁸

Platform One and Organic Software Factories

Platform One, under the Office of the Chief Software Officer, is a coordinating operation that provides platform support to developers in Air Force software factories such as Kessel Run, Kobayashi Maru, SoniKube, Ski CAMP, Rogue Blue, Blue Sky, Thunder Camp, BESPIN, TRON, Mad Hatter, Corsair Ranch, Space Camp, etc. to bring software development capability directly into the Air Force. These software factories can then focus on mission-oriented development to provide warfighters with new or improved capabilities. The first of these teams was Kessel Run “whose motto is ‘continuous delivery, continuous feedback, continuous learning.’”²⁹ A key purpose is to provide capability to warfighters that already exists in the commercial sector. “This is today’s technology, so the fact that we will think of this as innovation in the Air Force when its technology we all enjoy when we go home means we need to reboot ourselves.”³⁰ The Department of Defense has slowly iterated its way through acquisitions to the point that it is far removed from modern technology and this activity helps correct the course.

Kessel Run hopes to change how the Air Force, and by extension the Department of Defense, develop and deliver software that adopts the best practices from industry. But one way the Defense Department hopes to accomplish its goals is to further immerse itself in startup culture. [...] “You can’t ask people to hey come and take a \$30,000 pay cut also it’s going to be a bad environment and you’re not going to be happy here.” [...] From a software perspective many Defense Department staffers don’t understand that software is continuously iterated. [...] “Software is never done and that’s a concept that’s very different from the way we traditionally do things in the DoD.” [...] Most of the products surround applications that are built around optimizing for planning.³¹

These effort focuses on iterative and agile software development and also partners with defense contractors as needed. Software coders include contracted support and direct government employees. This initiative is helping address the issues with the traditional process for a system's software. Due to federal regulations, anytime a large portion of code needed to be updated, the entire bid, design, build, test, field process had to be followed, which in traditional acquisitions comes with a large amount of red tape, instead of maintaining an open avenue to continuously be able to patch the software as is done with practically every other software package created outside of the Department of Defense.

Defense Innovation Unit and Defense Digital Service

The Defense Innovation Unit (DIU), formerly the Defense Innovation Unit-Experimental (DIU-X), and the Defense Digital Service (DDS) were created in 2015 by Secretary of Defense Ash Carter. These initiatives are intended to foster leverage commercial technologies that can be useful for the military. The organizations consist of military, civilian, and contract support.

DIU is an organization created to rapidly convert emerging technologies of the commercial sector into military capability through rapid prototyping and rapid fielding. "DIU is the only Department of Defense organization focused exclusively on fielding and scaling commercial technology across the U.S. military to help solve critical problems."³² The aim is to award contracts within 60-90 days using other transactional authority, whereas traditional defense contracts frequently take years to definitize.

DDS is an organization that focuses on "initiatives that are critical to the well-being of service members, civilians, and core operations of the Department."³³ For example, DDS established the "Hack the Pentagon" program to offer private hackers a reward for discovering vulnerabilities and

overhauled the Defense Personal Property Program (DP3) used during service member's relocations. DDS is staffed by a team of military, civilian, and contractor support.

Decoupled Production and Digital Engineering

A major cause of the reduction of businesses operating in the defense industrial base is due to the typical requirement for the prime contractor for a new system to be responsible for the development and production of the system.

Historically we have been a big production and sustainment house and required defense contractors to be heavily into production and support, which has created the collapse in the defense industry because in order to be competitive a company basically needs 500 different product lines. With digital design capabilities, we can decouple design and production. For example, Tesla's production is nowhere near as cheap and has nowhere near the capacity of Toyota, but they have great designers who have been able to turn the automotive industry on its head with their innovative approach. We need our acquisition process to allow for a company like Tesla to design a system and a company like Toyota to produce it.³⁴

If the Department of Defense instead leverages the growing field of Digital Engineering, it will allow design and production to be separate activities allowing an innovative design team to develop a system without that company needing to heavily invest in high-capacity production factories that require is much different business model. "Digital engineering is the art of creating, capturing and integrating data using a digital skillset. From drawings to simulations and 3D models, engineers are increasingly using advanced technologies to capture data and craft design in a digitized environment. Through progressive applications, the art of digital engineering enables designers to explore possibilities and develop innovative solutions in a virtual environment. [...] Once the design is finished, the digital information can be utilized by the construction and operations teams."³⁵ The Air Force is investigating this decoupling that may allow more non-traditional businesses to begin supporting the development of defense capabilities.

Protecting Critical Technology Task Force

On 24 October 2018, Secretary of Defense James Mattis issued a memorandum establishing the Protecting Critical Technology Task Force. The memo states that “it is estimated that American industry loses more than \$600 billion dollars to theft and expropriation, [...] eroding the lethality and survivability of our forces.”³⁶ Air Force Major General Thomas E. Murphy was placed in command of the task force with a mission to put a stop to the acquisition of United States technology and intellectual property. During an Association of the U.S. Army forum on Russia and China event, Major General Murphy stated:

The loss of technology to strategic competitors has a direct effect on the joint force's lethality. And while those technology transfers — some legal and some not quite — are almost always unwanted, they've certainly been enabled by a lack of U.S. attention on stopping them [...]. We are in a competition [...]. China and the others are stealing our stuff, and it is causing the erosion of the lethality of the joint force. China, in particular, is employing a comprehensive national strategy to acquire critical U.S. technologies through both licit and illicit methods [...]. China devotes significant resources at a national level to infiltrate our universities and our labs [...]. They are doing it for a reason. They've even coined the phrase ... 'Picking flowers in the U.S. to make honey in China,' which I would say perfectly illustrates their deliberate plan to steal R&D, know-how and technology to advance their military capability. They are not even hiding it.³⁷

The compelling reason for improving the speed of the acquisition process due to the rapidly-evolving capabilities of competing nations is largely due to the vulnerabilities this task force is specifically charged to address. Most companies do not have adequate cyber-security protections in place to keep competitors from infiltrating their networks and acquiring company information. The inability to protect data includes classified information from the defense industry.

CFIUS Critical Technology Pilot Program

The Committee on Foreign Investments (CFIUS) was established in 1975 to assess the risks to national security for foreign investments in United States businesses. “CFIUS' primary concern in most reviews is that technology or funds from an acquired U.S. business might be transferred

to a sanctioned country as a result of being acquired by a foreign acquirer.”³⁸ The Critical Technology Pilot Program under CFIUS was established on 10 November 2018 providing special authorities for addressing foreign investments through the signing of the Foreign Investment Risk Review Modernization Act (FIRRMA). Key provisions of FIRRMA: adds four new covered transaction types, created an abbreviated filing process, increased the review timeline, enhanced mitigation agreement requirements, granted special hiring authority, and established a fund for filing fee collection.³⁹ In combination with the Protecting Technology Task Force, the additional scrutiny of foreign actions that can impact national security through acquisition of data from United States businesses will help reduce or prevent the continuing of the current trend that negatively impacts the military’s survivability and lethality.

Notes

- ¹ (Military Officer-Joint Staff 2019)
- ² (Tirpak 2020)
- ³ (Military Officer-NATO Staff 2019)
- ⁴ (Pope 2019)
- ⁵ (W. Roper 2019)
- ⁶ (Tirpak 2020)
- ⁷ (Holt, Air Force Contracting Flight Plan: Mission-Focused Business Leadership n.d.)
- ⁸ (Holt 2019)
- ⁹ (Headquarters Air Force Acquisition Leader-5 2020)
- ¹⁰ (Holt 2019)
- ¹¹ (Headquarters Air Force Acquisition Leader-2 2020)
- ¹² (OSD Official 2019)
- ¹³ (Tirpak 2020)
- ¹⁴ (Headquarters Air Force Acquisition Leader-2 2020)
- ¹⁵ (How to Participate in DARPA’s SBIR and STTR Programs n.d.)
- ¹⁶ (Tirpak 2020)
- ¹⁷ (Holt 2019)
- ¹⁸ (W. Roper 2019)
- ¹⁹ (Tirpak 2020)
- ²⁰ (U.S. Air Force 2017)
- ²¹ (Headquarters Air Force Acquisition Leader-4 2020)
- ²² (Tirpak 2020)

Notes

- ²³ (Oprihory 2020)
- ²⁴ (Roper 2019)
- ²⁵ (Roper 2019)
- ²⁶ (Simulation Software Company CEO 2019)
- ²⁷ (Headquarters Air Force Acquisition Leader-3 2020)
- ²⁸ (Headquarters Air Force Acquisition Leader-4 2020)
- ²⁹ (Tirpak 2020)
- ³⁰ (Insinna 2019)
- ³¹ (Pomerleau 2019)
- ³² (Accelerating Commercial Technology for National Security n.d.)
- ³³ (Solving mission-critical problems within the Department of Defense n.d.)
- ³⁴ (Headquarters Air Force Acquisition Leader-4 2020)
- ³⁵ (What is digital engineering? 2020)
- ³⁶ (Mattis 2018)
- ³⁷ (Lopez 2019)
- ³⁸ (Committee on Foreign Investment in the United States 2018)
- ³⁹ (Summary of the Foreign Investment Risk Review Modernization Act of 2018 n.d.)



Chapter 4

Barriers to Efficient Acquisitions

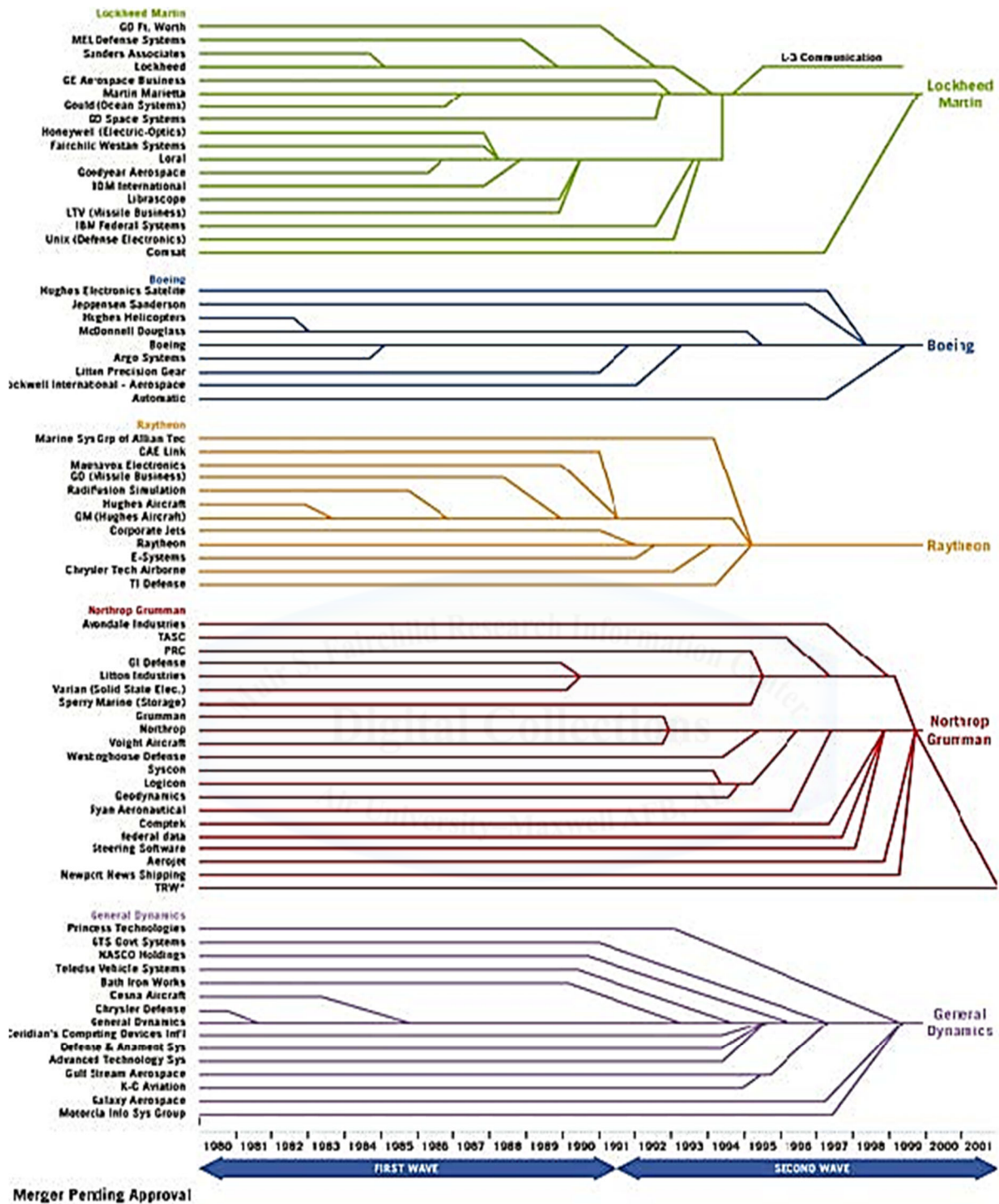
The bullshit to work ratio makes working with the military undesirable.

—Unattributed¹

Due to the traditional acquisition process, industry finds working with the government to be extremely challenging when compared to commercial business practices. The smaller the business, the more daunting the task becomes for having the capability to understand all the nuances required by a government contract. "Generic startups don't jump in and work with the government, it is a big multi-year commitment that comes with specific requirements and long-term implications for the company."²

Shrinking Defense Industrial Base

In the past, a large number of businesses worked with the government. Today, the majority of defense contracts only go to five major companies: Lockheed Martin, Boeing, Raytheon, Northrop Grumman, and General Dynamics (see Figure 6). A host of reasons have played into the constriction of the industrial base that has occurred in the United States.



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FINAL REPORT OF THE COMMISSION ON THE FUTURE OF THE UNITED STATES AEROSPACE INDUSTRY

Figure 6. Defense Industrial Base Contraction³

“A key element in the defense acquisition process is maintaining a healthy supplier base. [...] Suppliers are in business to make money and if commercial opportunities are more attractive than what the Department of Defense (DoD) offers, suppliers will move toward the commercial opportunities, leaving DoD with fewer alternate suppliers and longer supply chains.”⁴ Unfortunately, this is exactly what has happened in the United States. Through acquisitions, mergers, suppliers going out of business, or suppliers leaving the defense sector, the defense industrial base has reduced to just a handful of companies. Aside from limiting competition, the remaining primary defense contractors have learned from the government to be extremely risk-averse, which is stifling to innovation and rapid acquisition initiatives. A tech company President recently stated:

Small companies are better at being an innovation engine. At least historically in big companies, a good idea has to make it through the business bureaucracy structure. Commonly great, but risky, ideas get squashed where a small company would have moved forward. Government program offices face the same problem when trying to be innovative. These large bureaucratic companies are who the government primarily works with and will likely cause a future loss of battlefield advantage.⁵

Public Perceptions

An issue interrupting the ability of the government to work with companies, especially in high-tech fields, is resistance from employees of those companies. Google, Microsoft, Amazon, and many other high-tech companies have faced backlash from their employees over company decisions to work with the Department of Defense. For example, in 2018 when Google disclosed they had a contract with the Department of Defense for Project Maven to work on artificial intelligence capabilities for drone targeting systems, it “sparked immediate protest, with several employees resigning and thousands more signing a petition sharply condemning the company.”⁶ Due to the employee protests, Google decided not to continue working with the Department of

Defense on the project. Some individuals, such as Amazon CEO Jeff Bezos, have been outspoken about the state of affairs:

“One of the things that’s happening inside of technology companies is there are groups of employees who, for example, think technology companies should not work with the Department of Defense,” Jeff Bezos said Saturday at the Reagan National Defense Forum. “People are entitled to their opinions, but it is the job of a senior leadership team to say no,” he said. [...] Bezos was alluding to Google employees who persuaded the company to stop supplying the military with algorithms to identify objects in battlefield drones. [...] Bezos is hardly alone in his criticism of Silicon Valley, which the Defense Department has been wooing as it looks for a technological leg up over China and Russia.⁷

This comes at a time when the divide between the military services and the general public has steadily increased for decades. “In the WW2 Congress, 80% of congressmen were veterans, we are at 12% in congress today; 20% of the American people were in uniform, now only 1% are in uniform.”⁸ The Air Force needs to find the right messaging to help the public understand the synergistic benefits of government-industry partnerships and not rely on the hope that business leaders alone will drive change. Naturally, this is a difficult challenge because it is a whole of nation issue targeting a culture shift as opposed to a discrete problem with a clear solution.

Abnormal Business Processes

In industry, when one company wants to work with another company, they have no need to go out and hire a third-party company to teach them how to work with the specific company they are trying to work with or hire a bunch of people from the target company first. However, because working with the government is so convoluted, this is exactly what is happening with companies trying to work with the Department of Defense. For example, the company Dcode provides training to other companies to teach them how to work with the government and help prepare them for complications they will likely experience. The DoD acquisition system “now requires specialized knowledge, skills and abilities in contracting and pricing that take years to master.”⁹

While the process for working with the Department of Defense can be complicated for little to no benefit that does not benefit the company's commercial business, such as the Department of Defense-only cost accounting system, China is much easier to work with and results in profitable business. The Undersecretary of Defense for Acquisition and Sustainment, Ellen Lord, stated, "we are trying to decompose acquisition so it's very intuitive to anybody who wants to do business with the Department of Defense."¹⁰ Table 1 provides a snapshot of how many industry companies view working with the government compared to working with commercial businesses:

Table 1. Industry View of Working with Government Versus Private Sector¹¹

View of Government Work	View of Commercial Work
Long procurement lead times with little sense of urgency. No actionable metric measuring time from proposal acceptance to contract award.	Response to market signals is a key to profitability. If one company can't deliver, another one will.
Excessive regulatory compliance burden: CAS, TINA, FAR, DFAR, ITAR, Title 10, NDAA requirements, etc. Creates confusion, generates process delay, increases program complexity, and adds cost.	Commercial rules and regulations are fewer, less stringent and change less often.
Negative view of contractor profit coupled with regulatory controls. Often appears that government would accept a higher price if contractor profit is measurably lower.	Profit is the life blood of commercial industry. No profit, no business.
Rigid, risk averse acquisition culture. Too many people with the ability to say "no," but with little responsibility for program success.	CEOs and PMs empowered to make the necessary approvals to speed the process. Risk has a price, but real progress is dependent on the intelligent acceptance of risk.
Competing socioeconomic goals impede the efficiency of the acquisition process. Too many priorities.	Socio-economic factors considered, but not first priority.
Lack of peacetime measure of effectiveness for DoD acquisition process and DoD in general. Hard to measure deterrence until it fails. Money saved goes back to the Treasury.	Any number of business metrics to measure health of the corporation, internally and against competitors.
Lack of clarity on identity of real customer: Warfighter, program manager (PM), or the contracting officer?	After all is said and done, negotiations and contract signing are done with the contracting officer.
Competition for the sake of competition.	Competition is good and can drive down costs, but sometimes has the opposite effect, if applied blindly.
Lots of talk about "should cost" and best value, but too many contracts awarded on the basis of LPTA.	LPTA is a "race to the bottom."
Aggressive and/or rigid DCMA and DCAA actions without commensurate knowledge of the program acquisition strategy and objectives.	No commercial equivalent.

Long procurement lead times, excessive regulatory burden, risk-averse culture, competing goals, lack of clarity, aggressive/rigid contract oversight without proper program knowledge, etc.

are examples of working with the government that can delay a program mostly caused by inefficient bureaucratic constructs that are largely absent in the commercial sector. Program delays add cost to any program and frustrate prime and subcontractors with no overall benefit to the acquisition effort itself. One of the many mistakes driving these issues is the Department of Defense has tried to make businesses work with the government, but instead, the government should figure out how to work with the commercial sector instead, which is what some of the new initiatives are investigating. “Historically we have been trying to push commercial into defense, but we find we need to push defense into commercial instead.”¹²

Additionally, the bidding process is stringent and burdensome which in no way reflects how real businesses collaborate. As stated by a manager from a tech company: "If the challenge is presented in a way that we are used to doing business, such as timely contracting, hack-a-thon, etc., it may get our attention, but if it is a 100-page proposal with extremely prescriptive response requirements, we aren't going to want to get involved."¹³ General John E. Hyten, Vice Chairman of the Joint Chiefs of Staff, stated “the JROC requirements process has to be changed to allow rapid software development, he said. The JROC is an industrial age model, not an information age model. We have to change it.”¹⁴ The traditional system rewards companies that know how to play the game and not necessarily the one that has the better solution:

Industry bidding on a project commonly gets pushed to bid a price that can win the contract, so they can be the ones paid to fix it later, to fit inside the known available funds instead of providing realistic cost estimates; when both a bottoms-up and a top-down estimate doesn't fit the available budget for what is being asked for, industry starts looking for what items can be cut; to get to affordable, there usually isn't a silver bullet either; instead of finding a handful of items to cut to get to affordable, it would be thousands of things for a complex system.¹⁵

Security

If there is one area that rises to the top of the issues for inefficiency and working with the government, the closest to a “smoking gun” is security. While having adequate security controls is challenging and an ongoing iterative function that must be a balance between allowing work to move forward and protecting the information, the security structure that exists today is an impediment. One of the main challenges for tackling this massive problem is that security for the government is owned by a separate department and the Air Force cannot individually overhaul the entire federal security system, which is what is needed. A program can only go as fast as its slowest process and security processes are the backbone of slowing every aspect of the entire acquisition process down. The security system is not set up with a readiness or mission-oriented approach, it is instead a series of hurdles that are much better at screeching rapid process to a crawl and tripping up the domestic workforce than it is at protecting information from getting into the hands of adversaries.

Security Clearance Timelines

A large portion of Department of Defense contracts require a security clearance of some level. Getting everyone cleared that a company needs working on a particular project takes years. Worse, the company is unlikely to win a bid for a contract if the company is not already staffed with employees that already have the appropriate clearances and getting clearances without an already established program the company is working on is not easy either. The primary method for a company to establish a cleared workforce is to hire individuals that already have a clearance, either from another defense contractor or those that have recently separated from government service that still has an active clearance. With this in mind, it is no surprise that the defense industry has shrunk to just a handful of companies.

Security Overclassification

Hand-in-hand with the need for security clearances is overclassification of information. From an interview with General John E. Hyten, Vice Chairman of the Joint Chiefs of Staff:

‘In many cases in the department, we’re just so overclassified it’s ridiculous, just unbelievably ridiculous,’ Hyten told the audience at an Air Force Association event. To underline his point, Hyten said when he was head of U.S. Strategic Command, he invited Adm. Harry Harris, then the head of U.S. Pacific Command, to a briefing — one so classified that their deputy commanders, both three-star officers, were not allowed to attend. ‘If the only people in the room are four-stars, you really can’t get any work done,’ he noted. [...] At December’s Reagan Defense Forum, Air Force Secretary Barbara Barrett said she will look into declassifying some space programs, stating that ‘there is much more classified than what needs to be.’¹⁶

The definitions for varying levels of classification are one of the leading causes of overclassification and should be overhauled. When applying the definitions, a case can be made for a legitimate need to classify most things or cause classification by conglomeration, which is just as bad from the logistics of data handling. Typically, draft classification documents are put together at a much lower level and the actual classifying authorities that sign the documents into legitimacy have less specific knowledge of the systems and approve the bulk of classification documents that come to them with little change.

Classification is not a science. The 2,000-plus officials who are authorized to make initial classification decisions exercise their individual judgments as to whether disclosure would harm national security. [...] Given the subjectivity of the analysis, agencies frequently come to different conclusions about the sensitivity of the same piece of information. [...] Officials encounter multiple incentives to err liberally on the side of classification. It is easier and safer for busy, risk-averse national-security officials to make classification the default. Current and former government officials have estimated that 50 to 90 percent of classified documents could safely be released. [...] When so much information is needlessly classified, many officials cut corners for the sake of efficiency, sidestepping the complex and cumbersome procedures for handling classified information. Others simply lose respect for the system and become careless.¹⁷

Information at a higher classification level limits the workforce that can support a project, slows down the transfer of information which is critical for collaboration, and even causes work

to be accomplished in environments that commonly have less efficient workspaces and supplies that become an impediment to accomplishing the mission. In addition, when unable to share the information, it restricts the capability to get buy-in from Congress or the public for resources to be utilized for the program since it can become impossible to fully explain the purpose.

Cybersecurity vs. Inadequate Software Tools

The process to approve new or updated software to be loaded on government systems and networks takes too long, leaving the Department of Defense primarily using outdated software. This becomes an even bigger issue when trying to work with companies that are structured around newer software tools that are not yet approved for use on defense programs or are not allowed to be custom configurable. This statement from a defense industry CEO highlights the issue:

Based on the security approval process for software, it requires industry working with the government to use outdated tools with limited ability to adjust or upgrade the tools for how they are being used. This stifles innovation and interaction with the government. If a company can't perform the way they would do for the private sector and have to restructure the business to relearn and use obsolete and unconfigurable software development tools, there is little incentive to take a contract, the effort sets us back for our commercial work. The government has to adopt a process for rapid implementation of new software. Commercial companies can deliver new functions to their office within hours, whereas a fast-moving Gov office might need 6 months and 12 meetings to get there.¹⁸

If the process does not go slow enough to ensure proper cybersecurity protections are in place, the information is basically being given away to competitor nations. However, the commercial sector commonly delivers software within 90 days whereas the Department of Defense is lucky if new software for a system comes out as fast as two years. The current process practically guarantees obsolete software, so a middle ground timeline needs to be developed.

IT Security Architecture

The government's IT architecture is so secure that government offices can barely communicate with each other. Hackers seem to have an easier time getting information from the system than individuals attempting to collaborate on a project. For unclassified email, the encryption capability is disjointed. A large portion of communication-related to an acquisition program is For Official Use Only, which is required to be sent encrypted. However, there is not a simple way to encrypt email to support contractors because it requires the contractor to be given a government Common Access Card (CAC) and a government email account. The Air Force's webmail has issues with encryption capability and emails between federal government agencies is frequently incompatible. The incompatibility commonly drives messages to be improperly sent unencrypted. Another issue with Air Force email encryption is in an attempt to lock-down the requirement to protect PII, the system frequently flags conference line access numbers as PII and does not allow the user to override it, which is an issue when recipients of the meeting are unable to receive encrypted emails due to lack of compatibility. A work-around large defense contractors have employed is to hose unclassified information on a web-access portal, leaving the contractor in charge of both company and government information database that resides outside of the government domain.

There are additional issues on classified networks. Aside from most secure offices having a limited number of computer stations to use that are commonly set up as sharable "hot desks" that limit how many people can do work at once, there are numerous networks even at the same classification level, all with their own different requirements. These various secure networks have compatibility issues. In addition, due to the standards, multiple defense contractors have their own proprietary classified networks.

The plethora of classified networks commonly causes the main method to transmit data to be limited to email size capacity since one cannot access the cloud storage of a different network when not on that network. Sharepoint and similar web storage are used, but they are difficult and time-consuming to set up, maintain, and they do not work for transmitting large amounts of data. The main method still required today is to send top secret hard drives through the postal service, which is much less secure than if the government were to properly set up a collaborative classified IT architecture.

Government email is not very mobile to the majority of the workforce. Commonly it is only command-level personnel that receive government-issued mobile devices. The bulk of the Department of Defense operates as if it were still 1997 when it comes to email, data, and network management. Aside from the encryption issue, the Air Force webmail system frequently has other broken features as well, aside from the entire network frequently being down.

Notes

¹ (Tech Company Consultant 2019)

² (AI-Data Analytics Company CTO 2019)

³ (Diaz 2020)

⁴ (Diaz 2020)

⁵ (AI-M&S-Data Company President 2019)

⁶ (Fang 2019)

⁷ (Weisgerber 2019)

⁸ (Defense Department Analyst 2019)

⁹ (Holt, Air Force Contracting Flight Plan: Mission-Focused Business Leadership n.d.)

¹⁰ (Tirpak 2020)

¹¹ (Diaz 2020)

¹² (Headquarters Air Force Acquisition Leader-2 2020)

¹³ (Tech Company Manager 2019)

¹⁴ (Hitchens 2020)

¹⁵ (Headquarters Air Force Acquisition Leader-2 2020)

¹⁶ (Mehta 2020)

¹⁷ (Goitein 2016)

¹⁸ (Defense Aerospace Company CEO 2019)

Chapter 5

Conclusion and Recommendations

The country needs and, unless I mistake its temper, the country demands bold, persistent experimentation. It is common sense to take a method and try it: If it fails, admit it frankly and try another. But above all, try something.

—Franklin D. Roosevelt¹

Improving the efficiency of the acquisition process must be a continuous and iterative activity. “Speed matters in an era of reemerged great power competition.”² While numerous initiatives are in work to improve the speed of acquisitions, there are many other areas that can be improved upon. Aside from continuing current acquisition improvement initiatives, below are additional recommendations to consider as possible next steps to continue driving to an acquisition system that can stand up to competition and improve the survivability and lethality of the Air Force.

Contracting

Program offices should have a rapid contract capability already setup that can be rapidly activated for unplanned work needed for the mission. Similar to generic study contract line item numbers build into many contracts, full contracts that are generic and “umbrella” in nature connected to a particular program element would be useful for initiating previously unplanned

work quickly. Short streamlined contracts such as used for Pitch Days could be used for this as well.

Manpower

It would be useful to have Space Combat Developers similar to Air Combat Command combat developers that have been invaluable in acquisitions for aircraft and aircrew systems.

Direct administrative support is needed for acquisition branch chiefs. Squadron Commanders in flight test have had a deputy commander, a secretary, an executive officer, and a special programs coordinator, whereas the same size and equivalent command positions in acquisitions commonly do not have any of this support, especially in space acquisitions. This is how morale and welfare are thrown out the window due to unequal support for branch chiefs.

Casual status government civilians can be used to increase continuity. Some civilian organizations, such as the Aerospace Federally Funded Research and Development Center, has an hour-restricted casual status option for retiring Aerospace employees where they have an option to provide support in a limited capacity instead of an all-or-nothing approach to ending employment.

New efforts need a more efficient way to quickly add staff. Currently, a new rapid initiative has to carve personnel from local programs and wait for the next move cycle. Commonly to fully staff a new project it takes a few move cycles to accomplish, meaning it can take a year or two just to get minimum staffing level to even start decently moving forward on the effort or productivity on other programs has to be cut due to loss of personnel to the new effort.

Military service should have a process to pause service or separate, then more easily return. The leave once and never return approach doesn't allow flexibility for special family situations and currently causes the loss of the service member.

Programs need to be balanced with available staff. Most programs appear to not have enough capacity and make up the difference by overworking personnel. If the Air Force cannot get enough personnel, then the answer is to cut programs until which time more personnel are approved.

Funding

Structure program elements to be at the Program Executive Officer portfolio level or higher for better funding flexibility. “Industry can move faster than the government because they aren't restricted to moving money around in their business.”³

Expand funds matching/private investment to standard acquisition programs in addition to small efforts such as SBIR/STTR.

Programs should not have the following year's funding levels cut due to efficient spending in the current year. It effectively punishes the efficient management of funds and incentivizes wasting money to maintain future funding levels.

Program Initiation

“The law says you can't stand up a new organization unless you show it saves dollars or people.”⁴ Since the United States has entered a period of great power competition, a law that requires money to be saved for a new organization to be created is counter to developing strategies and pursuing new initiatives to counter and progress beyond competing nations. This should be pushed against.

Requirement documents need to transition into problem documents. The traditional requirements documents are too prescriptive and more commonly provide pre-decided solutions instead of the actual problem needing to be solved. In traditional acquisitions, contractors find that some needless requirements are faster and cheaper to just build in versus trying to go through the process to have the requirement changed. Co-creation solutions developed in partnership with

industry is a better approach than the government coming up with solutions and leaving no creativity trade space for developers. Problem statements should be the primary portion for bids as opposed to large proposal requests that drive non-traditional businesses away. There are numerous new acquisition initiatives focusing on working with small innovative businesses, but those companies have fewer resources to bury themselves in long lists of outdated military specifications and standards that are not written with industry interests in mind and can inadvertently preclude viable innovative solutions to the actual problem.

Working with the government needs to function in a way that is not foreign to commercial businesses to better attract non-traditional sources and grow the defense industrial base, especially for high-tech companies.

Security & IT Architecture

Separate classified issues/programs to have more stand-alone portions that can be solved in a vacuum in an unclassified environment to integrate back to the larger classified system.

Develop new definitions for classification levels. The current definitions are a driving factor in the wide-spread overclassification.

Security clearances special programs and compartments access should follow the individual similar to their basic clearance level regardless of their organization and be tracked by a centralized source. It should just be part of the individual's clearance. A lot of time is wasted reading people out and back into these special categories. Signing a piece of paper that the individual will no longer talk about it is not an adequate trade for the time required to read someone back in when they already know the information. Currently, every Permanent Change of Station, or every contract change for a support contractor, can cause these special access categories to get rebooted and with the backlogs for in-briefs it impedes work for months. For example, unless the individual

is a general officer level or in a special status such as in student status, special compartmented information will not transfer with the member to an assignment at the Pentagon, even if their new job requires that same access. Reading someone out of these categories in no way helps protect the information.

CACs for support contractors should last longer than the end date on a contract. There are numerous examples of a support contract ending and the same company having been awarded the follow-on contract, but the team of hundreds of contractors have to turn in their cards on Friday, then come in Monday morning to wait in line to try to get a new CAC, with many taking over a week to get the new card due to the crowd, and not being able to do work until the new card was acquired for the new contract. This is a blatant waste of time and money.

High-capacity data transfer and storage methods should be easily available within each classification. The majority of units just say removable USB storage devices cannot be used, but a process does exist to clear them for use, and a rare few organizations do utilize the process to allow government-approved removable hard drives are available for use with government computers. Classified and unclassified networks need to be setup as a collaborative environment within their applicable classification level.

The international community needs to collectively enforce international intellectual property rules on China and regain access to strategic supply lines currently dominated by China.

Informational Instrument of Power

The Air Force, and the Department of Defense as a whole, is failing with respect to the exploitation of information and should consider a campaign of strategic messaging as a show of force by revealing specific capabilities for deterrence. On one hand “overclassification is one of the reasons it’s been so difficult [...] to build support both in the public and with other members

of Congress for a Space Force. [...] Once Americans have access to that currently classified data, they will throw their support behind a Space Force. The lack of an understanding really does hurt us in doing things that we need to do.”⁵ Overclassification restricts the ability to release information. The United States cannot deter in the black and is failing at utilizing the information instrument of power to its full potential. Deterrence is about imposing a cost on an adversary and forcing them to decide if actions they may take are worth the cost.

Notes

¹ (Roosevelt 1932)

² (Tirpak 2020)

³ (Headquarters Air Force Acquisition Leader-2 2020)

⁴ (Defense Department Analyst 2019)

⁵ (Strout 2019)



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