



July 2017

MILITARY ACQUISITIONS

DOD Is Taking Steps to Address Challenges Faced by Certain Companies

Accessible Version

GAO Highlights

Highlights of [GAO-17-644](#), a report to the Committee on Armed Services, U.S. Senate

Why GAO Did This Study

Private industry investments in research and development have significantly outpaced DOD's own spending in this area over the past three decades. Recognizing that this situation is likely to continue, Congress has passed legislation aimed at enabling DOD to leverage technologies made by companies that do not typically do business with it, referred to in this report as non-traditional companies.

A Senate report included a provision for GAO to review DOD efforts to attract non-traditional companies that could potentially develop their commercial products for DOD's use. This report describes (1) key challenges identified by non-traditional companies when trying to do business with DOD and (2) actions DOD is taking to address them.

To perform this work, GAO conducted interviews with 12 non-traditional companies. Companies were selected based on size, the amount of business they had with DOD, and the type of technology they produce. GAO discussed the nature of the challenges identified with the companies. In addition, GAO obtained information from DOD on steps it is taking to mitigate identified challenges through document reviews and interviews with military service and Office of the Secretary of Defense officials.

What GAO Recommends

Although GAO is not making recommendations, DOD reviewed a draft of this report and had no comments.

View [GAO-17-644](#). For more information, contact Michael Sullivan at (202) 512-4841 or sullivanm@gao.gov.

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What GAO Found

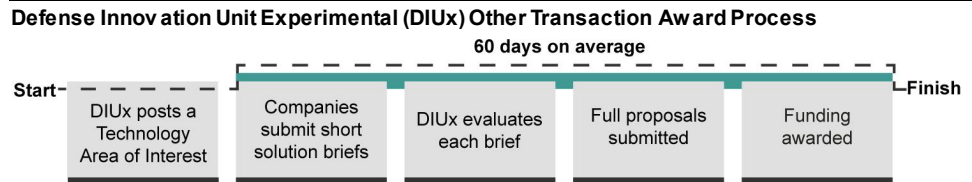
According to representatives from 12 innovative companies that do not typically do business with the Department of Defense (DOD), there are several challenges that deter them from selling their products and services to DOD or further developing their products and services for military use. These challenges can be grouped into the six areas shown in the table below.

Challenges That Deter Companies from Developing Products for Military Use	
Complexity of DOD's process	Intellectual property rights concerns
Unstable budget environment	Government-specific contract terms and conditions
Long contracting timelines	Inexperienced DOD contracting workforce

Source: GAO presentation of company observations. | GAO-17-644

According to these company representatives, collectively these challenges have created an environment where companies choose to either not pursue DOD business or believe that their resources could be better spent pursuing commercial business where the cost to compete is lower and selection decisions are made faster. For example, 1 of the 12 companies GAO spoke with conducted a cost comparison study and found that it took 25 full time employees, 12 months and millions of dollars to prepare a proposal for a DOD contract. In contrast, the study found that the company used 3 part time employees, 2 months, and only thousands of dollars to prepare a commercial contract for a similar product.

DOD is taking steps to implement some of the requirements that Congress mandated in recent legislation to address some of these challenges, as well as implementing other innovative solutions. For example, as required by Congress, DOD established an advisory panel to identify opportunities to streamline the acquisition process, including recommending regulations that should be eliminated. The panel, which consists of 18 current and former DOD executives, expects to issue a final report in 2018. Each of the military services also has efforts underway to shorten their contracting process. In addition, DOD established an innovation unit in April 2015 to reach out to companies that do not typically do business with the department and facilitate business agreements within a desired period of 60 days using the process below.



Source: GAO presentation of DIUx data. | GAO-17-644

Because many of the steps and initiatives that DOD is undertaking are in the early stages of implementation, it is too early at this time to determine whether they will address all of the challenges identified by companies that normally do not do business with the department.

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Abbreviations

DFARS	Defense Federal Acquisition Regulation Supplement
DIUx	Defense Innovation Unit Experimental
DOD	Department of Defense
FAR	Federal Acquisition Regulation
FedRAMP	Federal Risk and Authorization Management Program
FedRAMP Plus	Federal Risk and Authorization Management Program Plus
OTA	Other Transaction Authority

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July 20, 2017
The Honorable John McCain
Chairman
The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

The Department of Defense (DOD) has had a long history of pioneering innovative technology that has enabled the United States to achieve technological superiority on the battlefield and spurred the development of new commercial products. According to DOD and National Science Foundation research and development data, in 1987, DOD accounted for about 40 percent of all research and development spending in the United States. However, the focus and pace of research and development changed dramatically over the decades. By 2013, DOD accounted for less than 20 percent of the spending. Innovation is now being driven by the commercial sector. The commercial sector increased its research and development spending almost 200 percent from 1987 to 2013. Companies are developing sophisticated data analytics software packages, advanced cybersecurity capabilities, and autonomous vehicles that could be used by DOD.

In 2014, DOD's Office of Acquisition, Technology and Logistics' Better Buying Power initiative recognized that in order for the U.S. military to maintain its standing against adversaries in all areas of warfare, including ground, air, sea, and cyber, it needed to start leveraging commercial technologies created by companies that do not typically sell or develop products for DOD's use. (We refer to these companies as non-traditional companies in this report.) DOD, however, has experienced problems attracting these companies to do business with them.

The Senate Armed Services Committee's report accompanying their proposed version of the Fiscal Year 2016 National Defense Authorization Act included a provision for GAO to study the problems DOD has had in attracting non-traditional companies. This report describes (1) key challenges identified by non-traditional companies when trying to do business with DOD and (2) actions DOD is taking to address them.

To identify the challenges that non-traditional companies face when trying to do business with DOD, we interviewed company representatives and

collected corroborating documentation when possible from 12 non-traditional companies. We selected these companies based on several factors, including company size, the extent to which the company conducted business with DOD, and the development of technologies that are relevant to our national security needs, such as data analytics, cybersecurity, and autonomous vehicles. For reporting purposes, we grouped the challenges that were identified into six broad categories. We include several examples of challenges based on the companies' points of view in this report. The statements expressed to GAO by participants represent the perspective of their own companies and cannot be generalized. We also reviewed DOD studies and budget data, and had discussions with representatives from three traditional companies and knowledgeable DOD acquisition and contracting officials to obtain additional information on the potential challenges non-traditional companies face. The traditional companies provided quantitative information about the challenges and also identified other potential challenges that non-traditional companies could face based on their own experiences. We provided company representatives with an opportunity to review a summary of the challenges section of this report and incorporated their comments as appropriate.

To identify DOD's efforts to address challenges identified by commercial companies, we determined the status of DOD efforts to implement various provisions included in the fiscal years 2016 and 2017 National Defense Authorization Acts. We analyzed data from several new initiatives aimed at improving DOD's outreach to non-traditional companies and reducing the time for contract awards. We supplemented the data collected with information from a series of interviews with DOD acquisition professionals across the three military departments and the Office of the Secretary of Defense. See appendix I for more details on our scope and methodology.

We conducted this performance audit from June 2015 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

DOD acquires many different products developed by commercial companies to enable the warfighter to protect our country. For the purposes of this report, we describe the three types of products that DOD acquires as the following:

1. **Products that are commercially available**, such as computers and software. DOD acquires these products from a variety of suppliers.
2. **Commercial products that are further developed by companies for DOD use based on those currently available in the marketplace**, such as adding avionics equipment to an unmanned aerial vehicle. These products are the focus of this report because they are often produced by companies that do not work regularly with DOD (non-traditional companies).
3. **Products developed exclusively for military use** (military-unique), such as tanks, fighter jets, and submarines with military capabilities that do not have a commercial application. Since 2011, we found that when DOD acquires these products, it typically does so with companies such as The Boeing Company, Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Company, General Dynamics Corporation, the General Electric Company, BAE Systems PLC, and Rockwell Collins, Inc. We consider these companies traditional companies because they have consistently worked with DOD to develop military-unique products.

Before DOD acquires a product, it conducts market research to determine which of the three product types is most suitable for its particular need. DOD contracting officers then follow the Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS) to procure the product. As shown in figure 1, the degree to which the product is commercially available and the risks associated with developing or producing the product influence the type of contract used and the contract's terms and conditions.¹

¹For purposes of this report, the term "development" refers to any changes, modifications, engineering, integration, and research required to deliver an item that meets DOD requirements.

Figure 1: Notional Characteristics of the Three Types of Products Procured by DOD

Commercially Available Products	Commercial Products Further Developed for DOD's Use	Military-Unique Products
No government development funding	Some government development funding	All or significant amount of government development funding
Fixed-type contract	Fixed or cost-type contract	Cost-type contract
Fewer contract terms and conditions 	Additional contract terms and conditions can apply 	Larger number of contract terms and conditions can apply 

Source: GAO presentation of Federal Acquisition Regulation and Department of Defense (DOD) acquisition information. | GAO-17-644

Note: The figure is a generalization of the types of products DOD procures. We did not use Federal Acquisition Regulation terminology to define the product types. The number and type of terms and conditions can vary by product.

DOD may use commercial item acquisition procedures under FAR Part 12 to procure commercially available products and negotiated contract procedures under FAR Part 15 for military-unique products.² Negotiated contracts for military-unique products generally contain more government-specific terms and conditions than commercial item acquisitions, in part because of the risk DOD takes to fund the development of these products. There can be a great deal of variation in the contract type for commercial products that are further developed for DOD's use, as well as the number of contract terms and conditions that would apply. If DOD determines that products are commercial items as part of its commercial item determination process, it must acquire the product using FAR Part 12 procedures instead of FAR Part 15 procedures. Alternatively, DOD might find the desired product is not a commercial item, but nonetheless requires a relatively low risk development effort. In that case, DOD can negotiate a fixed-price-incentive contract under FAR Part 15.

²FAR Part 12 also instructs contracting officers to use the policies in conjunction with the solicitation, evaluation, and award policies and procedures described in other parts of the FAR, specifically FAR Part 13—Simplified Acquisition Procedures, FAR Part 14—Sealed Bidding, or FAR Part 15—Contracting by Negotiation, that the contracting officer believes are most appropriate.

Congress also provides Other Transaction Authority (OTA) that allows DOD to enter into agreements with companies to complete research and development and prototype projects.³ OTAs are flexible agreements that typically include very few required terms and conditions and instead allow the parties to negotiate terms and conditions specific to the project. This flexibility can help agencies attract and partner with entities that have not done business with federal agencies due to concerns about standard government requirements. However, OTAs are not procurement contracts. DOD would still follow the FAR or another express authority to procure products successfully developed through an OTA.

DOD has long played a large role in influencing innovation in the United States through its research and development investments. Among other things, DOD funds basic research performed by universities, as well as applied research and development performed by companies. Several studies and agency documents highlight how DOD's funding has led to technological advances that enable the development of military products as well as commercial products. For example, the Defense Advanced Research Projects Agency supported the development of a communications network in the 1970s to facilitate information sharing.⁴ This network is considered the foundation of the modern internet. In the 1950s, the Air Force and the Defense Advanced Research Projects Agency funded research on speech recognition and artificial intelligence that enabled the development of the Cognitive Assistant that Learns and Organizes.⁵ In the 1990s and 2000s, commercial companies started leveraging this research to develop commercial technologies like Siri, the iPhone assistant. The Army has funded research that led to the development of powerful, lightweight lithium batteries, which are used in a variety of military products, such as night vision equipment.⁶ Today,

³DOD's Other Transaction Authorities have been codified at 10 U.S.C. §§ 2371 & 2371b.

⁴Defense Advanced Research Projects Agency, *Paving the Way of the Modern Internet*, Accessed June 14, 2017, <http://www.darpa.mil/about-us/timeline/modern-internet>.

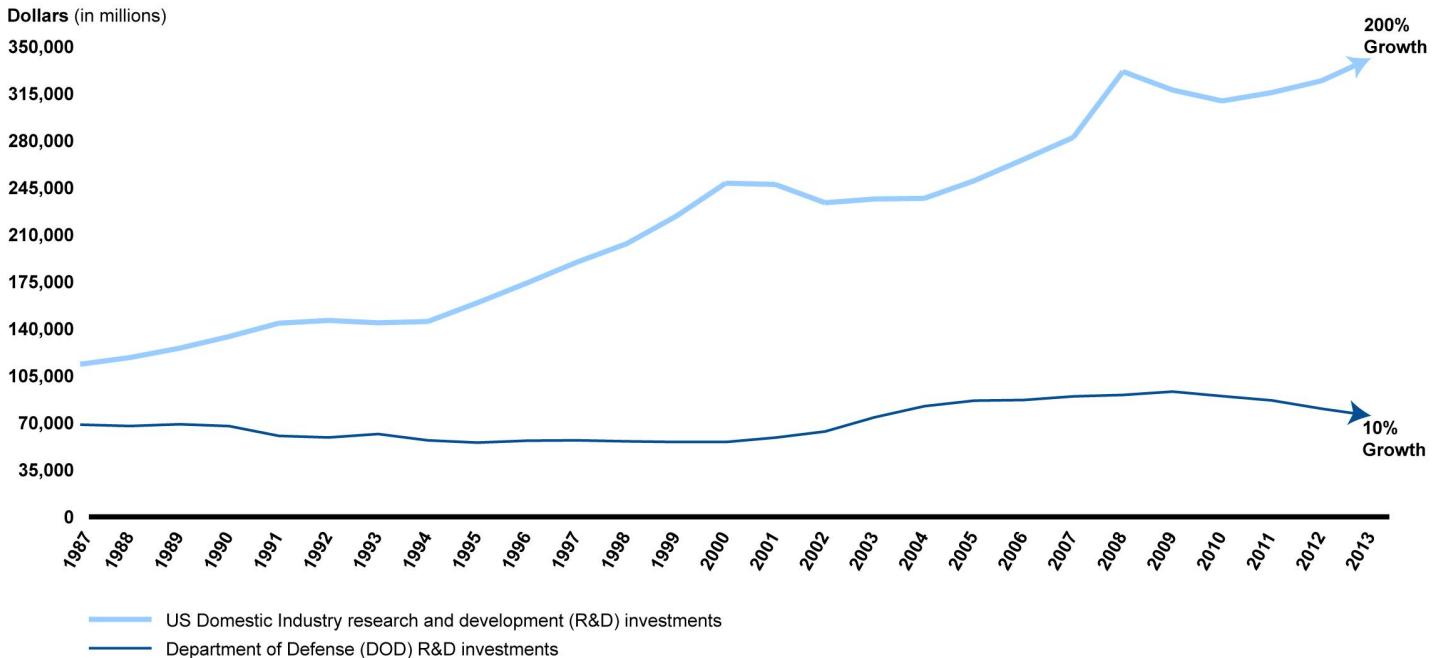
⁵The Cognitive Assistant that Learns and Organizes is a software system that learns from interactions and advisement from users to perform interrelated decision-making tasks. The Information Technology & Innovation Foundation, *Federally Supported Innovations: 22 Examples of Major Technology Advances that Stem from Federal Research Support* (Washington, D.C.: 2014).

⁶RAND Corporation, *Soldier-Portable Battery Supply: Foreign Dependence and Policy Options* (2014).

lithium batteries are widely used in consumer electronics products and electric vehicles.

Based on DOD and National Science Foundation research and development data, DOD's influence on the type of technologies developed by U.S. companies began to diminish as companies significantly increased the amount they invest in research and development. As shown in figure 2 below, DOD spent about \$69 billion on research and development in 1987, while U.S. companies spent about \$114 billion. In 2013, DOD spent about \$75 billion, while companies spent about \$341 billion. Between 1987 and 2013, companies' investments skyrocketed by approximately 200 percent. This growth was fueled, in part, by significant investments in the information, pharmaceuticals, and computer and electronics sectors.

Figure 2: DOD and Private Sector Research and Development Spending



Source: GAO presentation of National Science Foundation and Office of Management and Budget data. | GAO-17-644

Note: Expenditures have been adjusted for inflation in accordance with DOD National Defense Budget Estimates for Fiscal Year 2017. Industry research and development spending may include funding provided by DOD for research performed by industry.

In its 2016 Annual Industrial Capabilities Report to Congress, DOD acknowledged that the department benefits when there is an influx of new companies with new technologies competing for business opportunities. The report further stated that DOD must take advantage of the rapid evolution of emerging commercial technologies that, when integrated with military systems and novel concepts of operations, could be a source of battlefield advantage. In order to take greater advantage of newly developed technologies coming out of the commercial sector, the report acknowledged that the department should leverage innovation created by non-traditional companies.

However, available industry data, as well as DOD studies, indicate that it may be difficult for the department to attract non-traditional companies to sell or further develop their products for DOD's own use.⁷ As shown in table 1, one reason for this is that DOD is not a significant customer for top innovative companies.

⁷Examples of studies include the Defense Business Board: *Innovation: Attracting and Retaining the Best of the Private Sector* (Washington, D.C.: 2014); and RAND Corporation: *Identifying and Eliminating Barriers Faced by Nontraditional Department of Defense Suppliers* (Santa Monica, Calif.: 2014).

Table 1: Percent of Top Innovative U.S. Companies' Sales or Revenue Derived from DOD Contracts in 2016

Company ^a	Sales (\$ billions)	Percentage of sales derived from DOD contracts ^b
Apple	216	< 1
Amazon	136	< 1
General Electric	111	< 2
3M	30	< 1

Company	Revenue (\$ billions)	Percent of revenue derived from DOD contracts
Google	90	0
Microsoft	85	<1
IBM	80	<1
Hewlett Packard	48	<2
Facebook	28	0
Tesla	7	<1

Source: GAO analysis of data from the Federal Procurement Data System – Next Generation and 10K annual reports submitted by each company to the U.S. Securities and Exchange Commission. | GAO-17-644

^aWe compiled the list of top innovative U.S. companies based on the Boston Consulting Group's The Most Innovative Companies 2016 Getting Past "Not Invented Here" (2017) and PWC 2016 Global Innovation 1000: Software-as-a-Catalyst (2016).

^bSome companies may sell products to the Department of Defense (DOD) through third-party vendors. This data is not available in the Federal Procurement Data System – Next Generation.

In 2016, for example, Apple earned \$216 billion in sales, of which about \$70,000 came from contracts directly with DOD. Amazon earned \$136 billion in sales, with about \$275,000 coming from contracts directly with DOD. Google and Facebook did not earn any revenue through direct sales to DOD.

DOD's Acquisition Environment Creates Unique Challenges for Non-traditional Companies

According to company representatives that we spoke to, DOD's acquisition environment presents unique challenges to non-traditional companies that they otherwise do not experience in the private industry. The acquisition environment is driven by laws that provide transparency and fairness, regulations that promote specific socio-economic goals, and

DOD’s approach for implementing those laws and regulations. For the most part, the selected 12 companies we spoke with expressed frustration with the complexity of DOD’s acquisition process; the time, cost, and risk associated with competing for and executing a contract; and interacting with DOD’s contracting workforce. Table 2 highlights six key areas of DOD’s acquisition environment that create challenges for non-traditional companies, according to these companies.

Table 2: The Department of Defense’s (DOD) Acquisition Environment Presents Key Overarching Challenges According to Selected Non-Traditional Companies

Challenges identified by companies GAO contacted	Non-traditional companies											
	1	2	3	4	5	6	7	8	9	10	11	12
Complexity of DOD’s acquisition process	√	√	√	√	√	√	√	√	√	√	√	√
Unstable budget environment	√	√	√	√	√	√			√	√		
Lengthy contracting timeline	√		√	√	√	√	√	√	√	√	√	√
Government-specific contract terms and conditions	√	√	√	√		√	√	√	√	√	√	√
Inexperienced DOD contracting workforce	√	√	√			√	√	√		√	√	√
Intellectual property rights concerns	√	√	√	√		√		√	√	√	√	√

Legend: √ indicates challenges cited by each selected company.

Source: GAO presentation of company observations. | GAO-17-644

Together, these challenges create an environment wherein the selected non-traditional companies told us that their resources might be better spent pursuing commercial business where the cost to compete is lower and selection decisions are faster. Two of the 12 non-traditional companies in our review are currently not pursuing business with DOD as a result of these challenges.

Complexity of DOD’s Acquisition Process

The non-traditional companies we spoke with identified several challenges related to the complexity of DOD’s acquisition process that made it difficult for them to do business with the department. One particular challenge is the difficulty companies had in identifying the right avenue to develop on-going or longer-term business arrangements with DOD. Several non-traditional company officials said that DOD acquisition program managers wanted to obtain their product but could not do so because DOD did not have a validated requirement for it. As a result, these non-traditional companies had to find alternative paths to sell their products to DOD. Some companies spent several years demonstrating their products to other organizations within DOD before establishing a viable business arrangement with one of these organizations. In some

cases, multiple DOD decision-makers throughout the department weighed in, some of whom had no purchasing authority. This slowed down the process even more. Company officials said that in the commercial market they are used to communicating directly with people who have the authority to (1) discuss their needs, (2) gauge whether the company's product could satisfy those needs, and (3) award a contract within months.

Non-traditional companies we spoke to also raised concerns about the lengthy process for obtaining security clearances. Some company officials told us that DOD required their company representatives to obtain security clearances prior to DOD discussions on technology needs. Company officials also noted that the process for attaining personnel security clearances, which is shared between DOD and the Office of Personnel Management, can take over a year to complete. One company even said it took 5 years to obtain a facility clearance from DOD.

Software companies identified the time and cost associated with obtaining multiple software certifications, which they said are required by DOD prior to competing for business, as an additional challenge they face when entering the defense market. This includes providing documentation to obtain the Federal Risk and Authorization Management Program (FedRAMP) certification, which is managed by the General Services Administration, and the FedRAMP Plus certification, which is managed by the Defense Information Systems Agency.⁸ These certifications provide a government-wide and DOD-specific standardized approach for cloud products and services, respectively.⁹ Officials from one large non-traditional software company said it has spent at least \$40 million so far to obtain FedRAMP certifications for 50 products and it has taken on average 18 months to obtain the certifications. The company has also been working for almost 2 years to obtain DOD's FedRAMP Plus certification for these products. A company official stated that DOD

⁸FedRAMP is a government-wide program that provides a standardized approach to security assessment, authorization, and continuous monitoring for cloud products and services. According to the Defense Information Security Agency's Cloud Computing Security Requirements Guide, FedRAMP Plus leverages the work done as part of a FedRAMP assessment and adds specific security controls and requirements necessary to meet and assure DOD's critical mission requirements.

⁹The cloud is defined as any of several, often proprietary, parts of the internet that allow online processing and storage of documents and data as well as electronic access to software and other resources.

continues to add more requirements that sometimes conflict with the FedRAMP requirements or, at a minimum, add additional controls and create ambiguity. The official also said that, “as a company that provides services to numerous customers, it is unmanageable to comply with different rules and requirements for different agencies.”

An official from one small non-traditional company we spoke to stated that they have invested over \$100,000 and well over a year in pursuing FedRAMP certification even though there is no guarantee that they will win a contract. In addition, he estimated that once certified, monthly costs to maintain the certification would range from \$10,000 to \$20,000. The official also described the certification process as “a series of checklists that do not necessarily make products safer or more secure.” However, he said that they must obtain these software certifications because the federal government will not talk to companies without them. For example, the company has had to answer and provide data or documentation for a standard list of nearly 100 questions that the General Services Administration developed for companies to obtain FedRAMP certification.

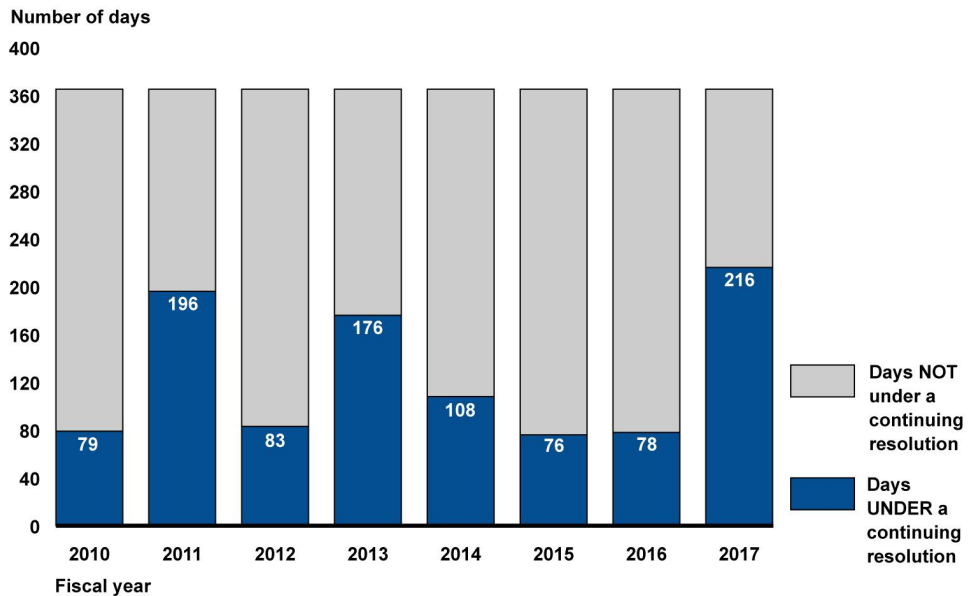
Unstable Budget Environment

Some of the small non-traditional companies we spoke to expressed frustrations with DOD’s funding process, including the effect budgetary delays from continuing resolutions and sequestration have had on DOD’s ability to award contracts.¹⁰ One official said that doing business with any company or organization that has an unstable budget environment creates additional risk and could cause them to go out of business or lose investors. Their experiences with DOD, in some cases, drove them away from the defense market and back to pursuing business with more financially stable entities.

¹⁰A continuing resolution is an appropriation act that provides budget authority for federal agencies, specific activities, or both to continue in operation when Congress and the President have not completed action on the regular appropriation acts by the beginning of the fiscal year. Sequestration refers to across-the-board spending reductions. The Budget Control Act of 2011, Pub. L. No. 112-25 (2011), established spending caps and an accompanying sequestration procedure through 2021, but the Bipartisan Budget Act of 2013 extended the budget caps and sequestration through 2023.

It takes 2 years for major acquisition programs to receive funding through DOD’s budget process, which dates back to the 1960s.¹¹ Adding to the challenges of this process, as shown in figure 3, DOD has started each fiscal year since 2010 operating under a continuing resolution. In general, continuing resolutions prohibit new activities and projects for which appropriations, funds, or other authority was not available in the previous fiscal year.¹²

Figure 3: Number of Days DOD Operated Under a Continuing Resolution in Fiscal Years 2010-2017



Source: GAO presentation of Department of Defense (DOD) budget data. | GAO-17-644

As an example of the impact this environment can have on DOD’s ability to contract with a non-traditional company, after demonstrating its product

¹¹DOD’s current budget process, known as the Planning, Programming, Budgeting, and Execution Process, evolved from the Planning, Programming, and Budgeting System, which was introduced within DOD in the early 1960s by Robert McNamara during his tenure as Secretary of Defense.

¹²There are a number of standard provisions enacted in most continuing resolutions that, when taken together, establish an expectation that agencies will continue to carry out the status quo during a continuing resolution, unless otherwise specifically stated. B-324481, Mar. 21, 2013. For example, one such standard provision (sometimes referred to as the ‘no new starts’ provision) has provided that amounts appropriated under a continuing resolution are not available to initiate or resume projects or activities for which authority, appropriations, or funds were not available during the prior fiscal year.

for nearly 4 years, one company that produces augmented reality products was provided funding to support additional engineering and development activities by the Army. However, the Army program subsequently lost funding due to sequestration. As a result of these difficulties experienced in the past, the company is no longer actively pursuing business in the defense market, according to a company representative.

Lengthy Contracting Timelines

Non-traditional companies that we spoke to stated that DOD’s contracting timelines are significantly longer than what they experience with the commercial market, and there is a potential for a bid protest when competing for DOD work that could further delay contract award. One official said that their investors would prefer that they pursue business in the commercial market where contracts are awarded more quickly.

DOD’s contracting process can be very lengthy, depending on the dollar value of the contract. For example, in January 2017, the Army Contracting Command established standard contracting timelines that ranged from 55 days (about 2 months) for contracts valued less than \$25,000 to 700 days (about 24 months) for contracts valued over \$1 billion. In general, the timelines, as shown in table 3 below, increase as the dollar value of the contracts increase and competitively awarded contracts generally take longer to award than non-competitive contracts.

Table 3: Established Timelines for New Army Contracts

Dollar value	Procurement action lead time (in days)	
	Competitive contracts	Non-competitive contracts
<\$25,000	55	55
>\$25,000 to <\$1 million	75	100
\$1 million to < \$50 million	180	250
\$50 million to \$250 million	600	520
\$250 million to \$500 million	630	550
>\$500 million to <\$1 billion	630	610
>\$1 billion	700	610

Source: GAO presentation of Army data. | GAO-17-644

Data collected by the Air Force show that in fiscal year 2016 it took an average of nearly 13 months from the time a request for proposal was

issued until an award decision was made for 52 sole source contracts valued between \$50 million and \$500 million. Figure 4 shows the activities that contributed to this timeframe.

Figure 4: Average Time to Complete Air Force Contracting Activities for Sole Source Contracts Valued between \$50 Million and \$500 Million in Fiscal Year 2016



Source: GAO presentation of Air Force data. | GAO-17-644

Note: Air Force study did not include foreign military sales contracts.

The Air Force study found that companies spent on average nearly 5 months putting together their initial proposal and another 1.5 months revising the proposal based on DOD feedback that the proposal did not meet certain DFARS requirements.¹³ For example, a contractor may have received subcontractor proposals and included them in its proposal. However, the contractor may not have completed the required commerciality and price reasonableness analysis of the subcontractor proposals, which should have been reflected in the initial proposal to the Air Force. According to an Air Force official, there was a significant amount of back and forth between the Air Force and companies to make sure proposals adequately responded to the requirements in a solicitation. Once an adequate proposal was received, the Air Force, Defense Contract Management Agency, and Defense Contract Audit Agency then reviewed and evaluated the technical and financial aspects of proposals over the next 4 months. The Air Force spent the final months negotiating with companies and awarding a contract.

Non-traditional company officials that we spoke to said they are accustomed to contracting timeframes that are much shorter, ranging from a few weeks up to about 6 months when working with commercial companies. In addition, they said that the time and resources they invest in developing a proposal for commercial companies is significantly less

¹³According to DFARS 252.215-7009, offerors shall complete a proposal adequacy checklist, providing the location of requested information, or an explanation of why the requested information is not provided. In preparation of the offeror's checklist, offerors may elect to have their prospective subcontractors use the same or similar checklist as appropriate.

than for a DOD proposal. For example, one of the 12 companies GAO spoke to conducted a cost comparison study and found that it took 25 full time employees, 12 months and millions of dollars to prepare a proposal for a DOD contract. In contrast, the study found that the company used 3 part time employees, 2 months, and only thousands of dollars to prepare a commercial contract for a similar product. A company official explained that a lot of time and resources were spent developing detailed schedules that outline the engineering resources over the life of a project so that DOD could evaluate whether the company had the appropriate resources to complete the work. The official said the company had no plans to monitor how it performs against the detailed schedules and only prepared them for the purpose of submitting a DOD proposal. He said that they were not required to provide this type of detailed information for commercial proposals.

Concerns raised by the non-traditional companies we spoke to regarding the length of time it could take to win a DOD contract were also identified by three traditional companies we spoke to. One of the companies shared a study that it conducted in 2016 that showed that it took on average over 12 months from the time the Air Force issued a request for proposal until a contract was awarded for 60 proposals the company submitted that were valued between \$50 million and \$500 million. Company officials also provided data that showed one of its large business units had experienced contract cycle times as long as 3 to 4 years from the time DOD released a request for proposal until an award decision was made.

The Director of Defense Pricing noted that DOD's contacting process typically takes longer than the commercial industry process because DOD has to be transparent in its dealings, ensure competition wherever possible, and protect the interests of the taxpayers.

Government-Specific Contract Terms and Conditions

Most of the 12 non-traditional companies that we spoke to said they had commercial products that the department was clearly interested in obtaining. However, after discussions with DOD, they chose to not develop these products for DOD's use because it might trigger a large number of contract terms and conditions that would be expensive to implement. Like other federal agencies, DOD includes standard terms and conditions in its contracts that are unique to the government that some companies we spoke to believe would add significant cost or add little value to the transaction. For example, based on the FAR, companies

are required to establish a government-unique cost accounting system when it awards certain cost-type contracts to disclose actual cost accounting practices and to follow disclosed and established cost accounting practices consistently.¹⁴ DOD and other federal entities also require companies to comply with socio-economic obligations, such as those for equal employment opportunity, small business set asides, labor standards for government contractors, and a drug-free workplace. They could also require companies to use American-made materials in their products, provide whistle-blower protections, safeguard their information systems, and comply with cyber regulations related to cyber incident reporting.

One non-traditional company conducted a study that determined it would take at least 15-18 months and cost millions to establish a government-unique cost accounting system. According to a company official, accepting DOD cost-type contracts with this requirement would mean that their engineers would have to log hours specific to the projects they are working on at any given time. The official explained that this additional step would not only add to their workloads, but create inefficiencies that might inhibit communication and undermine innovation, which he said, “is the very ethos of this company.” As a result, the official stated that the company has decided not to compete for DOD cost-type contracts that require a government-unique cost accounting system. The company official also said that the company’s contracts and agreements with DOD and another government agency have included anywhere from 27 to 69 terms and conditions. While this is significantly fewer than the roughly 200 terms and conditions the company official estimated would have been included in a cost-type contract, it is much more than the 12 that are typically included in contracts with commercial companies. Company officials pointed out that each additional clause adds costs and burden to the company, and are concerned that they could incur tremendous liability if the prescribed clauses are not strictly followed.

Traditional companies we spoke to confirmed the difficulties, as well as the costs with implementing government-unique contract clauses. For example, one traditional company we spoke to stated that they must expend resources to track changes to the FAR in order to stay in

¹⁴For example, the FAR establishes basic guidelines for the allowability of almost 50 specific types of contract costs. For example, it precludes or limits companies from recovering certain business expenses, such as interest expenses, selling costs, and training and education costs.

compliance with government contracting regulations. Company officials said that they review an average of 100 new regulatory actions for applicability each month. Further, they typically direct all clauses to individual suppliers because it is difficult for the prime contractor to determine which ones would apply. We found, for example, that legislation regarding whistle-blower protections has changed several times since 2009 and that different rules apply depending on which federal agency awarded the contract, whether the agency was participating in a whistle-blower pilot program, or whether contracts were funded by the American Recovery and Reinvestment Act.¹⁵ This example demonstrates how companies with multiple contracts may have to comply with different whistle-blower protection simultaneously. In addition, the implementation of the regulations themselves is costly. For example, while officials from this same company acknowledged the need for cyber security, they estimated that new DOD cyber security regulations would cost the company an estimated \$100 million to comply. They stated that these types of requirements contribute to the 12 to 14 percent price differential between their commercial and DOD products.

Officials from another traditional company that we spoke to said there are also costs associated with ensuring that its suppliers comply with these clauses, and these costs contribute to the company's lower rate of return on its defense business (7 to 10 percent profit) versus its commercial business (15 to 18 percent profit). These officials also stated that one of its suppliers turned down a \$20 million performance-based logistics contract because it could no longer effectively manage the large amount of federal requirements included in contract clauses.

The traditional companies we spoke with stated that in most cases they separate their commercial and defense business units to ensure that overhead costs that support their DOD business do not extend to their commercial business and make their products less competitive in the commercial space. For instance, officials from one traditional company stated that it has taken great care to keep a primarily commercial business unit separate and apart from its primarily DOD business unit, including supply chain, sourcing, engineering, sales, and related support functions.

¹⁵American Recovery and Reinvestment Act of 2009. Pub. L. No. 111-5 (2009).

The Director of Defense Pricing indicated that DOD has heard similar concerns about the cost of compliance raised by traditional companies and said that the department has been trying to substantiate data with the companies for several years, in order to determine what actions may be necessary to address these concerns.

Intellectual Property Rights Concerns

Non-traditional companies we spoke to raised concerns about the possibility of losing their intellectual property rights when further developing their products for DOD's use. According to an Air Force handbook related to the acquisition of technical data and software, DOD seeks access to technical data and computer software rights to enhance competition and sustain each system and its subsystems over their life cycle.¹⁶ Examples of technical data include product specifications, engineering drawings, and operating or maintenance manuals. Examples of computer software include source code, algorithms, and associated software design documentation. According to DOD acquisition policy, DOD ordinarily only acquires the technical data, computer software, and the associated data rights essential to meeting its needs. For example, in the case of noncommercial items:

- If the contractor developed an item or computer software exclusively with government funds, the contractor retains the copyright over the technical data pertaining to the item or the computer software, but the government acquires "unlimited rights" to use the data or software without restriction.¹⁷

¹⁶*Acquiring and Enforcing the Government's Right in Technical Data and Computer Software Under Department of Defense Contracts: A Practical Handbook for Acquisition Professionals*, August 2015.

¹⁷Unlimited data rights mean the rights to use, modify, reproduce, display, release, or disclose technical data or computer software in whole or in part, in any manner, and for any purpose whatsoever, and to have or authorize others to do so. DFARS 252.227-7013(a)(16) and DFARS 252.227-7014(a)(16).

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- If the contractor developed an item or computer software with mixed funding, then the government normally acquires “government purpose rights.”¹⁸
 - If the contractor developed the item or computer software completely at private expense, then DOD usually acquires only “limited rights” (for data) or “restricted rights” (for software).¹⁹

Both non-traditional and traditional companies we included in this review consider intellectual property, including technical data and software rights, to be essential to a company’s survival. As one official we spoke with explained, intellectual property is the “life-blood” of their company. It is what distinguishes a company in the marketplace and is an integral part of the value placed on a company. Companies try to protect their intellectual property so that others do not copy it and for that reason many of the companies we spoke to believe it is too risky to further develop their commercial products for DOD’s needs.²⁰ Based on our review of documents, we found that in one recent court case, the Court of Federal Claims awarded a company expectation damages for lost profits after the government “repeatedly breached the Cooperative Research and Development Agreement by releasing the plaintiff’s proprietary information to unauthorized recipients, including its competitors.”²¹

¹⁸Government purpose rights mean the rights to use, modify, reproduce, release, perform, display, or disclose technical data or computer software within the government without restriction, and release or disclose technical data or computer software outside the government and authorize persons to whom release or disclosure has been made to use, modify, reproduce, release, perform, display, or disclose that data or software for United States government purposes. See DFARS 252.227-7013(a)(12) and DFARS 252.227-7014(a)(12).

¹⁹Limited rights permit the government to use, modify, reproduce, release, perform, display, or disclose technical data, in whole or in part, within the government. The government must obtain the express permission of the party providing the technical data to release or disclose it outside the government, except in the limited situations where release or disclosure is authorized. DFARS 252.227-7013(a)(14). Restricted rights mean the government’s rights to use a computer program with only one computer at one time and make the minimum number of copies of the computer software required for safekeeping (archive), backup, or modification purposes. The government may modify restricted rights software, subject to restrictions, and release or disclose restricted rights software outside the government in limited situations. See DFARS 252.227-7014(a)(15).

²⁰While for purposes of this report we refer to any changes in a commercially-available item as further development, the FAR, in some instances, uses the term modification.

²¹*Spectrum Sciences & Software, Inc. v. United States*, 98 Fed. Cl. 8 (2011).

Non-traditional companies we spoke to prefer to sell their commercial products to DOD so there is no negotiation between them and DOD as to the rights DOD will take in technical data or software. Even then, problems still occur. For example, an official from a non-traditional software company said his staff spends a great deal of time educating contracting officers on DOD's software rights under the company's software license agreement. He said that DOD acquisition officials are "stuck in research and development mode" and believe DOD should have greater software rights even though DOD did not contribute any money to the development of the software. Another non-traditional company official said that DOD shared a demonstration copy of his company's software with the prime contractor who then tried to integrate the software into its own system. Although the prime contractor was unsuccessful in this endeavor, the official said that the prime contractor was competing against the company for DOD's business. This official said the company is no longer doing business with DOD.

Traditional companies we spoke to confirmed the non-traditional companies' concerns. One official at a traditional company said that DOD is putting increased pressure on companies to grant unlimited technical data and software rights or government purpose rights rather than limited or restricted rights. For example, in a 2013 Army request for proposals, the program was pushing for an open systems architecture approach and companies were told that one evaluation criterion would be the extent of data rights (more rights) that they were willing to grant DOD. This was problematic for the company because the intellectual property used to build the components was developed at private expense.

Officials from another traditional company said that a prime contractor it was working with expected the company to offer unlimited rights to its software to increase their chances of winning a contract. In this example, the agency's request for proposals allowed offerors to propose their own technical solutions, but it also provided that, as part of the technical evaluation, offerors would be assessed a weakness where data rights assertions did not allow the agency to procure, maintain, and modify the hardware and software in a competitive environment. The company understood that to be competitive for award with this evaluation scheme, it had to provide at least government purpose rights to its software and technical data, as well as provide the source code for its software, regardless of whether they were commercial or had been developed at private expense. According to company officials, they were willing to negotiate with the prime contractor to some extent in order to help them win the contract, but it was not going to offer government purpose or

unlimited rights in commercial data or software that it developed at private expense, or turn over software source code. The prime contractor told the company that its unwillingness to turn over the information was hurting its proposal. In the end, the prime contractor was not selected for this contract.

Inexperienced DOD Contracting Workforce

Non-traditional companies that we spoke to generally described DOD's contracting workforce as inexperienced, especially when procuring software services, such as access to the cloud, and performing market research to determine the types of products that could meet DOD's needs and to make commercial item and price reasonableness determinations. Non-traditional and traditional companies that we spoke to provided several examples of their interactions with DOD's contracting workforce. For example, officials from two non-traditional software companies said that DOD contracting officers they interacted with were inexperienced in how to buy cloud services. One company official said that contracting officers tried to use a firm-fixed-price contract to buy cloud services. While it may make sense to use a fixed-price type contract for acquiring hardware, such as laptops and printers, the official said that it is much more difficult to use a fixed-price contract for cloud services. Commercial cloud service providers price their services based on the amount of services a customer uses every month, which could vary based on changing needs

In addition, in response to a DOD request for information, officials from a non-traditional company that provides data integration and analytics products stated that DOD issued a request for proposals to develop a military-unique solution for a requirement that could be met with existing commercial products. Based on our review of documents, we found that the company eventually protested DOD's procurement on these grounds and the U.S. Court of Federal Claims agreed with the company. The court issued a permanent injunction ordering the DOD component to satisfy the requirements of 10 U.S.C. § 2377, which requires DOD to determine whether commercial items exist that can satisfy its needs, in whole or in part. Company officials attributed DOD's initial decision to seek a military-unique solution, in part, to an inexperienced and risk-averse workforce.

Traditional companies also pointed out other areas of market research where the contracting workforce is inexperienced and therefore could result in contributing to additional lengthy processes that non-traditional

companies could face. All three traditional defense companies we met with stated that DOD contracting officials were requesting significantly more documentation than in the past to make determinations of commerciality and price reasonableness, partly because some contracting officials are inexperienced in these processes. One company, for example, spent an average of 220 hours (28 days) in 2008 to complete commercial item determination documentation for components on one military system, while in 2014 the average number of hours increased to 1,105 hours (138 days) for the same system. The companies also stated that, at times, DOD contracting officers are not following the FAR for establishing price reasonableness by first performing market research, such as comparing offers to published market prices or conducting an independent government cost estimate before asking the company for additional cost data. Some company officials stated that they have spent considerable time and money tracking down the information DOD has requested. Some company officials said DOD's desire to obtain data related to the costs the company incurred to develop the product rather than the market price customers are paying for the product has also had an impact on companies' suppliers, with some of them refusing to provide this information to DOD and others refusing to do business with DOD anymore.

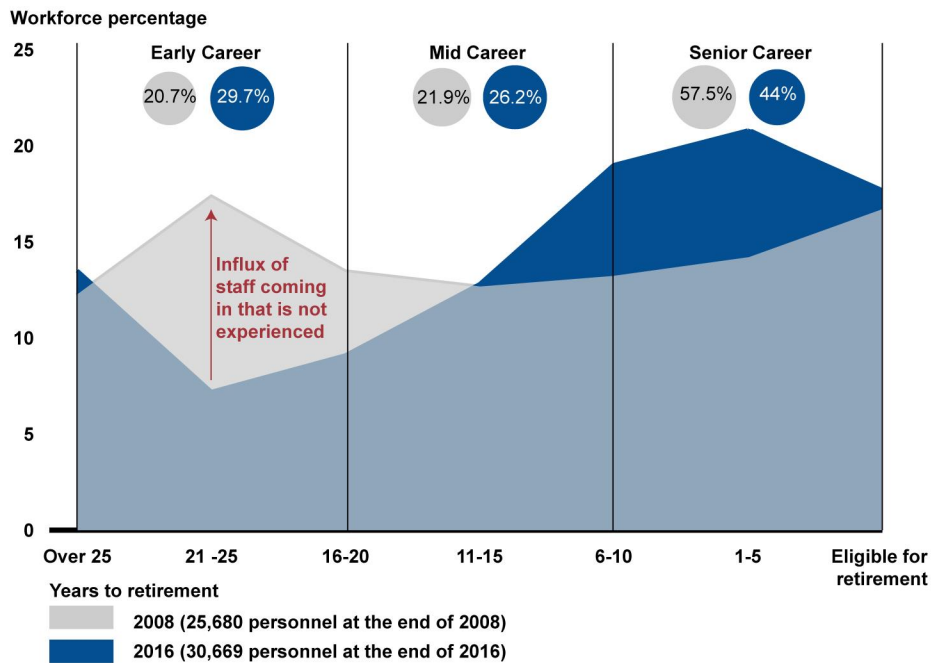
In a prior report related to market research, in which we examined 28 contracts, we found that the market research conducted by selected federal agencies, including DOD, varied.²² The agencies tended to conduct more robust market research for 12 higher dollar contracts than the 16 lower dollar contracts we reviewed. We recommended that DOD clearly document the basic elements of market research that was conducted.

Overall, DOD and military service senior acquisition officials were aware of these concerns and in the case of market research, are interacting with commercial companies to identify ways DOD can improve its capabilities. One senior contracting official noted that very few people outside the companies that provide cloud, analytics, and certain types of software understand these products. Several acquisition and contracting officials said that many of the concerns raised by companies may be due, in part, to the large number of new contracting officers it has hired since 2008.

²²GAO, *Market Research: Better Documentation Needed to Inform Future Procurements at Selected Agencies*, [GAO-15-8](#) (Washington, D.C.: Oct. 9, 2014).

Statistics collected by DOD’s Human Capital Initiatives Office show that the department increased the size of the contracting workforce by almost 5,000 positions over the past 8 years, from 25,680 personnel at the end of fiscal year 2008 to 30,669 at the end of fiscal year 2016, a 19 percent increase. As shown in figure 5, the influx of new personnel has helped DOD address concerns about having a disproportionate number of staff that were ready to retire compared to new staff that were being hired and trained to take their place. However, with the influx of new staff comes a degree of inexperience.

Figure 5: Change in the Distribution of DOD’s Contracting Workforce Based on Years to Retirement Eligibility



Source: GAO presentation of Department of Defense (DOD) data. | GAO-17-644

DOD has established curriculum and experience requirements for contracting officers to achieve in order to advance in their career. For new staff, this includes classes on contract planning, execution, management, and pricing. Following a proficiency assessment in 2010, however, contracting leaders thought it was necessary for the Defense Acquisition University to add a 4-week research-intensive fundamentals course that provides new hires practical experience using the FAR and DFARS. Contracting leaders emphasized that it is not only important for contracting officers to master the what [of contracting], but the how in

being able to use critical thinking and sound judgment when applying knowledge.

DOD Is Taking Some Actions to Address the Challenges Faced by Non-Traditional Companies

Congress and DOD recognize that changes to laws, regulations, and DOD's implementation practices are needed to address the challenges cited by companies and are taking steps to address them. The fiscal years 2016 and 2017 National Defense Authorization Acts, for example, contain several provisions aimed at eliminating some contract terms and conditions that are burdensome to non-traditional companies. DOD is in the process of implementing some of the provisions. DOD has also taken actions to attract non-traditional companies by establishing industry outreach offices in high-tech areas across the country and piloting new, streamlined ways of doing business with these companies within a desired completion period of 60 days. Between April 2015 and March 2017, the offices facilitated 25 arrangements using OTAs between companies and DOD organizations worth \$48.4 million. The military services are also examining ways to reduce the time it takes to award contracts. Because these initiatives are just getting underway, it is too soon to determine whether they will address the challenges faced by non-traditional companies.

DOD Is Implementing Recent Congressional Requirements to Address Some Challenges

The Fiscal Year 2016 and 2017 National Defense Authorization Acts include provisions for DOD to address aspects of its acquisition environment that create challenges for companies. These include addressing some of the complexities associated with DOD's acquisition processes; eliminating or reducing the burden of some contract terms and conditions; clarifying intellectual property rights policies; and addressing contracting workforce concerns. Table 4 highlights some of the new requirements.

Table 4: Fiscal Year 2016 and 2017 National Defense Authorization Act Provisions That Address Some Department of Defense (DOD) Acquisition Challenges Faced by Non-Traditional Companies

Complexity of DOD's acquisition process
<ul style="list-style-type: none"> Requires DOD to establish a personnel security program to quickly investigate and adjudicate security clearances for personnel from commercial companies with innovative technologies and solutions to propose solutions for DOD requirements.
Government-specific contract terms and conditions
<ul style="list-style-type: none"> Requires DOD to establish an advisory panel to study ways to streamline acquisition regulations. Requires the Defense Federal Acquisition Regulation Supplement to include a list of defense-unique provisions of law and of contract clause requirements based on government-wide acquisition regulations, policies, or executive orders not expressly authorized in law that are inapplicable to subcontracts under a DOD contract or subcontract for the procurement of commercial items. Limits contracting officers' ability to convert a commercial item acquisition to a Federal Acquisition Regulation (FAR) Part 15 negotiated procurement and requires a written contracting officer determination for conversions valued over \$1 million with head of contracting activity approval for conversions valued over \$100 million. Requires DOD to treat items valued at less than \$10,000 that are purchased by a contractor for use in the performance of multiple contracts with DOD and other parties and are not identifiable to any particular contract as commercial items. Codifies DOD's Other Transaction Authority for prototypes and allows DOD to award follow-on production contracts for successful prototypes without using competitive procedures, if competitive procedures were used to award the prototype transaction.
Intellectual property rights
<ul style="list-style-type: none"> Requires major defense acquisition systems that receive milestone A or B approval after January 1, 2019, to be designed with a modular open systems approach to the maximum extent practicable, and if a modular open system approach is used, to describe in the acquisition strategy how intellectual property and technical data deliverables will be addressed. Requires DOD to obtain government purpose rights in technical data pertaining to a major system interface developed exclusively at private expense or in part with federal funds and in part at private expense and used in a modular open system approach unless the Secretary of Defense determines that negotiation of different rights in such technical data would be in the best interest of the United States.
Inexperienced DOD Contracting Workforce
<ul style="list-style-type: none"> Requires DOD to establish a centralized capability to provide resources and expertise to oversee the making of commercial item determinations.

Source: GAO presentation of selected Fiscal Year 2016 and 2017 National Defense Authorization Act provisions. | GAO-17-644

DOD has started to implement some of these legislative provisions. For example, in June 2016, the Defense Contract Management Agency established a Commercial Item Group to assist DOD contracting officers with complex determinations. The group, which had about 53 personnel in January 2017, also provides training on assessing whether a product qualifies as a commercial item and offers assistance to DOD contracting officers for conducting market research and analyzing the reasonableness of a contractor's prices. According to Defense Contract Management Agency statistics, from October 1, 2016, to January 6, 2017, the Commercial Item Group was averaging 7 days to deliver a recommendation of commerciality. Of the items they reviewed, the group recommended 93 percent to be commercial. DOD is also working with several large commercial companies to enter into advanced agreements that DOD officials believe will significantly reduce the time associated with

determining the commerciality of an item and the fair and reasonable price of such items.

In addition, DOD established an 18 person advisory panel of current and former DOD executives, referred to as the 809 Panel, to identify opportunities to streamline the acquisition process. The National Defense Authorization Act identified two duties for the panel. First, the panel is expected to review the acquisition regulations applicable to DOD with a view toward streamlining and improving the efficiency and effectiveness of the defense acquisition process and maintaining the defense technology advantage. Second, the panel is expected to make any recommendation for the amendment or repeal of regulations it considers necessary to:

- Establish and administer appropriate buyer and seller relationships in the procurement system.
- Improve the functioning of the acquisition system.
- Ensure the continuing financial and ethical integrity of defense procurement programs.
- Protect the best interests of DOD.
- Eliminate any regulations that are unnecessary for the purposes described.

According to the panel's May 2017 interim report, the panel has established nine working groups that are focused on a variety of topics, including barriers to entry in the DOD market, cost accounting standards, budget issues, commercial buying practices, and streamlining regulations.²³ The panel's Executive Director stated that interim reports with recommended legislative changes will be issued by each working group as it completes its work. The panel will then issue a final report in 2018.

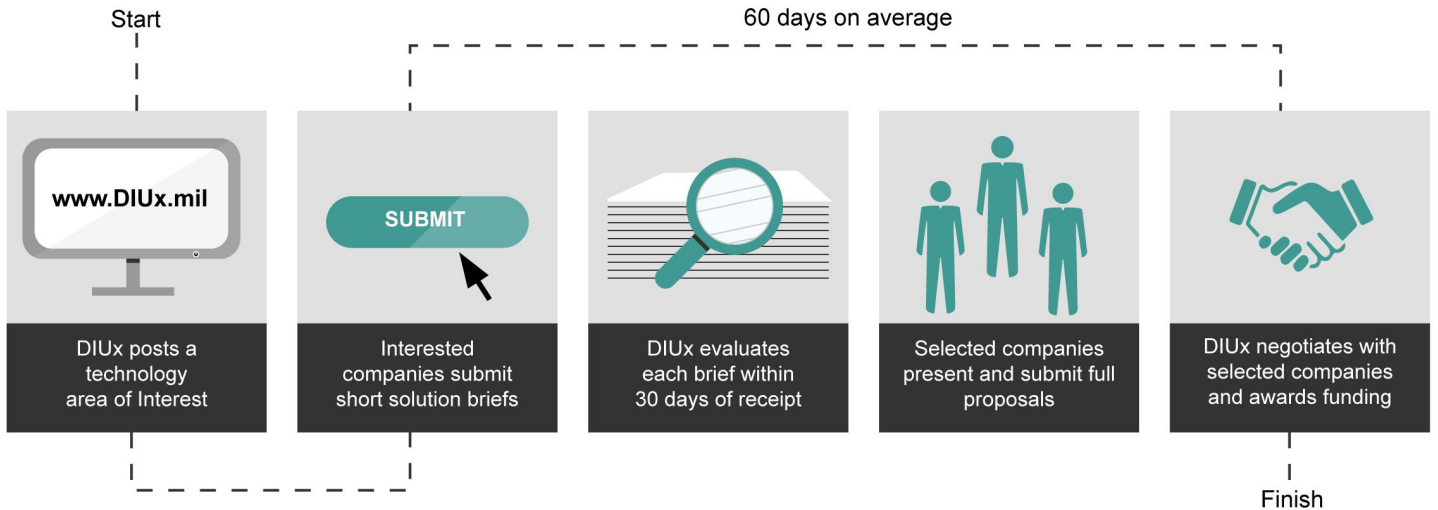
²³Advisory Panel on Streamlining and Codifying Acquisition Regulations: *Section 809 Panel Interim Report* (May 2017).

DOD Has Also Initiated an Effort to Attract Non-Traditional Companies

DOD has established offices in high-tech areas of the country to build relationships and identify promising technologies developed by commercial technology providers or non-traditional companies and to help facilitate business agreements between these companies and DOD organizations. Known as Defense Innovation Unit Experimental (DIUx), the new outreach effort is part of DOD's Defense Innovation Initiative that is focused on pursuing innovative ways to sustain and advance emerging technology capabilities. The initial DIUx office was announced in April 2015 and was opened in Silicon Valley in August 2015. For the first year, the office had no funding or authority to award contracts according to the director of DIUx at that time. Instead, office staff met with these companies to learn about their products and then helped facilitate meetings between the companies and interested DOD organizations. The former director stated that commercial companies they worked with became frustrated that DIUx could not help them overcome challenges with identifying and obtaining DOD business.

In May 2016, the former Secretary of Defense appointed new leadership for DIUx and allocated funding and delegated contract award authority to the organization. DOD is now referring to the new effort as DIUx 2.0. The revamped office reports directly to the Office of the Secretary of Defense and was provided \$20 million in research, development, test and evaluation funding. The office is using OTAs to enter into agreements with industry for prototyping projects. The office solicits proposals through an online Commercial Solutions Opening, which is similar to a broad agency announcement and then, with the assistance of contracting experts from the Army Contracting Command-New Jersey, is awarding OTAs to prototype commercial technology. The statutory authority behind the Commercial Solutions Offering Process, which is illustrated in figure 6 below, allows DIUx to mirror the contracting practices that commercial companies normally use—intended to enable DIUx to design projects, and negotiate payment milestones, terms and conditions, and intellectual property rights for a desired completion period of within 60 days.

Figure 6: Notional Depiction of the Defense Innovation Unit Experimental (DIUx) Commercial Solutions Opening Process to Award Other Transaction Agreements



Source: GAO presentation of DIUx data. | GAO-17-644

According to the DIUx Commercial Solutions Opening How-To Guide, the process begins with DIUx posting technology areas of interest on its website. Interested companies submit a short briefing online describing the proposed technology and information about the company. DIUx evaluates the briefs and if DIUx is interested in learning more, it may invite companies to pitch their products in person and then submit a full proposal. After a merit-based evaluation, DIUx officials select proposals to pursue and negotiate the terms and conditions of proposed projects, and, through the Army Contracting Command-New Jersey, awards OTAs. DIUx generally uses a combination of price analysis methods, such as a company price list or previous government or commercial contract prices to determine whether a price is acceptable.

Due to the volume of companies submitting proposals, DIUx has decided to prioritize its selections to the following five research and development areas: artificial intelligence and machine learning, autonomy, human systems, information technology, and space. As of March 31, 2017, DIUx has awarded 25 agreements for a total value of \$48.4 million.²⁴ According to a DIUx official, prior to the fiscal year 2017 continuing resolution, DIUx awarded agreements in an average of 59 days. Due to funding constraints during the continuing resolution, DIUx's average increased to

²⁴In some cases, DIUx can award traditional companies OTAs.

121 days. DIUx is now working to reduce that average back to 60 days. The director stated that DIUx's most recent agreement, which started while under the continuing resolution, was awarded in 75 days. Projects funded include high-speed unmanned aircraft, network security detection, automated text analysis, and communication devices. For example, DIUx partnered with the Air National Guard to award an agreement with a non-traditional company to adapt a wireless, hands and ears-free, commercially available device as a communicator for warfighters. The Air National Guard was looking for a solution to replace existing communication tools, which add weight to a warfighter's load, occupy their hands, and restrict visibility.

Military Services Are Taking Steps to Reduce Contracting Cycle Times

The military services have also initiated efforts to streamline or standardize their contracting processes, one of the major challenges identified by non-traditional companies. For example, the Naval Sea Systems Command conducts analyses of its award cycles times and has undertaken initiatives to streamline them. In addition, the Air Force has focused its efforts on reducing the time it takes to award sole source contracts for sole source acquisitions valued between \$50 million and \$500 million. Between fiscal year 2014 and 2016, it reduced the time needed to award a contract from 16.1 months to 12.8 months, or by 20 percent.

According to an Air Force official, the Air Force initiated several efforts to improve the contract cycle times, including (1) early coordination between companies and Air Force contracting officials, the Defense Contract Management Agency, and Defense Contract Audit Agency to help companies improve their proposals and reduce the amount of re-writing; and (2) an emphasis on training engineers who help evaluate the technical details of proposals. Previously, the Air Force found that the engineers had technical knowledge about technologies or products, but were not as knowledgeable or familiar with how to document their evaluations to aid contracting officers during the contract negotiation process. Air Force officials stated that the Air Force's goal is to further reduce the contracting timeframe to less than 11 months in fiscal year 2017 by ensuring all contracting offices are following best practices and collecting additional lessons learned.

In October 2016, the Assistant Secretary of the Army for Acquisition, Logistics and Technology issued a memorandum directing improvements to the Army's contracting processes by eliminating redundant layers of management and oversight, improving accountability and transparency, and improving the contracting workforce and workload. For example, the memorandum stated that there are over 350 documents that potentially need to be included in a contract file, many of which are redundant. This inefficiency results in time spent on non-value-added activities instead of negotiating good business deals and conducting adequate post-award administration. The memorandum also states that more robust source selection guidance, sharing of best practices, and enhanced training may help drive more streamlined practices, reduced timelines, and better outcomes.

The Army Contracting Command expects contracting officers and contract specialists to track their ability to meet various acquisition milestones and to communicate closely and often with their customers when establishing and adjusting milestones. According to an Army Contracting Command official, Army leadership plans to identify trends and areas of opportunity where contracting activities can be streamlined. One effort already directed by the Assistant Secretary of the Army for Acquisition, Logistics and Technology is to improve the customer's ability to prepare a complete contract request package because inadequate or missing contract request documents significantly impact the contracting process, causing rework and delays in contract award timelines.

In June 2017, we issued a report that examined the Army's contracting operations and found that top Army leaders focus their contracting reviews on efforts to obligate funds before they expire, competition rates, and small business participation.²⁵ Leaders have not consistently evaluated the efficiency and effectiveness of the Army's contracting operations. While Army leaders, including successive Assistant Secretaries of the Army for Acquisition, Logistics, and Technology, have acknowledged a need for improvements in contracting since 2012 and have taken positive intermittent steps to do so, the leaders did not sustain the efforts or—alternatively—provide a rationale for not doing so. Among other things, we recommended that the Secretary of the Army establish and implement metrics to evaluate the timeliness of contract awards and

²⁵GAO, *Army Contracting: Leadership Lacks Information Needed to Evaluate and Improve Operations*, [GAO-17-457](#) (Washington, D.C.: June 22, 2017).

to document the rationale for key decisions. DOD concurred with the recommendations.

Agency Comments

We are not making recommendations in this report. We sent a draft of this report to DOD for advance review and comment. In response, DOD informed us that it had no comments on the report.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Secretaries of the Air Force, Army, and Navy; the 15 companies we selected to prepare this report; and other interested parties. In addition, this report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff has any questions concerning this report, please contact me at (202) 512-4841 or sullivanm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix II.



Michael J. Sullivan
Director
Acquisition and Sourcing Management

Appendix I: Objectives, Scope, and Methodology

This report describes (1) key challenges identified by non-traditional companies when trying to do business with Department of Defense (DOD) and (2) actions DOD is taking to address them. For the purposes of this report, we define non-traditional companies as those that do not typically sell or develop products for DOD.

We analyzed DOD and industry research and development spending from 1987 to 2013 to describe changes in spending over time. We obtained data on DOD research and development outlays from the White House Office of Management and Budget Summary of Outlays for the Conduct of Research and Development: 1949-2017. We obtained information on industry research and development spending from the National Science Foundation Survey of Industrial Research and Development and the National Science Foundation and U.S. Census Bureau Business Research and Development and Innovation Survey. To adjust for inflation, we converted then year dollars to 2017 dollars using the research and development deflator in the National Defense Budget Estimates for 2017 (Green Book). Private sector investment could include funding from DOD.

To identify the challenges that non-traditional companies face when trying to do business with DOD, we first conducted a literature review. Our literature review included previous reports from GAO, think tanks such as the Brookings Institute and RAND Corporation, and the Defense Business Board, as well as testimonies delivered at congressional hearings. We then reviewed the documentation to identify challenges and to help inform interview questions posed to company representatives from 12 non-traditional companies to learn about their experiences in pursuing DOD business.

We selected these 12 companies based on several factors, including the extent to which the company had conducted business with DOD, company size, and the types of technologies they have developed. Specifically, we selected companies that had few or no contracts with DOD from fiscal year 2010 through 2016 based on the number of contracts awarded to the company from the Federal Procurement Data

System-Next Generation system. We selected large companies that are on the Fortune 500 list and smaller companies that are not on that list to ensure that we considered various perspectives of the challenges faced. We also considered whether companies were developing products in key technology areas identified in the Defense Innovation Initiative, including data analytics, cybersecurity, autonomous vehicles, and space launch vehicles.¹ We used industry reports and information from company web sites to identify companies developing relevant technologies. To aid in our company selection, we conducted interviews with technology and industry experts at various think tanks and venture capital firms, along with DOD officials. We also reviewed industry lists of top small innovative companies, such as Fortune's "These Big Data Companies are Ones to Watch," Fast Company's "The World's Top 10 Most Innovative Companies in Robotics."² As a result of our research and these discussions, we selected 12 innovative companies to include in our review. Five companies asked to remain anonymous. The other companies include:

Small companies

- Cylance, Inc., a cybersecurity company
- DreamHammer Products LLC, a drone management platform company
- MotionDSP, Inc., a video software company
- Liquid Robotics, Inc., an autonomous vehicle company

Large companies

- Amazon Web Services, Inc., a data analytics company
- Microsoft Corp., a data analytics company
- Palantir Technologies, a data analytics company

With each of the companies, we interviewed senior representatives that were knowledgeable about their business in defense and commercial markets. We asked company officials to discuss the similarities and

¹DOD has identified these technologies and others through its Defense Innovation Initiative. The initiative is intended to help advance U.S. military superiority.

²K. Noyes, "These Big Data Companies are Ones to Watch," *Fortune*, (2014); E. Sofge, "The World's Top 10 Most Innovative Companies in Robotics," *Fast Company*, (2014).

differences in selling their products to DOD and commercial customers. Companies provided specific examples of contracts or experiences they have had with DOD and commercial companies to illustrate similarities, differences, and challenges. Where possible, companies provided relevant documentation to support their examples. We analyzed the interview responses and supporting documentation and identified over 20 challenges. We then grouped these into six overarching challenges that nearly all of the non-traditional companies said they faced when trying to doing business with DOD.

The statements expressed by participants represent the perspective of these companies and cannot be generalized because we used a non-probability method to select companies for the sample. We also obtained information on challenges mentioned by reviewing DOD studies, as well as through discussions with senior representatives from three traditional companies (The Boeing Company, Honeywell International, Inc., and another company that asked not to be identified). The traditional companies provided quantitative information about the challenges and also identified potential challenges that non-traditional companies could face based on their own experiences. We provided company representatives an opportunity to review a summary of the challenges section of this report and incorporated their comments, as appropriate.

In addition, we spoke to knowledgeable acquisition and contracting officials within the Office of the Secretary of Defense and the military services. Among others, DOD officials included two senior acquisition executives, the Director of Defense Procurement and Acquisition Policy, the Director of Defense Pricing, acquisition officials from nine program executive offices, contracting officials from six program executive offices, and officials from the Office of Small Business Programs, the Strategic Capabilities Office, the Defense Contract Management Agency Cost and Pricing Center, and the Defense Innovation Unit Experimental (DIUx).

To determine DOD efforts to address the challenges described by non-traditional companies, we first examined the National Defense Authorization Acts for Fiscal Years 2016 and 2017 and identified several provisions that may address the six overarching challenges identified by non-traditional companies. We obtained status documentation or updates from various DOD organizations related to its efforts to implement the provisions. Second, we collected and reviewed documentation on new DOD-wide efforts aimed at addressing specific challenges, including DIUx. This organization is DOD's primary effort to identify promising technologies developed by non-traditional companies and then to help

facilitate business deals between those companies and DOD organizations. Third, we met with senior DOD personnel and acquisition professionals from across the three military service departments and the Office of the Secretary of Defense to identify military-specific initiatives focused on addressing some of the cited challenges and collected pertinent documentation on these efforts.

We conducted this performance audit from June 2015 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Michael J. Sullivan, (202) 512-4841 or sullivanm@gao.gov

Staff Acknowledgments

In addition to the contact named above, Cheryl Andrew (Assistant Director), Sameena Ismailjee (Analyst in Charge), Emily Bond, Kurt Gurka, Joe Hackett, Jeff Hartnett, Alexandra Stone, Michelle Vaughn, Nate Vaught, and Robin Wilson made key contributions to this report.

Appendix III: Accessible Data

Data Tables

Accessible Data for Highlights: Defense Innovation Unit Experimental (DIUx) Other Transaction Award Process

- 1) Start
 - a) DIUx posts a Technology Area of Interest
- 2) 60 days on average
 - a) Companies submit short solution briefs
 - b) DIUx evaluates each brief
 - c) Full proposals submitted
 - d) Funding awarded
- 3) Finish

Source: GAO presentation of DIUx data. | GAO-17-644

Accessible Data for Figure 1: Notional Characteristics of the Three Types of Products Procured by DOD

- 1) Commercially Available Products
 - a) No government development funding
 - b) Fixed-type contract
 - c) Fewer contract terms and conditions
- 2) Commercial Products Further Developed for DOD's Use
 - a) Some government development funding
 - b) Fixed or cost-type contract
 - c) Additional contract terms and conditions can apply

3) Military-Unique Products

- a) All or significant amount of government development funding
- b) Cost-type contract
- c) Larger number of contract terms and conditions can apply

Source: GAO presentation of Federal Acquisition Regulation and Department of Defense (DOD) acquisition information. GAO-17-644

Accessible Data for Figure 2: DOD and Private Sector Research and Development Spending

Year	US Domestic Industry R&D (adjusted to 2017 dollars - formula in cell)	Base Year FY 2017 DOD RDT&E (adjusted to 2017 dollars - formula in cell)
1987	113625.09	68647.30
1988	118591.25	67648.52
1989	125556.88	68954.56
1990	134257.98	67584.73
1991	144166.80	60300.81
1992	146224.63	59132.46
1993	144457.85	61692.12
1994	145427.46	56977.09
1995	159383.89	55301.45
1996	174122.30	56730.94
1997	189546.03	56996.74
1998	203245.97	56259.29
1999	223721.45	55760.76
2000	248361.86	55759.30
2001	247417.80	59004.28
2002	233816.86	63554.68
2003	236583.03	74143.82
2004	237088.64	82391.88
2005	250122.46	86512.37
2006	266069.09	87007.74
2007	282418.25	89698.59
2008	331448.12	90765.11
2009	317706.93	93250.11
2010	309564.40	89880.29
2011	315821.55	86697.50
2012	324570.11	80532.80
2013	341444.00	75285.84

Accessible Data for Figure 3: Number of Days DOD Operated Under a Continuing Resolution in Fiscal Years 2010-2017

Fiscal year	Days not under a continuing resolution	Days under a continuing resolution
2010	286	79
2011	169	196
2012	282	83
2013	189	176
2014	257	108
2015	289	76
2016	287	78
2017	149	216

Accessible Data for Figure 4: Average Time to Complete Air Force Contracting Activities for Sole Source Contracts Valued between \$50 Million and \$500 Million in Fiscal Year 2016

- 1) Solicitation Issued 0 Days
 - a) 146 Days
 - i) Company Develops Initial Proposal
 - b) 44 Days
 - i) Company Revises Proposal Based on DOD Feedback
 - c) 119 Days
 - i) Air Force and other DOD Organizations Review and Evaluate Company Proposal
 - d) 62 Days
 - i) Air Force Negotiates with Company and Awards a Contract
- 2) Contract Award 371 Days

Source: GAO presentation of Air Force data. GAO-17-644

Accessible Data for Figure 5: Change in the Distribution of DOD's Contracting Workforce Based on Years to Retirement Eligibility

	Over 25 years to retirement	21-25 years to retirement	16-20 years to retirement	11-15 years to retirement	6-10 years to retirement	1-5 years to retirement	Eligible for retirement
2008	2,907	1,546	1,953	2,757	4,097	4,497	3,812
2008	13.5%	7.2%	9.1%	12.8%	19.0%	20.8%	17.7%
2016	3,174	4,498	3,498	3,286	3,419	3,675	4,301
2008	12.3%	17.4%	13.5%	12.7%	13.2%	14.2%	16.6%

Accessible Data for Figure 6: Notional Depiction of the Defense Innovation Unit Experimental (DIUx) Commercial Solutions Opening Process to Award Other Transaction Agreements

- 1) Start
 - a) DIUx posts a technology area of interest
- 2) 60 days on average
 - a) Interested companies submit short solution briefs
 - b) DIUx evaluates each brief within 30 days of receipt
 - c) Selected companies present and submit full proposals
 - d) DIUx negotiates with selected companies and awards funding
- 3) Finish

Source: GAO presentation of DIUx data. GAO-17-644

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